

**Regional Botanic
Gardens of Queensland**

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Australian Plants

Contents

Introduction	339
Botanic Gardens of Queensland	341
Pea flowers of the Gold Coast Regional Botanic Gardens	345
Redlands City Botanic Gardens – Indigiscapes	353
The Mackay Regional Botanic Gardens	354
Some wonderful Queensland species that can be grown in cool climates	360
Proteaceae of south-west Queensland – an amazing food source	362
<i>Zieria collina</i> , Hill Zieria – a vulnerable understorey plant in Tamborine Mountain Botanic Gardens	368
Inland, but not outback – Peacehaven Botanic Park	370
Cooktown Botanic Gardens – the first flora of Australia	374
The Birdwing project at the Gold Coast Regional Botanic Gardens	380
Two more wonderful Queensland regional species	383

Front and back covers: Maroochy Bushland Botanic Garden – Mountain Creek and palm collection. Photo: Lawrie Smith

This issue was compiled by Kate Heffernan, Chair, Botanic Gardens Australia and New Zealand Queensland.

Australian Plants articles

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Introduction

Kate Heffernan, Chair, Botanic Gardens Australia and New Zealand Queensland and Botanic Gardens Consultant, Queensland.

As a collective scientific regional plant collection the Botanic Gardens of Queensland grow thousands of significant taxa. These articles prepared by a number of regional botanic gardens show only a small insight into the diversity of Queensland's vegetation. Each contribution is an inspiring introduction into the incredible work behind the scenes planning, planting, recording and maintaining plant collections and displays for the visiting public, academics, horticultural professionals and very critically the younger generation.

Our highly urbanised cities and towns offer all too few opportunities for adults, let alone children, to explore and investigate the intricacies of Australia's unique plants that have evolved in an incredible range of environments. Across the state, Queensland's botanic gardens invite discovery and they also offer opportunities for involvement. Almost all are supported by the amazing work of volunteers, and many of these articles were provided by members of Botanic Gardens Friends Associations.

The diversity of Queensland's botanic gardens is also in its people. Friends' and volunteer guides' honorary roles include advocacy. They spread the message to many thousands of visitors through guided walks, presentations or staffing and providing information at Visitors Centres.

Botanic Gardens Herbaria across the state are largely operated by honorary citizen scientists from Friends and more recently measuring the impact of Myrtle Rust in Botanic Gardens is another scientific role willingly undertaken by Friends or volunteers. Friends share their knowledge and passion for plants and for Botanic Gardens by organising nature based children's activities and hosting special therapeutic gardening events for disabled of all ages and disadvantaged youth. Many Friends and volunteer groups have been responsible for the planning and planting of the collections, and represent their gardens on numerous local government and Botanic Gardens advisory committees.

The partnership between some Botanic Gardens and their Friends or volunteer groups is acknowledged as the driving force responsible for the Gardens actual existence. Without the might and voice of committed people, state and local government authorities often don't instantly recognise the importance of their own regions' Botanic Gardens and



their critical role in science, education, conservation and community. With the impacts of climate change and the challenges of retaining diversity in our cities and towns, botanic gardens can be, and most often are examples of sustainable horticulture and sustainable tourism.

As Chairperson of the Queensland Branch of Botanic Gardens Australia New Zealand (BGANZQ), and on behalf of our large and small botanic gardens from Goondiwindi to Maroochy, Cairns to Longreach and Emerald to Brisbane I extend an invitation to visit, enjoy and learn from Queensland's Botanic Gardens. I hope this issue inspires many visits. If you are not already a Friend or a volunteer I invite you to visit your nearest Botanic Garden, or check its website to explore the range of possibilities for occasional or regular involvement.

Thank you to *Australian Plants*, in particular John Aitken, for inviting BGANZ Qld to contribute to this issue and for assisting us through the process.



Longreach Botanic Walkway – a 2.5 km linear garden between the Longreach town centre and the Hall of Fame, which provides interpretative displays of the native plants of the Mitchell Grass Downs bioregion.

Photo: Lawrie Smith

Botanic Gardens of Queensland

Article and photos: Lawrie Smith AM, Landscape Architect and Honorary Secretary, Botanic Gardens Australia and New Zealand Queensland.

Queensland Herbarium has identified and classified 13 bioregions throughout Queensland: Cape York, Wet Tropics, Einasleigh Uplands, Gulf Plains, Northwest Highlands, Central Queensland Coast, Brigalow Belt, Desert Uplands, Mitchell Grass Downs, Southeast Queensland, New England Tableland, Mulga Lands and the Channel Country. Currently, there are more than 25 botanic gardens in various stages of development, with at least one located in each of these bioregions.

This development process has not been specifically planned but there have been five distinct periods in the establishment of the network of botanic gardens. In the first 30 years following the proclamation of the State of Queensland, botanic gardens were established in Brisbane (1855), Rockhampton (1869), Townsville Queens Gardens (1870), Toowoomba Queens Gardens (1875), Cooktown (1878) and Cairns (1886).



Cairns Botanic Gardens – rainforest walkway



There was a long pause of almost 50 years until 1932 when Townsville Anderson Park and Toowoomba Laurel Bank were added as second gardens and Myall Park was established in 1941.

Thirty years later Brisbane commenced a new botanic garden at Mt Coot-tha in 1970, with Bowen and Hervey Bay following in 1974. In the same year Fairhill Nursery on the Sunshine Coast developed its botanic gardens as a significant research facility for native plants.



Great Sandy Region Botanic Gardens, Hervey Bay, featuring the pathway to the Bicentennial Orchid House, which contains an extensive collection of orchids.

The pace of development then quickened, primarily as a result of a Royal Australian Institute of Parks and Recreation conference in Coffs Harbour, which investigated the collections of native plants in the existing Australian botanic gardens and arboreta. The resulting comprehensive report (1984) recommended the development of a series of botanic gardens in the regions of Australia to supplement and extend the research and knowledge of Australia's unique flora. The collections in the various gardens had basically concentrated on the economic and aesthetic value of exotic plant material.

During the 1980s, the bicentenary of Australia stimulated perhaps the most dynamic period of development with new botanic gardens being established throughout Queensland: Gladstone Tondoon (1979), Innisfail (1980), Bundaberg (1981), Tamborine Mountain (1983), Redcliffe (1984), Emerald (1987), Noosa (1987), and in 1988 Townsville Palmetum, Rockhampton Kershaw, Ipswich Kholo and Goondiwindi.



