



8 Managing Native Pastures for Conservation

KEY POINTS

- » Native pastures and bush runs are a high priority for conservation.
- » Native pastures can be managed to maintain their productivity and conservation values.
- » Native pastures need active management to maintain their conservation values.
- » The key tools for maintaining the health and diversity of native pastures are grazing and fire.
- » Usually, the best way to conserve the biodiversity of native pastures is to maintain the long-established grazing regimes that have favoured their conservation to date.
- » Excluding livestock from native pastures during 'good' spring seasons encourages greater recruitment of native plants.
- » If native pastures are grazed too soon after fire, livestock will damage the regenerating trees and shrubs.
- » Grazing during drought or after fire can eliminate tussock grasses from native pastures.
- » The best time to burn is autumn, because it allows the native plants to set seed and the native animals to finish breeding.

MANAGING NATIVE PASTURES FOR BIODIVERSITY

Native biodiversity is an important component of healthy native pastures, and sustainable grazing management can maintain and enhance this biodiversity. The past few decades have seen growing community pressure to protect native biodiversity, particularly in agricultural areas where much of the native vegetation has been converted to pasture and cropping, and some native animals and plants have become extinct or threatened. This concern has led to environmental legislation and regulation. Increasingly too, consumers are demanding good environmental credentials for the products they buy, leading to the growth of environmental quality assurance and accreditation schemes. Graziers may benefit from meeting the new environmental standards by gaining access to niche markets.

Graziers have managed their native country in many ways. There is no one way to correctly manage for native biodiversity, because different species are favoured by different management regimes. Some of Tasmania's most highly valued fine and superfine wool is produced on healthy native pastures with a diversity of grasses and wildflowers and few weeds. The sustainability of these pastures depends on continuing the existing management regimes, and responding appropriately to changing environmental conditions.



Threatened plant species, including grassland paperdaisy (top) and characteristic species, such as billy buttons (Craspedia sp., bottom), in diverse native grasslands grazed by sheep.

MANAGING HABITAT FOR NATIVE PLANTS

Many native wildflowers rely on grazing to reduce the dominance of native grasses, and to create the inter-tussock spaces or gaps needed for them to establish and flourish. Healthy pastures can have more than 60 native species per 10 m². When the inter-tussock spaces close up, this density can drop to as low as 10–15 species per 10 m². The spaces are important for rare native annuals, lilies and orchids. Research in infrequently grazed native pastures, ungrazed grassy roadside verges and highland grasslands of Tasmania has shown that a lack of grazing can lead to reduced populations of herb species. On the Tunbridge Tier Road, a travelling stock route, threatened wildflowers such as grassland candles and grassland cupflower (*Colobanthus curtisiae*) have disappeared in the 10 years since graziers started trucking their sheep rather than using the traditional stock route.

Livestock grazing can be used as a conservation management tool to preserve many threatened plant species, especially in the absence of other herbivores. However, some species are sensitive to grazing, because they are highly palatable and not adapted to recovering from grazing. Some species sensitive to grazing are listed as threatened and need continued protection from livestock, including the soft peppergrass and spur velleia. These species persist around farm houses, in cemeteries and along roadside verges rather than in paddocks.



Tasmanian native grasslands provide habitat for many wildflowers that are relatives of garden flowers.

In the absence of grazing, fire has an important role to play in maintaining the inter-tussock spaces. Fire also helps many native species germinate.

MANAGING HABITAT FOR NATIVE ANIMALS

Native vegetation provides essential habitat for native birds, mammals, reptiles and invertebrates. Birds play an important role in maintaining ecosystem health by reducing the number of insect pests, pollinating plants and dispersing seeds. Some smaller mammals, such as bandicoots, potoroos and bettongs, and reptiles, such as lizards, also feed on insect pests and play an important role in dispersing fungi.

