STUDENT PROJECT

# THE VALUE OF ECOLOGICAL PLANTINGS IN PUBLIC GARDENS

*Chris Flynn*[1]

## ABSTRACT

This paper has been developed from a third year dissertation written as part of the Diploma in Horticulture course at the Royal Botanic Gardens, Kew. It serves as an overview of the subject of ecological planting and its potential applications within public gardens. It also outlines some scientific benefits regarding ecological studies, the impact that this type of planting may have on horticulture (both in gardens and the nursery trade), and the educational benefits for the public and school groups.

The case study below looks at the viability of representing a section of Snow Gum Grassy Woodland (a vegetation type found in New South Wales, Australia) outside in Coates Wood, Wakehurst Place, UK.

## INTRODUCTION

Public gardens have been used throughout history for a variety of purposes to demonstrate the beauty of the natural world and ethnobotanical uses of plants, and to assist in taxonomic classifications. Moving into a new millennium, people are looking to public gardens to exhibit as much of the natural world as possible in interesting and aesthetically pleasing ways.

Ecological planting styles and associated plantings aim to show how the floral matrix of a location fits together and allows people to glimpse stylised areas of the world that they may never see. This type of ecological planting fits into targets laid out under the BGCI GSPC section d) Promoting education and awareness about plant diversity:

> *"Target 14: The importance of plant diversity and the need for its conservation incorporated into communication, educational and public-awareness programmes."* (GSPC, 2002)

Currently these feelings are generally achieved with geographical planting styles that bring together a range of the most attractive or meritorius plants from a country or continent. However, despite this being visually attractive, it doesn't tell the story of a specific flora, which is what ecological plantings can do. They also offer more to education by not only showing off the variety of plants from different parts of the world, but also the way that they interrelate and grow naturally.

[1]Chris Flynn is a Third Year Student on the Diploma in Horticulture at the Royal Botanic Gardens, Kew.
Address: School of Horticulture, Royal Botanic Gardens, Kew, Richmond, TW9 3AB.
Email: c.flynn@kew.org.uk

By reviewing the ways that many gardens currently display their plant collections and combining this with studies undertaken in natural *Eucalyptus* woodland in NENP, a plan can be produced to assist in the development of garden features that will incorporate more ecologically based planting styles to better represent the interactions of the world's incredibly diverse flora.

### *Some Definitions for the Text*

History of garden displays – For the dissertation, the garden displays mentioned in the historical sense will be based on a range of styles from across Europe.
Public Gardens – For the dissertation, the public gardens mentioned in the text are based on several gardens in England and Australia. These are places that have been selected by the author to best demonstrate the range of planting styles found in today's gardens.

### *Abbreviations*

RBG Kew – Royal Botanic Gardens Kew
RHS – Royal Horticultural Society
MSB – Millennium Seed Bank
NSW – New South Wales
NENP – New England National Park
ABSA – Access and Benefit Sharing Agreement
SSSI – Site of Special Scientific Interest
BGCI – Botanic Gardens Conservation International
GSPC – Global Strategy for Plant Conservation
ACT – Australian Capital Territory

## LITERATURE REVIEW

When researching the dissertation, the author found that there were very few texts specifically regarding the development of ecological planting styles. The most focused published work was *The Dynamic Landscape* (Dunnett *et al.*, 2004). This text describes itself as "a fusion of scientific and ecological planning design philosophy that can address the need for more sustainable designed landscapes" (Dunnett *et al.*, 2004). This text combines a number of papers covering various elements of ecological design, written by several authors who all have expertise regarding different areas within this discipline. Alongside this, the Australian Journal *Ecological Management and Restoration* (Morgan and Scacco, 2006) provides a range of articles in several volumes each year regarding the impact of various methods of ecological management on landscape. However, it doesn't relate specifically to the use of ecological plantings in public gardens, although it does contain a lot of adaptable principles.

