

Grassy bush

Lowland grassland

Highland grassland

Grassy woodland and forest



About this kit

This kit discusses a number of grassy bush types and provides guidelines for managing them. 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 that can be modified to suit your particular circumstances and needs.

Grassy bush is bush with an understorey dominated by native grasses. The grassy bush types covered in this kit are:

Lowland grassland

Highland grassland

Grassy woodland and forest.

Included in this kit are:

- A description of each of the grassy bush types and where they tend to be found.
- Public places where you can see good examples of each of the grassy bush types.
- The significance of grassy bush in terms of conservation and biodiversity, and some of the threatened species that may be found in it.
- The management issues relevant to grassy bush. The management guidelines included are those that are specific to grassy bush. Where no specific guidelines are given use the general principles outlined in **Kit 2 Managing Your Bush**.
- The likely causes of rural tree decline and some ways of managing it.

When you have read the guidelines for grassy bush you will probably need to reread **Kit 2 Managing Your Bush**. This kit contains more detailed information on the principles and practices of managing remnant native vegetation. 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.**

Looking after grassy bush types

This kit refers to a number of grassy bush types: lowland grassland, highland grassland, and grassy woodland and forest. The most important characteristic of these bush types is an understorey dominated by native grasses such as silver tussock grass, kangaroo grass, wallaby grass or spear grass. Saggis and sedges may also be common.

Lowland grassland

Native grasslands have few or no trees. Before European settlement native tussock grasslands occurred on many of the fertile plains between Launceston and Hobart. A superficial resemblance to European pasture made both the northern and southern Midlands and the lower Derwent Valley attractive to early settlers. The lowland tussock grasslands have been heavily cleared and today only small patches remain in places like country cemeteries and road reserves. Some larger areas of lowland native pastures are still found on grazing properties where they are valued for the high quality wool produced by sheep grazing on them.

Lowland grasslands are of two types: lowland silver tussock grassland or kangaroo grass tussock grassland, both of which are endangered.

LOWLAND SILVER TUSSOCK GRASSLAND is generally found on alluvial river flats less than 600 m above sea level. It also occurs in coastal areas on sand ridges or next to wetlands, where it is usually the result of excessive burning of shrubby coastal vegetation. The dominant grass is silver tussock (*Poa labillardierei*) which is a narrow-leaved species that forms dense tussocks up to 1 m in height. Lowland silver tussock grassland usually occurs in association with black gum (*Eucalyptus ovata*) grassy woodland.

Many farmers value these river flat grasslands for the shelter they provide newly shorn sheep or lambs. They are also important for erosion control during floods. Lowland grassland is probably the Tasmanian vegetation type that has undergone the most destruction since European settlement. The remnants of this community in the Midlands are of particularly high conservation significance as they have concentrations of rare and threatened species. Every remnant – no matter how degraded – is important.

KANGAROO GRASS TUSSOCK GRASSLAND is found on well-drained, fertile valley floors in low rainfall, low altitude areas. It is also found on shallow soils on well-drained hill tops and ridges on basalt, dolerite and deep sands. It is dominated by kangaroo grass (*Themeda triandra*) which is a deep-rooted, summer-growing, perennial grass. It has a distinctly-shaped flowering head and its foliage is red-green during the non-growing season. Other common grasses of kangaroo grass tussock grassland include wallaby grass, weeping grass and tussock grass. Kangaroo grass tussock grasslands are often characterised by a rich variety of lilies, orchids, daisies and other herbs in the patches between the tussocks. They are rich in rare or threatened species. Kangaroo grass tussock grassland is one of Tasmania's most endangered vegetation types.

Highland grassland

Highland grasslands are found in fertile valleys and plains between 600 m above sea level and the lower limit of alpine vegetation (approximately 1000 m above sea level). Many of the original upland tussock grasslands survive though often in a degraded state. The dominant grass is silver tussock (*Poa labillardierei*) which is a narrow-leaved species that forms dense tussocks up to 1 m in height. In some cases, such as at Paradise Plains in the north east highlands, the grassland has replaced rainforest after fire. In most cases it seems that it has occupied the plains for thousands of years.

