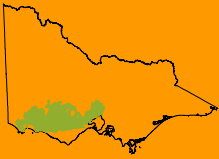




Victorian Volcanic Plains Native Vegetation Management Guide

Restoring the Missing Links

Native Grasslands and Grassy Woodlands



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- Site Assessment & Planning
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Summary

- Restoration, or revegetation, is one of several management actions used to rehabilitate native grasslands and grassy woodlands.
- It can be as simple as planting a few missing species within a remnant, through to major ground works and sowing many species into a large, degraded site.
- Restoration techniques include natural recruitment, planting tube-stock and direct seeding. The use of these will depend on the aims of the project and site conditions.
- Plant species used for restoration need to suit the site conditions.
- Restoration, particularly grassy ground cover replication on degraded sites, can be expensive.

Rehabilitation of native grassy communities

Rehabilitation of a native grassland or grassy woodland may be required because of past management practices that have degraded the site, or because of more recent soil disturbance that has resulted in the loss of indigenous vegetation and habitat. Remedies may be as simple as weed control, ecological burning, supplementary planting to restore missing species, or installing habitat features to improve the condition of a remnant. Rehabilitation can also be more complicated and involve major ground works and restoration of a whole suite of indigenous plant species into degraded sites. This brochure covers various aspects of restoring indigenous plant species into native grassy communities.

Restoration, or revegetation, may be needed for small patches in a relatively intact remnant (e.g. following weed control), or for larger areas disturbed by earth works such as pipelines and tracks, to extensively modified areas such as ploughed or cropped paddocks. The objectives of the restoration could be:

- To increase the size of an existing remnant to provide more habitat for indigenous plants and animals.
- To create a buffer against surrounding incompatible land uses and to enhance the viability of a remnant.
- To provide suitable habitat for the introduction of significant animal species.
- To replace cleared areas (e.g. following weed control or soil disturbance) with indigenous species to reduce the potential for further weed invasion.
- To establish a low maintenance native grassland cover that has fewer weeds, less potential for soil erosion, and a reduced fire hazard, on disturbed sites such as roadsides.
- To improve landscape values of open space, using indigenous ground species with low water needs.



Preparing for the restoration works

Develop a plan outlining the aims of the restoration project, the issues to consider, and how, when and where the works will be done.

The **aims of the project** may be to:

- Increase the size of the remnant.
- Buffer an existing remnant.
- Provide habitat for a threatened species.
- Fill in gaps after weed removal or soil disturbance.
- Replicate a native grassy community on a completely degraded site.

The **techniques to use** will depend on the aim of the project, the size of the site, and the condition of vegetation already present. A combination of methods might be useful for different parts of the restoration site.

- Natural recruitment is usually the best method for relatively intact remnants, and can be aided by fencing, periodic burning, limiting stock grazing, or weed control.
- Planting tube-stock can be used to fill gaps or small clearings within remnants without creating much soil disturbance. Also useful for planting buffers around remnants and can be done in batches as time allows.
- Direct seeding by hand or machine. Small clearings within remnants can be sown by hand. Direct seeding by machine is mostly reserved for larger degraded areas (e.g. adjoining remnants, cleared paddocks, degraded roadsides).

Other **issues to consider** include:

- Is extensive site preparation required? Larger, degraded areas may need to be sprayed with herbicide or have the topsoil removed for a weed free start.
- Are there threatened species present that need to be protected during any works?
- Do any of the species to be planted require particular mycorrhizal fungi for successful growth.
- Are there persistent weeds present that need ongoing monitoring and control?

You will need to **plan the timing** of the project. For direct seeding, you might be able to immediately purchase seed of the species you require, provided suppliers have sufficient stocks. You could then start the works soon after you have completed the planning and organised funding.

Usually however, you will need to allow a period of time for collecting seed, overcoming seed dormancy, or for growing particular plants. Generally allow at least 12 months before the on-ground works can begin.

Seed of most grassland and grassy woodland species on the volcanic plains can be collected from late spring through to early autumn. Planting tube-stock is usually carried out following rains in autumn, or in early spring (on heavy soils). Direct seeding is often done in late winter to early spring. Be aware of the potential for compaction and damage to wet soils when using heavy equipment.

Consider **who will do the work?** Will you be able to do it all yourself or will you need help from community groups or contractors? Different contractors may be needed for certain aspects of the work such as collecting seed, growing seedlings, ground preparation, direct seeding or planting tube-stock.

If you are applying for funding for the project, you will need to consider **what costs are required** to complete all aspects of the works. For example, you may need to include:

- Site assessment and planning (does it need to cover a consultant's fee?).
- Seed collection or purchase.
- Growing seedlings.
- Site preparation (e.g. fencing, or spraying, ripping, grading degraded sites).
- Direct seeding and/or tube-stock planting (e.g. contractor time, or organising and catering for volunteers).
- Equipment and materials (e.g. planting tools, fencing, guards).
- Follow up watering, weed control or replacement plantings if needed.



Which plants should be used?

The most suitable plants to use will depend on the aims of the restoration. Is it to fill gaps in an existing remnant or to replicate a native grassy community at a highly disturbed site? Species selection will also depend on the type and condition of vegetation present, variety of habitats present, and the proposed use and future management of the site.