The two main texts on ecology used were *Plant Strategies, Vegetation Processes, and Ecosystem Properties* (Grime, 2001), and *Plant Ecology* (Crawley, 1997). Grime takes a very scientific look at plant functional types and how these relationships are predictable with regard to vegetation structure. Crawley provides a very good overview of ecology both as a scientific discipline and as an important part of the natural world. It looks at plant organization and community structure which are very important factors when addressing a topic like ecological planting.

The two main texts regarding woodlands and the woodland vegetation types that were used were both Australian as these related to Australian woodlands. *Woodlands: a Disappearing Landscape* (Lindenmayer, Crane & Michael, 2005), looks specifically at the different types of woodland that occur throughout Australia, their history, and how they might be protected for the future. *Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT* (Keith, 2004). This text is a huge work documenting and breaking down all of the vegetation types from across NSW and giving details on locations, geography, topography, species lists and issues with the vegetation types.

## HISTORY OF GARDEN DISPLAYS

Medieval cloister gardens and the monastic walled gardens were places for growing plants of note for scent, medicinal purposes and religious significance. As countries settled and the frequency of war dwindled, physic gardens came into being, attached to monasteries and places of learning. These gardens were designed for developing botanical skills and investigating the medicinal properties of plants. Later these became more taxonomically based with the introduction of Linnaeus' binomial system and the linking of plant families.

These physic gardens, such as the Chelsea Physic Garden (founded in 1673 by the Worshipful Society of Apothecaries), later developed into botanic gardens and their purpose began to change with the expansion of the British Empire. Further advances were made in the fields of botany and taxonomy so botanic gardens began to form. The earliest of these in Britain was Oxford Botanic Garden established in 1621 for 'the glorification of God and for the furtherance of learning' (University of Oxford, 2009).

As the Empire expanded, the focus of public gardens altered from being places of leisure for the wealthy, to being places of learning for scholars. They then began to embrace ethnobotany as more and more new products were being derived from exotic plants. Alongside the importance of ethnobotanical research, was the explosion of the High Victorian Bedding scheme which introduced a huge variety of new plants, styles and colours.

Today, public gardens embrace many aspects of the past, combining elements like the classic Renaissance Parterre, High Victorian Bedding schemes and the large Arts and Crafts-influenced herbaceous borders. With the ever increasing need for *ex situ*

conservation and focus on education regarding the world's flora, the role of public gardens is changing and new styles are evolving to meet this demand.

## HISTORY OF ECOLOGICAL PLANTING

Ecological planting is far from a new idea. The ideals behind this style have been present in garden design for more than 200 years.

In the 18th century, garden designers were seen as assisting nature by taking the best elements and placing them in formal settings. Even then the idea of 'enhancing nature' had undertones of a movement for an ecological style. However, these designs are now seen as highly artificial.

In the late 1700s "the German philosopher and natural historian Alexander von Humboldt … found inspiration in far away countries where he studied nature and wrote about it in order to inspire higher pleasure" (Hermand, 1997). Along with the writings of novelists of the time, such as Jean-Jacques Rousseau and Johann Wolfgang Goethe, the ancient Greek image of the Elysian Fields (a part of the underworld, which was the final resting place for the souls of the heroic and virtuous) was captured and reinvented as the nature garden where there was no architectural decoration and the planting style would imitate pure nature. Humboldt assessed nature in a very scientific and methodical manner, aiming to create a new understanding of the world's flora, inspiring new styles of planting in public parks and gardens 'related to arrangements in nature' (Woudstra, 2004). These plantings were then termed plant geographical or phytogeographical and would slowly evolve into ecological plantings.

The earliest work on plant geographical arrangement was carried out in Germany, with the then Berlin Royal Botanic Garden (later moved to Dahlem in 1897) being one of the earliest botanic gardens to no longer contain "any order beds, the classical feature for systematic or methodological planting as found in other botanic gardens" (Woudstra, 2004). The style was recognised in Britain by a few individuals, including Joseph Loudon, in the early 1800s, but these ideas were only mooted by prominent figures like Joseph Paxton (Head Gardener to the Duke of Devonshire at Chatsworth). However, slowly people became inspired to look more closely at the flowers in our native grasslands and the potential for introducing exotic species that would naturally occupy similar habitats.

