

Australian Plants

A close-up photograph of a white daisy-like flower with a green center and a bud above it, set against a dark background. The flower has many long, thin white petals radiating from a green, textured center. Above the main flower is a bud with pointed green sepals. The stems and leaves are visible in the background, some in focus and some blurred.

Registered by Australia Post
Publication No. PP226253/00017

June, 2006
Vol. 23, No. 187

\$3.95

This edition introduces you to some of the floral delights that await you during the ASGAP 2007 conference to be held in Newcastle, NSW in October and to those of its associated pre- and post- conference tours.

While much of the NSW coast abounds in magnificent coastal scenery with floriferous heathland and pockets of rainforest (see articles by Diane Dean, Cas Liber and John Wrigley), Sharryn Brown goes beneath the surface beauty and gives us the lowdown on the manoeuvrings of would-be developers. Griff Foley tells of past battles fought and won, giving us heart to work to ensure others will be able to write just as glowingly of east coast natural areas in the future. Paddy Lightfoot and Sue Rostas tell uplifting stories of what can be done to rehabilitate degraded areas as suitable for both wildlife and people. While John Nevin, Bill Hardin and Merle Thompson tell of the biodiversity and beauty of places further inland. Finally, Peter Vaughan's garden at Hartley Hill shows that what we grow in our gardens need not necessarily be constrained by the attributes of where we live.

My thanks to all contributors who so willingly answered the call for articles. The response was so great that we have had to hold some over until next edition! Apologies to those concerned. I hope appetites will be whetted to visit Newcastle and surrounds. We look forward to welcoming you in October.

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Front cover: **Flannel Flowers (*Actinotus helianthi*) in Awabakal Nature Reserve - photo: J. Rostas (p. 249)**

Back cover: **Flannel Flowers (*Actinotus helianthi*) and *Melaleuca nodosa* in Awabakal Nature Reserve - photo: J. Rostas (p. 249)**

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Our Garden 49: Hartley Hill

Sand Gardens at Hartley Hill

Peter Vaughan*
APS Newcastle

Gardening on this site was difficult because of the natural heavy and sticky clay soils. Water penetration was extremely slow and weeds very difficult to remove. The range of native plants that could be grown was restricted.

Sand gardens were the answer. I use unwashed, unscreened beach sand. I used it because it is cheap, but also because it lacks nutrients, which native plants like and weeds don't. I have never had any sign of problems with salt. 15 centimetres of beach sand is placed over the natural soil, I do not mix it in. Already established plants usually tolerate the sand around their stems. I do not use any mulch, in fact I occasionally rake my gardens to remove any leaves that may fall onto the surface.

When I plant I remove the sand so the new plant is sitting on the natural soil level, then fill around the plant with sand only. As the plant grows, its roots easily penetrate the natural soil level, reaching a cool, often moist zone. I like that. Meanwhile, the sand above often dries out and gets hot, which is not good for weeds. I like that too.

My sand garden for WA plants faces north-west and so has strong light. I have further increased the light intensity for these plants by using bricks white sand for the top 5 cm. This increases photosynthesis, strengthening plants and removing water from their leaves. This garden is also next to a covered verandah which provides a dryer environment. Note grafting is not the complete answer for WA plants, dry air is also needed, especially if near the coast.

When choosing plants to grow, be bold and try some WA plants that will be difficult. I find grafted *Verticordias*, *Eucalyptus caesia*, *Banksia blechnifolia*, *Conostylis* and black Kangaroo Paws grow successfully.

But also remember that some of our best sand-loving species come from the east coast. Compact forms of *Banksia serrata*, *Scaevola aemula*, Flannel Flowers, *Epacris* species and Sturts Desert Rose all are features in a sand garden.

In fact deep sand is excellent for all native gardens as water runoff is slowed and absorption improved. Weeds grow slower and are easy to remove. For my rainforest garden I use deep sand with a cover of sugar cane mulch on top. It looks good and allows better water penetration. Annual daisies and flannel flowers prosper and regenerate well in a sand garden if it is watered from mid-Winter to Spring.

One early problem with a sand garden is slow water penetration. We overcame this problem by hand watering or using water spikes for about a year.

Hartley Hill Homestead was created in 2000. Like the owners, Peter & Karen Vaughan, the gardens are designed to be different. The established gardens now form a 15 hectare wildlife refuge at Newcastle, NSW. The gardens of Hartley Hill Homestead are open to the public each year in the second weekend of October, with all proceeds donated to the Hunter Medical Research Institute and the Hunter Wetlands Centre.



Above and Right:

Melastoma affine (compact form), *Helipterum roseum* and *Eremophila nivea* feature in this south facing bank.

Photos: J. Rostas



Above and Bottom Right:

Verticordias, Schoenias and Damperias grow in this north facing bed.

Verticordia chrysantha on the left, *Verticordia galeata* with more dense flowers on the right, and *Schoenia filifolia*.

Photos: S. Rostas (above)
and P. Vaughan (left)



