

# 9

## Other bush types

**Saltmarsh**

**Dry coastal vegetation**

**Wetland**

**Buttongrass moorland**

**Heath**

**Alpine vegetation**

**Banksia scrub and woodland**

**She-oak woodland and forest**

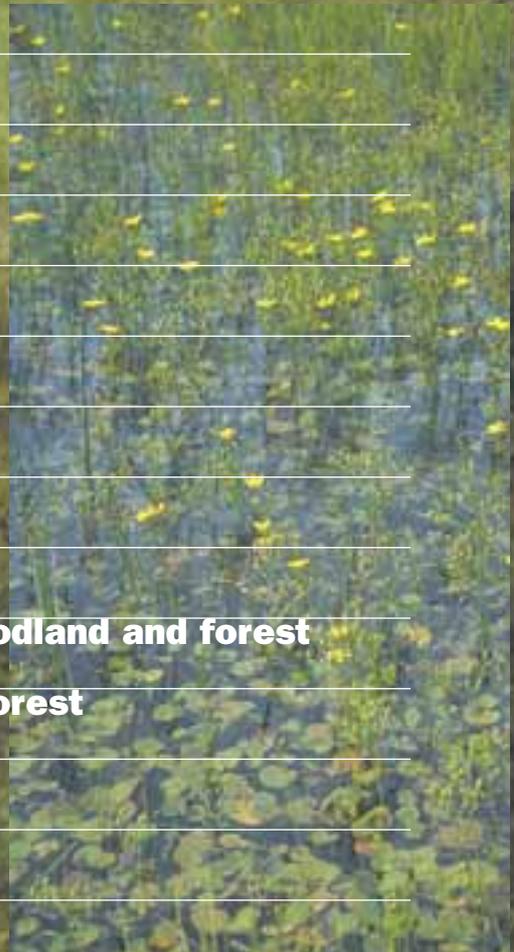
**Oyster Bay pine and South Esk pine woodland and forest**

**Tea-tree and paperbark wet scrub and forest**

**Blackwood forest**

**Dry rainforest**

**Temperate rainforest**



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## About this kit

This kit discusses a number of native bush types and gives specific 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 principles for managing each bush type. You can then modify the guidelines to suit your particular situation and needs.

The bush types covered in this kit are:

Saltmarsh
Dry coastal vegetation
Wetland
Buttongrass moorland
Heath
Alpine vegetation
Banksia scrub and woodland
She-oak woodland and forest
Oyster Bay pine and South Esk pine woodland and forest
Tea-tree and paperbark wet scrub and forest
Blackwood forest
Dry rainforest
Temperate rainforest.

Each section in this kit discusses a single bush type or a group of related bush types. This includes:

- A description of the bush type and where it tends to be found.
- Public places where you can see good examples of the bush type.
- The significance of the bush type in terms of conservation and biodiversity, and some of the threatened species that may be found in it.
- The management issues relevant to the particular bush type. The management guidelines included are those that are specific to the bush type in question. Where no specific guidelines are given use the general principles outlined in **Kit 2 Managing Your Bush**.

When you have read the specific guidelines for your bush type 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.**

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# Looking after saltmarsh

Saltmarsh occurs in areas that are periodically inundated by the sea, where the wave action is subdued and sediments are able to accumulate. It is therefore largely confined to estuaries and inlets. Near the mouths of estuaries and inlets, where the inundating water is highly saline, saltmarshes are dominated by succulent herbs and shrubs. The most common succulent herb is the beaded glasswort (*Sarcocornia quinqueflora*), and a common succulent shrub is shrub glasswort (*Sclerostegia arbuscula*). Where inflowing rivers and streams make the water less saline, tussock rushes, tussock sedges, tussock grasses and non-succulent herbs are more prominent. The saltmarsh rush (*Juncus kraussii*) is a common saltmarsh species.

## Good examples

The most accessible areas of saltmarsh in south east Tasmania are at Lauderdale, Old Beach on the Derwent River, and on the spit at Marion Bay. In the north excellent saltmarshes can be seen near Port Sorell and Bakers Beach, and near Smithton. However, saltmarshes can be seen in any part of the state in estuaries and sheltered bays.

## Biodiversity values

Saltmarsh is poorly reserved in Tasmania. It contains several rare and threatened plants including the blue wilsonia (*Wilsonia humilis*) and the saltmarsh statice (*Limonium australe*). Saltmarsh and its adjacent mudflats are used by many migratory birds, some of which are rare or threatened. Saltmarsh stabilises the coast and contributes significant amounts of organic material to estuaries. This is important for the food chain which contains the breeding stock of many commercial and non-commercial fish species. Saltmarshes in the north west and on King Island are important food sources for the endangered orange-bellied parrot (*Neophema chrysogaster*).