With the explosion of the Arts and Crafts movement, and rebellion from formality, the application of Humboldt's work was rarely mentioned in Britain as it was heavily science-based, and often lacked the picturesque detail that was so important at the time. It was only in the late 1940s when landscape architects like Brenda Colvin began to see the land as more than just a place for food production, and later with Brian Hackett promoting "an ecological approach to design" (Hackett, 1962–63) that the "importance of ecological planting for reasons of conservation, appearance, diversity and economy" (Colvin, 1977) were truly recognised.

This principle was applied in its earliest stages to woodland landscapes, rather than urban settings and worked in two principle ways. One of these was to base designs on

a survey of the natural vegetation of an area; the other was to plant according to abiotic factors like soil, climate and aspect and for the appearance of the plants (a similar principle to physiognomy).

In the later 1960s, other landscape architects took these principles on board and began to translate them into the urban environment to stress "the importance of nature and the natural environment for the quality of life" (Woudstra, 2004). This resulted in the formation of Land Use Consultants (founded by Max Nicholson in 1966), who would undertake environmental projects with an emphasis on naturalistic styles, and the designs by other groups for many New Towns like Warrington, being based on re-creating natural arrangements with native material.

Today there are two main categories that the ecological planting style can be divided into. These are:

- Geographical – aiming to re-create vegetation types (or their essential characters) from areas around the world
- Physiognomic – aiming to re-create natural characters/patterns and vegetation function, but with little regard to the geographic origin of the component species

## PRESENT DAY GARDENS AND THEIR THEMATIC APPROACHES

### *RBG Kew*

Currently the thematic approach at RBG Kew can be described as largely taxonomic. Plants are generally grouped according to either their family (e.g. Celastraceae beds), exhibiting several genera from one family, or are grouped by genus (e.g. *Quercus* collection), mostly tree collections amongst short mown grass.

The layout of the gardens at RBG Kew is largely historically based and mostly focuses on taxonomy and plant research. There are some areas that are laid out in a more ecological (such as the Mediterranean Garden), geographical (such as the Rock Garden), physiognomic (such as the Woodland Garden), or historically representative style (such as the Queen's Garden).

### *RBG Kew – Wakehurst Place*

Wakehurst Place is the satellite garden of RBG Kew in the High Weald of Sussex. Focusing more on geographical plantings, Wakehurst Place allows for the expansion of the collections at Kew and is also able to grow many plants successfully outside that Kew cannot.

Wakehurst Place's collections are used for research purposes by both the MSB and the Jodrell Laboratory (RBG Kew). Wakehurst Place is described as "a living green museum, mixing botanical science with horticulture, highlighting the importance of plant conservation for the future of viable life on earth" (Cloutman, 2002). There is a

strong conservation message attached to many of the displays throughout the garden with good interpretation indicating the need to conserve plant species and habitats.

### *RHS Wisley*

RHS Wisley is one of four gardens across the UK run by the RHS. "The flagship garden of the RHS, Wisley, captures the imagination with richly planted borders, luscious rose gardens and of course, the state-of-the-art new Glasshouse" (RHS, 2009). The thematic approach at Wisley is largely on the side of decorative horticulture. It combines classical garden elements like a rose garden, small arboretum, fruit gardens, the famous long borders and cottage gardens. The gardens are also used to demonstrate various horticultural techniques such as pleaching, composting and other formative pruning.

### *The Eden Project*

The Eden Project is a largely physiognomically themed garden, with its main biomes giving the natural characters, patterns and vegetation functions of areas like the Mediterranean and Rainforest, but without being too geographically specific.

The Eden project is described as a "global garden: a place of beauty and wonder which explores humankind's dependence on natural resources. Here you will find crops, landscapes and wild plants which reflect the amazing diversity of our planet. There is also internationally famous architecture and art which draw inspiration from nature; and a stage on which people working to make our world a better place can tell their stories" (The Eden Project, 2009).

### *Bedgebury National Pinetum*

"Bedgebury National Pinetum has the most complete collection of conifers in the world. The aim is to have 7 specimens of each conifer from different wild-collected sources and having a variety of ages – thus providing a continuing genetic resource" (Friends of Bedgebury Pinetum, 2008).

