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REVEGETATION IN A PERI-URBAN LANDSCAPE

A Landholder's Perspective

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REVEGETATION IN A PERI-URBAN LANDSCAPE
A Landholder's View

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Abstract

Landholders address many issues when undertaking revegetation in a peri-urban landscape of isolated trees, scattered remnants and possibly altered hydrology. They face a knowledge dilemma.

Past agricultural practices have resulted in extensive landscape modification. Apparently local populations of plants, and discontinuity between major vegetation types, are a result of our interference. Are these populations now less genetically diverse than in the past? Have birds, bats and other animals brought seed and distributed pollen from elsewhere?

The only way to gain an idea of the composition of the "original" vegetation is to look at nearby but scattered remnants, but "how nearby is nearby?" Boggy areas and wetlands with their own plant communities are locally present due to past land use practices. They are naturally part of the more level country lower down, but only 10km away, and contrast with the constant water movement and active erosion which characterise the escarpment country.

This area demonstrates a natural continuum of vegetation types from the coastal wallum through wet sclerophyll forest to the rainforest plateau of the Blackall Range. It is a transition zone.

We, as landholders, balance the desirability of local provenance using nearby remnants as a guide, and selecting alternative species from the wider region. Do we accept that change has already occurred? Even the provenance of locally recorded species may be unknown. The gene pool is already so mixed for some species, the attitude may well be "does it really matter"? It frequently does matter. At this point, we begin to wonder what we are doing, and ponder other issues!

Every landholder will have desired outcomes for the revegetation of his or her property. Is it habitat, an aesthetically pleasing landscape, revegetation per se, or a mix of these attributes? Any revegetation program we undertake will have a social dimension while taking into account the physical, climatic and geological features of the site.

We want to do "the right thing" but don't always have the time and tools to access the literature, and probably conflicting views, relating to provenance and genetic diversity. We hope our changes will be for the better.

Paper

The movement towards swapping city living for a semi-rural lifestyle beyond the urban sprawl has considerable appeal and is part of a continuum of changing land use patterns. Many individuals in this new wave of “rural” residents recognise that little of the natural vegetation remains, and plan a revegetation program. These landholders face many challenges and deal with many issues on the journey towards their own revegetated landscape.

The challenges

When we joined the movement away from the city, we knew that much of Australia’s landscape, particularly in peri-urban areas adjacent to the coastal strip, had been extensively modified. The rate of vegetation clearance had increased with rapid urban expansion, especially over recent decades, and rural land use patterns had also changed. Our region in the Sunshine Coast hinterland of South East Queensland had been particularly affected, but the areas immediately outside all of our capital cities face similar challenges.

Historically, our valley was prospected for timber early last century and anything accessible and of value was harvested. Prior to WWII, the whole valley, including steep escarpment slopes, was cleared for banana growing. When the banana industry moved on, a variety of small crops were grown, orchards established, dairying undertaken and beef cattle grazed..

Subdivision began to occur 20-30 years ago. Much of the land was no longer actively managed and weeds became established. Beef cattle were sometimes used as a management tool but cattle may control some weeds and spread others unless additional control programs are undertaken. Weeds are a major concern for all landholders as they out-compete much of the remaining native vegetation. Our small valley is just one example of the challenges faced when undertaking a revegetation program.

The issues

Our revegetation program is being undertaken in a changed landscape of isolated trees, scattered remnants and possibly altered soil hydrology. There are many issues to address.

The apparently local populations of plants we now see, and the discontinuity between major vegetation types, are undoubtedly a result of our interference in the landscape. Are the widely spaced populations resulting from our interference now less genetically diverse than in the past?

Unless fenced out, which historically has not been the case, cattle impact on the condition and species composition of sensitive riparian zones which are often the major sources of local seed. Potential seed trees, and especially understorey plants, are reduced in diversity and numbers, resulting in an inadequate sample population.

A further change which has occurred as a result of clearing, grazing, and naturally slip-prone soils, has been the development of permanently wet areas fed by natural springs. In the past, the valley would have been covered with vegetation through which ran several small but permanent streams. These steadily cut down to a rocky

base, and continue to carry silt following heavy rain. Constant water movement and active erosion are natural features of this steep country. Boggy areas and wetlands with still water and their own plant communities are not. They are part of the country lower down, but only 10km away, where the gradients level out. Soil conditions and plant function are important factors to be considered together when selecting species for revegetation.

The construction of roads for access and farm dams to provide additional water would also have impacted on the hydrology of this steep and dissected valley.

A knowledge dilemma

For many areas, it would require a great deal of research to determine “original” species composition, and it is quite possible that botanical records do not exist. The only way to gain an idea of the composition of the “original” vegetation is to look at nearby but scattered remnants. This immediately poses the question “how nearby is nearby”? Distance may not be the determining factor.

In our particular case, we need to recognise that the area is in many ways a transition zone. The valley lies between the wet sclerophyll forests west of the coastal wallum vegetation and the rainforest on the plateau of the Blackall Range. It is only 30 km from the ocean to the rainforest and is a natural continuum with the gradation of vegetation types generally determined by physical factors such as the underlying soil, altitude and hydrology. Variable soil types derived from comparatively recent volcanic history are indicated by noticeable changes in the present vegetation patterns.