## Management issues

Some owners of saltmarshes have attempted to drain them for agricultural use. This usually results in salt-scalded bare ground. Saltmarshes have also been used for rubbish dumping although this practice has largely stopped. Some saltmarshes are used for stock grazing. This can result in a loss of species, soil compaction, and promotion of the few weeds that can invade saltmarsh, such as buckshorn plantain (*Plantago coronopus*). While saltmarshes generally recover well after fire (except when the fire is followed by stock grazing), fire is not necessary for their regeneration. Several estuaries in the state, most notably the Tamar estuary, have been invaded by the introduced ricegrass (*Spartina anglica*).

Ricegrass occupies the intertidal mud flats and reduces bird habitat. As it is difficult to remove once well established, it is important to destroy any colonising plants in estuaries that are largely free of the species.

The major recommendation for saltmarsh is to leave it alone. This means excluding fire and grazing.

Ricegrass invasion should be monitored closely.

Remove any ricegrass plants that colonise in areas that have not been infested previously. However, care should be taken when removing them because when a plant is broken up each of the fragments can form a new plant. **Kit 3 Weeds in Your Bush** provides more information on weeds and their management.

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# Looking after dry coastal vegetation

Dry coastal vegetation occurs on well-drained soils along the coast. It can occur on sand dunes, cliffs and rocky shores. It is dominated by plants that are confined to the coastal zone. The most common dominant species in Tasmania are sea rockets (*Cakile* species), marram grass (*Ammophila arenaria*), coast fescue (*Austrofestuca littoralis*), coast spinifex (*Spinifex sericeus*), blue daisy-bush (*Leucophyta brownii*), boobyalla (*Myoporum insulare*), coast wattle (*Acacia sophorae*), coast beard-heath (*Leucopogon parviflorus*), and coastal tea-tree (*Leptospermum laevigatum*). Sea rockets are weeds that occupy the high tide line, while the introduced marram grass occupies foredunes where it competes with native vegetation.

## Good examples

Dry coastal vegetation exists around much of Tasmania's coastline with varying degrees of invasion by weeds. In many areas clearing, grazing and shack building have led to a loss of coastal vegetation. The cliff and rocky shore vegetation in most national parks is still in good condition. However, sand dunes free from invasion by marram grass are relatively rare. The best accessible example of sand dune vegetation free of marram grass is at Friendly Beaches in Freycinet National Park.

## Biodiversity values

Dry coastal vegetation is well reserved in Tasmania. Several rare or threatened plants are found in dry coastal vegetation, which is also important for providing nesting sites for threatened birds. Birds such as the hooded plover (*Thinornis rubricollis*) and red-capped plover (*Charadrius ruficapillus*) nest just beyond the high tide mark among natural debris and sometimes in pigface (*Carpobrotus rossii*). However, they do not nest in taller vegetation, including areas infested with marram grass. The dune stabilising effect of marram grass changes the natural landscape of the beach, creating ledges of vegetation that are unsuitable nesting habitat for beach birds and sometimes making it impossible for little penguins (*Eudyptula minor*) to reach their burrows. Little penguins nest in coastal scrub and many colonies are threatened through habitat loss. Mutton bird or short-tailed shearwater (*Puffinus tenuirostris*) rookeries are also found in coastal scrub and the burrows are vulnerable to damage by stock.

All fauna listed under the Japan Australia Migratory Bird Agreement (JAMBA) and the China Australia Migratory Bird Agreement (CAMBA) are significant and include most international migratory birds and nationally listed threatened fauna. A number of rare migratory species roost and forage in coastal areas during the northern winter, including the bar-tailed godwit (*Limosa lapponica*), red knot (*Calidris canutus*), lesser golden plover (*Pluvialis dominica*), and grey-tailed tattler (*Tringa brevipes*).

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**THREATENED ANIMALS OF DRY COASTAL VEGETATION INCLUDE:**

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Hooded plover (*Thinornis rubricollis*)

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New Holland mouse (*Pseudomys novaehollandiae*)

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Little tern (*Sterna albifrons sinensis*)

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Fairy tern (*Sterna nereis*)

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Geometrid moths (*Amelora acontistica* and *Dasybela achroa*)

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**EXTINCT AND THREATENED PLANTS OF DRY COASTAL VEGETATION INCLUDE:**

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Coast banksia (*Banksia integrifolia*)

EXTINCT IN TASMANIA

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Green berry nightshade (*Solanum opacum*)

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Saltbush (*Atriplex suberecta*)

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Wiry mitrewort (*Mitrasacme paradoxa*)

