VICTORIAN VOLCANIC PLAINS
NATIVE VEGETATION MANAGEMENT GUIDE

A BURNING ISSUE

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NATIVE GRASSLAND AND GRASSY WOODLANDS

SUMMARY

- Periodic removal of accumulated plant material is required in productive grasslands dominated by Kangaroo Grass.
- Regular burning is an effective tool for removal of this biomass.
- Native plants and animals of grassy communities have evolved to live with fire.
- The season and frequency of burning are important, and every 2-5 years between late summer to early autumn is usually suitable.
- Mosaic or patch burning is recommended for larger remnants to retain animal refuges.
- Monitoring should be undertaken to determine if the burning program has been successful.

BIOMASS MANAGEMENT IN GRASSY COMMUNITIES

For native grassy communities to remain in good condition, older plant material and leaf litter in the ground layer needs to be reduced from time to time. In higher rainfall grasslands dominated by Kangaroo Grass in particular, the tussocks can develop into a dense sward, smothering smaller plants in the gaps. The Kangaroo Grass itself can also become less vigorous when heavy growth has accumulated over several years without defoliation.

Removal of accumulated plant material (biomass) stimulates new grass growth and creates open spaces between grass tussocks where native wildflowers can germinate and grow. This helps maintain a diverse range of indigenous plant species in the community. It also reduces fuel loads as part of a wildfire management strategy.

Periodic fires and grazing by native herbivores once performed the function of reducing biomass in the native grasslands and grassy woodlands of the Volcanic Plain.

Today, managers of remnant grassy communities need to find suitable techniques to manage the accumulation of plant material themselves. There are no set rules about which type of management is best for a particular site, and it will depend on factors such as the composition of the vegetation, the size and shape of the remnant, it's conservation values, existing threats, past management history, and the resources available for the task.

Many grassy woodlands, and grasslands on poorer soils and drier sites (e.g. those dominated by spear-grasses and wallaby-grasses), are slow to accumulate old plant material and may only need occasional biomass reduction. More productive grasslands dominated by Kangaroo Grass, however, typically need frequent reduction of biomass. Burning is one of the most common and most effective management tools for achieving this.

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WHY USE FIRE FOR BIOMASS MANAGEMENT?

Native grasslands in good condition often have a history of regular burning. For example, many roadside reserves that have often been burnt by local fire brigades for fire prevention purposes are of good quality, with numerous indigenous plant species present.

Regular burning on these roadsides has maintained an open grassland structure with scattered grass tussocks and ample inter-tussock space. An open structure reduces shading and provides suitable conditions for germination and establishment of seedlings of other plants.

Fire has been a part of the Australian land-scape for hundreds of years. Native plants and animals that live in grasslands have evolved to tolerate fire and in some cases fire is actually required to stimulate new plant growth.

Most indigenous perennial plant species in grasslands will grow again soon after the above -ground stem and leaves are destroyed. Many of the forbs have bulbs, tubers or corms that are protected beneath the ground, while most grasses can re-sprout from buds hidden inside the dense tussocks. Some species also regenerate from seed after burning.

On the other hand, many exotic weed species, particularly annual weeds, are not adapted to fire. Regular burning can therefore be used in some cases as a method of weed control.

Burning, if carried out carefully, also has the advantage of being less likely to introduce or spread weeds than other biomass reduction techniques. For example, grazing and mowing have a higher risk of creating soil disturbance and livestock manure elevates soil nutrient levels. Weed seeds can also be carried on livestock and on mowing machinery.

> *“Burning is less likely to introduce weeds than other methods of biomass management”*

When using fire as a biomass management tool it is necessary to consider what time of year you burn and how often.

WHEN SHOULD BURNING TAKE PLACE?

The time of year a burn is conducted is very important and the timing will depend on the component plant and animal species, the outcome you are trying to achieve, and the prevailing conditions.

In grasslands of reasonably good quality (i.e. that have a variety of indigenous plant species and are not too weedy), the most important consideration is to allow for the reproductive patterns of the indigenous plants and animals. For example, plants need time to flower and set seed, and the seeds need time to germinate. The seedlings then need to grow and survive to maturity.