Whilst maintaining the largest collection of conifers in the country, Bedgebury National Pinetum also plays a very important role in the *ex situ* conservation of many endangered conifers, such as *Prumnopitys andina* (Chilean Plum Yew). By growing large numbers of genetically diverse individuals as a part of the International Conifer Conservation Project, the aim is to both educate people and provide a varied *ex situ* genetic base for these species to ensure their survival.

## WHY ECOLOGICAL PLANTINGS? DO THEY HAVE A PLACE IN ALL GARDENS?

Through the use of ecological plantings, it is possible to demonstrate the world's flora in the most natural way possible outside of a vegetation type's usual range. Ecological

planting styles have had several ideals behind them, depending on the group that has been using them. Some, like public gardens and other educational centres like universities etc, use them to educate both students and the general public, while other groups see ecological plantings as an economical and sustainable way of creating planting schemes, often with native materials that require limited intervention. Some scientific groups will often use these plantings as a way to test ecological theories without needing to go into the field, although this application does have limited use as environmental conditions and other influencing factors like pests, disturbance and mycorrhizal associations are often difficult, if not nearly impossible, to re-create.

Looking at the two divisions of the ecological style (geographical and physiognomic) both are found in many public gardens. The most frequent style is the physiognomic, which is present in many common garden features like meadows, woodland gardens and bog gardens. These all make up popular areas of many public gardens and give the emotive feel of the naturally occurring areas. For example, a bog garden may contain *Lysichiton camtschatcense* (north east Asia) alongside *Gunnera manicata* (south east Brazil) and *Drosera capensis* (South Africa), but despite these plants originating from very different parts of the world they still create similar vegetation patterns and similar characteristics to boggy areas found in nature.

The geographic style is the more vaguely represented of the two styles. Currently in many displays, geographic plantings are either limited to dividing plants up simply into their native countries, regardless of what part of that country they are from or the vegetation type that they occur in, or they are divided even more crudely in a Paxtonesque fashion, where he describes dividing the world into quarters or smaller denominations.

By combining the geographic and physiognomic planting styles and fine-tuning them to include the ecological mapping of a site, one is presented with the potential to best represent geographically accurate vegetation types. The selection of these sites will depend on the climatic region in which they are to be reproduced, but by properly researching the site to be represented and the site in which it will be represented, a new garden feature could be created that will provide both an aesthetically pleasing and educational display.

"Healthy cities need effective green-space networks and woodlands; not just to promote healthy living for city dwellers, but also to sustain wider biodiversity, to promote water and air quality, and to regulate climatic extremes" (Gustavsson, 2004). Better utilisation of green spaces for the benefit of people is another important advantage of ecological planting. It is much more sustainable as it is less labour and cost intensive, and more environmentally sound because as long as the site is chosen properly, no fertilisers or other chemicals should be required for its establishment.

This style of planting will not always fit in with all gardens. For instance, the garden may be historically based, being preserved as a living example of an important garden style, such as the Arts and Crafts style at Munstead Wood, home of Gertrude Jekyll. Or an important person who lived there whose work influenced the garden, such as Down House, the home of Charles Darwin. Alternatively the garden may have restricted space

and not have the capacity to include new exhibits (for example at RBG Kew) or it may just not fit into the traditional layout of the garden, say in a small garden laid out systematically or a walled kitchen garden. And of course there is always the possibility of some opposition to the scheme either from 'Friends' of the garden, the general public or staff.

However, it is difficult to please everyone in an organisation. The benefits of incorporating areas like this into a garden are not only aesthetic, but also educational and of value for *ex situ* conservation efforts. This is an issue that more and more gardens are taking on and promoting within their collections.

## EDUCATIONAL BENEFITS OF ECOLOGICAL PLANTING

*"We saw the role of the Botanic Garden as informing visitors through 'WOW' experiences and the beauty or ugliness of plant species about their importance."* Rob Smith, Mt. Tomah Botanic Gardens, NSW (pers. comm.)