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



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## Management issues

The major management issue for dry coastal vegetation is weed invasion. It is particularly susceptible to weed invasion because of the high degree of natural disturbance, its relatively high fertility, and the large number of potentially invasive weeds that occur in adjacent gardens and farmlands. One of the most threatening invasive weeds, marram grass, is still planted to stabilise dunes. Like many other invasive weeds in the coastal zone it can disperse in sea currents and is currently spreading down the west coast of Tasmania. Another weed, the sea spurge (*Euphorbia paralias*), is spreading by currents southward in Tasmania and is one of the most serious threats to coastal biodiversity. It spreads rapidly and vigorously colonises a variety of habitats such as herbfields, dry slopes and rocky shores. Invasive woody plants found in dry coastal vegetation include South African boneseed (*Chrysanthemoides monilifera*), New Zealand mirror bush (*Coprosma repens*), and South African boxthorn (*Lycium ferocissimum*). Trampling by stock and humans can destabilise coastal soils leading to increased rates of weed invasion. Stock can also introduce weeds in their faeces and on their coats.

Fire is not necessary to maintain dry coastal vegetation. Certain fire regimes can eliminate some coastal species. For example, on King Island coastal tea-tree has disappeared because the area has been burnt twice in quick succession. Fires can also lead to cliff destabilisation and the development of unnatural sand dunes. Dunes are active landforms that are regularly mobilised by natural processes. Any increase in access by people, stock or vehicles is likely to cause greater sand mobility than would occur naturally.

If your dry coastal vegetation is in excellent condition maintain your current management regime. However, be aware of the first signs of invasion by the most threatening weeds such as sea spurge, marram grass and South African boneseed. If these weeds appear eliminate them using the advice given in **Kit 3 Weeds in Your Bush**.

The condition of your dry coastal vegetation can be improved by:

- reducing or excluding stock;
- excluding fire or reducing its frequency;
- hardening and restricting access roads and pathways;
- reducing the abundance of threatening weeds by using the techniques outlined in **Kit 3 Weeds in Your Bush**;
- strategic planting of local native shrubs and grasses in degraded areas.

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# Looking after wetland

Wetlands are areas of shallow water that are usually flooded for at least part of the year. They are distributed from the coast to inland areas and may occur at low and high altitudes. They include areas of marsh, fen and peatland, and may be found in streams and around lakes. They may be natural or artificial, permanent or temporary, static or flowing, and be fresh, brackish or salty. On some farms a small wetland may simply be a swampy area that has reeds and rushes. Plants and animals that live in wetlands are adapted to wet conditions for at least part of their life cycle. Many wetlands have dried out during the drought periods of the last 15 years. However, they may refill in the future.

Wetlands are among the world's most productive environments and their continuing loss and degradation is a major global problem. They are vital habitats and breeding grounds for many species, especially fish and waterbirds, some of which are in danger of extinction. They support wildlife that help to control insect pests on farms and provide important refuges for wildlife during drought. Wetlands help to purify water by acting as filters that trap sediment and nutrients. They reduce erosion and provide protection from floods by absorbing and slowly releasing water.

## Good examples

Wetlands with many birds can be seen at Orielton Lagoon, Pittwater and Moulting Lagoon, and on the mudflats at Robbins Passage. Coastal wetlands can be seen at Waterhouse Point, Asbestos Range National Park and Jocks Lagoon near St Helens. Lake Dulverton near Oatlands and Lake Crescent in the Central Highlands are also excellent examples of wetlands.

## Biodiversity values

Many wetlands have been drained or dammed. In the drier parts of the state almost one-third of the wetlands have been drained and another one-third have been flooded as dams. Many of the dry country wetlands are of national or international significance, with many listed on the Directory of Important Wetlands in Australia and several listed under the Ramsar Treaty, which is an international treaty dedicated to protecting the world's wetlands.

Wetlands are important habitats for many species, including some migratory species such as Latham's snipe (*Gallinago hardwickii*). A number of wetland bird species such as the Australasian shoveller (*Anas rhynchotis rhynchotis*) and the hard head (*Aythya australis*) are thought to be declining in numbers.

### THREATENED ANIMALS OF WETLAND INCLUDE:

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Green and gold bell frog (*Litoria raniformis*)

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Great-crested grebe (*Podiceps cristatus australis*)

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### THREATENED PLANTS OF WETLAND INCLUDE:

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Tunbridge buttercup (*Ranunculus prasinus*)

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Purple loosestrife (*Lythrum salicaria*)

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Water milfoil (*Myriophyllum integrifolium*)

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

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## Management issues

- Protect remaining wetlands from permanent inundation or drainage.
- Excluding stock is the best option, if possible. It is possible to graze a wetland with minimal damage when it is completely dry. However, stock should be excluded while the wetland is drying out. Stock trampling the boggy ground will destroy the vegetation mat that is important for a healthy wetland.
- Alternative watering points may be needed. If that is not possible it may be necessary to fence off most of the wetland while still providing access to the most suitable watering point.
- Exclude fire from wetlands.

