CHAPTER ELEVEN

AESTHETICALLY PLEASING PLANTINGS: RESTORING NATIVE VEGETATION IN COASTAL SYDNEY

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Introduction

The connection between the visual and performing arts and caring for the natural environment has been recognised for at least the past 40-45 years; one connection being that of observation (Curtis, 2003). The project described here, while primarily a land restoration project, was designed in a non-conventional way to make it interesting and aesthetically pleasing, thus inspiring a greater appreciation of local native flora and encourage pro-environmental behaviours in local residents and visitors to the area.

I have been fascinated and inspired by both art and the natural world since I was a child. I still have a photo of myself, aged four, seated at my easel in art smock, painting en plein air with tempera poster paints in my Melbourne backyard. After school, I studied art at tertiary level. At that time, the end goal of art school seemed to be to have one's works exhibited on the walls of a gallery, which seemed a bit precious and exclusive to me. I wanted whatever I created to be out in the public space where all kinds of people, not just art aficionados, could come across it as part of their daily comings and goings (see Laura Donkers in Chapter 4 of this volume). This sentiment of alienation from the art market and museum was shared in environmental art movements of the time (de Groat, 1994), but unfortunately not in the art school I attended. I moved on from art school to other careers.

For the past 20 years I have been working in roles related to ecological restoration in the urban space, mainly in local government. I currently work at Waverley Council, in the coastal eastern suburbs of Sydney, New South Wales, Australia. These days my ecological restoration work and art

practices have merged, and the boundaries between my artist self and my ecologist self are blurred. I bring my knowledge of plants and ecology and love of colour and design into revegetation projects, free from the constraints of the parameters of current theory and practice in landscape design, but instead working with practical constraints and barriers of community expectations and environmental conditions that provide me a defined space to work in and boundaries to push against. As well as coming from a place of nature conservation, my practice comes from an intuitive knowing and connectedness with the natural world – a non-ending awe for its beauty and complexity. In delivering revegetation, projects, I endeavour to 'tune in' to the local character of a place in the planning and design, and with the finished project, aim to inspire people to use a greater diversity of native plants in their gardens and public spaces. The creative practice is both in the design and delivery of these revegetation projects, but also from the simple point of view that growing plants is a creative act.

Human experiences and engagement with the environment give rise to aesthetic experiences that can lead to changes affecting humans and the landscape and thus ecosystems (Gobster, 2007). Part of my practice is to investigate the space where art and ecological restoration not just influence each other, but intersect in the landscape. In this chapter, writing as a revegetation practitioner, I describe recent revegetation projects I have organised in Eastern Sydney (New South Wales, Australia) and show how including an aesthetic dimension has enhanced them. Paraphrasing Curtis (2008), whilst aesthetics may not be essential in ecological restoration, I have found that aesthetic considerations may be a significant motivator for people to become interested in ecological restoration and revegetation, thus motivating them to adopt pro-environmental behaviour.

Ecology meets design and aesthetics

Greta de Groat purports that 'the concept of beauty can be used as a provocation and as part of a dialog that artists can use to explore our connectedness with the environment' (de Groat, 1994). Many amenity and park plantings are designed with the objectives of easy maintenance and continual green in mind. I think we can do better than typical amenity plantings of species in blocks and rows, sometimes even just the one species.

Ecology is the study of the interconnectedness of all life. All life creates by reproducing, thus making life and creativity inseparable. Academic, landscape architect and ecological designer Joan Iverson

Nassauer claimed in 1997 that 'we can align aesthetics and ecology by design' (Nassauer, 1997). Traditionally, landscapes that are seen as beautiful are ones that are 'cared for' by human intervention/activities, such as weeding, mowing and pruning, and typically contain many more colourful flowers that most wild or natural landscapes (Nassauer, 1997). She goes on to say that 'landscapes that attract the admiring attention of human beings may be more likely to survive than landscapes that do not attract *care* or admiration' (my italics added). 'Designers' and artists' work to improve ecological quality may have its greatest effect where it selects valuable ecological functions and makes them vivid for human experience. In this way, small, special places can demonstrate the health that is required for a more authentic conception of care' (Nassauer, 1997). Studies have shown that strong relationships can exist between the arts and Landcare, and that people can gain affinity for the environment through performing and visual art (Curtis, 2009; 2011).