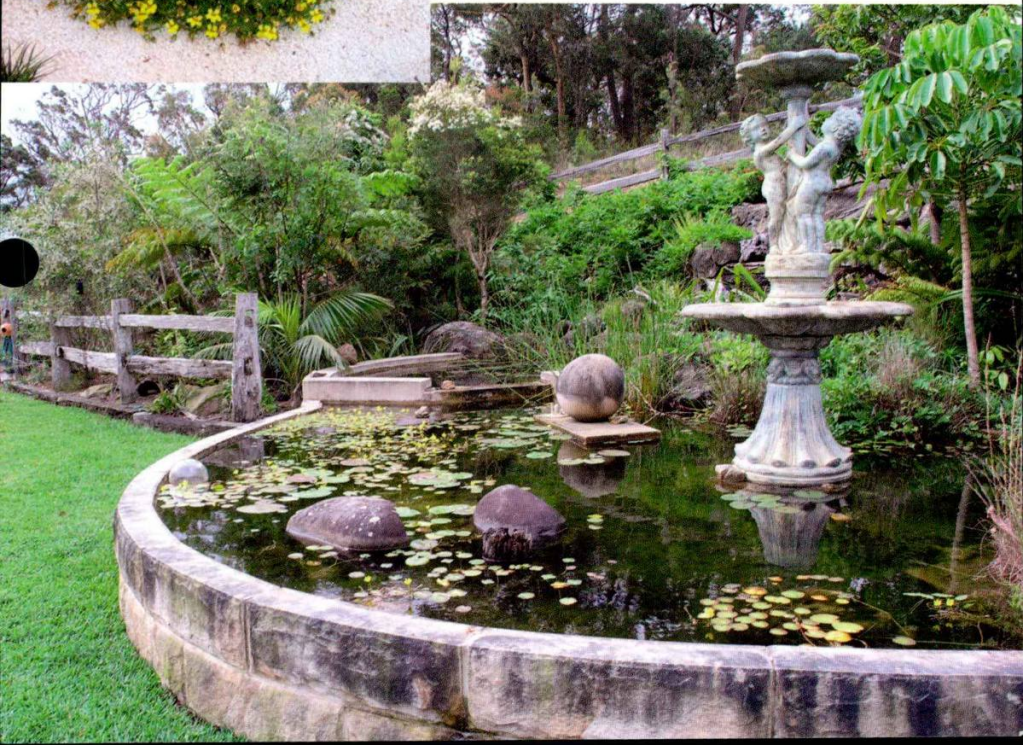


Above: Flannel flowers and Verticordias thrive in this garden bed of sand. Photo: J. Rostas



Left: *Velleia spathulata* makes a compact rockery plant. Photo: P. Vaughan

Right: Our water feature is a haven for native fish and frogs. Photo: J. Rostas



ASGAP 2007 Conference:

Newcastle

Sue Rostas

The Association of Societies for Growing Australian Plants (ASGAP) as you probably know is the umbrella organisation of the State bodies interested in the growing, conservation and promotion of Australian native plants.

ASGAP achieves its aims in three main ways: publication of Australian Plants; co-ordination of Study Groups for members who wish to delve more deeply into particular floral areas; and organisation of a biennial conference.

The conferences rotate around the States giving attendees opportunities to learn of the flora, natural areas and local gardens in each State under the guidance of knowledgeable local members as well as opportunities to chat and exchange ideas with fellow native plant enthusiasts from across Australia.

In October 2007, it is the turn of NSW in general and Newcastle in particular, to host the ASGAP conference and associated pre- and post-conference tours. These will highlight the flora of the northern half of the State (southern NSW gets its chance when the conference is in the ACT).

This particular conference has the added importance of marking and celebrating 50 years of the societies' interest in and work with Australian flora. To mark the anniversary John Walter has written a book charting the history of SGAP, its pioneers, characters and achievements. Both book and author will be at the conference.

The theme for the 2007 conference is 'Flora in Transition'. This is particularly appropriate for Newcastle as it lies in a transition zone between a southern more temperate climate and a northern more sub-tropical climate. With additional west to east transitional opportunities due to the cutting of the Great Dividing Range by the Hunter River.

The conference is also a chance for delegates to see that not only the flora but indeed the city and the surrounding region is in transition as it changes from one that relied primarily on mining and heavy industry to one that is much more economically, culturally and socially diverse.

Both during the conference and pre- and post-conference tours delegates will have a chance to see a wide range of habitats from rainforest, to melaleuca swamps, to wet and dry heath coastal heath often set against spectacular coastal scenery, to flora of more mountainous regions as well as that of the more arid Northern Tablelands. Excursions into the region's natural areas will be augmented by visits to a number of fine regional and private gardens.

For registration forms or more information on the ASGAP 2007 conference and pre-and post conference tours write to: PO Box 76 Adamstown, NSW 2289 or email: c.gillard@bigpond.com

APS Makes A Difference

Paddy Lightfoot

APS Newcastle District Group

In 1984 Professor Max Maddock of Newcastle University led a group of far-sighted Novocastrians to ask Newcastle City Council for protection of remnant melaleuca swamp at Shortland. Timber had been removed for pit props and housing and much of the area cleared for dairy farming, burnt, and used as a dump and filled for sporting fields. Under pressure from Max's group, the wetlands at Shortland were not filled in and a proposed highway was re-routed.

A Trust to co-ordinate development of an environmental centre based on wetlands was launched in September 1984. I attended representing the then Society for Growing Australian Plants – now Australian Plants Society. My brief from SGAP was to ensure only Australian plants were used. When Max heard I represented SGAP he immediately co-opted me to the Landscape Committee (now the Site Management Committee - SMC).

In 1985 I became a director of the public, not for profit, company, Shortland Wetlands Company (now the Hunter Wetlands Centre – HWC). Twenty years later, I am still on the board and convenor of the SMC which includes Carolyn Gillard another APS Newcastle member.

Following a flora survey of the plants on site, we decided to divide the 45 hectares into three basic zones. Around the Visitors' Centre we would plant natives from anywhere in Australia. This was to attract birds, look aesthetic and demonstrate what could be grown in Newcastle gardens. From there we graded to plants from the lower Hunter and then in the 'wilds' we used only plants found in the immediate locality. For our database we record the number of each species, when, and who planted. We have not recorded deaths – perhaps too distressing for the planters but mainly too time consuming a job.