This message is a very important one and gives an insight into what gardens are aiming to achieve through their displays. Education and the creation of an aesthetically pleasing environment are the top two reasons reiterated through many mission statements from various gardens.

The potential educational benefits of this type of specific ecological planting are numerous. The principal benefit, and the original thought that began this investigation, was that there are many parts of the world that people will never have the opportunity to visit, so by creating areas that are emotive representations of specific ecosystems, people will be able to experience the feeling of visiting these areas without ever having actually been there. By creating these areas in tandem with appropriate interpretation, the sensation of being in these different places will come alive.

A major educational benefit could be for ecological and biodiversity studies. Although these ecological plantings may be a stylised version of a naturally occurring ecosystem, they should demonstrate the diversity of associated plant life elsewhere on the planet. Through interpretation, the story of the interactions between the native flora and fauna can be told. These areas could fit in well with existing schools programmes within gardens where children are encouraged to think about how plants and animals interact, and adapt to different environments and influencing factors like disturbance and competition.

## THE CASE STUDY

### AN AUSTRALIAN SNOW GUM WOODLAND AT WAKEHURST PLACE

#### *Why Australian Eucalyptus Woodland?*

"Following European settlement, the relatively fertile woodland soils quickly attracted attention and large areas were cleared for cropland and towns or were grazed and converted to exotic pasture. The conversion of temperate eucalypt woodlands to

agricultural land represents one of the most significant vegetation changes in Australian history" (Hobbs, 2005). The clearing of these areas in Australia has led to an increase in the incidence of Eucalyptus Dieback and increased damage by the Christmas Beetle, which defoliates large stands of *Eucalyptus* each year. This is partly because there are fewer trees for the beetles to feed on. It is also down to the loss of habitat for Sugar Gliders and parasitic wasps which feed on and parasitize the beetles. "A colony of sugar gliders, comprising up to eight animals, may consume more than 200kg of beetles each year" (Lindenmayer *et al.*, 2005).

"Most of the big conservation efforts in Australia seem to centre on either tall forests or coral reefs. Woodlands seem to attract less attention despite their place in the national psyche. And yet woodlands are probably more in need of urgent conservation action than either forests or reefs" Hobbs in Lindenmayer *et al.* (2005). The conservation needed for these areas ties in well with targets laid out under the GSPC, section c) Using plant diversity sustainably:

> *"Target 13: The decline of plant resources and associated indigenous and local knowledge, innovations and practices, that support sustainable livelihoods, local food security and health care, halted" (GSPC, 2002).*

By increasing awareness through better education on areas like this and similarly threatened ecosystems across the world, we can hope that these remaining areas will be preserved and, together with repatriation schemes, these great landscapes may return.

A Snow Gum Grassy Low Woodland, which is the area that was studied for the purpose of the dissertation, is woodland dominated by *Eucalyptus pauciflora* ssp. *pauciflora* that has less than 70% canopy coverage giving it a light airy feel. Other canopy trees may include *E. nitens,* with species such as *Banksia, Lomatia* and *Coprosma* making up elements of the understorey. Herbaceous species of genera such as *Wahlenbergia*, *Pterostylis* and colourful Paper Daisies provide cover at ground level.

### *Review of Fieldwork and Findings*

Whilst in NSW in September 2008, the author worked alongside Professor Jeremy Bruhl (University of New England and former Australian Botanical Liaison Officer, RBG Kew) and Ian Telford (Honorary Curator, NCW Beadle Herbarium (NE)) in an area of NENP called Point Lookout. At 1563m above sea level, this is an area of Snow Gum Grassy Woodland largely populated by *Eucalyptus pauciflora*, with *E. nitens* appearing around the fringes of the woodland. This area is classified as NENP Vegetation Community 4: Plateau Grassy Woodland, based on the Specht Model (Specht, 1972).