If a fire repeatedly occurs during any one of these stages, new individuals will not enter the population and eventually the population will decline. Likewise, with animals, burning should occur at a time when they are not breeding and when the offspring have had a chance to grow.

A late summer to early autumn burn is generally considered most suitable as it avoids the reproductive cycle of most plants and animals.

Many of the indigenous forbs have died down by then with their roots or bulbs protected beneath the soil. Usually at this time of year the soil is hard and dry with cracks that offer protection for small animals during the fire.

Where conditions allow, an occasional early spring burn in weedier grasslands can help reduce the cover of cool-season annual weeds before they set seed. But regular late summer to early autumn burns also help to reduce the overall weed cover anyway, particularly if followed up with targeted application of herbicide on post-fire regrowth.

The way a burn is conducted is especially relevant for fauna. Ideally, in a larger grassland remnant, burning would be done in patches with some areas left unburnt each time. Burning in a patchy or mosaic pattern retains some habitat in which animals can shelter from the fire and predators.

BELOW: Low intensity fire

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HOW OFTEN SHOULD BURNING OCCUR?

In a productive grassland dominated by Kangaroo Grass, burning should be carried out every two to fire years.

More often than that and you may start to see a loss of indigenous plant and animal species because they haven't had the opportunity to complete their life stages and reproduce successfully.

On the other hand, if you leave it too long the grass tussocks, particularly Kangaroo Grass, can become so dense that they smother the smaller herbaceous plants that usually grow in the inter-tussock spaces. For a grassy woodland, a burning interval of every six or seven years is generally sufficient. More frequent burning in woodlands can inhibit the regeneration of trees and shrubs.

ABOVE: Mat Rush reshooting after a burn

ABOVE: Roadside burn

WHO CAN CARRY OUT THE BURNS?

For safety reasons many restrictions are placed on the burning of vegetation, so please consult the Country Fire Authority or your local Council for more information before commencing.

Burning grasslands also requires a number of resources and specialised equipment. If you do not have these yourself then have a chat with your local Council and local CFA brigade who may be able to assist.

MONITORING THE BURNING PROGRAM

Each grassland or grassy woodland remnant is different, so regular monitoring is essential to determine whether the burning program you are implementing is having positive results and achieving your aims. For example, has the burning created gaps between the grass tussocks? Have other indigenous plants begun to grow in the gaps? Are any threatened plant species that were there still surviving at the site? Are there more or fewer weeds than before?

If you think you should change the existing management regime of your grassy community, make sure you make any changes gradually and regularly check on what happens. If your grassland has been grazed in the past but not burnt for a long time, trial small areas of burning first (exclude grazing from the burnt patches). It is generally considered not good practice to introduce livestock grazing to grasslands that have been regularly burnt but not grazed in the past.

ABOVE: A slashed firebreak

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DEFINITIONS

Annual plant
A plant that completes its life cycle in only one year or season.

Biomass
In grassland management, used to describe the accumulated live and dead plant material in the ground layer.

Defoliation
The process of leaves being removed from a plant.

Exotic plant
A plant species introduced to Australia from overseas.

Forb
A non-woody plant (i.e. herb) other than a grass, sedge or rush.

Herbivore
An animal that only eats plants.

Indigenous
A plant or animal species native to a particular location, not introduced.

Native grassy community
Native grassland and woodland vegetation with a ground layer dominated by indigenous perennial grasses, usually with a range of indigenous wildflowers.

Perennial plant
A plant whose life span extends over more than one growing season.

Remnant
Patch of native vegetation remaining after most has been cleared or severely altered.

ABOVE: Fire in grassland

FURTHER READING AND RESOURCES

Williams, N. Morgan, J. Marshall, A. (2015) *A Land of Sweeping Plains: Managing and Restoring the native Grasslands of south-eastern Australia*.

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Farmilo B. J., Moxham. C (2018) *Linear Grasslands Reserves Monitoring – weed control program* Arthur Rylah Institute for Environmental Research. Heidelberg, Victoria.

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