All of these highland grasslands have been used for stock grazing and most are still used for this purpose. The lower altitude plains on the Central Plateau have been partly converted to

improved pasture, a conversion that is still continuing. Only a small proportion of highland grassland is managed to maintain biodiversity. While introduced grasses and herbs are found in most areas of highland grassland, the number of different species is still high and spectacular wildflower displays can be seen at places such as the Vale of Belvoir and Middlesex Plains.

Grassy woodland and forest

Grassy woodland and forest is one of the most characteristic bush types of the Midlands and central east coast. It occurs naturally on fertile soils, usually in low rainfall areas. The trees in woodland are spaced such that the gaps between their crowns are wider than the crowns. The crowns are closer together in forest. The terms grassy woodland and forest are used interchangeably and the management guidelines apply to both. The understorey of grassy woodland and forest is dominated by a diversity of grasses, saggs, sedges, lilies, daisies, orchids, peas and other wildflowers. The canopy can be dominated by white gum (*Eucalyptus viminalis*), cabbage gum (*Eucalyptus pauciflora*), black gum (*Eucalyptus ovata*), black peppermint (*Eucalyptus amygdalina*), silver peppermint (*Eucalyptus tenuiramis*), swamp peppermint (*Eucalyptus rodwayi*), blue gum (*Eucalyptus globulus*), or gum-topped stringybark (*Eucalyptus delegatensis*). In montane regions grassy forests often occur adjacent to grassy plains. Areas of sedge forest may occur on poorly drained sites within grassy woodland and forest. They are generally managed in the same way as the surrounding grassy bush.

Grassy woodland and forest can intergrade with heathy woodland and forest. If there is a dominant heathy component in the understorey then the management is different to that of grassy bush and you should refer to **Kit 8 Eucalypt Bush**.

Grassy bush is used for rough grazing and is an important part of farming enterprises. Much of this bush has been cleared for crops, pasture and housing.

Good examples

Township Lagoon Nature Reserve at Tunbridge has good examples of both types of LOWLAND GRASSLAND. The adjacent paddocks are cabbage gum (*Eucalyptus pauciflora*) grassy woodland. The best time to visit is in spring when there is a profusion of wildflowers. The Tunbridge area has one of the highest concentrations of threatened plant species anywhere in Tasmania. Lowland silver tussock grassland is found on many river flats, including the Macquarie, South Esk, St Pauls and North Esk Rivers.

HIGHLAND GRASSLAND can be seen at Middlesex Plains and the Vale of Belvoir near Cradle Mountain, and at Paradise Plains in the north east. Montane grassy forests can be seen in the vicinity of these plains.

GRASSY WOODLAND AND FOREST can be seen on the Domain in Hobart and in the Trevallyn State Recreation Area in Launceston. They are also widespread on north Bruny Island. The rest area on the Midland Highway near St Peters Pass is an excellent and typical example of grassy forest, with white gums, cabbage gums and a diverse understorey. This area has not been burned frequently and it has a dense understorey of small trees such as prickly box.

Biodiversity values

Grasslands and grassy woodland and forest are some of the bush types that have been most extensively cleared and modified. They are an extremely high priority for conservation, especially for threatened animal and plant species. A number of Tasmanian grassland plant species are extinct, and so is the Tasmanian emu that once lived in grassland habitat.