Tondoon Botanic Gardens, Gladstone, showcases an outstanding collection of tropical, sub tropical and dry rainforests from the Port Curtis region to North Queensland



The wetland appreciation area at the Bundaberg Botanic Gardens. This beautiful lake is the centrepiece of the gardens and attracts up to 114 species of birds. The Gardens sprawl over 27 hectares of land and feature a variety of 10,000 trees and shrubs.



The stimulation of the bicentenary, together with the growing interest in native plants, saw the development of the network of botanic gardens continue to expand throughout the 1990s into the twenty first century: Mt Isa (1990), Gold Coast (2002), Longreach (1991), Barcaldine (1992), Mackay (1994), Maroochy (1994), Tweed (1994), Redlands Indigiscapes (1997), National Tropical Botanic Gardens (2003), Ingham Tyto Wetlands (2007) and Whitsunday (2009).



Maroochy Regional Bushland Botanic Gardens, Buderim – Wallum heath garden and pond.

Most of these botanic gardens continue to develop as a vital component of the regional community; unfortunately some have faltered and are waiting for a new stimulus. Botanic Gardens Australia and New Zealand Queensland believes that the potential commemoration in 2020 of 250 years since Captain Cook and Joseph Banks sailed up the east coast in 1770 will set off a new wave of development for the botanic gardens of Australia.

Almost without exception, every new regional botanic garden in Queensland established during the past 40 years is the result of the involvement of local members of the Society for Growing Australian Plants (Queensland Region) (SGAP) through actively promoting, contributing to planning, assisting with development and participating in management. It is fair to say that without the considerable knowledge, experience and expertise of SGAP members through the collection and trial of bioregional species in their own gardens these numerous botanic gardens would not have been established.

Certainly without SGAP member involvement the immense scientific value of the collections, the related research and development and the provision of information would not have been so freely available. The botanic gardens of Queensland and the general community owe a debt of great gratitude to these dedicated members who have put into practice the SGAP motto “Cultivation, Conservation, Education”.

Pea flowers of the Gold Coast Regional Botanic Gardens

Alan Donaldson, Honorary Living Collections Coordinator, Friends of the Gold Coast Regional Botanic Gardens

A common misconception amongst many tourists and interstate settlers to the Gold Coast region is that it is a place of swaying palms and lush tropical vegetation.

This perception was, and still is, largely perpetrated by developers, who along with landscapers, have all but decimated the natural vegetation of the city and suburban areas of the coastal strip during the period of very rapid growth in the last 40 years.

Whilst there are still some areas of rainforest on the hinterland behind the coastal strip, the natural vegetation of this area (around 28° latitude and 153.5° longitude) was in reality predominantly Eucalypt forest and Wallum (coastal heath), with some areas of littoral rainforest.

An important understory plant family common to the areas of Eucalypt forest and coastal heath is the Fabaceae (Pea) family. Unfortunately



Part of the 1.7 km Mangroves to Mountains Transect Path at the Gold Coast Regional Botanic Gardens, which wanders through gardens planted with regional vegetation. Photo: Kate Heffernan

many of these plants are now uncommon (if not rare) in the Gold Coast area.

As part of the goals of a Regional Botanic Gardens, our aim is to have these plants well represented in the Gold Coast Regional Botanic Gardens. To that end, our collection has introduced the following genera and species of the Fabaceae family plants since our regional plantings commenced in the Mangrove to Mountains transect of the gardens in 2003.

Yellow and orange pea flowers

Pultenaea, the largest genus of pea flowers in Australia, had numerous species growing in the wild in our area. Four species of these have been grown in the gardens with reasonable success. Of these *Pultenaea villosa* (Hairy Pea Bush) has proven to be the most successful and worthy of growing in suburban gardens. It is a widespread shrub of around 2 m normally growing in Eucalypt forest. The hairy leaves, often with a brownish tinge, grow on arching branchlets.



Pultenaea villosa (Hairy Pea Bush)
Photo: Kate Heffernan

The orange-yellow 10 mm pea flowers give an excellent display from late winter to early summer. In the wild they are a good indicator of fire and may live for around six years, however the populations will decline if not burnt during that time.

In a garden setting they benefit from regular tip pruning and pruning by one third of their height after flowering. This helps to maintain a compact form and to extend their life span. A cultivar of this species 'Wallum Gold' has also been successfully grown in display areas and in our cultivar garden. Growing to approximately 0.4 m high with a spread of up to 2 m, this plant is a useful ground cover. Other *Pultenaea* species grown are *P. euchila*, *P. retusa* and more recently *P. cunninghamii*. Of these species *P. euchila*, although widespread in its range of distribution, is uncommon in the wild and has garden potential.



Pea flowers in a woodland understorey in bloom – Gold Coast Regional Botanic Gardens.



Oxylobium robustum. Golden Shaggy Pea.

Photos: Kate Heffernan



Oxylobium robustum, a shrub to 3 m, grows in moist sandy soils. With spikes of terminal flowers in late winter and spring it mixes well with other closely grown plants due to its scraggy growth habit. It has been grown in our Eucalypt forest area (dry soil) with reasonable success.

Jacksonia scoparia and *Viminaria juncea* are similar in appearance however in the wild they grow in different locations. Both are weeping shrubs up to 5 m in height with furrowed bark and leafless twiggy branches. The former is found in Eucalypt forests and the latter in coastal heath. In cultivation in the gardens they do best in tight groups, providing excellent flowering in late winter and spring. Their long-term survival in these situations has yet to be proven.



Above: *Viminaria juncea* Photo: Greg Boyles
Left: *Jacksonia scoparia* Photo: Kate Heffernan

Many of the *Daviesia* species such as *D. ulicifolia*, *D. umbellulata* and *D. villifera* are known for their stiff sharp leaves. This characteristic could be used to advantage in landscape design to discourage traffic. They are best used as infill and background plants. Their beautiful small orange-yellow flowers have reddish-brown or red markings in the base.

Three species of *Podolobium* have been grown in our Montane area garden. *Podolobium scandens* is a prostrate plant growing to around 1-2 m wide. *Podolobium aciculiferum* and *Podolobium ilicifolium* grow to around 2 m tall. All flower from late winter to summer in our gardens and their unusual foliage provides a good contrast to other pea flower plants.



Daviesia ulicifolia



Podolobium scandens

Photos: Brian Walters



Although difficult to source, we will attempt to grow *Aotus*, *Bossiaea*, *Dillwynia* and *Gompholobium* species that were once common to the coastal heath areas in our soon to be established Wallum garden. Attempts to grow some of these species in other areas of the gardens have not been successful in the long term. No doubt the complex mycorrhizal associations of their natural environments are critical to successful growth.