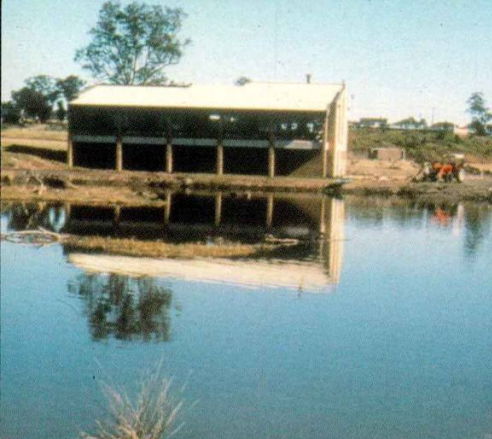
Our 30,000th tree was a Port Jackson Fig, *Ficus rubiginosa*, a magnificent locally occurring tree. The fig is historically important. Captain Phillip sent his convicts out from the tiny settlement on Port Jackson to collect the fruit to help prevent scurvy. Our 40,000th tree was another prominent local, the Red Ash – *Alphitonia excelsa*. By last year's end, our total had reached 46,566 natives.

Significant plantings at HWCA since 1988 include establishment of wildlife corridors, Casuarina forest, 'Wallum', 'bush', and revegetation of a canal link to Ironbark Creek (the two now being almost indistinguishable). The one exception to local species in the 'wilds' has been development of a wonderful rainforest along Ironbark Creek. This is adjacent to an outdoor classroom. For education purposes we have used species from anywhere on the east coast.

Apart from advising what to plant where, APS manages propagation of plants in a polyhouse which has automatic watering and a misting system for cuttings. Propagated plants are used on site or sold to the general public.

Members of APS Newcastle are looking forward to the 2007 Conference to showcase our involvement in the hugely successful Hunter Wetlands Centre. This is surely a jewel in Newcastle's crown. It is an area of wonderful wildlife habitat primarily set aside for relaxation, active and passive environmental education for Novocastrians and visitors to the Hunter.

A longer article entitled Bringing It Back: The Wetlands Centre Story was printed in *Australian Plants* Vol. 22, No. 175, June, 2003.



Top left: HWCA Visitors Centre in 1986 (left, photo: P. Lightfoot and 2006 (right, photo: S. Rostas)

Centre: APS propagators at HWCA (left, photo: P. Lightfoot) and the Sensory Trail (right, photo: S. Rostas)

Below: Swamp Lily (*Crinum pedunculatum*) beside BHP pond (Photo: S. Rostas)



Botanising Awabakal

Griff Foley

Visitors to Newcastle are often surprised at the wealth of bush reserves in this industrial city. During its first hundred and fifty years, large swathes of Newcastle land were set aside for mining. More recently, local residents have persuaded governments to turn some of this land into nature reserves.

This article celebrates the achievements of the plant-lovers who helped to create Awabakal Nature Reserve, 121 hectares of coastal heath and forest near Redhead south of Newcastle. This small group of enthusiasts is representative of the many people throughout Australia who have done the botany to convince public and politicians that native vegetation remnants are worth saving. The vital work of these local botanisers is little appreciated.

In May 1970, H.C. Dorman the President of the Newcastle Flora and Fauna Society (NFSS), condemned the neglect of one and a half square miles of dunes, heath, forest and wetlands between Redhead, Gateshead and Belmont. The area, he said, had been "all but forgotten except that on the map in the early '50's a broad line was drawn across it as the site of the future Sydney-Newcastle expressway".

At around the same time this area had passed from Crown Land to sand mining lease. NFSS took an interest in the area in the mid-1960's and in December 1966 formally proposed it became a nature reserve and school biological study centre. The State education department and parks and wildlife service endorsed the concept. Lake Macquarie Council also supported the proposal in principle but at the same time rezoned one part of the area for residential subdivision and another for a garbage dump.

"Prime areas of environment", Dorman wrote in the NFSS journal, *Hunter Natural History*, in May 1970, "a priceless heritage, especially when so close to dense population, cannot be lost simply because they are cheap land economically and their reservation is fraught with problems. Responsible authorities must take a stand, before it all goes by default" (Dorman 1970).

Here Dorman was expressing the principles informing the campaigns that preserved significant swathes of Newcastle bush from the 1960's to the 1980's. Some of the campaigners saw that establishing the botanical value of these native vegetation remnants would be vital to saving them. In the first issue of *Hunter Natural History* Dorman maintained that the preservation of Newcastle's "remaining though fast decreasing pockets of bushland" depended on an aware public and local government. He urged society members to contribute their botanical and communicative knowledge through the journal (Dorman 1969).

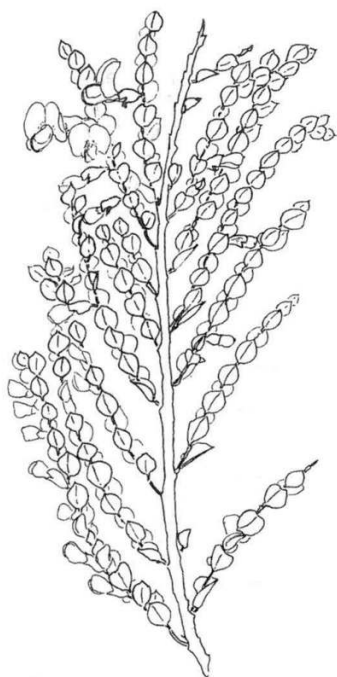
In the May 1970 issue of the journal *Nan Baxter*, another key person in the Awakabal campaign, contributed the first of a series of 26 papers on Redhead/Jewells flora¹. She provided a rough sketch map identifying eight habitats, each with its unique flora: cliff face, coastal strip, landward dune, lagoon, dry sclerophyll forest, forested gully, wetland, and "a flat, open area on either side of the south end of the Redhead-Dudley Road; a botanical joy". She announced her intention of documenting the wildflowers of each of these areas as they bloomed, and began with sketches and brief descriptions of nine members of the pea family: four *Gompholobium* species, one *Mirbelia*, two *Glycine* and two *Desmodium* (Baxter 1970).