EXTINCT OR THREATENED ANIMALS OF GRASSY BUSH TYPES INCLUDE:

Thylacine (<i>Thylacinus cynocephalus</i>)	EXTINCT
Tasmanian emu (<i>Dromaius novaehollandiae diemensis</i>)	EXTINCT
Ptunnara brown butterfly (<i>Oreixenica ptunnara</i>)	
Eastern-barred bandicoot (<i>Perameles gunnii</i>)	
Swift parrot (<i>Lathamus discolor</i>)	
Forty-spotted pardalote (<i>Pardalotus quadragintus</i>)	
Green and gold carabid (<i>Catadromus lacordairei</i>)	
Geometrid moth (<i>Chrysolarentia decisaria</i>)	

THREATENED PLANT SPECIES OF GRASSY BUSH TYPES INCLUDE:

Austral thorn bush (<i>Discaria pubescens</i>)
Bitter cryptandra (<i>Cryptandra amara</i>)
Black-tipped spider orchid (<i>Caladenia anthracina</i>)
Bush pea (<i>Pultenaea prostrata</i>)
Gaping leek orchid (<i>Prasophyllum correctum</i>)
Graceful leek orchid (<i>Prasophyllum pyriforme</i>)
Grass cushions (<i>Isoetopsis graminifolia</i>)
Gunns mignonette (<i>Stackhousia gunnii</i>)
Hairy cutleaf daisy (<i>Brachyscome rigidula</i>)
Hoary sunray (<i>Leucochrysum albicans</i> var. <i>tricolor</i>)
Knawel (<i>Scleranthus diander</i>)
Knawel (<i>Scleranthus fasciculatus</i>)
Lanky buttons (<i>Leptorhynchos elongatus</i>)
Native soybean (<i>Glycine latrobeana</i>)
Roadside wallaby grass (<i>Danthonia popinensis</i>)
Rough raspwort (<i>Haloragis aspera</i>)
Slender leek-orchid (<i>Prasophyllum pyriforme</i>)
Slender tick trefoil (<i>Desmodium gunnii</i>)
Spur velleia (<i>Velleia paradoxa</i>)
Swamp wallaby grass (<i>Amphibromus macrorhinus</i>)
Tunbridge buttercup (<i>Ranunculus prasinus</i>)
Tunbridge leek-orchid (<i>Prasophyllum tunbridgense</i>)
Yellow eyebright (<i>Euphrasia scabra</i>)

Refer to **Kit 5 Threatened Plant Species in Your Bush** for more information and an illustration of each plant.

Management issues

Fire and grazing are the main tools used to maintain the health of native grassy bush. In many cases fire is not essential as grazing by stock or native animals performs a similar role of reducing the competition from dense grasses. One of the main aims of managing grassy bush is to retain a rich and diverse flora by maintaining the gaps between the tussocks. Once the grass becomes rank and dense, the gaps between the tussocks disappear. As a result wildflowers, trees and shrubs fail to flower and set seed, and eventually they become sparse or disappear. Grassy bush may have over 50 different species in an area of 10 square metres but once the inter-tussock gaps close up this may drop to as low as 10-15 species. Both fire and grazing can be used to maintain the gaps between the tussocks.

Weed invasion is also a critical issue in grassy bush, particularly for woody weeds such as broom and gorse. Some native woody species such as prickly box and silver wattle can also become dense in native pastures and may be considered weeds by landowners. The invasion of native pastures by both native and introduced woody shrubs leads to changes in the structure of the vegetation. It can be a serious management issue because the quality of the pasture is reduced and wool can be contaminated by twigs, seeds and other woody material. In some districts gorse is tolerated by landowners because of the valuable shelter it provides for stock in the absence of native shrubs. It can also provide an important habitat for bandicoots by providing protection from cats and dogs.

Rural tree decline is one of the most pressing management issues of grassy bush. Vegetation types with grassy understories are the most affected by dieback or rural tree decline and white gums are the most affected of all the eucalypts.

Grazing

Grazing management will depend on the management aims and the condition of the bush. Some general guidelines are outlined below.