Given the extent of landscape modification, what confidence can we have in the provenance of locally collected seed? We know from early photographic records that virtually all the mature trees are in fact regrowth. Is there a seed bank in the soil; or have birds, bats and other animals brought the seeds from elsewhere?

In the recent past, the whole area provided food for large numbers of seasonally migrating birds. Graham Pizzey in his very readable book, “A Garden of Birds” comments on the regular annual migratory movements of honeyeaters. These may be local, long distance or coast to upland migrations which follow the blossoming of particular tree species. Older residents mention hunting parties from the coast who came to shoot the numerous pigeons which depended on the valley’s fruit-bearing trees, particularly the native figs. It would be reasonable to assume that all of these birds played some part in the transfer of pollen and seeds (genetic material) between a continuum of plant populations. Fruit bats, insectivorous bats and the now much less common mammals would also have played their part.

Local community groups concerned about the environment emphasise the importance of selecting species which are, as far as possible, local to the reasonably immediate area. They also encourage us to use locally collected seed (seed of local provenance). This is obviously a laudable approach but can we be confident of its basis in science in specific areas?

The native vegetation research and development program undertaken by Land & Water Australia has tested some of the science but Professor David Lindenmayer suggests that “.....*the relative effectiveness of current guidelines for landscape design and vegetation restoration is largely unknown.*”

A further factor, considering the history of the area, is current species composition of the “regrowth”. Is it now more or less diverse than in the past? Will a desire to create habitat with its multiple layers and diverse food sources result in the introduction of species which were never part of the mature forest community? Nearby remnants certainly provide some guidance but individual species may no longer be well adapted to the locally changed environment.

We, as responsible landholders, want to do “the right thing” but don’t always have the time and tools to access the considerable literature, and at times conflicting views, relating to matters of provenance and genetic diversity. The story must be similar for many landscapes.

Practicalities

We’ve now researched the history of our landscape, understand some of the problems, and want to get on with the job!

What approach do we take when considering revegetation of one of the “new” permanently wet areas referred to above? Would the “original” forest species tolerate a permanently wet root zone? Should alternative species whose main function is to hold the soil together, and which are found a relatively short distance away, be considered? It is certainly desirable to reduce the rate of erosion and to allow for natural filtration of surface water.

The landholder is faced with making a judgement which balances the desirability of local provenance using nearby remnants as a guide, and selecting alternative species, which may play different roles, from the wider region. Do we accept that change has already occurred as a result of considerable past plantings of vegetation from well beyond the region or at the very least, of locally recorded species whose actual provenance is unknown. The gene pool is already so mixed for some species, the attitude may well be “does it really matter”?

It probably does matter, particularly for species which have a tendency to get out of control when planted in an environment which lacks their natural checks and balances. The North Queensland umbrella tree, *Schefflera actinophylla*, is a classic example, coming as it does from a completely different region of the state. For the river or brush cherry, *Syzygium australe*, of which many thousands have been planted, it may well be too late to be concerned. At least the species is generally native to the region although it has to be recognised that the plants will have been derived from a wide range of seed sources and cutting grown selections, which of course also produce seed.

Other species are not common in cultivation so that using local provenance seed is generally desirable, whilst bearing in mind that the parent trees most probably established themselves in a cleared landscape and we usually don’t know anything about their genetics. The seed may of course have been stored in the soil but most probably came from somewhere else courtesy of an animal or bird vector, or may have been washed into its final resting place.

At this point, we begin to wonder what we’ve let ourselves in for and ponder other issues!

Every landholder will have a different set of desired outcomes for the revegetation of his or her particular property. Is it habitat, an aesthetically pleasing landscape,

revegetation per se, or a mix of these attributes plus others? Do we leave in place the now mature paperbark trees which established below the old dam wall as a consequence of changed hydrology? No-one knows whether they were deliberately planted or 'just grew'. Any revegetation program we undertake will have a social dimension as well as taking into account the physical, climatic and geological features of the site.

And now the result

With help from nearby practical community groups, we learned about our local plant communities. We talked to like-minded neighbours who were a mine of historical information. We learned to propagate seed from our own mature trees, accessing as many as possible to achieve at least some sort of genetic mix. We learned that achieving effective ground cover was critically important to reducing soil erosion in our area. We "blended" our revegetation into the bird attracting garden we created and we left in place the beautiful habitat paperbarks. We embarked on a fascinating and very rewarding journey.

And next?

Revegetation programs never stop! There are always weeds to remove, more understory to plant, increasing wildlife to accommodate and always, always, more to learn. We certainly hope that the body of scientific knowledge on which we base our decisions will become more readily available. We hope that our own experience can be used to add a practical dimension to the science. New research results will help us to improve our approaches and tell us where we made mistakes or could have done better. We will not, however, be removing our mistakes and starting again, unless of course we've inadvertently created a serious weed problem!

As landholders, we will do our best but also be aware that our own activities will result in further changes to the landscape. On balance, we hope that the change will be for the better.

References

Lindenmayer, D. 2002, *Vegetation restoration and landscape design for enhanced biodiversity conservation*, Project Fact Sheet 6, ANU34, Native Vegetation R&D Program, Land and Water Australia, Canberra

Pizzey, G. 1991, *A Garden of Birds*, HarperCollins Publishers Limited, Sydney