In a short article it is impossible to do justice to the wealth of botanical data contained in Nan's series and in the results of two transect studies conducted by NFFS members (McDonald et al 1970, 1971). These papers detailed, in words and line drawings, hundreds of native plant species².

The floristic diversity of the area is striking. Transect studies conducted in September and December 1970 revealed 134 species in two small sections, one 90 x 2 m, the other 30 x 2 m. Only 40 species were common to both transect sections. As the botanisers concluded, "major changes in the plant communities occur in the space of a few metres and in response to subtle changes in environmental conditions" (McDonald et al 1970, 60).

The dominant Redhead-Jewells plant family is Papilionaceae. In her plant surveys between 1970 and 1976 Nan Baxter identified 39 species in this family, including 5 species of *Bossiaea*, 5 of *Daviesia*, 5 of *Gompholobium* and 4 of *Pultenaea*. Her treatment of the *Bossiaea* family is, like all her plant descriptions, clear, detailed and redolent with her delight in the natural world:

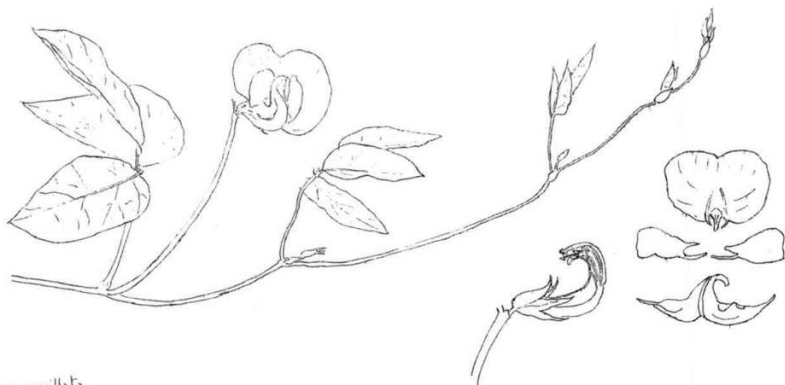
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1. For list of the first 22 of these papers and the plant species and families they identified, see *Index to Wildflowers of the Redhead Area Hunter Natural History* Vol 8 No 4, 298-301
 2. The Awakabal botanisers do not appear to have provided a precise number for the native plant species they identified. Nan Baxter recorded 132 species in her first 22 papers, but this figure included species located in the area between Redhead Rd and the Pacific Highway that was not included in Awakabal SCA. Nan Baxter and Kevin McDonald in their 1976 list of the plants of the whole Redhead-Jewells area calculated a cumulative total of 400 species in 100 families, but this figure included introduced species. This list is reproduced in Gilligan 2004, 46-68.



Bossiaea rhombifolia

Like all pea flowers, the *Bossiaea* is recognisable at once as a member of the family *Papilionaceae* by its characteristic petal arrangement of standard, wings and keel. In the *Bossiaeas*, the standard is comparatively large, curves backwards and is usually prominently striped with dull red on the back. The flowers arise on the stem, often profusely, in the angles of the leaves, when these are present. In this group of flowers in particular, the pattern made by the actual arrangement of the flowers and buds along the stem produces a constant source of wonderment. Common though they are, each plant brings its own delight, both from its design, and, especially in the case of *B. rhombifolia*, from its profligacy of bloom (Baxter 1972, 34).

In another paper Nan rejoices at the sight of *Pultenaea paleacea* – “rather a straggling plant but it makes up for this in the profusion and brightness of its orange-yellow blooms which are formed into little bunches at the ends of wiry stems” – spread under *Angophora costata*. (Baxter 1974b, 161) In yet another paper on the *Papilionaceae* she combines a lucid description of *Vigna vexillata* (“The flowers are clear mauve-blue, and as large as an ordinary garden sweet pea, though the stem bears at most two flowers. The flower is characterised with a recurved keel.”). A tip on its garden use (“This is a beautiful flower which grows easily from seed and makes a good ground or trellis cover...”). (Baxter 1974a, 89)



Vigna vexillata

Elsewhere Nan delights in the connection of two species of *Scaevola*...

S. albida – very pale in colour and very restricted in habitat, I have found it only in one place at the very edge of the cliff top at the south end of area 2. It grows about 9 inches in height, an erect, sturdy little plant, whilst below it, romping right down the cliff to the edge of the beach will be found the lovely *S. calendulacea*, a bright-blue, extraordinarily sweet-smelling flower, with semi-succulent bright green leaves. (Baxter 1971a, 86)

Nan generally sticks to botanical description, but occasionally the conservationist speaks:

One lovely bush only of *Boronia pinnata* was unexpectedly found by Wilf Dews whilst we were carrying out the transect in the Jewell's swamp area, and it was unfortunately engulfed by the greedy maw of the Rutile bulldozer before I managed to sketch it (Baxter 1971b, 23).

"This family", Nan writes in 1977 of the Liliaceae, is a pleasing one to deal with. *The blue lilies this year seem to have been particularly exuberant in their flowering, Patersonias and Thysanotus beside the road, and Stypantras in the swampy areas have been a delightful show. One continues to be confounded by the blindness of the residents to this lovely show of bloom, though Christmas Bells are of course singled out for special attention at Christmas time, when fine blooms disappear as fast as one locates them* (Baxter 1977a, 34).

And in discussing a Liliaceae species, *Sowerbaea juncea*: "This lilac coloured species are found in profusion in the marshy area of Jewell's Swamp though the rutile miners have devastated great areas of them—replacing them curiously by groves of *Acacia cyanophylla*, a Western Australian Wattle!" (ibid, 36).