- Do not set stock or stock heavily for extended periods. Native grasslands and grassy woodlands and forests tolerate moderate levels of grazing but their condition deteriorates at high stocking levels. The highly palatable kangaroo grass is eliminated from native pasture at high stocking levels and heavy cattle grazing can eliminate silver tussock grass. Do not stock at levels that cause a loss of tussocks and an increase in the amount of bare soil.
- Reduce the rank growth of grasses by crash grazing or burning. Crash grazing is a technique where a mob of sheep is put into an area to graze it heavily for a short period of time.
- If annual grasses and broad-leaved weeds are a problem stock heavily during early spring to reduce the seed set of weeds. Late winter and early spring is the main growing and flowering period for annual grasses and broad-leaved weeds. Burning in spring can achieve the same effect.
- Spell grassy bush over late spring and summer. Some of the healthiest and most diverse areas of grassy bush are those that are spelled in late spring and summer. This allows grasses, herbs and shrubs to flower and set seed.
- Stock grassy bush after the autumn break. Use your native pastures and bush runs for autumn and winter grazing.
- Do not graze too soon after burning. Grazing stock too soon after a fire will eliminate the regenerating seedlings. Do not graze until the new plants are out of the reach of stock.
- Limit access to sensitive areas through strategic fencing. This includes areas with grazing-sensitive threatened species, north-facing slopes where soil erosion is a major problem, and where the regeneration of trees and shrubs is needed. Grazing-sensitive threatened species include austral thornbush (*Discaria pubescens*), Gunns mignonette

(*Stackhousia gunnii*), young seedlings of Midlands wattle (*Acacia axillaris*), and peppergrass (*Lepidium hyssopifolium*). See **Kit 5 Threatened Plant Species in Your Bush** for more details on these species.

Fire

Fire is often used in grassy bush to produce green-pick for stock. Fire can also be used to control silver wattle and prickly box if they become too dense. It is also an important method of managing woody weeds.

- Autumn is the best season to burn for most species. Most of the plants and animals have completed their life cycle in autumn and conditions are more likely to be suitable for a controlled burn. Burning in spring and summer will stop flowering and seed set for that season. Spring burning could be useful for the control of weeds, particularly annual grasses.
- Burn grassy bush when the gaps between the tussocks start to close up. Intervals of 2-5 years between fires are recommended in ungrazed native grasslands to maintain the inter-tussock gaps. Highland silver tussock grasslands need less frequent fires than the lowland communities because of their slower growth rates. The recommended interval for highland grassland is 5-20 years. Grassy woodlands and forests also need less frequent fires than grasslands. Recommended fire intervals are 4-10 years for grassy woodlands and 6-18 years for grassy forests. However, this is only a guide and the appropriate interval will vary from situation to situation.
- Fairly hot burns are better than cool burns in most situations. The fire should at least remove all the ground litter.
- Don't burn if fire-sensitive threatened species are present. If you have Midlands wattle (*Acacia axillaris*) on your property it can be eliminated by fire, unlike most wattles. The role of fire in the regeneration of austral thornbush (*Discaria pubescens*) is not clear. It resprouts after some fires but the young shoots are highly palatable and the resprouting stems and leaves are heavily browsed. It is best to seek expert advice from the Threatened Species Unit of the Department of Primary Industries, Water and Environment if you wish to burn the riparian (i.e. riverside) grassy forests where austral thornbush is found.

Weeds

White gum woodlands are used extensively as bush run country in the Midlands. They are occasionally top-dressed with superphosphate and aerially seeded with pasture species. As a result these sites are often weedy and gorse can be a major problem. Annual weedy grasses and herbs are present even in remnants that are in excellent condition but they are only a problem when they are at high levels.

The weeds listed below are the common weeds found in grassy forest that threaten biodiversity. **Kit 3 Weeds in Your Bush** provides information on the control of these weeds.

Woody shrubs such as gorse, broom and Spanish heath are the most serious weeds. Gorse is widespread in much of the grassy bush run country.

Introduced grasses such as browntop bent, Yorkshire fog-grass and cocksfoot are widespread in native grassy understories. A number of farmers have commented that hairs-tail grass has been invading aggressively in the past few years.