Purple, mauve and red flowers

Hovea acutifolia is a favourite for its mass of spectacular purple flowers. Found in open shady Eucalypt forests, this shrub usually grows to around 2 m, sometimes taller. In our gardens it has been tip pruned and more heavily pruned after flowering to keep it compact and improve flowering. Grown with other yellow/gold pea flowers the contrasting flowers really stand out in late winter to early spring. An interesting characteristic of the plant is the popping sound made when the seed is ejected from the 15 mm black inflated pod in summer. Other species of *Hovea* such as *H. linearis* and *H. clavata* have not survived for any length of time in cultivation in our gardens.



Hovea acutifolia

Photo: Brian Walters

Kennedia rubicunda is a vigorous vine with large 4 cm red pea flowers in winter to spring. In our gardens it has been allowed to scramble on the ground and on to nearby *Allocasuarina* species trunks. It has not yet been grown on a more formal trellis, however with perseverance this should be possible.

Hardenbergia violacea is a well-known prostrate and twining plant with masses of purple pea flowers. There are now several cultivars of this plant with a variety of leaf forms and growth habits as well as a form with a white flower. Many of these have been planted in our newly established Friends' Centre garden and seem to be thriving at this stage.

Smaller running plants such as *Glycine* and *Desmodium* genera have been found growing naturally in our Eucalypt forest area. Their value in a garden setting is doubtful unless of interest to the serious collector.

Cullen tenax is a fine-stemmed, small purple flowering scrambling plant from Eucalypt forests. In our gardens it has been mass planted in a trial to form an unusual ground cover.

Swainsona galegifolia has significant blue, mauve or pink flowers from spring to summer. In our gardens regular pruning extends flowering and keeps the plants compact and under 1 m high.

Based on our garden's trials, other similar mauve pea flowers shrubs that are worth trying in home gardens include *Indigofera australis* and *Tephrosia rufula*.

Pea flowers have made a very worthwhile flowering attraction to our gardens and require only minimal horticultural care. In our gardens we have planted them with a variety of native mix fertilisers and some with water crystals. In the Mangroves to Mountains transect all plants are planted direct into the existing soil. We provide only limited watering until establishment, then rely on rainfall. With tip and post flowering pruning, their flowering characteristics can be enhanced and the life span extended in many cases. Some have a short life span, which in the wild is dependent on fire frequency. Whilst fire is not practical in a botanic garden, most species can be readily propagated from treated seed or from cuttings, allowing for regular replanting programs. With



Swainsona galegifolia
Photo: Kate Heffernan



the establishment of the Friends' Nursery in the near future we look forward to increasing the number of regional genera and species of this plant family.

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The Closed Forest Gorge, Gold Coast Regional Botanic Gardens.
Photo: Kate Heffernan

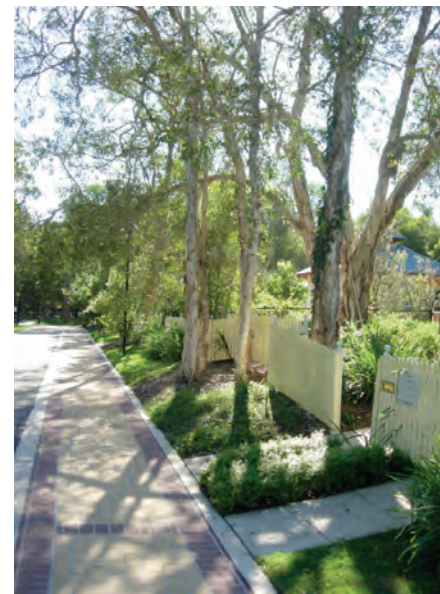


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Redlands City Botanic Gardens – Indigiscapes



The Redlands IndigiScapes Centre at Capalaba was opened in February 2000 and has botanic gardens featuring only plants locally native to the Redlands area. The gardens have many different themes and provide living examples of how native plants can be used to landscape the home garden.

Series of demonstration gardens along a 'street'.



A specific collection of plants within a garden.
Photos: Lawrie Smith



The Mackay Regional Botanic Gardens

Irene Champion and Dale Arvidsson

The Mackay Regional Botanic Gardens (MRBG) is strategically located near the southern entrance to Mackay City. A 51.4 ha site encompasses what was The Lagoons Water Supply and Recreation Reserve. The Lagoons are an anabranch of the Pioneer River and are a historically significant site, both pre and post European settlement.

The MRBG has been fully planned from the outset with development to take place in stages over a number of years, based on funding. The main focus of the MRBG is on the plants of the surrounding bioregion, the Central Queensland Coast bioregion. However, Stages 1 and 2 along the eastern side of the Lagoons also recognise and celebrate historic, regional, cultural and sister-city links while showcasing native species not only of this region but from many other regions and to a lesser extent, internationally. Currently, Stage 3, on the western side of the Lagoons, is under construction.

From the beginning

The official opening of Stage 1 in May 2003 was a dream come true for many people, especially members of the Mackay Branch of the Society for Growing Australian Plants (Queensland Region) (SGAP Mackay) who had tirelessly worked over 18 years for the establishment of a regional botanic gardens to preserve representative samples of Mackay district plant communities. There had been many steps along the way that finally led to the adoption of *The Mackay Regional Botanic Gardens Master Plan* (2000) and SGAP Mackay was actively involved in them all as members served on advisory committees, provided advice, information on plant communities, comprehensive plant lists and physically helped whenever and wherever they could.

A brief timeline:

- As early as the late 1880s, the site was first mooted as a botanic garden for the fledgling city.
- Renowned Landscape Architect Arne Fink was commissioned and developed a site design as being suitable for a botanic garden in 1977.
- SGAP Mackay commissioned a feasibility study funded by the Queensland Region of SGAP for a proposed City Gates Native Gardens in 1985. Both the local Council and the public favourably received the study, however sufficient funding was not available at the time.



Mackay RBG Visitor Centre and lagoon

Photo : Dale Arvidsson



The Orientation Precinct at the Gardens.

Photo: Lawrie Smith



- Real progress started in 1990, after Council received compensation for the impact of a rail line constructed across the Lagoons. Preparation of the Lagoons Reserve Master Plan was initiated, Landscape Architect Catherine Brouwer was engaged and a far-reaching community consultation process was undertaken. The plan was adopted at the end of 1991. This plan and the research findings it included were to become valuable reference material.
- Planting started in 1996 in the first section of the habitat gardens, situated south of the rail line and west of an already completed and landscaped Australian South Sea Islander hut. (This section was later renamed the Regional Forests in the MRBG Sign Strategy.) Planting continued and by 1999 the Pioneer Peaks, Koumala Range and Reliance Creek, the three garden swales immediately north of the rail line, were developed and planted.
- SGAP Mackay members planted over 3,000 plants during regular working bees and by the time the first stage of the MRBG was officially opened, they had planted many thousands more – all local species grown from local material.
- Early in 2000, Council appointed Lawrie Smith's Landplan Landscape Architects to develop the *Master Plan for the Mackay Regional Botanic Gardens* and appointed a Steering Committee to oversee and guide the process.
- Things moved on very quickly! Council adopted the plan, and funding was secured from Council and State Government for the first stage.