In late 1976 Nan Baxter and her husband George returned to their "very old" house at Guiting Wood, on the edge of Minchihampton Common in Gloucestershire, "600 blessed acres of National Trust" (Baxter G. & N. 1977, 190). In her farewell message to NFFS members Nan wrote:

It was, of course, inevitable that, on what was probably our last stroll in the Awakabal Reserve a hitherto unrecorded flower should be in full bloom. The plant had been noted before, but never had either flower or seeds on it, and had been temporarily — and I hope, forgivably — classed as a wattle. The plant is Daviesia mimosoides, and there is quite a large area of it on the right hand side of the first Awakabal trail. It is a shrub with a delightfully drooping habit, with leaves very like those of many wattles, i.e. lanceolate oblanceolate to narrow oblanceolate, extending scattered to the tips of the branches, where they are about one-third the length of those lower down the stem. Regrettably, drawing time has run out, the flowers, though pale golden in colour, are of course very similar to Daviesia corymbosa (q.v.) which is at present flowering in the open (Baxter 1977b 191).

On November 9th 1976 the NSW Minister of Lands announced that 121 hectares of land between Dudley and Redhead would become a nature reserve, called Awakabal, in honour of the local indigenous people (McDonald 1976, 232-233). The botanising of Nan Baxter and her small band of colleagues was instrumental in preserving this treasure house of indigenous flora. Those who have the good fortune to come to the ASGAP conference next spring will see this flora in all its glory.

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 4. 1971b Wild flowers of the Redhead area. Part V: Family Rutaceae *Hunter Natural History* Vol 3 No 3 23-273
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 6. 1974a Wild flowers of the Redhead area. Part XIV ("Another collection of members of the Pea Family") *Hunter Natural History* Vol 6 No 2 89-94
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 17. McDonald K, Dorman, H.C., Baxter, N. & Baxter G. 1971 A second transect study in the Redhead District *Hunter Natural History* Vol 3 No 1, 38-55 + ii pp
3. A reader looking for this article and the one before it (Part VI) might find, as I did, that all of Part VI and half of Part VII appear between pp 236 & 244 of *Hunter Natural History* Vol 3 No 4, while the second half of Part VII appears between pp 19 & 25 of *Hunter Natural History* Vol 4 No 1.

Lowdown on Catherine Hill Bay

Sharryn Brown
APS Newcastle

Catherine Hill Bay (CHB) is located on the South Wallarah Peninsula (SWP), 100 km north of Sydney, between the Wallarah National Park in the north and Munmorah State Conservation Area in the south. Lake Macquarie State Conservation Areas lie to the north-west and south-west. CHB has a history of almost 150 years of underground coal mining. This long mining tenure and associated surface facilities have inadvertently helped to protect the land from development pressures ensuring ecological values remained intact. Following cessation of mining in 2002, it was expected that the land would become a national park and form part of a green corridor separating the major urban areas of the Central Coast and Hunter Valley. However, mining companies held freehold title to the land as well as mining rights, and once mining ceased, the land was sold to developers.

The area is underlain by the basal formation (Munmorah Conglomerate) of the (Triassic) Narrabeen Group and the underlying Moon Island Beach sub-group of the (Permian) Newcastle Coal Measures. Outcropping of the Great Northern Seam occurs at sea level. The ground is hilly with significant ridgelines and gullies with high scenic value including spectacular coastline views. The variety of vegetation communities present relate to the topography and underlying geology and support a high diversity of fauna species.

Away from the salt-laden winds, the woodlands and forests contain mature gnarled Sydney Red Gum (*Angophora costata*) and Scribbly Gum (*Eucalyptus haemastoma*), as well as Spotted Gum (*Corymbia maculata*), Red Bloodwood (*C. gummifera*) and Sydney Peppermint (*E. piperita*). The understorey comprises grasses with scattered shrubs. An unusual, tall-growing form of *Xanthorrhoea resinifera* is found within these forests. The trunk



Scribbly gum, Geebung, tea tree &
Xanthorrhoea

Photo: A. Brown

of this species is normally underground or only centimetres above ground. In contrast the form of *X. resinifera* which occurs around CHB, the most northerly range of this species, is over 1 m tall. The leaf bases exude yellow resin (most other species have dark red-brown resin).

Exposed headlands are dominated by prostrate Kangaroo Grass (*Themeda australis*) and dwarf forms of shrubs including *Banksia integrifolia* and *Westringia fruticosa*. These Themeda Grasslands are listed as an endangered ecological community. (*T. australis* can normally grow to 1.2 m high and is a tufted perennial.)

Sharryn has been a member of APS since 1980 and is a former Conservation Officer for the Newcastle Group. She is self-employed as an environmental consultant (Banksia Environmental Consultancy). Here she gives background to the area that attracted Cas Liber (pg. 256)

Within sheltered moist gullies and along drainage lines Cabbage Tree Palm (*Livistona australis*), Swamp Mahogany (*Eucalyptus robusta*), Turpentine (*Syncarpia glomulifera*), Sandpaper Fig (*Ficus coronata*) and Maidenhair Fern (*Adiantum aethiopicum*) occur. *L. australis* is a tree with a solitary stem to 30 m high with bright green, palmately divided leaves 3–4.5 m long. Its flowers and black fruits are born on a much-branched hanging panicle about 1 m long. The name Cabbage Tree Palm was given by early settlers as the apical bud, or heart of the palm, is edible. *Ficus coronata* is a bushy shrub or small tree with a rough sandpaper-like leaf surface. The edible fruit to 20 mm long is axillary or cauliflorous and purple-black when mature (January to June).