Horehound has become invasive in the past decade and is a serious problem for wool growers. It tends to establish where sheep camp. Other common herbaceous weeds include yellow daisies such as flatweed, hawkbit and dandelion.

Managing by condition

The best management regime for grassy bush will depend on the condition of the bush. Management guidelines based on the condition of the bush are given below. However, the specific needs of threatened plants may override these recommendations. If you are unsure what condition your bush is in refer to **Kit 1 Bush on Your Farm**.

Excellent condition

Grassy bush in excellent condition is characterised by:

- A rich diversity of species and a mixture of dominant grasses, including kangaroo grass, wallaby grass, weeping grass, tussock grasses and wheat grass. There is a rich variety of wildflowers.
- Inter-tussock spaces (gaps between the grass tussocks) that are important areas for the germination of trees, shrubs and wildflowers.
- A cryptogamic mat (a mat of lichens and mosses) on the soil surface. This protects the soil from erosion, helps the infiltration of water, helps nutrient recycling, and plays a role in seed germination.
- Low levels of weed invasion.
- Young trees of different ages.

Bush in excellent condition is an asset. Maintain your current management. There is no need to change your farming practices unless there is an obvious reason to do so. Recommendations for grazing and fire management are given below. However, other aspects of your farm may affect what is practical and the particular requirements of threatened plants may override these recommendations.

Ungrazed native grasslands and grassy woodland and forest will need some form of regular management to reduce the growth of grasses and maintain the gaps between the tussocks. This can be achieved by occasional crash grazing so that the rank grasses are reduced to a short sward. Burning can also result in a healthy grassland. A hot burn in autumn is preferable. It will probably be needed about every three years to maintain the gaps. Mowing or slashing is an option in the short term but unless the grass clippings or hay are removed they will cover the inter-tussock gaps and suppress germination of the native species and favour the invasion of weeds.

An active weed control program, particularly of gorse and broom, is vital for maintaining the integrity of grassy bush.

Tree planting is undesirable and is not needed in grassy bush in excellent condition.

Good condition

Grassy bush in good condition is characterised by:

- A lack of inter-tussock spaces.
- Weed invasion. Native pastures and bush runs are occasionally top-dressed with superphosphate and aerially seeded with pasture grasses and clovers. As a result these sites are often weedy. Gorse can be a major problem, as can annual grasses and herbs.
- Many areas of bare soil, especially on the warm north-facing slopes preferred by stock.

Management will need to focus on reducing the stocking levels so that the bush can recover. Destocking may be the best option in some situations. This will also reduce the risk of soil erosion by restoring a perennial grass cover. You may decide to limit access to sensitive areas through strategic fencing. Sensitive areas include areas with highly palatable threatened species and north-facing slopes where soil erosion is a major problem.

Poor condition

Grassy bush in poor condition is characterised by:

- Little diversity in the ground cover.
- Many patches of bare ground.
- No cryptogamic mat to protect the soil.
- Severe weed problems.
- Soil compaction with poor water infiltration.
- No regeneration of trees and shrubs in the forests and woodlands.

Threatened species are often found in grassy bush in poor condition. The species found tend to be those that need disturbance as part of their life cycle. For example, curly sedge (*Carex tasmanica*) is often found where there has been digging or other soil disturbance and where there is only a handful of native species. Peppergrass (*Lepidium hyssopifolium*) is another threatened plant that thrives on disturbed soils with very low levels of stock grazing. If your bush has threatened species it is best not to change your management regime without advice from the Threatened Species Unit of the Department of Primary Industries, Water and Environment.

If your poor quality grassy bush does not contain threatened species, you will probably need to change the pattern and intensity of stocking by spelling it over spring and summer. Weed control is a major management issue in degraded native pastures and grassy woodlands and forests. In many cases it may be a matter of learning to live with most of the weeds and directing your management to favour the native species so that they eventually dominate.