There are numerous plants that grow in wetlands and around their edges. Once a wetland has been established it is likely that a range of rushes (*Juncus* species) and bog rushes (*Schoenus* species) will appear.



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# Looking after buttongrass moorland and heath

**Buttongrass moorland** is found on poorly-drained and infertile soils. It is the most common vegetation type in lowland western Tasmania. It also occurs on poorly-drained, infertile flats elsewhere in the state. Buttongrass moorland is less than 2 m tall and is dominated by buttongrass hummocks (*Gymnoschoenus sphaerocephalus*) with a rich mixture of shrubs, sedges and rushes in the gaps between the hummocks. Sphagnum peatland is a type of moorland that is generally found in areas between 600 m and 1350 m in altitude.

**Heath** is usually found close to the coast on highly infertile sandy plains. The most extensive areas of heath in the state are found in the Furneaux Group of islands and in the north east. Small areas of heath are occasionally found on poorly-drained inland sites and rock-plate hill tops. Heath is dominated by shrubs less than 2 m tall in the tallest layer. The most common dominant species are tea-tree (*Leptospermum* species), paperbark (*Melaleuca*), banksia (*Banksia marginata*), casuarina (*Allocasuarina*), and grass-tree (*Xanthorrhoea*).

## Good examples

**Buttongrass moorland** can be seen from all the main roads in western Tasmania. The Peter Murrell Nature Reserve at Huntingfield, south of Hobart, contains small areas of buttongrass and sphagnum peatland.

**Heath** can be seen alongside roads in Rocky Cape National Park, Waterhouse Point Protected Area, Mount William National Park, the Friendly Beaches section of Freycinet National Park, and at Remarkable Cave on the Tasman Peninsula.

## Biodiversity values

Buttongrass moorland is extremely well represented in Tasmania's reserve system and is relatively rare on private land. Most rare or threatened plant species that occur in buttongrass moorland are also well reserved. One of the most threatened species that uses buttongrass moorland is the orange-bellied parrot (*Neophema chrysogaster*). Species such as the emu wren (*Stipiturus malachuru*), striated field wren (*Calamanthus fuliginosus*), tawny crowned honeyeater (*Phylidonyris melanops*), broad-toothed rat (*Mastacomys fuscus*), and ground parrot (*Pezoporus wallicus*) are all buttongrass species.

Heaths are generally well reserved in the state. However, the few surviving heaths in the driest parts of the state are significant because of their local rarity. The inland heaths of the north east coastal plains and the Furneaux Group include some vegetation communities that are unreserved or poorly reserved. Many rare or threatened plant species occur in heath.

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**THREATENED SPECIES OF BUTTONGRASS MOORLAND INCLUDE:**

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Orange-bellied parrot (*Neophema chrysogaster*)

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New Holland mouse (*Pseudomys novaehollandiae*)

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Hickmans pygmy mountain shrimp (*Allanaspides hickmani*)

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Scottsdale burrowing crayfish (*Engaeus spinicaudatus*)

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**THREATENED SPECIES OF HEATH INCLUDE:**

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Southport heath (*Epacris stuartii*)

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Conebush (*Isopogon ceratophyllus*)

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Heath (*Epacris barbata*)

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Chaffy bushpea (*Pultenaea paleacea* var. *sericea*)

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

## Management issues

Both buttongrass moorland and heath are relatively resistant to invasion by weeds, provided that the nutrient levels of the soils are not raised. However, these vegetation types are particularly susceptible to shrub dieback caused by the cinnamon fungus (*Phytophthora cinnamomi*) which has the potential to eliminate some heath species, such as the cone-bush (*Isopogon ceratophyllus*), from Tasmania.

Both vegetation types would be replaced by taller vegetation over almost all of their range in the long-term absence of fire. However, frequent fire will lead to a loss of peat beneath the buttongrass moorland, and convert heath to sedgeland or bracken fernland.

Buttongrass moorland is useless for domestic stock grazing. Some of the more fertile heaths, particularly those in the north east, are used for grazing, especially after burning. However, fire followed by stock grazing appears to degrade these heathlands and encourage the invasion of weeds.

Unsustainable moss harvesting and peat mining leads to degradation of sphagnum peatlands.