The flowers and fruit of *Neisosperma kilneri*. It is a plant of significance to the Mackay region and is classified as an endangered species. Photos: MRBG



The Coal Garden, which has been designed to highlight the importance of the coal industry to Mackay's economy, whilst engaging school students and visitors with the scientific theory of the evolution of life on the planet. The unique geologic requirements to form coal, hands on experiences touching coal, fossils and petrified trees, all take place in a garden setting based on the fossil history of plants. The path is textured with plant 'fossil' impressions. Photo: Lawrie Smith

- Lawrie Smith again oversaw Stage 2 development and has been a key consultant with Stage 3 – the current 'Meadowlands' development.

Although a regional botanic gardens for Mackay was a long time coming there have been many benefits for its later development.

Challenges

So now in 2012, what have been the challenges, what has been learned and what has been achieved?

Probably the biggest challenge faced by the MRBG is the extremes of the climate that can fluctuate between drought to flooding rain over the space of just a few months, coupled with the devastation caused by cyclonic winds. In just two years, devastating climatic events led to the demise of over 1000 trees and shrubs in 2008 and 2010.

The topography and soil types over much of the site are also a challenge. The soil can be like porridge during the wet and become like concrete during the dry. Even on upper slopes plants have died because the soil



Eulamere Lagoon bird viewing platform.

Photo: Lawrie Smith

has become saturated. Displaying flora from a diverse range of regional locations, from the reef islands and coastal fringe to high altitude peaks on one site, has not always been successful!

Ongoing funding and staffing levels are a problem not unique to the MRBG, but impact on the maintenance and success of the living collection display.

Achievements – In spite of the challenges

Being 'master planned' and having the information today not known 20 years ago has allowed the MRBG to take advantage of 'modern thinking' on the role of botanic gardens, advanced scientific research and development in horticulture and a greater understanding of indigenous plant communities and individual species.

The MRBG has a high profile with over 40,000 visitors per annum, a much sought-after educational program, a vibrant Friends Group and the continuing support of other groups such as SGAP Mackay, Birdlife Mackay and horticultural groups.

The Living Collection is thriving and already includes many rare and threatened species and species that have been introduced to horticulture for the first time, aiming to meet global strategies for plant conservation.

The Master Plan has been updated and adhered to and has taken advantage of further research.

Other Council Departments and the wider community are benefitting from the knowledge being amassed and documented by the MRBG.

Today the MRBG is an active BGANZQ member and has developed a Memorandum of Understanding between SGAP Mackay and the Australian National Botanic Gardens to provide material for their living collection and ex situ conservation of listed endangered species.

Today, SGAP Mackay is still involved with membership of the MRBG Horticultural Reference Group, operating the MRBG Herbarium, promoting plants at the annual plant sale at the MRBG and many other joint activities.

We've come a long way!



Graptophyllum ilicifolium (Mt Blackwood Holly), which is indigenous to the Mackay Region, is the floral emblem of the MRBG.

Some wonderful Queensland species that can be grown in cooler climates



Syzygium wilsonii (Powderpuff Lillypilli) is a 1-3 m high shrub with very attractive flowers and weeping foliage. This species is endemic to the far north Queensland rainforests.

Photo: Lloyd Hedges



Xanthostemon chrysanthus (Golden Penda) is a medium sized rainforest tree from north Queensland, from Townsville to Cape York.

Photo: Lawrie Smith

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ANPSA 2013 Conference

Registration is now open

'Diversity is in our Nature' is the theme of the 2013 Conference of the Australian Native Plants Society Australia, which is being hosted by the Society for Growing Australian Plants (Qld Region Inc).

The Conference is for all those interested in the amazing diversity of our Australian native flora. Activities and tours available before, during and after the Conference will enable participants to enjoy diverse experiences of Queensland's flora and scenery.

When: 10-16 August 2013

Where: Alexandra Park Conference Centre, Alexandra Headland, Sunshine Coast, Queensland

A variety of accommodation is available at the Conference Centre, which is situated very close to the beach, on a hill surrounded by bushland. All seminars, workshops and main meals will be held at this venue.

The Conference will feature:

- keynote and 'A.J.Swaby Address' speakers
- seminars
- workshops
- study group presentations
- a biennial dinner with guest speaker
- two days coach travel around South East Queensland.

The following fantastic tours will be available both before and after the conference.

Tour A - Bunya Mountains & Darling Downs

Tour B - Mangroves to Mountains

Tour C - Sandstone & Brigalow

Tour D - Scenic Rim and Beyond

Tour E - Rainforest Meets the Barrier Reef

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Alloxylon flammeum (Queensland Tree Waratah) is a spectacular rainforest tree from northern Queensland. Whilst it is classified as vulnerable in its natural habitat, it is easily cultivated in cooler climates.
Photo: Lloyd Hedges



Tecomanthe sp. *Roaring Meg* is a slender, decorative vine from North Queensland, which produces magnificent bunches of decorative tubular flowers on the old wood.
Photo: Lawrie Smith



Proteaceae of South West Queensland – an amazing food source

Dr Nita C Lester, Director of a number of honorary boards such as Keep Australia Beautiful and Myall Park Botanic Garden, Professor, Griffith University,



Regions of Queensland
Wikipedia Commons

South-west Queensland lies to the south of Central West Queensland and west of the Darling Downs and includes the Maranoa district and parts of the Channel Country. Towns of South-west Queensland include Charleville, Roma, St George, Cunnamulla, and Glenmorgan where the Myall Park Botanic Garden is located.

The recent summer seasons have produced magnificent food supplies of nectar and seed, rewarding birds, reptiles and invertebrates alike. Annual rainfall can be as low as 200 mm with temperatures as

high as 45°C. Lately, however, the area has experienced higher rainfall and cooler temperatures. These conditions have given members of some plant families the opportunity to grow and flower prolifically. The Proteaceae, Asteraceae, Poaceae and Myrtaceae families include many of the most reliable food producers. Proteaceae species are few in number in this region but their contribution is great.