Consider rehabilitating the area, including treating the eroded areas, direct seeding of trees and shrubs, and controlling weeds. **Kit 3 Weeds in Your Bush** and **Kit 4 Revegetating Your Farm** provide information on managing weeds and revegetation.

Rural tree decline

Over the past 20 years many isolated paddock trees and eucalypts in the bush remnants of the Midlands have died. In some areas almost every tree is dead. As no regeneration is taking place in these areas, they will remain treeless unless action is taken.

White gum is the tree most affected by dieback. However, black gum, candlebark, black peppermint, swamp peppermint, silver peppermint, cabbage gum, blue gum and gum-top stringybark are also affected. These forest types generally have grassy understories.

Many theories exist on the cause of rural tree decline. However, the most likely causes are given below.

- **LOW RAINFALL** over the last two decades is a major factor, especially in areas where the average annual rainfall is below 625 mm (25 inches). Low rainfall areas of the state have often experienced dry conditions in summer and autumn without compensating winter and spring rain. During the last 20 years it has been common to see little rainfall for two successive months during summer and autumn. This is unprecedented in the meteorological records.
- **CHANGES IN THE ENVIRONMENT AROUND TREES** due to clearing, fertilising and grazing. The stress of drought on trees is greatly increased if the area around them is cleared and grazed. Lone trees or trees near the edges of patches of remnant native vegetation experience higher winds at ground level and more sunshine, especially if they are on the upwind and sunny side of the bush. Therefore, evaporation is higher and the trees transpire more. Frost effects are also greater. Larger bush remnants are much less affected by tree decline than smaller remnants.
- **STOCK GRAZING** increases the evaporation from soil by removing the ground cover. This leads to higher soil temperatures and greater soil moisture loss. Stock compact the soil, especially under shade trees, causing reduced water infiltration (seepage into the soil) and more runoff. The loss of soil micro-organisms and damage to the fine feeder roots further stresses the trees. As soil nutrient levels increase so do leaf nutrient levels. This makes the leaves more palatable and nutritious to possums and insects.
- **THE END OF THE POSSUM FUR TRADE** and the increased availability of food through improved pastures and stock water supplies have allowed populations of brushtail possums to explode. The browsing of foliage can be the final blow for severely drought-stressed trees.
- **INSECT ATTACK** tends to be local and sporadic but when it happens it is usually severe. Possums and insects are most attracted to new growth at the ends of branches and the shoots on the trunk and branches (the epicormic growth). Epicormic shoots are a sign that the tree is trying to recover from stress, often using its last reserves of energy. Browsing of these shoots can be the last straw.
- **NOISY MINERS** are aggressive native birds that chase away other insectivorous birds. They dominate remnant stands where the understorey is sparse. Although they eat insects they do not eat as much as the usual bush birds. Noisy miners occupy a large proportion of woodlands and forests affected by dieback.
- **SELF-THINNING** can occur as stands age. Much of the dry bush in Tasmania has a greater density of trees than when the land was taken up for pasture because of changed fire and grazing practices. There is not enough water, nutrients or space to allow all the trees to reach their full size so the weaker ones die out as the stand ages. These weaker trees are generally the smaller ones.
- **THERE IS NO EVIDENCE THAT A PLANT DISEASE IS THE CAUSE** of rural tree decline.

Best bet management for rural tree decline

A serious problem in many bush remnants is the lack of tree regeneration. Drought is natural but in the past regeneration during good years made up for the loss of mature trees. Normally regeneration does not occur where the bush is set stocked. However, it does occur where the bush is only lightly grazed in late autumn and winter and spelled over spring and summer.

VERY SICK TREES

It seems almost impossible to stop sick trees dying. Many farmers say that once the bark of an affected tree splits and starts 'weeping' gum or sap the tree will be dead within a year.

