

B15. Restoration/Rehabilitation/Revegetation/Regeneration

Two of the guiding principles for biodiversity protection are that biodiversity is best conserved in-situ, and that regeneration is a higher priority than revegetation (Del Marco *et al*, 2004). The related terms, 'restoration', 'rehabilitation', 'revegetation' and 'regeneration' are often used in place of each other. The following table provides definitions of each term.

Restoration	The return of a community to its pre-disturbance or natural state in terms of abiotic (non-living) conditions, community structure and species composition (English and Blythe 1999)
Rehabilitation	Any attempt to restore elements of structure or function to an ecological system without necessarily attempting complete restoration to any specific prior condition (Meffe and Carroll 1997)
Revegetation	Replanting vegetation (may be part of a restoration project)
Ecological Recovery /Regeneration	Describes the restoration of natural ecosystems through the natural cyclic processes of renewal and self maintenance of species and their populations (Del Marco <i>et al</i> , 2004)

Natural regeneration should be encouraged via weed management, erosion control and/or trampling control (e.g. fencing, bollards, and signage) before revegetation is attempted. Use of the Bradley Method of regeneration and its key principles are widely accepted within the Australian environment.

The key principles of the method are:

1. work (weed) from areas in good condition towards degraded areas;
2. disturb the soil as little as possible; and
3. let the regeneration of native plants govern the rate of weed removal (Bradley, 1988).

This technique is suitable at sites where "sufficient propagules, such as seeds or root stock, are present" (Reid & Scheltema, 1995, p159). As a general rule, it is recommended that revegetation will only be necessary in bushland of degraded, or lesser, vegetation condition. Where planting occurs, local provenance species must be used.

Local provenance refers to seed collected from natural populations growing in the same vegetation community and position in the landscape within a reasonable (closest possible) distance of the area being restored. Provenance refers to patterns of genetic variation exhibited by a species over its geographic range. The characteristics of the plants being collected from, or the area in which they are located, should sufficiently match those of the planting location or its local vegetation (Mortlock, 1999).

In planning for restoration and revegetation works, collect relevant information about the site to ensure that all relevant considerations are met. For example, the local species plant list for the site should be as complete as possible and plant communities found on the site should be mapped.

The NAIA Templates can be used as a tool to collect this kind of baseline information - such as the structural plant communities present and their correlating soils, drainage characteristics, topographic position, growth form layers, dominant species, crown cover and icon species present. "A plant community gets its character from the structure of the

vegetation (the number of layers, their height and density) as well as the species composition” (Harris & Scheltema, 1995, p167).

A wealth of area-specific information exists on the flora and plant communities of the Perth region, particularly the Swan Coastal Plain. The Perth Region Plant Biodiversity Project (PRPBP), a collaborative project between the PBP, the Department of Environment (DoE) and the DEC, makes much of this information more accessible and further interprets the information for use.

The information presented in the PRPBP (available on the PBP website at: <http://www.walga.asn.au/about/policy/pbp/prpbbp>) aids in getting to know and understand:

- common and uncommon plants and plant communities;
- how plants and plant communities vary with the underlying landforms and soils;
- plant communities associated with vegetation complexes;
- plants and plant communities of the floristic community types, rare plants and plant communities;
- rare plants and rare plant communities;
- vegetation condition scales and mapping
- the plants and plant communities of selected Bush Forever sites; and

Knowing and understanding Bushland Reference sites is a key component of using the NAIA Templates. These regionally significant natural areas provide reference for the best representation of typical plants and plant communities of the major landforms (and the variation within these communities) in a series of east-west transects across the major landforms of the Perth region.

Revegetation Works

Depending on the aims of the project (for example, restoring degraded bushland) it may be necessary to replant bushland areas. Before starting with on-ground works, ensure you have sufficient and appropriate plant material available for planting. Seed/cutting collection of local plant species will be necessary. Seed collection periods vary across seasons, plant species and geographical regions. Forward planning is vital. See section B16 (p46) for more information about seed collection.

Project site/s will need to be prepared for revegetation in several ways.

- Consider the current use of the degraded area. If the site mapped out for revegetation is aligned over a current informal trail and no other effort has been made to relocate the path via infrastructure and/or communication with visitors about the intention to revegetate, the project will inevitably be compromised by human impacts. Install signs informing visitors about the project.
- Develop a weed management program considering the condition of the site and the amount and type of weeds present at the site. Weed control is best when carried out for several seasons before planting and will need to be undertaken over several seasons, after planting, while seedlings become established.
- Where rabbits are a problem or kangaroos are present, ensure seedlings are protected from grazing with tree guards or exclusion fencing.
- It is recommended that the fire history of the site be sought as frequent fires at the site may have altered the original vegetation. A faunal species list would also be helpful in regards to provision of habitat and ecological relationships between flora and fauna.

Further Information:

Apace offer a course "Introduction to Bush Regeneration" to assist people with bushland regeneration/revegetation techniques and practices. Contact Apace - Ph: 08 93361262 for more information.

Other useful references include:

Bradley J. (1988) *Bringing back the Bush: the Bradley method of bush regeneration*;

Scheltema, M. and Harris, J. (ed) (1995) *Managing Perth's Bushland: Perth's bushlands and how to manage them*; and

Buchanan R.A. (1989) Bush Regeneration: recovering Australian landscapes