Invertebrates are the most numerous and diverse animals in native pastures. While some invertebrates are pasture pests, most play a valuable role in ecosystem functioning. For example, soil mites, a highly diverse and abundant group in Tasmanian native pastures, help break down organic matter and recycle nutrients. Other invertebrates pollinate plants and disperse seeds, while others feed off, or parasitise, invertebrate pests such as corbie grubs.

Some general principles can be followed when managing bush for animal habitat. Tree hollows are important for many species, especially parrots and owls, and should be retained. Large old trees, even dead ones, are used by many birds and bats for nesting and foraging. They also provide vantage spots and perching trees for many species, including eagles, hawks, owls and ducks. 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.

Reptiles and small mammals, such as bandicoots, bettongs, quolls and devils, need understorey, such as sags, tussocks, dense bracken and small shrubs, for habitat. Maintaining patches of rank grass growth, dense understorey and gully vegetation on the farm is important for conserving native fauna. Logs on the ground, dead wood, leaf litter, sticks, rocks and stones are also important components of the bush for native animals.

Different invertebrates may have different habitat requirements for food, shelter and reproduction. Recent observations in the Midlands of invertebrate populations associated with different vegetation types and management practices showed that invertebrate species composition varied markedly between the different vegetation types. Within vegetation types, the species composition varied markedly, depending on the grazing and burning regimes used. These observations emphasise the importance for native biodiversity of using a variety of management regimes in native pastures.

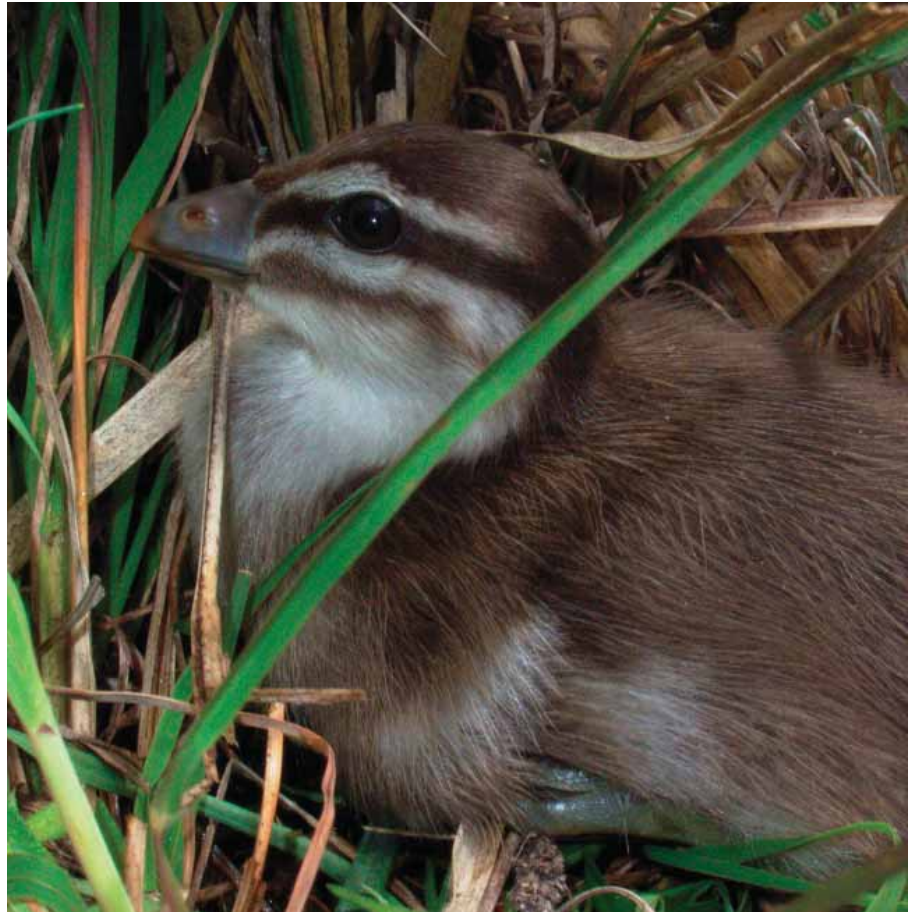


Native plants provide habitat and food for native insects.