The Proteaceae family

The name Proteaceae is derived from the name of the Greek god Proteus, a deity that was able to appear in many forms. This is an appropriate image as the family is known for its astonishing variety and diversity of flowers and leaves. Many genera of Proteaceae are highly variable. Banksia in particular provides one of the most striking examples of adaptive radiation highlighting the difficulty in making a simple, diagnostic identification key for the family, although individual genera may be easily identified.

In most Proteaceae species the pollination mechanism is highly specialised. It usually involves the use of a 'pollen presenter', an area on the style end that presents the pollen to the pollinator. Nectar feeders are unlikely to come into contact with the anthers, but can hardly avoid contacting the stigma; thus the stigma functions as a pollen presenter, ensuring that nectar feeders act as pollinators.

Because of their large inflorescences, the Proteaceae are highly attractive to both a large variety of insects, their attendant predators such as birds and lizards, and nectarivorous birds such as sunbirds and honeyeaters. Some produce berries, attracting other bird species.

Many species are fire adapted, meaning that they have strategies for surviving fires that sweep through their habitat. Some are resprouters, and have a thick rootstock buried in the ground that shoots up new stems after a fire. Others are reseederers, meaning that the adult plants are killed by the fire but disperse their seeds, which are stimulated by the smoke to take root and grow.

Individual species

Individual species of the region include a number of grevilleas, hakeas, banksia and xylomelum. The following section will investigate a few of these species: *Grevillea juncifolia*, *G. parallela* and *G. longistyla*; *Hakea leucoptera* subsp. *leucoptera*, *H. lorea* subsp. *lorea* and *H. purpurea*; *Xylomelum cunninghamianum* and *Banksia spinulosa* subsp. *spinulosa*.

From St George to south of Charleville golden-orange caught our eyes repeatedly as Phillip (my husband) and I travelled throughout the region in September. *Grevillea juncifolia* not only attracted the humans; the bird, insect and reptile life at every site was magnificent. Only the dry west can produce such a beauty. *G. juncifolia* is an erect shrub, 4-7 m in height with a distinct grey appearance. The leaves are linear with fine hairs, held erect and may be simple or finely divided. Leaves or lobes are only 0.5-2 mm wide and may be up to 30 cm long. The golden-orange flowers appear in winter and spring and are normally held erect except when the weight of the inflorescence dictates otherwise. This species would contribute much to both public and private spaces.



Grevillea juncifolia

Photos, unless specified otherwise, are by Marion Firms, Nita C. Lester and Peter Reilly.



Grevillea parallela

Grevillea parallela is another species that welcomes all life in the region. The species stands out in the landscape and as you move closer, the area explodes into life. We observed honeyeaters and insects enjoying the nectar while frilled lizards were lying in wait for their next meal. This species is a tall shrub or small tree, 2.5-15 m high, with pendulous foliage. The bark is dark, hard and conspicuously furrowed. The leaves are narrow, tapering to the base, dull green above, silky-hairy with 1-5 longitudinal veins beneath, 10-40 cm x 0.2-1.0 cm. Leaves may occasionally be divided into 2-6 narrow lobes.

The white-cream flowers are perfumed, waxy, crowded and borne in cylindrical racemes 5-10 cm long. Several racemes form a terminal panicle. The flowering period is from July to December. The flowers are a rich food source while the broadly winged seeds are hoarded by ants in late summer.



Grevillea longistyla

Grevillea longistyla is the last of the grevilleas for inclusion. It is a 'quieter' species, often by-passed by humans as the small inflorescences and narrow leaves seem to disappear into the general scape but it is no less important as a food source for our fauna. We observed numerous specimens throughout the Blackdown National Park. It is a graceful, quick growing, upright shrub

with fine, slender, deep green foliage on reddish stems, which provide an interesting contrast. It grows to a height of 3-4 m and to a width of 2-3 m. The waxy flowers with their long, red styles are borne in loose clusters in the upper leaf axils from late winter to early summer.

Hakea leucoptera subsp. *leucoptera*, *H. lorea* subsp. *lorea* and *H. purpurea* are the selected hakeas and these provide further food and shelter for the fauna of the region. Nests abound as the prickly foliage affords protection to birds such as fairy-wrens, finches and robins, while the highly scented nectars provide food for numerous bird species and insects.



Hakea leucoptera subsp. *leucoptera*



Hakea purpurea



Left and below: *Banksia spinulosa* subsp. *spinulosa*



All three species are very hardy with numerous inflorescences during spring and summer. *H. purpurea* is the smallest of the three forming dense bushes from 1-2 m tall and of at least similar width.

Xylomelum cunninghamianum (Woody pear) is a small tree to 20 m with flaky bark and leaves vary from coarsely toothed juvenile to narrow mature leaves with smooth margins. The inflorescences are 3-4 cm long consisting of tiny brown-yellow flowers and amazing woody pear shaped fruit 3-4 cm long. Phillip and I observed this species throughout the south west in dry sclerophyll forest locations.

Banksia spinulosa subsp. *spinulosa* with narrow, toothed leaves was observed in a number of disconnected locations such as Blackdown National Park and Carnarvon Gorge National Park. As we approached each specimen, honeyeaters flew, and upon close inspection numerous invertebrates were feasting. It is a small to medium shrub with stems which arise from a lignotuber.

The flower spikes are 75-100 mm wide, up to 450 mm long and yellow or orange in colour. This is one of a group of banksias with 'hooked' styles projecting from the axis of the flower spike. The styles are often deep red, black, orange or yellow, which has given rise to the common name of Hairpin Banksia. The seeds are enclosed in follicles attached to a woody cone and are generally retained within the cone until it is burnt.

If time is of the essence, and you are not able to enjoy the distances of the south-west, consider visiting Myall Park Botanic Garden because at this one location, the south west species can be observed. Myall Park Botanic Garden is a privately owned (open to the public) botanic garden 7 km north of the Glenmorgan township and showcases semi-

arid, arid and dry tropical Australian species. Within the 132 ha site, all of the above species and hundreds more are growing in a natural style bushland setting. Numerous walks, trails, art installations and much more, make this botanic garden one that should not be missed. Accommodation is available on site along with numerous campsites.

Currently a restoration project, partly funded by the Australian Garden History Society, aims to increase the Proteaceae species within the Garden. This restoration promises to showcase not only the south west species but also many others from all around Australia that successfully grow in the dry.

If you are like Phillip and me, stopping, reversing and turning back every time a flower or plant form catches our eye, the south west region will not disappoint. The Proteaceae in spring provide amazing food supplies and shelter for numerous fauna species and much enjoyment for humans.