Wetlands within the area range from saline to brackish to fresh water and contain a variety of species including Swamp Paperbark (*Melaleuca ericifolia*), Snow-in-Summer (*M. linariifolia*), Ball Honey-myrtle (*M. nodosa*), Prickly Paperbark (*M. styphelioides*), Swamp Oak (*Casuarina glauca*), Willow Bottlebrush (*Callistemon salignus*), Golden Spray (*Viminaria juncea*), Bare Twig-rush (*Baumea juncea*), Tall Spike-rush (*Eleocharis sphacelata*), Knobby Club-rush (*Isolepis nodosa*), Giant Sedge (*Lepironia articulata*) and River Club-rush (*Schoenoplectus validus*). *C. salignus* is a small tree that could be confused with a *Melaleuca*, due to the presence of *Melaleuca*-like papery bark on the trunk, and its occurrence along creek lines and damp places. The new leaf growth is a reddish-purplish colour and the flowers are creamy-white to yellow in spikes up to 5 cm long.

In 2004, the Wallarah Peninsula Alliance nominated the coal lease area as a National Park. A formal Conservation Assessment of the area was made in 2005 by the NSW Department of Environment and Conservation. The assessment concluded that SWP contained four threatened plant species, known habitat for nine threatened fauna species and potential habitat for another seven. The area contains four State-listed endangered ecological communities and five vegetation communities thought to be naturally rare.

A summary of the submission is available in the Hunter Branch of the National Parks Association Newsletter dated December 04 'Walarah Wonderland' (<http://www.npansw.org.au/web/about/hunter/home.htm>). This submission states that proposals for a Lake Macquarie Central Coast National Park have been identified and acknowledged by more than 60 government, local council, consultant and developer studies, reports and recommendations since 1969. The submission covered approximately 18,400 hectares of land bordered by Lake Macquarie to the west and the Pacific Ocean to the east and straddled the boundary between Lake Macquarie and Wyong Councils.

Proposed developments at Catherine Hill Bay were rejected by the local council and also the Land and Environment Court during 2005 and 2006. However, following private discussions with the NSW State Government, it now appears that some development will take place. In documents obtained under the FOI legislation, of the 91 possible sites in the Hunter ranked in terms of suitability for development by the Department of Planning, CHB was ranked the second least suitable. At the time of writing, the details have not yet been finalised and are being fought by Wallarah Peninsula Alliance and other conservation groups. Information on the campaign to save Catherine Hill Bay can be accessed on www.catherinehillbay.org.au.

Coastal Wanderings

Cas Liber
Banksia Study Group Leader

A few winters ago I was shown around a spectacular area for east coast wildflowers by two members of the APS Newcastle Group, Barbara Burke and Angela Speering.

Approximately 110km north of Sydney is a small township of Catherine Hill Bay, the hill on Flowers Drive to the north of the town having some wonderful heathland to explore on either side of the road.

Much of the heathland is low-growing (10–50 cm) shrubs with occasional 1 m *Westringia fruticosa* and *Banksia integrifolia* var. *integrifolia*. Interspersed with grasses are low growing forms of *Banksia spinulosa* var. *collina* ranging from 40 cm to 1 m high, with a variety of colour forms; gold inflorescences 10–15 cm high with gold, red, maroon, black and even pink styles all to be found within a few metres of each other. They have wonderfully compact foliage with serrated leaves, though some of the darker styled plants seem to have more revolute leaves, suggesting some influence of *B. spinulosa* var. *spinulosa* which occurs further south. Interestingly, the garden plant *B. spinulosa* 'Stumpy Gold' came from this area many years ago, a boon for anyone on the Central Coast wishing to grow both an indigenous and horticultural plant.

Of similar appeal is a dense low growing form of *Lambertia formosa* - one seen was a spectacular dense cushion 10 cm high by around 40 cm across which resembled some natural topiary. The leaves are elliptic and 1 to 1.5 cm long by about 3 mm wide with a midline spike. A few flowers were seen on these plants.

Scattered about also were low forms of *Isopogon anemonifolius* and *Hakea laevipes* (this lignotuberous plant was previously included under the non-lignotuberous and taller growing *Hakea dactyloides* (Finger Hakea) but split off in the recent botanical revision). The name comes from the Latin for 'fat foot' in reference to the lignotuber. Volume 17B of *The Flora of Australia* states that it flowers in November–January; certainly none was flowering when I was there.

Other hakeas included a lowish form of *Hakea teretifolia* (Dagger Hakea) up to 1 m, and *Hakea bakeriana*, up to 1.5 m with scattered deep pink flowers partly hidden in the lime green foliage.

There was also a *Dodonaea triquetra* forming a rounded bush to 1 m. Also in flower was a fairly compact form of *Logania albiflora*, a plant with small white flowers with a great scent. Twining around was a form of *Pandorea pandorana* with white flowers tinted with maroon, which was most attractive.

Underneath the westringias and also forming mats out in the open was a fully prostrate *Acacia myrtifolia* with distinctive red stems and small lanceolate leaves. Flowering equally well whether shaded or in sun, it grew to maybe 30 cm across. We also noted a prostrate *Mirbelia rubiifolia*. I must come back in late spring to try and catch this in flower (it is a pea with pink flowers). Also there were mats of *Astroloma humifusum*.



Hakea bakeriana



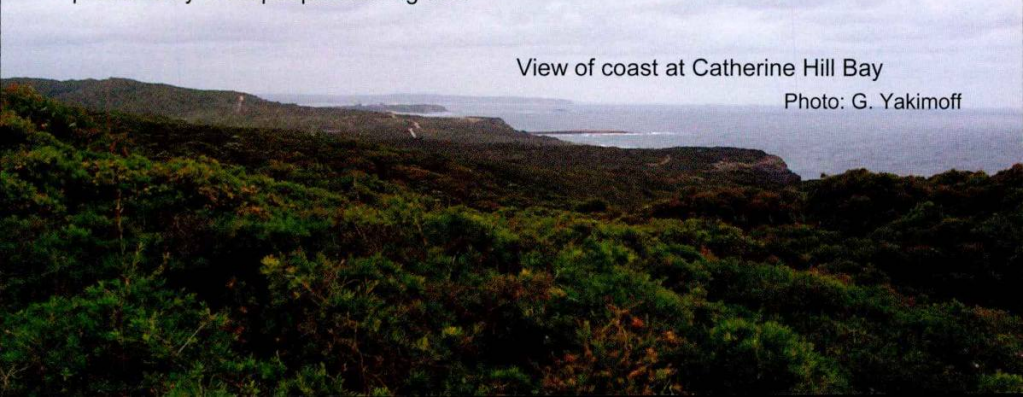
Banksia oblongifolia

Photos: Paddy Lightfoot

Widespread too, around 100m further inland, were stands of hundreds of plants of *Banksia oblongifolia* forming groves of natural bonsai a uniform 1 m tall and wide. Scattered plants sported inflorescences in late bud or fully open, with an unusual green-blue (aqua?) tinge.

