

6. Key steps to effective restoration

Your restoration plan should cover at least 5 years (Atkinson 1994). This is broadly equivalent to a management plan (**section 3**), and outlines the steps involved in the project. These steps are covered in the following sections.

SITE PLAN AND INVENTORY

A site plan includes an inventory of what plants and animals are present. It will clarify where different species should be planted, e.g., sensitive species that need careful siting to provide future seed sources. It may also identify places where physical alterations are appropriate, e.g., increasing water supply to a wetland. The biological information will provide a baseline for future monitoring and assessment of success. Ensure your site plan includes the following:

- Legal boundaries of the site.
- Approximate boundaries and areas of soil-landform units (slopes, terraces, basins, wet/moist/dry areas).
- Environmental gradients, e.g., rainfall and altitude.
- Favourable microhabitats, e.g., locally moist or sheltered areas.
- Human uses and any threats to the site.
- Needs or opportunities to alter the site, such as re-grading steep-sided drains.
- Current native and introduced vegetation - mapped if possible on an aerial photo.
- Exact locations of valuable or rare plants and serious weeds.

SITE HISTORY AND SPECIES LIST

Depending on the degree of damage to the site, you may find little to indicate what the former native plant communities were, particularly in lowlands. You may be able to determine the former communities by looking at the nearest similar sites, reviewing historic records of plants and animals or studying pollen records. However, information about ferns, mosses, lichens and invertebrates is likely to be poor.

Develop a species list for your plantings from the site plan and history, supplemented by good national and regional floras. There are several guides to restoration planting in New Zealand, but only a few are regionally based and take account of local species

and provenance. These include guides for Waitakere City, Christchurch, and Lyttelton Harbour. Some native plant nurseries have catalogues with species and habitat information.

A web-based tool (see <http://www.bush.org.nz>, under 'ecology') called "Planter Guide" lets you generate a species list for land or microsites anywhere in New Zealand below the natural treeline. You simply enter the appropriate ecological region for your land, the soil/drainage type and any other environmental attributes or uses. If you do not know the broad soil group, a built-in identification module will help you. The guide produces a list of potential species for the site and the appropriate sequence of planting. It does not necessarily indicate what grew on the site in the past. "Planter Guide" will continue to be refined, but it cannot be accessed when it is being updated.

In practice, only a quarter of the lowland flora is suitable for restoration planting – species that are vigorous and relatively tall-growing (trees, shrubs, tussocks, reeds and tall ferns). Propagation and cost limitations will also prevent you using all identified species.

Be careful with national species lists based on environmental tolerances as they often do not take account of regional variations. Your species list should reflect the main environmental gradients identified in the site plan. Local ecological advice is important when you are finalising the species list, particularly for drought and frost hardiness of the selected plants.

Common species should form the framework of the restored area, as they will be well adapted to the conditions. Colonising species provide fast growth, inhibit weeds and provide shelter for sensitive species. If species are matched to their micro-habitats, your chances of success will be greater.

PLANTING PLANS

Use your site plan, site history and species list to produce a planting plan in line with the goals of your restoration plan. You can draw each plant or group of plants on a map, or on idealised cross sections, which need to be interpreted before laying the plants out for planting. The number and type of plants needed are based on the area of each site and the soil-landform type. Get an ecologist to check your planting plan.

Groups of plants provide better protection and mimic natural patterns. On sand dunes, clumped planting reduces the risk of failure, helps to trap moving sand and reduces wind funnelling (Bergin 2000, Bergin and Herbert 1998).

Your planting plan should have the following elements:

- Species most common to the area should form the framework.
- Colonising species should be densely planted in open or exposed areas.
- Sensitive species should be planted in sheltered areas and microhabitats.
- Species providing bird food (nectar and fruit) should be planted.

- Local fire-tolerant or retardant species, such as broadleaf/kāpuka, ngaio, māhoe, NZ flax/harakeke and tussock grasses, could be included.

BUDGETING

Budgetting is important to ensure that all aspects of your project are properly funded. Plant costs are the main expense for volunteer-based projects, with additional costs for fencing materials, mulch, and control of pests and weeds. Labour costs can be significant if you use professional advice or paid workers. Work out detailed costs at this stage.

- Allow for an on-going commitment to the project of at least 5 years, or longer for difficult sites.
- Break costs down into time periods that reflect different stages of activity and expenditure.
- Keep some funds for maintenance of the restoration site and its plants.
- Allow additional funds for any specialist advice.
- Update the budget whenever you initiate any further management actions.

RECORD KEEPING

Keeping good records in a safe place is important for future use and reference. Remember that restoration plans do not record all relevant information. You cannot rely on people's memories, and key people may leave over the lifetime of your project. An electronic spreadsheet can be used, as it is updated easily. You should keep back-up copies in safe locations. Alternatively, hand-written cards can be used and kept in a box - the must also be updated, and you should store duplicates separately.

- Record plant species lists, numbers of plants planted, their sources and costs.
- List contacts for volunteers and suppliers of material.
- Store monitoring assessments (methods used, results, management actions decided).
- Store any hand-written material, plans and photographs in a safe place.