Garden scene at Myall Park Botanic Gardens showcasing small flowering shrubs and tall trees plantings using a relaxed landscaping design.





Zieria collina, Hill Zieria – a vulnerable understorey plant in Tamborine Mountain Botanic Gardens

Articles and photos: Brian Davison, Honorary Curator, Mount Tamborine Mountain Botanic Gardens.

Reaching a height of 550 metres in the Gold Coast hinterland, Tamborine Mountain is part of the Mt Warning volcanic 'flows' formed some 23 million years ago. The Tamborine Mountain Botanic Gardens (TMBG) is situated on the loams that have developed on this basalt and the soils from older rocks below.

The Mountain enjoys a sub-tropical climate but has lower temperatures and higher humidity than the surrounding lowlands and coastal areas.

The remaining stands of sub-tropical rainforest that once covered most of the mountain top are surrounded by wet sclerophyll forest that extends down the slopes with the towering *Eucalyptus grandis* (Flooded or Rose Gum), *Lophostemon confertus* (Brush Box) and *Eucalyptus microcorys* (Tallowwood) being the dominant species. The rainforest was once rich with many larger trees including the much sought Red



Tamborine Mountain Botanic Garden.



Zieria collina

Above: Zieria flowers

Left: Zieria bush on the edge of the rainforest area within the gardens.

Cedar (*Toona ciliata*). Most were removed for their commercial value or in the clearing of land for agriculture. About 50% of the Botanic Gardens is covered in rainforest in various stages of regeneration.

One of the rarer understorey plants is *Zieria collina*, a member of the Rutaceae family. It has delicate, 3 cm lanceolate shaped leaves that are densely hairy underneath and arranged in threes. It has masses of small 5 mm wide, white, 4 petaled flowers on axils that are at their best in October. The fruit are small, green and contain a black seed.

Z. collina grows on the edges of the rainforest in the Botanic Gardens and continues into the surrounding wet sclerophyll forest that stretches towards Canungra. Growing to 3 metres, the shrub appears to prefer strong light and regenerates more readily on bare soil or where there is a very light covering of leaf litter which often includes Eucalyptus leaves.

There have always been fires in the forests on the flanks of Tamborine Mountain. They burn into the wet sclerophyll forests and sometimes reach the edges of the rainforest. *Zieria collina* germinates after fire in these positions.

Being one of about 30 of the *Zieria* genus (nearly all native to Australia) this delicate understorey plant is listed as vulnerable in its natural habitat. It grows naturally only on Tamborine Mountain and on the adjacent slopes towards Canungra. Interestingly, the various species of *Zieria* are distributed across Australia, often in small, isolated pockets like Tamborine Mountain. This has happened because they have evolved as mountain species and each species has evolved a little differently as these mountains have become isolated.



Inland, but not outback – Peacehaven Botanic Park

Article and photos: Patricia Gardner, Friends of Peacehaven Botanic Park

Situated at Highfields near Toowoomba, this new 4.7 hectare botanic garden was originally part of a dairy farm, overtaken by expanding suburbs. It is now owned and managed by the Toowoomba Regional Council. The site, on red basalt soil, commands wonderful views across the Darling Downs to the Bunya Mountains in the distance, as shown above.

The aim is to create a botanic garden specialising in the endemic plants of the Darling Downs, with an emphasis on showcasing local natives suitable for garden use. Toowoomba's gardening tradition is based firmly on the use of introduced plants and there has been little appreciation of the district's original vegetation. Toowoomba's ongoing, mining-driven population explosion, with its accompanying building boom, is seeing a flurry of garden-making. Peacehaven hopes to draw attention to the overlooked virtues of our own flora for use in this process.

Perhaps the most interesting section to date is the trees from the much maligned "scrubs" – the semi-evergreen vine thickets (SEVTs), which

are still regarded locally as being full of plants of no value. Yet these inland relatives of rainforest trees have great potential for garden use. Unlike their damp-climate cousins, they are very drought hardy. These small trees were planted in 2006 at the height of the long drought. It was not until last year that they knew anything like "normal" annual rainfall. Yet apart from the day they were put in, they have never been given any supplementary water. The only concession to their water needs was a layer of mulch.



A section of the semi-evergreen vine thicket plantings planted as an understorey (foreground) beneath a canopy of remnant Eucalypts and Corymbia species.



Descended from a rainforest flora of long-ago, when Australia's climate was much wetter, the trees of dry scrubs have adapted by evolving smaller, tougher leaves to reduce transpiration. They have also learned to shed leaves, to reduce transpiration still further, when faced with a dry season or a long drought. They do not form buttresses. Instead the young seedlings send their roots downwards as fast as they can, seeking water. This narrow root zone has a virtue in gardens, in that other plants can be grown close to them, and they are unlikely to bother paths and foundations.

They also tend to be naturally small trees, a quality which makes them suitable for suburban gardens. They develop shady green canopies in the open and are also happy to grow under Eucalypts. Unlike dry sclerophyll plants, which are often the first choice when water-wise native plants are installed, scrub trees can be dense with green foliage, belying their ability to perform as well as the hardiest Eucalypts in a drought. Highly amenable to clipping, trimming and pruning, they are easily managed so that the same species might be a single-trunked shade tree, a screen with foliage to the ground, or even a neat hedge.

Peacehaven's trees are now beginning to flower and fruit. The white doughwood (*Melicope micrococca*) displays massed small white insect attracting flowers. With a basic framework of trees established, Peacehaven has reached its next phase and smaller plants are now being installed among them.



Above: The delicate pretty flowers of the White Doughwood,

Left: A five-year old bush of the White Doughwood, *Melicope micrococca*,



Teucrium argutum var. *incisum* is a perennial and often a scrambling and suckering herb to 50 cm high. Its branches are densely covered with glandtipped hairs and sessile glands.



The flowers of *Teucrium argutum* var. *incisum* (left) resemble those of *Teucrium argutum* var. *argutum* (right) but the leaves are quite distinctive.

The shelter provided by the maturing trees of the Dry Rainforest section has now allowed for the planting of the pretty cut-leaf native germander, *Teucrium argutum* var. *incisum*. The soft, deeply incised leaves of this rare inland species make it a more appealing ornamental plant than the better-known *Teucrium argutum* var. *argutum*.



Cooktown Botanic Gardens – the first flora of Australia

Sandra Lloyd, Curator, Cooktown Botanic Gardens
Photos, unless specified otherwise, are by the author.