This area ranges in height roughly from 1000 to 1500m above sea level and has an average annual rainfall of 791.5mm (Bureau of Meteorology, 2009). The geology of the area is tertiary basalts (12–70 million years ago, with some being late Mesozoic), owing to it lying along one of the ridges of a chain of ancient super volcanoes, which stretch

Fig. 1 The view from Point Lookout, NENP, NSW. Photo: Chris Flynn.

up into southern Queensland. The soil is quite fertile by Australian standards as the area is a basalt cap, however this would equate to a depleted soil in the UK. The disturbance regimes in this area are mostly grazing of wallabies and the cyclical incidence of fire.

The canopy of this woodland is mostly *Eucalyptus pauciflora* with *E.nitens* occurring only on the peripheries. The understorey varies from the centre of the woodland, where *Lomatia fraseri* and *Persoonia acuminata*, with species like *Acacia melanoxylon* creeping in toward the shrubby transition areas. Moving into these transitional areas, *E. nitens* dominates the canopy and the flora begins to contain rainforest escapees like *Tasmannia stipitata*, *Elaeocarpus holopetalus* and *Banksia integrifolia* var. *monticola.*

The dominant species of ground cover is the tussock-forming Snow Grass (*Poa sieberiana*), which is interspersed with a range of herbs including *Glycine clandestina*, *Brachyscome aculeata*, *Coronidium scorpioides*, *Eryngium brownii* and *Swainsona brachycarpa*. There are also Baby Greenhood orchids (*Pterostylis parviflora*), which appear in the shelter of the large basalt rocks that litter some parts of the woodland, as well as several bulbs being present like the striking yellow *Bulbine bulbosa* and the equally striking *Stylidium graminifolium*. In the more moist areas, the Spiny-headed Mat-rush (*Lomandra longifolia*) dominates over the *Poa sieberiana*, and the tree fern species *Dicksonia antarctica* is present.

*Wakehurst Place – Coates Wood*

After 1987 this area was planted up with what has become the national collection of *Nothofagus* and "has been developed here along with other temperate arborescent Southern Hemisphere taxa" (Jackson *et al*., 1998). These new plantings include a variety of *Eucalyptus* and other Southern Hemisphere trees.

Coates Wood is a west-facing, shallow-sloped area of Wakehurst Place. It is relatively frost-free as there are no barriers to the cold air moving down the slope into Bloomers Valley. The ground is well drained due to the gradual slope of the land and also the presence of existing wet channels nearby. Currently there are several species growing very successfully here that were found in the proposed representation site in NENP, which is a good indication that the soil and rainfall are suitable to cultivate species from this region effectively.

*Planning and Design Considerations*

> *"Stylization/abstraction of native plant communities – whilst the design of such groupings is based on the botanical and aesthetic composition of naturally evolving communities, they will usually be abstractions of them, simpler in species composition and smaller in area than the natural models. Yet they will contain the most important species of those communities, ecologically and aesthetically, and distribution patterns which express or even heighten the unique character of those natural communities."* (Morrison, 2004)

Working on the principal that this is an ecologically representative abstraction of a Snow Gum Woodland, it becomes easier to define the species required and how they will fit together. When completing field work, the essential characteristics to be noted include: environmental factors (soil, aspect and precipitation), dominant and 'visual essence' species composition, and community structure and likely successional processes. The visual essence species are the *Eucalyptus* and *Poa*, amongst these the various shrubs help to characterize the understorey, with the herbs adding colour to the ground layer. Successional processes here may include the gradual influx of some more rainforest-type species until fire comes through, after which the fire-adapted woodland species can regenerate. Leading on from this, one of the questions that Gustavsson raises in *Exploring Woodland Design* is, "What natural processes are important for you to start, and what should actually be avoided to allow for later natural processes or cultural-social events?" (Gustavsson, 2004). In this case study one of the most important processes to be started is the grazing disturbance of the area. This would be accompanied by some succession planting of the understorey shrubs so that there won't be a single-age stand of plants. With regard to allowing for natural processes, allowing the ground layer to successionally self-seed would be a process left to its own devices, only interfering when self-sown trees begin to get too big.


Fig. 2 Coates Wood map from the Wakehurst Landscape Plan 1998, revised by Chris Flynn in 2009.