Native bushland can be seen by some as a place that is uncared for, or alternatively, just 'boring'. This is especially true in comparison with 'typical' urban public place landscapes, which can be highly manicured with a small number of plant species. A recent response from a community engagement exercise (regarding a proposal to replace some uncared for exotic plants in a coastal location that had been destroyed by fire) illustrates this opinion:

> It would be a pity if Waverley Council replaces this with the same scruffy collection of native grasses, banksias and other uninspiring shrubbery that seems the default Council option. (Bronte resident 2019)

There is a delicate balance between undertaking revegetation projects that provide habitat for native plants while engaging, inspiring and maintaining the support of our local community and visitors. To align with the cared-for aesthetic, many Council land managers rely on a small palette of plants that are robust and resilient to use. Appearances matter, and affect public willingness to accept plants and designs that improve ecological quality (Nassauer, *et al*., 2019). Although a monoculture of Mat Rush (*Lomandra longifolia*) – as often seen along motorway roadsides – can cope with harsh environmental conditions, it does not provide many biodiversity and aesthetic benefits. 'The appearance of many indigenous landscapes and wildlife habitat violates cultural norms for the neat appearance of landscapes' (Nassauer, 2007). These 'scruffy collections' can convey a lack of care for the landscape to people who equate cared-for planted areas with order, and my challenge was to install a multi-species plantings that will looked cared for, and avoid monocultural plantings or rows of

identical shrubs. In the introduction to her book *Australian Dreamscapes*, photographer Claire Takacs quotes the British garden designer and writer Noel Kingsbury: 'In order for natural environments to be valued by humans, they have to be liked'. She notes that Kingsbury sees the role of gardener or design as 'arguably more important than ever; planting which serves a purpose has to look good too' (Takacs, 2018).

People need nature

Many of us who live in the city still consider nature to be somewhere else: it's 'out there': 'in the country'. The reality is that nature is increasingly disappearing across the planet. The United Nations predicts that by 2030 urban areas are projected to house 60% of people globally (United Nations, 2016). Australia is not excluded from these statistics. Habitats and vegetation communities along the entire length of Australia's eastern seaboard are in decline from development and inappropriate management. We need to begin to replace biodiversity in our 'own backyard'. Without biodiverse plantings and habitats in our cities and urban areas, many humans will no longer know the diversity and beauty nature provides. If one cannot see nature, or only sees a very manicured and monocultural version of it, one is unlikely to be interested in conserving it in all its glorious complexity and variety, and will not be motivated to appreciate and protect it. While people may not consciously make the connection between their daily walk in a biodiverse environment, there are reasons why houses in 'leafy' suburbs are more desirable (Plant, 2017).

Locally generated ecosystem services provided by vegetation and other natural features have a substantial impact on the quality of life in urban areas. People need nature not just for the ecosystem services it provides, such as air filtration, microclimate regulation, noise reduction, rainwater drainage, and sewage treatment (Bolund, 1999), but for physical and mental wellbeing. A plethora of evidence citing the value of nature to human health and wellbeing has been collated in recent years (Arvidson, 2016), and more than 350 papers have been cited in literature reviews (Franco, *et al*., 2017). Books such as *The Nature Principle* (Louv, 2013), *Vitamin N* (Louv, 2017), and *The Nature Fix* (Williams, 2018) also list numerous proven benefits to humans of spending time in nature. Formalised nature experiences such as Forest Bathing – originating in Japan – are becoming increasingly popular in the west (Hansen, *et al*., 2017). As more and more people are realising the connections between nature and health, there is a growing acknowledgement that urban landscapes need to consider biodiversity in their design (Wood *et al*.,

2018). It is difficult to draw causal relationships beyond formal studies. Several surveys of Waverley residents have shown that there is much appreciation of the 'clean and green' aesthetic that is present in the area, but the survey questions have not been detailed enough to demonstrate whether this appreciation is for park plantings and street trees, or natural and native vegetation.

Restoring the continuity of the coastal vegetation corridor

Revegetation projects can either be a mere planting exercise: for purposes of aesthetics; to reduce the need for mowing; to provide some ecosystem services, such as bioremediation; or an attempt to provide as many of the ecological functions as possible that are present in an intact vegetation community. These functions include: provision of habitat for animals and plants; protection of soils from erosion by wind, water and trampling; protection and enhancement of the gene pool of plant species and vegetation communities that are potentially low in genetic diversity, and generally restore ecosystem services and biodiversity to the surrounding landscape and human population.

In addition to interrupting the movement of pollen, seeds and fauna through the landscape, disconnected patches of vegetation face their own issues and challenges. Patches typically shrink under these conditions, leaving remaining plant species at risk of inbreeding and local extinction. Inbred plants often have difficulty producing flowers or fruit, thus reducing the future viability of the plant population, disrupting the food sources they would provide to fauna, and removing their potentially unique genes from the gene pool of that species.