- Use a list of plants recorded from the remnant (e.g. during an initial site assessment) to identify species you could use to fill in gaps.
- Consult species reference lists for the region for other species that might be missing from your native grassy remnant. Ask your local council or the Catchment Management Authority for help to find a suitable species list or planting guide.
- Look at where plants are currently growing in the remnant or do some research, to find out what habitat each species grows in (e.g. wet, dry, rocky, shaded, sunny, salty).
- Check with the relevant authorities for site specific advice, especially in relation to the presence of threatened species.
- For restoration of larger, degraded sites, start with species that form the dominant ground structure of the vegetation being replicated (e.g. Kangaroo Grass, wallaby grasses, spear-grasses, tussock-grasses).
- Make sure that plants used for the restoration are indigenous to your area and that seed has been collected locally.



Collecting ripe seed is important. On the left are wallaby-grass seed heads showing different stages of maturity. Seeds of most wallaby-grasses can be collected from late spring through to early autumn. The seed is ripe when it separates easily from the stem of the plant, and is best sown in winter or early spring.

Seed collection

If you are collecting seed outside your property to use for your restoration project, you should:

- Check with the Department of Sustainability and Environment to see whether you need a permit. For example, you may need to apply for a permit under the *Flora and Fauna Guarantee Act 1988* if you wish to collect seed from public land, including road reserves.
- Also check whether you need to have insurance cover before collecting seed on public land such as roadsides.
- Seek written permission from the land manager.

Look after the seed collection site:

- Be careful not to damage indigenous plants when collecting seed from a native grassland or grassy woodland.
- Be aware of hygiene measures. For example, use clean tools and footwear, so as not to introduce weed seeds or pathogens to the collecting site.
- Try to collect equal quantities of seed from a number of plants within 100 m to maintain genetic diversity.

Seed handling and storage is important:

- Make sure you can tell if the seed is mature or not. You may waste your time if the seed collected is not ripe.
- Be sure to handle and store seed carefully to prevent damage. The often fragile attachments of some seeds are needed to assist germination.
- Don't forget to keep records of the type and quantity of seed collected, when it was collected, and from which site. Label the seed containers before or immediately after collection.
- Find out the storage requirements of the type of seed you want to collect. Some seed will need to be harvested and sown fairly quickly, while other seed can be kept longer if stored properly.



Definitions

Genetic diversity	The variation of individual genes within species or populations (affects ability to adapt to environmental changes).
Habitat	The environment in which a plant or animal lives.
Indigenous	A plant or animal species native to a particular location, not introduced.
Mycorrhizal fungi	Fungi that form associations with the roots of certain plants, increasing nutrient absorption from the soil, and promoting growth and survival rates of the plants.
Pathogen	A disease-producing organism.
Rehabilitation	Returning a remnant native vegetation community to former health.
Remnant	Patch of native vegetation remaining after most has been cleared or severely altered.
Restoration	Re-establishing indigenous plant species in cleared patches or at degraded sites.
Seed dormancy	Property of a mature seed that prevents germination before a certain time, or before a particular environmental event occurs.
Viability	The ability (of a remnant native vegetation community) to live and continue grow into the future.

Further reading

- Florabank guides on collecting, storing and using native seed: www.florabank.org.au
- Grassy Groundcover Gazette. <http://www.greeningaustralia.org.au/community/vic>
- Ralph, M. (1997). *Growing Australian Native Plants from Seed*. Murray Ralph, Fitzroy Victoria.
- Ralph, M. (1994). *Seed Collection of Australian Native Plants for Revegetation, Tree Planting and Direct Seeding*. Murray Ralph, Fitzroy, Vic.
- Scarlett, N.H., Wallbrink, S.J. & McDougall, K. (1992). *Field Guide to Victoria's Native Grasslands. Native Plants of Victorian Lowland Plains*. Victoria Press, South Melbourne. (Includes a chapter on grassland restoration.)
- Waters, C., Whalley, W., & Huxtable, C. (2000). *Grassed Up: Guidelines for Revegetating with Australian Native Grasses*. NSW Agriculture, Dubbo, NSW.

The **Grassy Groundcover Recovery Project**, run by Greening Australia is making great advances in the use of direct seeding in degraded grassy communities. Although direct seeding is more cost-efficient than using tube-stock, it is more wasteful of limited wild seed resources. This project has found that more seed can be produced from container-grown plants than can be harvested from the field. Under nursery conditions the plants get regular water and produce more seeds per plant. The seeds are also less likely to be damaged by insects or be contaminated by weeds, and can be harvested as soon as they are ripe.

Victorian Volcanic Plains Native Vegetation Management Guides are a joint initiative of:



These Grassland and Grassy Woodland guides are based on 'Management of Native Grasslands in the Melbourne Area' information kit produced by Department of Conservation & Environment, Victorian National Parks Association, & Australian Heritage Commission (1992). This publication may be of assistance to you but the Corangamite Catchment Management Authority, its employees and other contributors do not guarantee that the publication is without flaw of any kind or is wholly appropriate for all your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.