*Propagation of Material*

Ideally for this sort of project it would be best to use wild origin natural source material, as it would account for the geographic variations within species and give the most accurate portrayal of the area to be represented. Propagating from seed would be the ideal method in this case as it expands the genetic base of the collections. Natural seedling variation will occur, and it is more likely that genetically different material will not always be susceptible to the same diseases whereas one disease could wipe out a whole batch of clonal material. However, in garden displays, more instantaneous results are often required to create interest for the public. So, while wild origin natural source seed-collected material is being grown on, vegetatively propagated (wild origin natural source) material from other accessions within the living collections at Kew or Wakehurst (indirect wild origin natural source) could be used to give quicker results. This would enable the creation of a display in 4–5 years rather than 8–10.

*Interpretation*

Interpretation is a key resource in ensuring that this type of planting is a success, as it would be very possible for people to walk through what they may simply regard as 'some trees and a bit of long grass'. The installation of clearly marked interpretation that tells ethnobotanical or ecological stories, enables visitors to take home some of the important conservation messages that go with it.

When looking at different presentation methods for interpretation, one of the most inventive was the table-top interpretation panels in the Westwood Valley picnic area at Wakehurst Place. Here there are large oak benches with a plastic inlay for interpretation highlighting how the actions of people are damaging the delicate flora that exists on Ardingly Sandstone. The placement of this interpretation is very clever, it requires no extra effort for people to read, as they are already sitting down, thus it is more likely to be read.

When looking at the different information and images that could be included in the interpretation panels, using stylised imagery (woods bathed in sunlight, flowers) and including pictures of birds and animals (such as Kurrawong and Koalas) is more likely to grab visitors' attention than more scientifically detailed pictures. Also, telling stories within the interpretation about events and behaviour such as bush fires, animal interac-

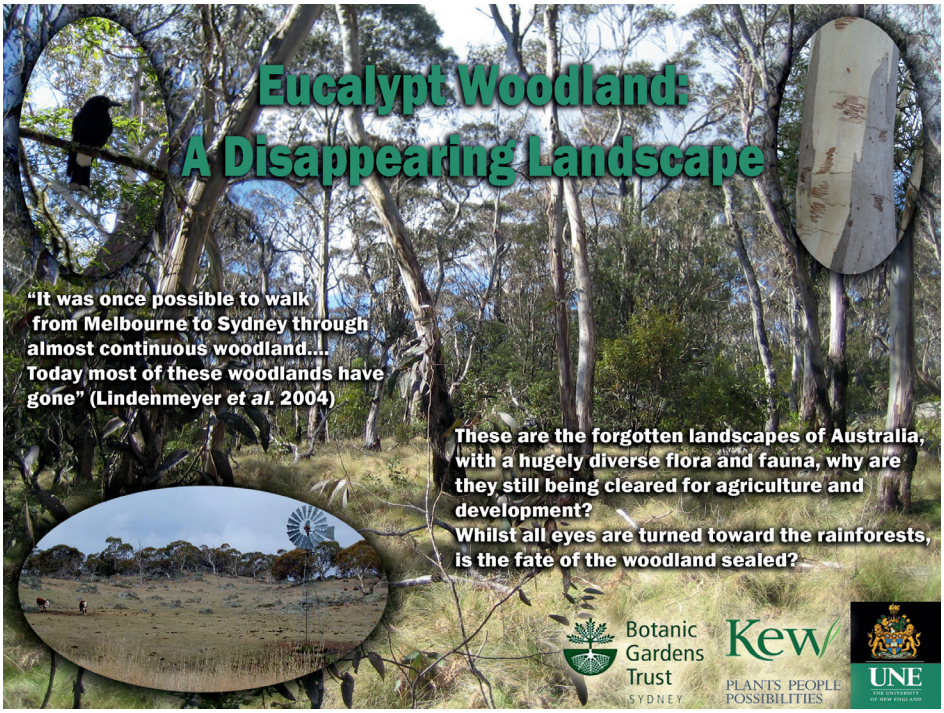


Fig. 3 Interpretation Panel. Photo: Chris Flynn.

tions and the Aboriginal uses of plants is more likely to capture people's imagination than purely academic description.