Habitats and vegetation communities along Australia's eastern seaboard are in decline from development and inappropriate management. In Sydney, land classified as 'open space' is becoming increasingly sought-after for more homes, transport corridors, playing fields and public buildings. The amount of land available for native vegetation, fauna habitat and ecosystem services is reducing.

Vegetation of Sydney's Eastern Suburbs

The remaining areas of remnant native vegetation in Sydney's eastern suburbs are highly fragmented. In Waverley, a very narrow strip of vegetation, consisting of areas of remnant native bushland and weeds stretches along the coastline cliff tops, providing an essential connection for migratory and local fauna that stretches from South Head at Watson's

Bay to Kamay Botany Bay National Park at La Perouse. The corridor is also important for the movement of plant genetic material, in the form of seed and pollen.

The thin strip of vegetation clinging to Sydney's coastline is a particularly important natural vegetation corridor that allows fauna species to navigate through Sydney during migration, and for the dispersal of seeds and pollen. Restoring the continuity of this vegetation can help reverse many of the detrimental processes resulting from urbanisation to some extent. In this project, it was my, and Council's, aim to firstly protect extant coastal remnant vegetation from further decline, and secondly to begin to fill in 'missing links' in this vegetation corridor, thus restoring connectivity, biodiversity and ecological processes as much as possible. While fulfilling these ecological objectives, I also brought in aesthetic objectives.

Waverley's coastal scenery is highly visible to residents and tourists alike. Ocean views are greatly valued. The Bondi to Bronte section of the Coastal Walk is considered the best walk in Sydney for tourists (Anonymous, 2019). Seeing the plants, although often subliminal, is part of the experience of the Coastal Walk and Clifftop Walk. This vegetation faces multiple pressures including edge effects, invasion by weeds, digging by dogs, and trampling by tourists after a great viewpoint or Instagram photo. Part of this cliff top walk is the site of the annual Sculptures by the Sea[1] exhibition, which attracts half a million visitors annually, making this vegetation part of the background of thousands of images.

To help reverse the ongoing decline of local remnant vegetation, Waverley Council commissioned the *Biodiversity Action Plans: Remnant Sites 2014-2020 (BAP)* (Total Earth Care, 2015) with community input invited prior to their adoption by Council. The BAP was prepared to guide Council to best protect and improve the condition of the small amount of remaining remnant bushland, while balancing the needs of bushland and recreational use of open space. It recommended that several areas adjoining and between remnant vegetation patches be planted, in order to create buffers around bushland remnants to protect them from weed encroachment and other damage from edge effects; and connect isolated patches of bushland to improve habitat connectivity along biodiversity corridors for a number of fauna species including birds, microbats, reptiles and insects; and increase biodiversity in the local government area by planting a wide range of plant species that would have formerly been present in the area.

[1] Sculptures by the Sea: https://sculpturebythesea.com

Given the high profile of this area, and the extreme weather conditions coastal locations endure, any planting undertaken had to be able to physically survive as well as look good. As well as being resilient to environmental pressures, it also has to withstand pressures coming from adjoining high use areas. In my role at Council, I designed and co-ordinated the installation of this revegetation. I contracted and worked with professional bush regenerators, and community and bush regeneration nurseries to prepare the land, grow the plants, and install and maintain the plantings.

Recreating Coastal Heath

Twenty-six separate locations were identified for revegetation in the 2015-2016 year. Species chosen were based on the vision of recreating a Coastal Heath vegetation community, and drew upon local knowledge, species present in local and non-local reference sites, historical data and propagation potential. Reference sites included existing patches of remnant vegetation in the Waverley local government area, and larger, more intact coastal bushland to the north and south of Sydney, including the Royal National Park. An emphasis was also made on including species with a natural geographic range that extended north of Sydney and an ability to survive in more tropical conditions, but could also survive a drought. In an era of climate change, this is particularly important for the longer-lived species such as trees and larger shrubs.

It was intended to create 'layers' of vegetation as this approach has known habitat values (Parsons, 2007). Commonly, this is looked at as tree/shrub/groundcover layers as in a woodland. In the case of recreating coastal heath this looks more like a shrub/tall grass/groundcover layers. In some of the frontline coastal locations, this was reduced to a tall grass/groundcover combination.

I visited each site multiple times during the planning phase and drafted an individual palette of desired species for each location. Wherever possible, palettes aimed for diversity, especially in the low shrubs and grass layers, while also keeping retention of views and provision of protective habitat for small and vulnerable fauna in mind.