### Grazing

Stock grazing is not appropriate in heath managed to maintain biodiversity. However, if you wish to continue using such areas for stock consider leaving the areas ungrazed for a couple of years following a fire as this will give the palatable species a chance to re-establish. Trampling of sphagnum peatlands by stock results in their degradation.

### Fire

The general recommended fire frequency for buttongrass moorland is 5-20 years, and for heaths 10-30 years. However, the appropriate frequency for particular areas is best judged from the growth rates of the shrubs and the rate of decline in the number of plant species. If there appears to be no danger of buttongrass moorland or heath converting to scrub and there is no loss of the smaller plant species, there is no biodiversity reason to burn. Conversely, if the growth rate of the shrubs looks set to convert the heath into scrub, or if the smaller plant species are disappearing, burning will be beneficial. Autumn burns are preferable to spring burns as they avoid harming ground-nesting birds such as the ground parrot. Ideally, fires should be intense enough to kill all the foliage but not so intense that they burn into the peat.

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## Weeds and diseases

Where there are no weeds in buttongrass moorland or heath take care not to increase the fertility of the site through drift from aerial top-dressing, dumping of material, or diversion of drainage from higher nutrient areas. Increasing the fertility of the area will encourage weeds to colonise.

If there is some penetration of weeds into your heath, there is little you can do apart from counteracting the possible causes such as nutrient drift or stock grazing. In some extreme cases it may be possible to restore heath by scraping off the nutrient-rich upper few centimetres of soil. If your heath is badly invaded by woody weeds eliminate the invading shrubs using the recommendations given in **Kit 3 Weeds in Your Bush**.

If the cinnamon fungus has invaded your area of buttongrass moorland or heath make sure that you do not transfer any soil from infected areas to uninfected areas. If your buttongrass moorland or heath is free of the fungus, clean all your boots, vehicles and machinery before entering the area as the fungus can be transported in mud and water (see **Kit 2 Managing Your Bush**).



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## Looking after alpine vegetation

Alpine vegetation is found above the tree line, in treeless areas and among subalpine forests. It is less than 2 m tall. The alpine vegetation of Tasmania is extremely unusual globally in that most of it is dominated by small-leaved shrubs or hard cushion plants. However, there are also substantial areas of Tasmanian alpine vegetation that are dominated by grasses, herbs or sedges.

### Good examples

There are several places where alpine vegetation can be seen from the road, including Mt Barrow, Ben Lomond, Mt Wellington, Mt Field (Wombat Moor), Hartz Mountains, and the Central Plateau (Lake Ada Road, Lake Mackenzie Road, Lake Highway and Poatina Road).

### Biodiversity values

The international biodiversity significance of Tasmanian alpine vegetation has been recognised by its almost complete reservation within the World Heritage Area and other reserves. However, there is some alpine vegetation that is significant for its rare or threatened species that occurs on private land. This is alpine vegetation that occurs below the climatic tree line on basaltic soils.

#### EXTINCT AND THREATENED SPECIES OF ALPINE VEGETATION INCLUDE:

Alpine apple berry ( <i>Rhytidosporum alpinum</i> )	
Jewel beetle ( <i>Stigmodera insculpta</i> )	EXTINCT
Alpine spider ( <i>Plesiothele fentoni</i> )	
Pencil pine moth ( <i>Dirce aesiodora</i> )	

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

### Management issues

The two issues for the management of alpine vegetation on private land are fire and stock grazing. A combination of burning and stock grazing lead to severe erosion, a loss of some native species, and the long-term promotion of unpalatable species. Unfortunately, stock grazing without fire also leads to increased areas of bare ground in alpine vegetation that does not have a complete cover. The removal of stock from such areas has increased the vegetation cover at a rate of 1% per year.

Research has shown that both fire and grazing, and especially a combination of the two, should be excluded from alpine vegetation managed for biodiversity. Even if your alpine vegetation is not being managed for biodiversity you will need to exclude stock from already eroded areas if you do not wish to destroy the soils on which your stock ultimately depend.



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# Looking after banksia scrub and woodland

Banksia or honeysuckle (*Banksia marginata*) varies in appearance, forming a shrub or small tree. It is widespread in Tasmania and forms scrub and woodland on coastal sand dunes where the fire frequency is low. Banksias also form groves in the Midlands, usually on sandy soils. Some of these groves are extensive, up to 2 km in length with magnificent old trees, although the majority occur in small copses. Inland stands of banksia were probably once extensive in the grassy lowlands throughout south east Australia. Today, few remain and those that do are mostly in poor condition with weedy understories and little regeneration. Coastal stands of banksia generally survive in better condition.