*Conclusions*

Following the research into the viability of ecological plantings in public gardens and the case study proposal for creating a Snow Gum Grassy Woodland at Wakehurst Place, the author concludes that there is certainly a case for the inclusion of these types of planting in public gardens.

When looking at garden displays through history, they have always changed with the needs of man. We move forward into an age when so much focus is on educating people in order to protect and preserve many parts of the world's flora that have come under threat. By creating garden features showing these areas, it will greatly assist in demonstrating the extent of the plant life under threat and, through careful interpretation, can show the effects on animal and human life. These areas will have a high educational and scientific value as they should be produced with the aim of creating as near to perfect a replica as possible. It will never be possible to completely re-create these areas as there are too many influencing factors – such as soil type, mycorrhizal associations and temperatures – that would be near impossible to reproduce outside of the ecosystem's natural range. However, by choosing areas whose general climatic conditions and soil type are similar to the chosen area and by researching the hardiness of the plants and viability of the project, it should be possible for many ecosystems from across the globe to be represented outside in Britain.

As there are some abiotic barriers to the representation of different ecosystems as mentioned above, interpretation will play a key role in creating the emotive feel of the site and the educational story-telling of these places. By capturing the imagination of the public using colourful images, interesting subject matter and appropriate layouts, the message is better told and more likely to be received. This in turn is more likely to get people interested enough to act on what they have learned, whether it is by donating to projects like the MSB, or volunteering in conservation programmes, which will all assist in protecting the world's flora.

*Recommendations*

The author would like to recommend that further study into the benefits of more strict ecological plantings be carried out to further enhance the perception of this style of planting and to make the idea more accessible to a wider range of gardens. This could be done by creating detailed guides to the flora of specific locations within certain countries, including climatic and geographical data that may be used to promote these vegetation types as viable garden features in Britain.

The author would also recommend that the case study, upon which the dissertation is based, may be used as a template for the representation of other parts of the world's

Fig. 4 Ebor Falls, Guy Fawkes River National Park, NSW. Photo: Chris Flynn.

flora in public gardens. With further investigation into other vegetation types and their suitability for representation in different areas of Britain, it will be possible to collect more information on the hardiness of many exotic species, not previously grown in the UK, which will benefit not only public gardens with regard to their displays, but also private gardens via the nursery and garden retail trade. By making plant lists available for these types of features, demand for the plants may be created and, if managed properly, the production of these could be used as a source of fundraising to assist in the conservation of the ecosystems which the plants comprise.

## REFERENCES

*Personal Communications and individuals consulted in writing the dissertation on which this paper is based*

*RBG Kew*

Tony Hall – Manager of Arboretum Operations and Woody Plant Nursery

Joanne Everson, – Team Leader, Rock Garden

Tom Cope – Commelinids Team, Monocots Section, Herbarium

Charlotte Case – Third Year Diploma Student

*Wakehurst Place and MSB*

Iain Parkinson – Conservation and Woodlands Manager, Wakehurst Place

Tim Pearce – International Projects Coordinator, Millennium Seed Bank Project

*RBG Sydney*

Karen Wilson – Special Botanist, National Herbarium of NSW

Peter Spring – Senior Arborist

Adrian Pedra – Horticulturalist

*Mount Tomah Botanic Gardens*

Rob Smith – Assistant Director

Ross Ingram – Horticultural Development Officer

David Crestani – Senior Horticulturalist (Turf)

*Mount Annan Botanic Gardens*

Peter Cuneo – Manager – NSW Seedbank, Natural Heritage Project Leader

*University of New England*

Jeremy Bruhl – Assoc. Prof Faculty of Arts and Sciences, School of Environmental and Rural Sciences, Director N.C.W. Beadle Herbarium (NE)

Ian Telford – Honorary Curator, N.C.W. Beadle Herbarium (NE)

Peter Clarke – Assoc. Prof Faculty of Arts and Sciences, School of Environmental and Rural Sciences

*Brisbane Botanic Garden*

Ben Power – Senior Gardens Supervisor

Philip Cameron – Senior Botanical Officer

Dissertation Tutors – Iris Turner and Sid Sullivan

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