Eighty locally indigenous species were selected for planting. This floral diversity reflects the enormous floral diversity of the Sydney region. Around 10 to 15 'tried and tested' plant species are typically used in revegetation projects in exposed coastal areas, and these were incorporated into designs as a structure or skeleton to support other species. Some highly desirable species, such as those in the *Epacris* genus, are difficult to

propagate and were not considered for this project. Palettes for some locations, such as coastal frontline locations, included only three or four species, while more sheltered locations could support 20 or more species.

Plant selection and design/layout were natural and organic responses to the site. I drew upon the historical knowledge that these sites were once dominated by Coastal Heath. I also drew upon my many years of observation of plants growing in remnant bushland in similar conditions, and experience gained from installing previous revegetation projects. The need to for plantings to be attractive and to avoid impacting upon ocean views also influenced plant selection. Fortunately, these three criteria were synergistic (Figure 1; Figure F — colour section).

Figure 1: Calga Reserve, Bronte. Site prepared for planting, 2016 (left). Same site in 2019 (right). Photos: Sue Stevens.

While most of the design and layout was an organic process, I did apply some basic design rules. These included planting smaller grasses and sedges such as *Dichelachne crinita* and *Ficinia nodosa*, and lilies such as *Dianella congesta* in groups and clumps, larger grasses and such as *Lomandra longifolia* and shrubs that mature laterally such as *Westringia fruticosa*, singly or in groups of no more than three; and small shrubs such as *Olearia tomentosa* in small groups, or curvy lines. This way, palettes with even low numbers of species looked more interesting than block or row designs. This design methodology was a departure from current

landscaping practice where designs are made in plan view on a computer in a studio. It is currently popular to use very small numbers of species and for single species to be mass-planted in straight rows or blocks. In this project, plantings were deliberately dense, allowing the plants to shelter each other during their establishment phase, and reducing the need for weeding in the future. A few trees and larger shrubs were included, chosen in the knowledge that, in a frontline coastal environment, they would end up wind-pruned and stunted from salt burn and would not attain the heights expected under sheltered cultivation conditions.

When choosing species, I considered species that provided variety and interest throughout the whole year, with leaf shapes, sizes and textures ranging from narrow needles to broad and fleshy leaves and with colours that included the grey-green common in coastal vegetation through to light and dark green to rusty red shades. I included as many types of plant habits that were possible without obstructing views, such as sedges, grasses, compact shrubs, lilies, twiners, scramblers and medium sized shrubs. While species selection was ambitious for frontline coastal conditions, and not all plants survived, the end result was much more species diverse than what would have eventuated from a more conservative approach to species selection. Including the 'usual suspect' plants such as *Lomandra longifolia*, provided the 'bones' of the revegetation, and supplemented by a range of species that increase floristic diversity, and extend flowering times for bushland areas.

There are some parallels between the way that I included aesthetic considerations in the project, and the 'new perennialism' school of landscape design that is popular in the Northern Hemisphere. A major difference, though, is that the plants of coastal Australian vegetation are often small-flowered, with the flowers hidden 'inside' the plant. Seasonal variations can also be less obvious, so other aspects of the plant need to provide interest. Like the new perennialism flavour though, it is important to recognise and even celebrate that some plants will brown off in summer, bringing the cycle of seasons to urban areas, where seasonal change may otherwise be less apparent. My intention was to bring seasonal diversity to plantings as well as plant species diversity. For example, I included a number of wattle (*Acacia*) species that flower cream to yellow in winter and plants that flower blue in early summer such as lily (*Dianella*) species in my designs. Australian landscape architect Paul Thomson says, 'colour, like texture should only be used to add to the intention of the design (Thompson, 2012).

Plants were deliberately installed in autumn and early winter to ensure their establishment phase would not be affected by summer heatwaves. In

their first year, the plants had to survive a huge East Coast Low (ECL), record summer temperatures, and then a record dry winter. The ECL hit the Sydney coastline less than two weeks after planting was completed, and brought heavy rains, strong winds and dumped salty water on many of the new plantings. Some species at some sites did not survive these weather events, although most did, and the result was an additional layer of design contributed by nature's elements. This added to the natural look and feel of the plantings, and the areas where plants failed created niches for later infill plantings. This infill planting extended the age range of plants on the site, further adding to the 'natural look' of the plantings, and to the feel of the revegetation being co-designed with nature.

Outcomes

During the 2016 Project, 45,000 tubestock plants were installed into 26 separate locations in the Waverley local government area, covering around 11,000 square metres of previously turfed or weedy land. This was followed by an additional 15,000 tubestock installed in 2017 and 10,000 in 2018, to extend some areas and infill areas in the 2016 sites where plants had failed. Overall, more than 85% of plants survived their first year.