“ It’s important to maintain the trees and tussocks for their shelter value, secondary to their feed value. ”

“ I think our management also caters for the small mammals, reptiles, birds and insects that occur in native pastures. At the time they’re breeding in spring and summer, we’re not using that ground for grazing, so they’re not being disturbed.

“ The native animals have evolved in the native grasslands, it’s their habitat, and if you don’t maintain their habitat you lose them. If a tree falls over in the bush, we don’t clean it up. Where a tree has fallen, stock can’t get in, and it becomes a patch with overgrown grass, a refuge for a small mammal or a lizard. We also have a rule that dead trees in the bush are not cut down for firewood, because we have to maintain the bird nesting sites. ”



Some native animals use native grasses and sedges as protection during breeding, including this pacific black duckling (*Anas superciliosa*).



Henry Foster

'Fosterville', Campbell Town

'I'm lucky to have been the manager of a property that still has a large area of native pasture. Our native pastures have great biodiversity value because of the wildflowers and all the other plants and animals they provide habitat for. A key objective in managing these native pastures is to preserve this biodiversity.

'To do this, we graze native pastures from late summer to early spring, thus allowing the grasses and wildflowers to complete their life cycle free of stock. Allowing them to seed is important for maintaining their seed banks in the soil. And, of course, by doing this, it gives you the opportunity to watch them flowering and to see them in all their glory.

'If you don't graze native pasture, it becomes very overgrown, and you end up with a mass of dry, dead material that tends to smother everything. So, to maintain its biodiversity, native pasture needs to be grazed fairly regularly. The alternative is to

burn it, which is quite a good way of getting rid of the excess dead material.

'Also, if you want to maintain native pastures in good condition, it's essential that you don't fertilise them. A good *Themeda* pasture will quickly disappear if you apply superphosphate.

'Often the populations of wildflowers are quite sparse: a patch here and a patch there. There are several native plants I've seen that occur in very small populations in only a few areas. In the case of the black-tipped spider orchid, we have found them only in one particular area, and it's probably an area of only one hectare.

'I don't believe in putting fences around these areas as they cause more problems than they solve. By managing our native pastures so we don't graze them over spring and summer, we're able to maintain all the species that occur there.'



Promoting Tree and Shrub Regeneration



KEY POINTS

- » Tree and shrub regeneration is essential if bush runs are to be preserved for the future.
- » Natural regeneration is the cheapest and most effective way of retaining the bush on your property.
- » Getting the bush to regenerate can be difficult.
- » Plan to regenerate each bush area on your property over your lifetime on the farm.

HOW DOES NATURAL REGENERATION OCCUR?

Natural regeneration is the process by which old trees and shrubs replace themselves. It is by far the best form of regeneration. Natural regeneration results from the germination of seeds that have fallen from existing plants, and the resprouting of shoots from existing stumps and roots. After disturbance, most species recover by resprouting rather than germinating.

Natural regeneration is a cheap and effective method of re-establishing or rehabilitating bush on farms, particularly on a large scale. It is cheaper to fence off and manage existing stands of bush than to re-establish trees for shelter and other purposes. There are many other advantages too. Natural regeneration comes from existing plant material, so it is adapted to local conditions, and it helps preserve the genetic make-up of the bush on the property.

MANAGE GRAZING TO ALLOW REGENERATION

Fencing allows stock grazing in the bush to be controlled. If regeneration occurs, exclude livestock until the young trees are out of the reach of livestock, which may take 3–5 years or more. Leave dead branches on the ground, because they create ‘cages’ over the young seedlings, which protect them from browsing animals. Placing old branches over young seedlings does the same thing.

Dense grassy swards can limit regeneration, so using mobs of cattle or sheep for short periods to crash graze can promote regeneration by reducing competition. Hoof action during short periods of intensive grazing can also bury the seeds and protect them from predators.