## Good examples

A small grove of banksia woodland can be seen on the eastern side of the Midlands Highway a few kilometres south of the rest area between Oatlands and Tunbridge. A coastal stand exists on the northern end of Kingston Beach near Hobart. At Sisters Beach in northern Tasmania an unusual stand of saw-toothed banksia (*Banksia serrata*) can be seen.

## Biodiversity values

Coastal banksia woodlands are well reserved and in good condition. However, there are few good stands of the inland banksia woodland which makes this vegetation type valuable for conservation.

## Management issues

Fire and grazing are the major management tools in banksia scrub and woodland.

### Fire

Banksias have a hard seed that is stored in a cone and released after fire. However, fire is not essential for regeneration and in some areas banksias regenerate in the absence of fire. Drought and high temperatures also lead to seed release.

- Intense fire will probably kill many of the old trees so take care!
- If you want to experiment, burn a small patch of your banksia grove and see if any regeneration occurs.
- Autumn is probably the best time of the year to burn but experiment with burning in other seasons.

### Grazing

- Fencing a banksia grove allows for better stock control.
- If regeneration has occurred exclude stock until the young trees are out of their reach. Electric fencing is effective for a small area.
- Leave dead branches on the ground as they act as a cage protecting the young banksias and other species from browsing animals.
- If there is a dense grassy sward and no regeneration, crash grazing a large mob of sheep for a short time may help regeneration by reducing competition.

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## Weeds

Rank grasses such as Yorkshire fog, cocksfoot and brown-top bent often form a dense sward in banksia groves. Crash grazing for a short period of time may help to reduce these grasses but seedlings may also be lost.

## Revegetation

Banksia woodlands are often difficult areas in which to establish trees, including banksias, because of the competition from grasses and the poor sandy soils. These soils often have large numbers of ants that feed on the seed. Experiments with hand-sowing seed, including banksia seed, have not led to the establishment of young plants.



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# Looking after she-oak woodland and forest

She-oak (*Allocasuarina verticillata*) is a small, drooping tree. It is the most drought-resistant tree in Tasmania. Because it reaches a lower maximum height and has a slower growth rate than eucalypts, it usually only dominates native vegetation in places where eucalypts find it hard to grow. These are generally north-facing slopes with shallow and rocky soils in areas receiving less than 700 mm of rainfall per year. Therefore, she-oak woodland and forest is widespread in dry eastern Tasmania and on the eastern Bass Strait islands, most commonly near the coast. She-oak can be found as the dominant tree in woodland and forest.

However, it can also form a major understorey component of eucalypt forest. The recent dieback of white gum (*Eucalyptus viminalis*) in the lowlands has extended the areas occupied by she-oak woodland to include areas where she-oaks previously formed the understorey. The presence of a dense she-oak understorey increases the rate of dieback amongst emergent eucalypts during drought.

She-oaks do not respond to fire and grazing in the same way as eucalypts. Frequent fires will eliminate she-oaks while allowing eucalypts to survive. She-oak seedlings are more palatable to stock than eucalypt seedlings so under light grazing regimes eucalypts may re-establish successfully but not she-oaks.

She-oak woodland and forest varies from an almost closed forest that has little else beneath the trees but needles, to a woodland in which umbrella-shaped trees are interspersed in a species-rich sward dominated by tussock grasses. Little of this community has been cleared since European settlement. In fact, it may occupy a greater area now than it did under Aboriginal occupation because of changed fire regimes.

## Good examples

A fine example of she-oak forest can be seen on the hill to the east of the Midlands Highway between the rest stop north of Oatlands and the ruin of Antill Ponds. Here, the emergent white gums have recently died leaving the she-oak to dominate. Excellent examples of she-oak woodland and forest can also be seen on the northern slopes of the Domain in Hobart and in Cataract Gorge in Launceston.

## Biodiversity values

She-oak woodland and forest is not a high conservation priority in Tasmania as it is well reserved, has suffered no reduction in area, and contains few threatened species.

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## Management issues

She-oak is a preferred firewood as it burns slowly and intensely and produces little ash. She-oak forest is of little value for grazing as the tree litter suppresses the growth of grass beneath the canopy. However, she-oak woodlands are widely used as rough grazing country. Because they occur on some of the least productive sites for pasture, and often exist within paddocks that contain more productive pasture, it is common to see bare red ground between the trees in summer and signs of erosion. There is usually no regeneration of she-oak in these grazed woodlands and many of the trees are beginning to die. She-oak woodlands are more valuable for nature conservation than she-oak forests, which are less rich in native species. The main conservation management goals with she-oak vegetation are to maintain the woodland structure and the health of the understorey. In urban remnants there is also a problem with woody weed invasion, the most threatening being boneseed (*Chrysanthemoides monilifera*), gorse (*Ulex europaeus*), and briar rose (*Rosa rubiginosa*). Refer to **Kit 3 Weeds in Your Bush** for more information on weeds and how to manage them.