Cooktown Botanic Gardens on Cape York Peninsula is found near the Endeavour River, where Lieutenant (later Captain) James Cook beached the HM Bark Endeavour in June 1770, after having run aground on a shoal of the Great Barrier Reef. It is the place where botanists Joseph Banks and Daniel Solander collected many specimens of the Australian flora and fauna and sighted the kanguru (local Aboriginal Guugu Yimithirr language name).

Cape York Peninsula was once the ancient land link between Australia and New Guinea, until the last flooding of the Torres Straits. Some flora and fauna species are therefore closely linked to Papua New Guinea.

Cook's town became a settlement because of the Palmer River Goldfields and is in the dry tropics, with two seasons, a very wet season and a very dry season – a tropical monsoonal climate with strongly seasonal rainfall. Established in 1878, only four years after the town, Cooktown Botanic Gardens is one of the oldest regional botanic gardens in Queensland. The Gallop Botanic Reserve, which



A stand of *Melaleuca leucadendra* provide a beautiful setting for a picnic area within the Gardens.

contains the gardens, encompasses 62.3 ha (154 acres) on the edge of Cooktown and includes the walking trails to the beautiful beaches of Finch Bay and Cherry Tree Bay.

It is National Heritage Listed for Cultural Significance as 'a place of significant historical value to the people of Queensland'. The design of the garden is in the 19th century 'Gardenesque' style, which followed the "Picturesque" style (a natural garden with artificial features such as ferneries, bridges, trellis, ponds), while emphasising the botanical features of the plants. It is historically significant in that the original design was laid down in the 1880s, and it includes plantings from that time whose provenance is unquestioned, and of which the genetic structure can have significant value to science. They are part of the type-locality of the first scientific collection of plants in Australia.

The primary collection of Cooktown Botanic Gardens is the Banks and Solander collection. These are living specimens of the plants collected by Joseph Banks and Daniel Solander in 1770. Having run aground on the reef, they were on the river for seven weeks, much longer than elsewhere in Australia, with a week in Botany Bay, and elsewhere only a day or two to look for water and supplies. This makes the Endeavour River the basis of the European knowledge of Australian flora of the time and therefore a very important part of our history and our heritage. Botanic Gardens were maintained for scientific as well as recreational purposes and the search for new species was a feature of the nineteenth century. In Europe, Australian flora became fashionable for its beauty and botanical interest.



Dillenia alata, the Red Beech or Golden Guinea Flower, was collected by Banks and Solander at Endeavour River, Queensland in 1770. The flowers are bright yellow, 6-9 cm in diameter and only last for a day. The open fruit reveal bright red valves and black seeds. These are an attractive feature of the plant and they contrast well with the dense green foliage.



The scientists on board collected specimens of these unknown plants found along the Endeavour River, pressed and dried them, and the artists on board painted them. On their return to England the original herbarium specimens were retained by Joseph Banks and later the (British) Natural History Museum, where they remain today. Duplicates of some of these were subsequently sent to the Australian National Herbarium in Canberra, some reside in the Queensland Herbarium and the Australian Tropical Herbarium at James Cook University has four of these 240 year-old dried plants.

The label plates on specimens in the gardens reflect the history and, where possible, the local language group, Guugu Yimithirr, name for the plant.

Other collections include the Timber Trees, with Red Cedar (*Toona ciliata*), Kauri Pine (*Agathis robusta*), and Kwila (*Intsia bijuga*). These magnificent trees were logged in the past and we need to preserve them for the future.

The Society for Growing Australian Plants Garden was created by the Cairns and Tablelands Group, who since 1986 visit the gardens annually for a weekend in June. They are dedicated native plant specialists who freely give their time to the gardens.



The Palmetum has all the native palms found up this way, including the Foxtail Palm (*Wodyeta bifurcata*), pictured on the left, and *Livistona* species, as well as exotic palms.

The Wetlands Section contains mangroves and other wetlands plants including the *Nypa* Palm which grows with its feet in water, and the Wrinklepod Mangrove, *Cynometra iripa*, the huge Swamp Lillies, *Crinum pedunculatum*, and features the graceful large *Melaleuca leucadendra*, the Weeping Paper-bark.

Contemporary collections include the Rain-forest Garden, which is being developed to showcase species of the nearby wet tropics of Cedar Bay National Park.

The Brachychiton Section has a developing collection of Kurrajongs and related

plants. The hill was cleared of woody weeds to expose the graceful granite boulders that are an icon of Cooktown and gave space for these large trees including *Bombax ceiba* (Red Silk Cotton Tree) and *Brachychiton acerifolius* (Flame Tree).



Bombax ceiba (Red Silk Cotton Tree)



Brachychiton bidwillii (Little Kurrajong) Photo: Lawrie Smith

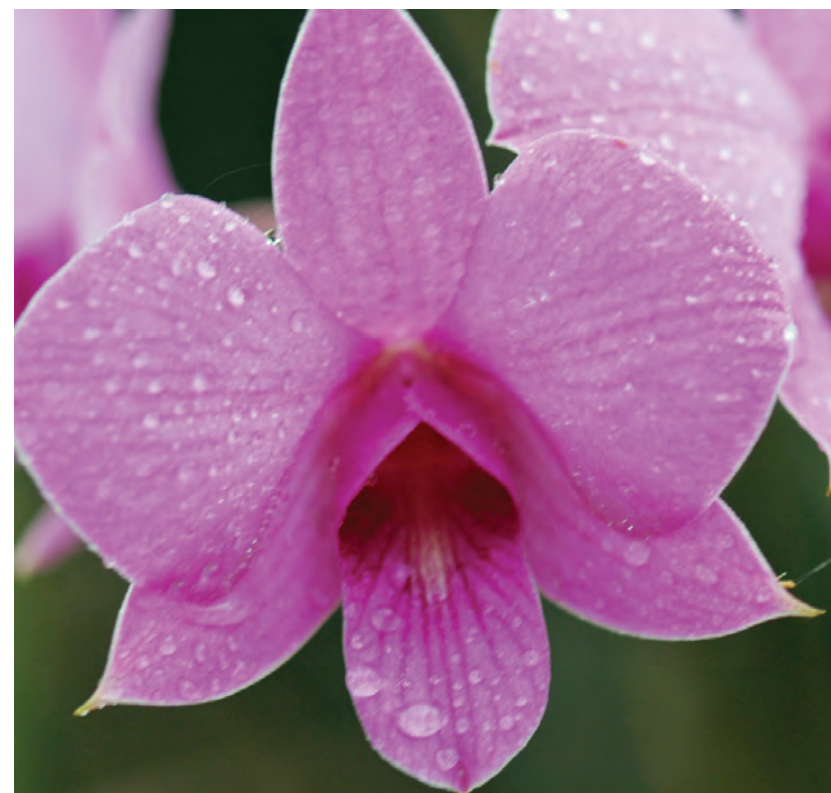


The new Aroid garden has some strange Snakeskin Lilies or Elephant Yams, the *Amorphophallus* species, including the native *Amorphophallus galbra* and *A. paenifolius*.