“ Our prime focus to restore these degraded native pastures is to first get the trees and shrubs growing. Then we will get the native grasses growing, and then we can make decisions on the best way of utilising the grasses. If we don’t do this then we have no decision to make. ”



Regenerating trees in areas fenced off to control stock grazing on river flats (left) and hillslopes (right).

LACK OF TREE AND SHRUB REGENERATION

There are many reasons why bush runs may not regenerate successfully, including

- » Livestock are allowed access to regenerating areas for too long – In many cases natural regeneration is occurring, but stock graze the young seedlings as they appear.
- » Competition from grasses and other weeds – Dense mats of grass prevent native seeds germinating, compete for resources, and suppress young seedlings. When grasses become rank, other plants often cannot flower and set seed because of competition from the grasses.
- » Competition from native trees – Many large native trees, including eucalypts, she-oaks and bull-oaks, suppress regeneration around them through a number of mechanisms, including competing for soil moisture, and having a dense layer of litter beneath them.
- » Lack of regenerating fires – For many species, recruitment is almost non-existent without fire. However, the role played by fire in natural regeneration varies depending on the vegetation type and species. (See the *Tasmanian Bushcare Toolkit* by J. B. Kirkpatrick and L. Gilfedder, 1999 for more information about the role of fire in different bush types.)



Eucalypt seedlings often germinate following fire or drought because they require bare ground and lack of competition to survive.

- » Soil compaction – The heavy hooves of livestock, particularly cattle and horses, compact soil and destroy soil structure. Using heavy machinery and vehicles, particularly when the soil is wet, has the same effect. Compaction makes it more difficult for seedlings to germinate

and establish their roots. If they do germinate, they are vulnerable to moisture stress, because less water penetrates compacted soils. Perennial plant roots, soil microbial activity and invertebrates can reverse compaction.



Livestock have been excluded from the corner of this paddock to promote tree regeneration.

Chapter 9 Promoting Tree and Shrub Regeneration

- » The cryptogamic mat is gone
 - The mat of cryptogams (mosses, lichens and algae) between the tussocks encourages native seeds to germinate.
- » Predation of young plants
 - Hares, deer, rabbits, wildlife and livestock can eat young seedlings, as can caterpillars, beetles, nematodes and other invertebrates.
- » Seed harvesting by ants – Ants can harvest almost all the seed fall of some species, particularly wattles and bush peas. However, ants are also beneficial: they play an important role in establishment by dispersing seeds and increasing soil porosity.
- » Drought and poor conditions
 - Many species need several consecutive wet winters to germinate and survive, because the natural recruitment and survival of seedlings is low. In addition, grazing, burning and trampling can lead to high mortality of the few seedlings that establish.
- » Natural seed production is low
 - While some plants produce large amounts of long-lived seed, others do not. Many species produce little seed in most years, but have occasional years of high seed production that result in mass regeneration. Management should be aimed at protecting the seedlings that establish following mass seeding events.



Mosses, lichens and algae are all part of the cryptogamic mat.

“ To see the trees growing back and to know that these areas will continue to provide grazing in the future mean—it’s a win–win situation. Apart from the economics, it’s the aesthetic considerations that make what I’m doing worthwhile. ”



USE FIRE TO ENCOURAGE REGENERATION

Experiment with fire to encourage regeneration. Burn a small patch of bush to see if any regeneration occurs. Seeds stored in hard cones, such as the seeds of silver banksia (*Banksia marginata*) and needle bush (*Hakea* spp.), and eucalypt seed stored in gum nuts are released after fire. Fire also creates an ashbed for many species. However, remember that intense fires may kill old trees.



Roderic O'Connor

'Connorville', Cressy

'I'm trying to encourage the regeneration of trees and shrubs on the superfine wool country of 'Connorville', because I want to make sure that wool production on this country is ecologically sustainable.

