RE-ESTABLISHING NATIVE PLANT COMMUNITIES FROM SCRATCH; LESSONS FROM MATAWAI PARK.

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INTRODUCTION

Matawai Park is a 4.4 ha native plants park situated in the township of Rangiora which now has the status of a scenic reserve. The Park began life as a wet grass paddock in 1969. On to this was placed unwanted soil from roading development, which was moulded into low hills around the paddock. The then Rangiora Borough Council decided to create from this a native plants park. This was a forward-looking concept in those days when re-vegetation projects were rare. This paper examines the stages of the Park's development from inception to the present day, reflecting at each stage on the issues that arise during the process of similar re-vegetation projects. This is done with the wisdom of hindsight, and no criticism of early decisions is intended. Discussions of issues just show the evolution of ideas.

INITIAL PHILOSOPHY

The initial philosophy was to plant the Park in native bush, which at first proved difficult because of the heavy clay soil, the composition of the road widening material (asphalt and concrete were common), and the disturbed natural drainage of the area.

At this stage of a re-vegetation project, a long-term philosophy is helpful to clarify future direction. These questions need to be considered:

- What is the function of the area? Is it botanical or recreational, or a mixture of both?
- Is the planting to be restricted to plants of local provenance or a wider selection?
- How is the area to be managed to ensure consistency?
- What is the status of the land?

A clear plan at this stage simplifies decision making and lessens the chance of problems arising later.

At Matawai Park, early survival rates were poor until Councillor Dudley Franklin used his forestry experience to help plant establishment. The ground was ripped, massed plantings were made, and hardy nurse species such as *Coprosma robusta* were used to help the establishment of less hardy plants. Weed control was a vital factor especially in these early stages of the Park's development. Roundup herbicide was not available then, and a combination of mulch and mechanical means was used.

Kahikatea, matai and cabbage trees were planted in wetter sites, *Pittosporum tenuifolium,* kanuka and black beech in drier sites and *Carex secta* and flax in permanently wet sites.

A number of generalised planting issues arise at the planting stage of re-vegetation:

- Buying strong stock is vital. A root collar diameter at least as thick as a pencil for trees and shrubs is a reliable indicator of reasonable plant reserves. These reserves help see the plant through the all-important first three years with minimum or no support.

- If cutting grown plants are used, these must come from an assortment of plants to provide a range of genetic material and a balance of sexes in the case of dioecious genera such as *Coprosma.* As well as this, it must be remembered that cutting grown plants may not be true to the general habit of the plant.

- Plant selection to suit the site and conditions will assist survival.

- Planting in a "blobby" shape will reduce the destructive desiccation of edge effects. The use of divaricating shrubs as margin plants will help here too.

- Planting techniques that avoid tangled root growth will prevent death of established trees. Fibrous rooted plants such as grasses and sedges are no problem in this regard.

These factors are all important to achieve a high likelihood of surviving the critical first three years of a plant's life.

ONGOING DEVELOPMENT

After 20 years, many plants in Matawai Park were growing well, and new issues of development were beginning to arise. Many of the plantings were of a similar age structure and some of the original nurse and successional trees were becoming senescent and in need of attention.

Although this is in fact a natural process, it must be remembered that Matawai Park has been re-vegetated from scratch and there was no residual seed source to allow normal successional development to occur. In some cases, the tightness of the canopy was excluding light from longer-lived species such as totara, to the extent that some of them were dying. Clearly the system was a dynamic one which needed monitoring in order to see that development continued in an appropriate manner. The philosophy at this time, after 20 years, was one of a managed reserve of native plants.

About this stage, the Matawai Park Advisory Group was formed from community volunteers by the Waimakariri District Council to oversee the Park's management. The group reviewed the Park's development and gave a lot of thought to the Park's long-term future.

ECOLOGICAL SELF-SUSTAINABILITY MODEL

The advisory group decided to formulate a plan for the Park's long-term development that would combine the public use role with an attempt at ecological self-sustainability. The model would, of necessity, have many limitations, but also many advantages as the Park continued to develop.
The main reasons for considering such a model were to:

- Reduce the need for management
- Save the ratepayers' money
- Act as a guide for enrichment to increase biodiversity
- Help ensure the longevity of the vegetation

It also seemed a logical and appealing idea.

With these ideas in mind, the Self Sustainability document was written. The model was founded on three principles on which plant distribution in nature is based:

1. Plants:

It had already been decided that plants of Canterbury provenance would be the only ones planted.