Paddock Trees

Isolated paddock trees give character to the landscape and are important shelter for stock and habitat for wildlife. Most of the paddock trees are now old and are not being replaced. Fencing followed by scarification of the soil can encourage natural regeneration if the trees remain healthy enough to have seed stocks. If not, direct seeding or planting can be used.

Possum banding (placing a band of tin around the trunks of selected paddock trees) helps to protect the trees from possum browsing and allows flowering and seed set.

FENCING

Fencing off a patch of bush or fencing around paddock trees may promote regeneration by allowing seed to germinate. It will also prevent stock grazing the regenerating seedlings. When the young trees are tall enough to survive grazing the fence can be removed. For further information about fencing off bush see **Kit 2 Managing Your Bush**.

RE-ESTABLISH AN UNDERSTOREY

If you can re-establish a diverse understorey with many shrubs and a ground layer you will encourage the return of the insect-eating birds that have been scared away by the noisy miners. This can sometimes be achieved simply by fencing off the area. In other cases you might need to fence and then plant understorey species.

CONTROL POSSUM BROWSING

Controlling possum populations in bush runs by shooting is only a temporary measure. Banding isolated trees is time consuming and expensive and it may not be a solution where the trees may die of other causes. Long-term control of possum populations, if possible, can only be organised on a regional basis. Many farmers have found that the Property-Based Game Management Program run by the Department of Primary Industries, Water and Environment is an effective way of managing possum numbers.

PROMOTE CONDITIONS FOR TREE ESTABLISHMENT

Natural regeneration of trees is essential for the long-term survival of native vegetation remnants. There are many requirements for new eucalypts to establish, including a viable seed supply dropped by trees, seed in the soil or suppressed seedlings in the understorey, and light or no grazing. See **Kit 2 Managing Your Bush** for more information on encouraging natural regeneration in the bush on your property.

BURN TO REDUCE TRANSPIRATION

If you have severe rural tree decline it may be worth experimenting with using fire to reduce the number of tree deaths. Research in Hobart in the drought period of the 1980s showed that grassy woodland and forest burned immediately before the drought did not suffer the same levels of dieback. Perhaps the fire reduced the competition for water from shrubs and grasses and therefore the drought had less impact on the trees. Use long-term weather forecasts to burn your grassy bush prior to the start of a dry period. Compare the results with a similar patch of bush you did not burn.

CASE STUDY

Trying to stop dieback in forest stands

Three landowners and researchers from the School of Geography and Environmental Studies at the University of Tasmania have recently co-operated to try to work out ways of stopping dieback in remnant bush in the Midlands of Tasmania.

Three stands with trees of mixed health were selected. At St Peters Pass near Oatlands a stand of mountain gum (*Eucalyptus dalrympleana*) was chosen. At Rose Hill near Jericho a stand dominated by candlebark (*Eucalyptus rubida*) was used. At Birralea a stand dominated by white gum (*Eucalyptus viminalis*) was selected. At each stand three treatments were tried, singly, and in all possible combinations. The treatments used were possum proofing using metal girdles, fencing to exclude stock, and watering.

At Rose Hill and St Peters Pass possum proofing proved effective in slowing or reversing the dieback, which continued in the unprotected trees. At Birralea dieback was concentrated in the smaller trees but there was no effect from possum proofing.

While fencing did not affect the dieback at any of the sites the soils became less compacted and new eucalypt seedlings were found within the fences but not outside them.

Watering did not have any effect on the dieback at any site.

The results of this experiment show that the causes of dieback and the most effective treatments vary between sites. At Birralea the dieback appears to be the result of self thinning, with the bigger trees growing healthily. Nothing needs to be done here. At Rose Hill and St Peters Pass possums were major contributors to dieback. On some of the metal-girdled trees new growth below the girdle was heavily chewed whereas that above was healthy.

The lessons from this experiment are: do not worry about dieback if it only affects the smaller trees, control possum populations where larger trees are affected, and fence to enable regeneration if needed in all situations.