'Elsewhere on the property, native regeneration is encouraged in gullies and shelter belts. We don't necessarily exclude grazing from the areas identified for rehabilitation. For example, in the gullies, we allow limited grazing by sheep but not cattle.

'Browsing by wildlife is a significant problem. We have a game management plan that has enabled us to control browsing animals. In some places, in the last 18 months, there's been phenomenal regrowth. I'm amazed that even after years of being browsed, given the right conditions, the trees and shrubs can come back.

'In order to maximise the natural regeneration, I think we need to

have more dry stock. We need to be able to move the sheep when required, rather than having a fixation on set stocking. To do that, we're putting in additional fencing, so we can manage the runs a bit better using rotational grazing.

'I would like to set aside a lot more areas for regeneration, but economics plays a big part here: at the end of the day I have a business to run. So, it has to be done slowly. Good property management decisions take time to implement, rather than being a quick fix. I think you have to take a 20–30-year view, a generational view.

'It's absolutely crucial to get someone to validate that you're managing the right areas for regeneration correctly. You need to get scientific advice. It's essential that governments continue to provide this advice to landholders, because of the social and ecological benefits that flow from better managing our native pasture and forest resource.'

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Managing Riparian and Wetland Grasslands

KEY POINTS

- » Riparian and wetland areas are vulnerable to overgrazing.
- » The best way to manage riparian and wetland areas is to exclude livestock.
- » Livestock may be allowed in riparian areas for short periods to manage weeds, but only when the stream banks are dry and stable.

CHARACTERISTICS OF RIPARIAN AND WETLAND GRASSLANDS

Riparian vegetation occurs along the margins of rivers and wetlands. It may differ from the surrounding vegetation in many ways, because the plants are adapted to living in a moist environment. Riparian grasslands tend to have few trees, and to be dominated by tussock grasses, with wildflowers in the spaces between the tussocks. Grassy woodlands are also found along rivers and surrounding wetlands.

Silver tussock grasslands are found on moist alluvial soils along rivers and on the adjacent floodplains. Extensive areas of silver tussock flats occur along rivers such as the Macquarie, South Esk, Meander and Lake, and some of their tributaries. These areas are often highly disturbed. They may have a good cover of silver tussock, but they may also have a large proportion of introduced grasses, docks, thistles and flat weeds.

Where the silver tussock grass is in reasonable condition, other grasses such as weeping grass, wallaby grasses and spear grasses may also be common. In wetter areas, aquatic species, such as watermilfoil (*Myriophyllum* sp.), running marshflower (*Villarsia reniformis*), water buttons (*Cotula coronopifolia*), jointed twig-sedge (*Baumea articulata*) and greater water-ribbons (*Triglochin procerum*) may persist, even though no surface water is present. Kangaroo grass and wallaby grass pastures can also be found along rivers, and may contain a diverse range of herbaceous species, such as blue bottledaisy, southern cranesbill, prickfoot, kidneyweed and various lilies and sedges.



Fenced off silver tussock flats (left) on the Macquarie River.

Wetlands are scattered along the floodplains of the South Esk basin and on the plains of the Midlands. The wetlands along rivers are usually shallow depressions or billabongs formed when the meanders have been cut off from the main channel. Some wetlands form in areas where floods break out onto low-lying areas. The wetlands on the grassy plains of the Midlands have been created by the action of wind forming a dune along the margin of the wetland or by erosion forming a pan. These wetlands are important habitats for aquatic insects, frogs and birds, and they can easily not be recognised when they have dried out in summer.

A healthy cover of native grasses binds stream banks, preventing erosion, and filters sediments and nutrients from adjacent areas. This in turn helps maintain good water quality and provides shading at the stream edge. Maintaining these areas protects the health of the river and its catchment.

GRAZING MANAGEMENT IN RIPARIAN AND WETLAND GRASSLANDS

Riparian and wetland environments are vulnerable to overgrazing. Inappropriate grazing management can substantially reduce the cover of silver tussock and other native grasses, causing the stream banks to become susceptible to erosion, and reducing water quality when flows are low. In Tasmania, it has been shown many times that excluding livestock leads to rapid recovery of silver tussock grass flats and the return of other native grasses.