2. Patterns:

In areas of natural vegetation, plants are organised in associations and communities. These patterns of distribution are based on variations of environmental factors such as light, soils, and exposure.

As well as plant distribution patterns within communities, there is a relationship between communities, which is important for Matawai Park; e.g. where the margin shrub communities are able to seal the edges of taller tree communities, this reduces damage from desiccating winds.

In Matawai Park, the Advisory Group sought to represent a range of natural plant communities of Canterbury.

3. Processes:

Some of the processes that create and maintain communities as dynamic systems are:

- Fruiting
- Dispersal
- Establishment
- Succession
- Disturbance
- Death
- Recycling

In order to represent a range of Canterbury's plant communities it has been necessary to create conditions that bring about these processes.

Matawai Park has both a botanical and a recreational function, and because of this, the ecological self-sustainability model could not be a purist one. Many non-ecological factors had to be considered, e.g. *Rubus squarrosus* was used to prevent a "desire line" forming which was damaging new plantings!

The main causes of this are:

- Matawai Park is in the middle of an urban area in a highly modified context that precludes many natural plant communities such as a salt-marsh community.
- The planning has to have non-natural expectations of communities; i.e. communities have to stay where they have been established.
- People are very much a part of this public park.

The existence of these factors means that intervention will always be necessary. Where appropriate, succession will be arrested to maintain grassed areas for picnicking and other passive recreation. However the model will be based on ecological principles. We seek to use plants whose needs can be met in the Park and will do the job required of them.

The Canterbury plant communities represented are organised in a mountains-to-the-sea theme from west to east, and are as follows:

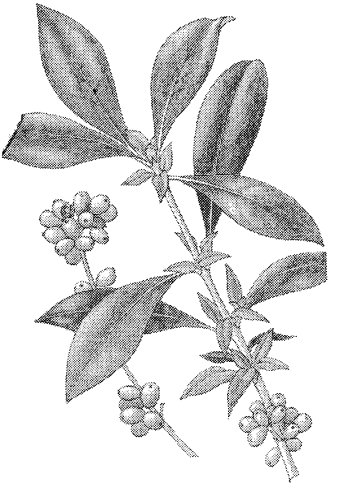
- **The mountain/black beech community** has trees over thirty years old. They are amongst the tallest trees in the Park and are now seeding.
- **The lowland podocarp wetland forest community** most nearly represents the original forest of the Rangiora area, the last of which was removed a few decades ago.
- **The broadleaved shrub community** consists of areas of successional vegetation, and also the marginal shrub community. In Canterbury, marginal communities have a strong representation of divaricating shrubs whose modular shape is effective in sealing forest edges against desiccating wind effects.
- **The wetland community** is dominated by flax *(Phormium tenax),* pukio *(Carex secta),* and raupo *(Typha orientalis).* Interestingly, in the last few years this area has dried out significantly. Possible causes for this may be increased transpiration loss from nearby tall trees as they grow, or drainage effects as surrounding sub-divisions develop.
- **The pond stream community** is on the one major spring in the Park and on several smaller ones connected by a series ditch/streams, which remain from the original paddock drains. In the centre of the Park there is also a pond large enough to attract ducks.
- **The short tussock grassland community** is largely created and maintained by a regime of fire and grazing in Canterbury. The Advisory Group felt that as this community type is such an icon in the Canterbury landscape its inclusion on the drier mounds was warranted. It is somewhat experimental, and will be monitored over time.

- **The coastal community** occupies a small area on the eastern corner of the Park. As there are no saline or coastal influences there is only token representation of this community.
- **The open grass community** provides grassed areas that are important for recreation. Efforts are being made to include a range of local turf species.

Many other Canterbury plant communities are not represented in the Park, as conditions are not suitable. The Advisory Group feels this organisation is based on sound principles and may well have application in other areas.

From its inception in the late 1960's the Park has developed into a great asset in North Canterbury. It is hoped that with the Management Plan under the auspices of the Waimakariri District Council and by the application of the modified Ecological Self-Sustainability Model of plant management, the Park has a great long-term future.

For further information on Matawai Park, visit our website: www.matawaipark.org



Karamū, *Coprosma robusta* – a fast-growing native shrub often prominent in natural successions to native forest, and widely planted. Its orange drupes provide food for birds, such as bellbirds and silvereyes, for many months each year. (del. Hugh Wilson).