10 km south in Lake Munmorah Conservation (previously Recreation) Area, now under the auspices of the National Parks and Wildlife Service lies Wybung Head. Here grew a colony of low growing *Banksia aemula* shrubs which ranged from 0.7–1.5 m high. A couple of plants forgot it wasn't summer/autumn and provided some attractive greenish yellow inflorescences in late bud to photograph. Nearby there was a great display of flowers in white (*Ricinocarpos pinifolius* and *Pimelea linifolia*), various shades of pink (*Eriostemon australasius*), blue (*Dampiera stricta*) and yellow (*Dillwynia retorta* and probably other peas).

To get there from Sydney, one drives north on the Sydney-Newcastle Freeway until the Doyalson Interchange and then drive on the Pacific Highway. Both Elizabeth Bay Drive (to Lake Munmorah) and Flowers Drive (to Catherine Hill Bay) run right off the Highway. I would regard this as a great place to visit near Newcastle for those interested in seeing wildflowers - presumably most people reading this!



View of coast at Catherine Hill Bay

Photo: G. Yakimoff

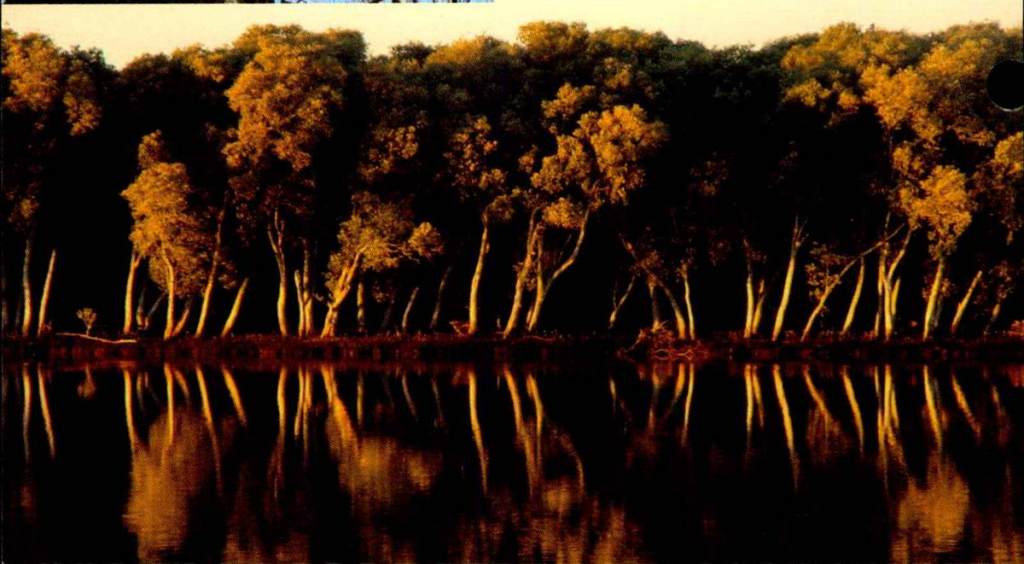


Kooragang Wetlands

Above: Plantings of indigenous species link rainforest remnants in the north-west of Kooragang Island.

Left: *Dendrobium linguiforme* adorns a *Casuarina glauca*.
See pg. 260 Photos: S. Rostas

Below: Mangrove sunset at Kooragang Island
Photos: J. Page





Above: *Podocarpus elatus*

Above right: Revegetating with some of over 130,000 indigenous trees and shrubs planted to date.

Right: *Maclura cochinchinensis*

Below: *Cynanchum elegans*

Bottom: Cabbage Tree Palms form part of the revegetation non-tidal areas.

Bottom right:

Pittosporum revolutum

See pg. 260

Photos: S. Rostas



Kooragang Wetlands:

Returning tide and rainforest

Sue Rostas
APS Newcastle and HCRCMA

Just 12 kilometres west of Newcastle CBD, in the middle of the Hunter River estuary lies the western end of Kooragang Island*, lined with mangroves and saltmarsh. Just centimetres above the reach of the tides grow a few remnants of rainforest.

Despite earlier removal of large trees such as red cedar, rosewood and ash during Newcastle's era as a convict settlement, this area inspired German explorer/naturalist, Ludwig Leichhardt to write of his visit in 1842:

...it is remarkably fine place to visit, not only to enjoy the beauty of nature, a broad shining river, a luxuriant vegetation, a tasteful, comfortable cottage with a plantation of orange trees, but to collect a great number of plants which I had never seen before...

The natural abundance of the island was further documented by Alexander Walker Scott and his daughters, Helena and Harriet, the first European landowners of Ash Island. 150 years of clearing, draining and landfilling since then has meant that by 1990s little remained to justify the above description. Concern about loss of fisheries, migratory shorebird and other wildlife habitat in the estuary led to initiation of the Kooragang Wetland Rehabilitation Project in the 1993. This project of the Hunter Central Rivers Catchment Management Authority (HCRCMA) is highly collaborative in nature, with managerial and funding input from all three levels of government, while neighbouring industries, community groups and individual volunteers also make things happen at Kooragang.