Riparian areas should be considered 'special needs' paddocks in the property's management plan. Grazing regimes should be related to the condition of the area, and the management objective should be to maintain or improve the condition of the pasture. For example, if the area is healthy and weed-free, excluding livestock completely is often the best option. Maintaining

the area in good condition is much more cost-effective than trying to rehabilitate it later. However, if it contains weeds, it may need limited grazing to prevent the weeds becoming a problem.

FIRE MANAGEMENT IN RIPARIAN AND WETLAND GRASSLANDS

Fire does not usually occur in riparian areas, so it should be excluded if possible. Riparian and wetland areas are moist environments, and may be less adapted to fire than other environments. In the event of an unplanned fire, livestock should be excluded, so the vegetation can recover. Fire may also trigger the germination of weeds, such as gorse, which will need time and effort to control.

WEED MANAGEMENT IN RIPARIAN AND WETLAND GRASSLANDS

If riparian vegetation contains weeds, such as gorse, hawthorn or thistles, strategic grazing may be needed, at least until the weed problem has been controlled enough for more effective methods to be used. In these circumstances, livestock can be used to graze targeted, weedy areas for short periods of time when the banks are relatively dry and stable. Long-term control of woody weeds needs mechanical or chemical control methods. Riparian and aquatic areas are sensitive environments, so advice should always be sought before undertaking such control operations. Many herbicides should not be used in or near aquatic environments, and inappropriate use of machinery can cause damage. Weed control requires long-term commitment, and may involve a



Silver tussock grassland fenced off with a wetland.

great deal of time and expense. After the initial control work, follow-up work is essential to ensure that the weeds do not re-establish.

PROVIDING LIVESTOCK WITH ACCESS TO WATER

If access to water is important, it may be necessary to establish alternative watering points. Formed access points at carefully selected locations will not cause undue damage. Boggy areas and high flow areas, such as the outside of meanders and bends, should be avoided. Sections of straight channel with a gently graded slope into the stream are the best access points. Walkways of concrete, logs or similar materials can be built to protect the stream surface. Riparian fencing needs careful planning because flooding is a continual problem. Several alternatives can be used, including hanging fences, drop fences and electric fences.

Further information about managing riparian areas can be found in the Land & Water river management guides mentioned in the bibliography.



Riparian wetland on the South Esk River. This ephemeral lagoon is fringed by silver tussock and sedgeland. Livestock are excluded, except in dry times.



Lindsay & Rae Young

'Lewisham', Ross

'We have five kilometres of river frontage at 'Lewisham'. Fencing off the river was the first step in our management plan.

'There were a lot of tracks and eroded areas where stock came in to water, and we had a lot of trouble with stock getting caught in muddy areas in the river in summer. We also used to get a lot of two-way sheep traffic between our property and the neighbouring one. This meant that if one of us got a disease in their sheep, it would have spread to both properties. We wanted to get Ovine Johne's accreditation, and this was probably the catalyst that made us fence off the river.

'We use four-wire electric fencing along the river, which has been successful. Most of the fence is under water in flood, so we get a lot of trash deposited on it. In the early days, we used to go and clear it every time it flooded, and it became a chore. It's less of an issue now that there's a lot of regrowth behind it. We try to make fence maintenance a

summer job now, after the flood period. So it's not a huge issue maintaining it, but it's something that has to be done.

'There were a lot of willows along the river, and we worked with our neighbours to remove them. Willow management is ongoing, because every year we have to control the regrowth. We get a contractor to spot spray the regrowth, which only takes him a day. Our neighbours do the same.

'A lot of the river has been planted out with native trees and shrubs grown from seed collected locally. Losses have been high, due mainly to browsing by game, but the ones that have survived are doing really well. We will continue to plant new areas every three or four years, so we have a mixed-age stand of trees and shrubs.'