The small Orchid House has many native orchids from funding received from Jason O'Brien MP and the Cooktown Local News, including



The developing flower of *Amorphophallus paenifolius*, the Cheeky Yam, Elephant foot yam or Stink lily, in the Aroid Garden. It occurs in the Northern Territory and Cape York Peninsula, especially on the Torres Straight Islands. It grows near sea level in monsoon forest, vine thickets and rainforest.



The beautiful Cooktown orchid, *Dendrobium phalaenopsis*, is the floral emblem of both Queensland and the Cooktown Botanic Gardens.

Cooktown Orchids, the Queensland State Floral Emblem. This beautiful mauve orchid generally flowers early in the year and is finished by the end of May. In 2011 surprisingly, there were occasional flowers still in November. Exotic orchids were donated by Cairns Botanic Gardens.

Cooktown Botanic Gardens, the living museum, is a magnificent showcase for the plants of Cape York Peninsula, and for tropical fruit trees and especially as a showcase for our history and our heritage.



The Birdwing project at the Gold Coast Regional Botanic Gardens

Lynette Reilly, Vice President, Friends of Gold Coast Regional Botanic Gardens

Butterflies are internationally recognised as valuable indicators of a healthy, biodiverse environment, sensitive to subtle changes in habitat or climate.

To see these 'fairies of the forest' on the wing – the green and black males or the gold, white and black females – is to become entranced. They are a beautiful sight in their own right as well as showing us that we have a healthy environment to live in.

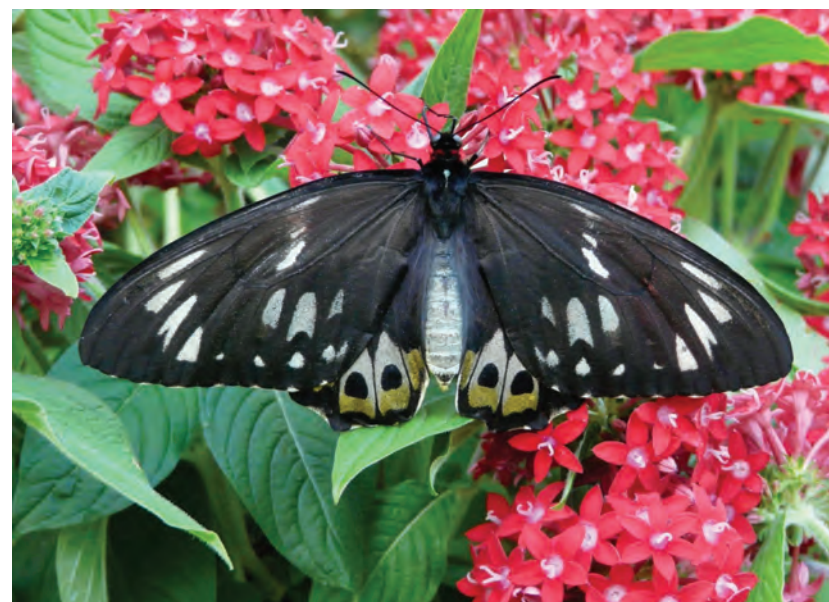
As Friends of a Regional Botanic Garden, many of our objectives relate to the conservation of local plants and animals, such as *to recreate local plant communities to encourage return of animal species especially birds, lizards and insects.*

This year our 'insect' focus has been on the local and 'vulnerable' Richmond Birdwing Butterflies.

Although they were once found from Maryborough in Queensland, south to Grafton in northern NSW, two-thirds of this original range has been lost due to land clearing. This deforestation means the soft new leaves of the Birdwing vine *Pararistolochia praevenosa* have been lost to the Birdwing caterpillars – and this is the only food they can eat. No larval food, no butterflies.

'Bring back the Birdwings' has been the focus of planting efforts over the years in some of its original range. Slowly the vines and their butterflies are growing in numbers as vegetated corridors with feeding stations are developed.

Here on the Gold Coast, two of our members have had success in not only growing the vines, but recording Birdwings laying and hatching. The three of us – who are also members of the Richmond Birdwing Conservation Network (a sub-group of the Wildlife Preservation Society of Queensland) – submitted a proposal to the Friends. We wanted the Gold Coast Regional Botanic Gardens to become part of a butterfly corridor along the Nerang River, by planting sufficient numbers of Birdwing vines in suitable sites in the Gardens. Appropriate educational signs at the proposed plantings near the existing butterfly food plant gardens would alert and draw visitors.



Female Richmond Birdwing Butterfly



Male Richmond Birdwing butterfly
Photos: Ray Seddon

Many steps followed:

- The Friends' management committee, the Project Control Group and the Horticultural Reference Group, in turn accepted our proposal for staged plantings.
- We asked the Corridor Convenor of the Richmond Birdwing Conservation Network to be our guest speaker at our annual Friends Lunch and many in the audience became enthused at the prospect of attracting Birdwings to our Gardens.
- We researched growing conditions for the vines – pH, drainage and light requirements – and mapped six possible sites for the initial plantings.
- We sought growers.
- We sought funding.

At the same time that these proposals were underway, I realised that the planting event would be an ideal time to launch my Birdwing Butterfly book. The Friends agreed to be the publisher with all profits to go to the Friends and the Butterfly Networks. I found a willing and experienced butterfly illustrator, Lois Hughes; confirmed an established Brisbane printer with 'green' credentials, Fergies; and sought funding.

These have all come together as part of our Birdwing Project.

- Our Threatened Species Month Community Planting Day in September 2011 included the first 20 Birdwing vines.
- A successful grant application to Jupiter's Community Benefit Fund will cover the printing costs (but not the planned workshops).
- *Birdwings New Home* was launched by local ABC radio personality Peter Scott after the Friends AGM in the Gardens on 27 November 2011.



This planting and publishing project has been at times exhausting and frustrating. But when there are beautiful Birdwing Butterflies, the size of small birds, fluttering in our Gardens, we will remember none of that and just rejoice in the present and the future.

For more information see our websites www.fgcbg.org.au and www.birdwingsnewhome.com

Two more wonderful Queensland regional species



Phaius australis, the Lesser Swamp-orchid



Eupomatia bennettii, Small Bolwarra

Photos: Kate Heffernan