Three years later, the vegetation is lush and flourishing at most locations (see Figure F — colour section). Some species are already regenerating on site, fulfilling the goal of self-sustaining ecological systems and there has been an increase in plant species richness along the coastal corridor. In terms of appearance, there is now a range of colours reflecting the diversity of plants and their different shades of green. With the range of species planted, flowering occurs throughout the year and the shape of the vegetation as a whole varies. While aesthetics are subjective, many local people do stop and take the time to pass on compliments, while on-time visitors may not be able to tell it apart from remnant vegetation. Comments and observations have particularly been about how these plants have 'beautified' the area, and the return of fauna, such as the Superb Fairy-wren. The plants are not impinging on views and add to the beauty of the coastal parks in Waverley. Some negative feedback has been received, principally as a result of the significant change to the landscape. However, these concerns have been minimised by ensuring view loss is avoided, access is maintained and the vegetation is kept weed-free and vibrant.

Opinions aside, the project has created healthy and diverse pockets of native heathland. The plant species diversity has already benefitted fauna species for which flowers are important such as native bees and butterflies,

birds and microbats. The diversity also provides additional cover for small birds and reptiles, and adds interest for humans, both overt and subliminal. I have observed that seasonal insect life has increased considerably, which is an encouraging sign given the importance of insects to the vegetation for their pollination services and as a food source for birds, reptiles and larger insects. Small birds such as the Superb Fairy-wren, that have been lost from much of urban Sydney due to shrinking garden sizes and garden style simplification, have also been frequently sighted in the new vegetation. This bird species relies on dense shrubbery for cover from predators – a vegetation layer that has been lost in many urban and rural areas.

A random survey of Waverley residents conducted in 2019 with a number of sustainability questions showed that 59% of survey respondents had changed their behaviour in the past 3 years, and that 'Appreciation for nature' was a factor that prompted this changed in 6% or respondents, and 'Health and wellbeing' was a factor for 3%, 'Thinking about my children / future generations' 11% (This question permitted multiple answers from 20 options, 'Making a difference' being the most popular answer). One behaviour change was 'Creating a wildlife friendly garden' with 11% of respondents ticking this option. Overall, respondents saw it important that Council allocate resources to 'Protecting bushland areas'. This option scored 4.5 out of a possible maximum score of 5 on scale of importance. 'Increasing tree canopy and green space' scored 4.3/5, and 'Protecting native animals and plants' scored 4.5/5 (Waverley Council and Jetty Research 2019). While these responses are small percentages, they are nonetheless encouraging when viewed within the context of the broader topic of the survey. Whilst it cannot be said that this particular revegetation project led to the behavioural changes identified in this survey, it nonetheless is part of the background context that residents find themselves in and appreciate.

As with most things ecological, there are numerous interconnections that are difficult to tease out and unravel. When looking at revegetation, the untrained eye either notices it, or doesn't notice it. It is noticed either consciously or unconsciously. It is either liked or disliked. People don't always recognise or remember what they see. My aim with this revegetation project has been not only to install natural and biodiverse revegetation that sits comfortably in the landscape and provides habitat alongside some local character and reflection to the original vegetation types of the coast. It has also aimed to provide a background to life and outdoor activities, and provide seasonal interest, and inspiration to those who care to notice.

Conclusion

Through this work, the coastal native vegetation of the Waverley area has been extended and given an improved chance of persisting in the future, thus preserving the natural heritage values and vegetation character of the area. This revegetation has made a strong contribution to the size and resilience of the local native vegetation, and to the aesthetics of local parks in the Waverley local government area, particularly in increased plant species diversity. The new vegetation has brought in colour, additional greenspace and subsequently to this additional fauna to the local area. On a macro scale it is a step towards encouraging an 'ecological aesthetic' in public place amenity planting, and a motivation for people to become interested in participating in Landcare (Curtis, 2008), or take steps towards creating more biodiverse home gardens. On a micro scale, the interconnectedness of plant sizes, leaf shapes, flowering times, insect and bird interactions mean that there will be may natural things of interest and beauty to contemplate when walking the coastal clifftops of Eastern Sydney.

My love for the natural world and its unending complexity has inspired me to go beyond the typical and expected in natural area restoration. The way I have gone about this revegetation project is a type of artistic practice: driven by observation and resulting in the creation of something. Installing diverse and interesting revegetation into the public space is a form of art, of placemaking, and of environmental restoration. Not all art is beautiful, and viewers will all have their own opinions, but hopefully these plantings, while also serving solid ecological purposes, will also inspire observation, wonder and joy in the community.

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