Maintaining the health of the dominant layer of she-oak woodland and forest is relatively simple:

- Exclude stock until the regenerated shrubs and trees are out of the reach of stock, assuming that seed is held on the trees and that no young trees are already present.



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# Looking after Oyster Bay pine and South Esk pine woodland and forest

Tasmania has two native cypress pine species. **Oyster Bay pine** (*Callitris rhomboidea*) woodlands and forests occur along the east coast from Cape Pillar to the Douglas-Apsley National Park and in the Furneaux Group. The threatened Tasmanian endemic, **South Esk pine** (*Callitris oblonga*), is found near a few rivers in the east of the state, including the Apsley, Swan, St Pauls and South Esk Rivers, where it forms a low woodland or forest community. Native cypress pines can be found as the dominant trees in woodland and forest. However, they can also form a major understorey component of eucalypt forest, and they occasionally occur in heath.

Both species are very hardy. The Oyster Bay pine is drought resistant and establishes readily in moderately shaded, undisturbed areas. The South Esk pine can survive flood damage and is highly frost resistant. Both species hold seed in woody cones that release the seed after the branches die, enabling them to regenerate after fire. However, individual trees are easily killed by fire. They take up to a decade to set new seed after germination so they can disappear from a site if fires occur in close succession.

## Good examples

The best places to see **South Esk pine** are in the riparian forest at Royal George on the Old Coach Road and from the Apsley River Bridge on the Coles Bay Road. **Oyster Bay pine** is common around Orford. Paradise Gorge, just below the dam on the Prosser River, houses a magnificent stand of Oyster Bay pine, which is currently replacing the local eucalypts. There are also accessible stands just south of Swansea and at the southern entrance of the Douglas-Apsley National Park.



Oyster Bay pine

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## Biodiversity values

The South Esk pine and vegetation containing it are threatened. It largely occurs on private land and is reserved only in the Douglas-Apsley National Park. Many other threatened plants occur with South Esk pine. Vegetation containing Oyster Bay pine is more widespread and is present in many reserves, although the level of protection is inadequate.

Many rare or threatened plant species occur in Oyster Bay pine and South Esk pine woodlands and forests, including Midlands mimosa (*Acacia axillaris*) and small-leaf sphyridium (*Spyridium microphyllum*). Refer to **Kit 5 Threatened Plant Species in Your Bush** for more information and an illustration of each plant.

## Management issues

The two key issues for maintaining Oyster Bay pine and South Esk pine woodland and forest are:

- avoiding their elimination by using an appropriate fire regime;
- woody weed invasion, particularly gorse and willow.

Excluding fire is the best management option for native cypress pine (*Callitris*) woodland and forest. If a stand is accidentally burnt and the trees killed, exclude all stock until the new plants are out of their reach. Then try to ensure that fire does not recur until the regenerating trees have ample mature cones. If your stand of Oyster Bay pine contains mature trees with most of their foliage well above ground level, low intensity fire or grazing may help to prevent fires that will kill the trees. However, this will also prevent any regeneration.

Woody weed invasion is rarely a problem in Oyster Bay pine stands. However, South Esk pine stands are usually badly invaded by gorse and occasionally willow. Dense understories of gorse can prevent regeneration of the pines. They are also highly flammable which increases the probability of fire destroying the stand. See **Kit 3 Weeds in Your Bush** for advice on gorse and willow removal.



South Esk pine

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# Looking after tea-tree and paperbark wet scrub and forest, blackwood forest, dry rainforest and temperate rainforest

These four vegetation types are grouped together because they share relatively simple management requirements. Dry rainforest and temperate rainforest regenerate without any large scale disturbance such as fire. The same goes for blackwood forest and tea-tree and paperbark wet scrub and forest over some of their range. However, over most of their range they form a stage in the development of rainforest.

**Tea-tree and paperbark wet scrub and forest** are dominated by manuka (*Leptospermum scoparium*), soft-fruited tea-tree (*Leptospermum glaucescens*), shiny tea-tree (*Leptospermum nitidum*), woolly tea-tree (*Leptospermum lanigerum*), swamp paperbark (*Melaleuca ericifolia*), and scented paperbark (*Melaleuca squarrosa*). This vegetation type usually has an understorey of rainforest species. In northern Tasmania and on the Bass Strait islands dense forests dominated by swamp paperbark are widespread.

**Blackwood forest** (*Acacia melanoxylon*) is widespread in lowland Tasmania, except on the most infertile soils. It dominates forests in well-drained areas where temperate rainforest has been burnt. In these situations it represents a stage in the regeneration of temperate rainforest. In swampy areas on fertile soils blackwood may persist as the dominant species in the absence of fire.

**Dry rainforest** is rare. It is confined to deep, south-facing rocky gullies in the driest parts of the state. It has a dense, closed upper canopy of small trees, most notably native olive (*Notelaea ligustrina*), pinkwood (*Beyeria viscosa*), and dogwood (*Pomaderris apetala*), with occasional emergent blackwoods (*Acacia melanoxylon*).

**Temperate rainforest** is most extensive in western Tasmania and in the north east highlands. It also occurs sporadically in most mountain ranges in eastern Tasmania. The canopy is dominated, either singly or in combination, by myrtle beech (*Nothofagus cunninghamii*), deciduous beech (*Nothofagus gunnii*), sassafras (*Atherosperma moschatum*), King Billy pine (*Athrotaxis selaginoides*), pencil pine (*Athrotaxis cupressoides*), leatherwood (*Eucryphia* species), horizontal (*Anodopetalum biglandulosum*), Huon pine (*Lagarostrobos franklinii*), celerytop pine (*Phyllocladus aspleniifolius*), and Cheshunt pine (*Diselma archeri*).

## Good examples

There are large areas of **tea-tree and paperbark wet scrub and forest** on the west coast, particularly where mining settlements have been associated with the burning of rainforest. They can also be seen in the north west of the state in some of the swampy flats between Smithton and Marrawah. On King Island magnificent swamp paperbark forests can be seen in the Lavinia Nature Reserve and at The Nook. The nature trail at Bakers Beach in the Asbestos Range National Park is also a good place to see paperbark wet scrub.

The best **blackwood forests** in Tasmania occur in the swampy flats between Smithton and Marrawah, and they can be seen from a nature trail at Dismal Swamp. Blackwood forest that represents a stage of rainforest regeneration can be seen along the main roads to the south, east and west of Queenstown.

The walking track that passes along the northern bank of the dam in the Trevallyn State Recreation Area passes through a stand of **dry rainforest**, as does the track in the Truganini Reserve, south of Hobart.

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All the main roads in western Tasmania pass through stands of **temperate rainforest**. Temperate rainforest can also be seen along many of the roads in the north east highlands, at Mt Field, and at locations on the east coast such as the Sandspit Forest Reserve.

## **Biodiversity values**

Tea-tree and paperbark wet scrub and forest is extremely well reserved. Swamp forest dominated by blackwood has been heavily cleared and drained for dairying and is inadequately protected in Tasmania's reserve system. The other type of forest dominated by blackwood is adequately reserved and is in no danger of extinction. Dry rainforest is rare and carries a high conservation value. Although there has been some clearing of temperate rainforest for forest plantations on private land in recent years the vegetation type is well reserved.

### **THREATENED ANIMALS OF THESE VEGETATION TYPES INCLUDE:**

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Grey goshawk (*Accipiter novaehollandiae*)

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North east forest snail (*Anoglypta launcestonensis*)

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## Management issues

The main management issue for all four vegetation types is the exclusion of fire. While tea-tree, paperbark and blackwood may, in some situations, require an occasional fire to maintain their dominance, unplanned frequent fires are likely to prevent them becoming an extensive feature of the landscape. None of these vegetation types are suitable for planned burning because of their fuel loads. Fire can lead to the destruction of temperate and dry rainforests, especially when repeated. Extreme stock disturbance or logging can open up the understorey of these vegetation types sufficiently to allow the invasion of some weeds, notably blackberry (*Rubus fruticosus*). Myrtle beech, the major dominant of temperate rainforest, suffers from a natural dieback called myrtle wilt. This dieback accelerates when the forest is disturbed. The opening up of the temperate rainforest canopy on infertile soils less than 800 m above sea level has also been associated with dieback caused by the cinnamon fungus (*Phytophthora cinnamomi*). While tea-tree and paperbark wet scrub and forest often appear over-mature or in need of a good 'clean out' their dense nature is just a stage in their development. Over time these forests will thin out, the eucalypts will become more dominant, and the understorey will become more diverse. Burning or clearing to encourage regeneration will merely start the developmental cycle all over again.

The management recommendations for these vegetation types are:

- exclude fire;
- control woody weeds (see **Kit 3 Weeds in Your Bush**).

If you manage rainforest with myrtle beech do not disturb the area around the tree roots or expose the trees by removing adjacent vegetation. If you manage temperate rainforest on infertile soils below 800 m avoid breaking the canopy and introducing soil to the area on machinery.