Flows have been restored to a number of tidal creeks, with mangroves and saltmarsh increasing in area and vigour. Over 130,000 trees and shrubs of species recorded on Ash Island in 1862 by Helena Scott have been planted to protect riverbanks and bring back the rainforest and thence the birds and other animals that depend on this vegetation.

Named for its once prolific Ash Trees (*Elaeocarpus obovatus*), the island remnants remain rare examples of floodplain rainforest at this latitude. In addition to Ash, the forests contain over 150 species including Red Cedar (*Toona australis*) (replanted only), Plum Pine (*Podocarpus elatus*), Whalebone (*Streblus brunonianus*), Yellow Pittosporum (*Pittosporum revolutum*), Cassine (*Cassine australis*), Flintwood (*Scolopia braunii*), Native Quince, (*Alectryon subcinereus*), Native Caper (*Capparis arborea*), Guioa (*Guioa semiglauc*) Cabbage Tree Palm, (*Livistona australis*), Tuckerroo (*Cupaniopsis anacardioides*), Black Apple (*Planchonella australis*), Orange Thorn (*Citriobatus pauciflorus*), Thorned Cockspur (*Maclura cochinchinensis*) and the endangered vine, White Cynanchum (*Cynanchum elegans*). Photos on pages 258 and 259.

* Kooragang Island was created from smaller islands such as Ash Island in the mid 1950s and 1960s.

Hunter Region Botanic Gardens

Kevin Stokes
Vice Chairman of the Board of Directors HRBG*

The Hunter Region Botanic Gardens cover approximately 140 hectares and are situated on the Pacific Highway just north-west of Newcastle, NSW. The soil is ancient barrier sand dunes and the natural vegetation varies from wetlands to Blackbutt/Angophora forest and heath. Some of the more common understorey plants include Banksia, *Ceratopetalum gummiferum* (NSW Christmas Bush) and Acacia.

There are five main areas in the gardens:

1. The Gardens and Coffee shops, and Administration Area

Maps and information are available along with light meals and drinks. Also there is a botanical and horticultural library and a significant herbarium which includes specimens of Hunter Region flora.

2. The Entrance Plantings and Pool, Band Rotunda and Eucalypt Lawn

Plantings for this area consist of a mix of native and exotic plants.

3. The Nursery and Workshop Area

Many of the plants displayed in the gardens are propagated on site and gardens need to be constantly maintained and old plants replaced.

4. The Natural Bushland and Walking Tracks

A number of walks enable visitors to enjoy the natural features of the bushland site. There is a boardwalk currently under construction over the Southern Wetlands that will enable visitation to that area and the possibility of sighting a Koala or two. All walks are essentially level. It would take most of a day to visit all areas of the site.

5. The Theme Gardens

Those of most interest to lovers of Australian plants include: Acacia, Grevillea, Palms, Rainforest, Local Flora, Lamiaceae, Rutaceae, Ferns and Parry Place, a garden named after members of the Parry family, pioneers in growing native plants in NSW. This garden is maintained by local members of the Australian Plants Society.

Long term plans being considered include establishment of a Gondwana theme for the gardens and an increase in number and diversity of plants local to the Hunter area.

The gardens are open 10am to 4pm all year except for Good Friday and Christmas Day. All visitors are welcome. Entry is by donation.

* It has taken 20 years of hard work and dedication by many people to bring the fledgling Hunter Region Botanic Gardens to the stage of development that we see and enjoy today. Begun in 1985, these gardens are managed and maintained entirely by volunteers with support from many sections of the community, as well as the many visitors that are attracted to the peaceful bush-land setting and beautiful features that make these gardens so unique.



Hunter Region Botanic Gardens

Left: *Oxylobium robustum*, a lovely local pea.

Above:
A sculptured swan adorns
the entrance pool.

See pg. 261

Photos: K. Stokes



Above: A view into Parry Place
featuring local plants that will grow in
local gardens.

Right: Red Ash tree carved by
Worimi Dates with traditional images.

Below: *Persoonia pinifolia* - probably
the most beautiful Persoonia.

Photos: K. Stokes





Above: *Grevillea magnifica*
one of the features of the
Grevillea garden.



Left: *Xylomelum pyriforme*,
Woody Pear, a delightful and
iconic local plant.

Below: *Hakea archaeoides*
an interesting and beautiful
Hakea from from the North
coast of NSW.

Photos: K. Stokes





NSW Northern Tablelands

Above:

View from Dandahra Crags,
Gibraltar Range National Park

Left:

Conospermum burgessiorum

Bottom left:

Mirbelia confertiflora

Below: *Telopea aspera*

See Page 265

Photos: J. Nevir



NSW Northern Tablelands

A 'hot spot' for botanical diversity

John Nevin
APS Armidale

The Northern Tablelands of NSW contain a rich and varied flora identified by botanists as an East Coast 'hot spot' for botanical diversity that equates with that of the Merredin area of Western Australia.

Why the extensive speciation? The answer lies in the wide variation of climate, soils and altitude within a relatively small geographic area.

Northern New South Wales / South East Queensland is an overlap area for winter rains from the South, monsoonal rains from the North, and summer falls from the Coastal East. Rainfall can vary from 1600 mm on the top of the divide to 600 mm as the landscape falls away to the Western Slopes.

Soils vary from rich basalts from lava flows from the huge Ebor volcano and their subsequent erosion to trachyte granitic intrusions of low fertility but remarkable botanical diversity. The altitude varies from 400 to 1400 metre with resultant temperature variations from heavy frosts and winter snow at altitude to hot dry areas to the west.

Country with richer soils was identified early for its agricultural value but thanks to the foresight of people such as Phillip Wright (New England NP), who recognised the beauty and value of such areas, there are now extensive representative areas put aside as National Parks.

Fortunately, the granite areas, because of their poor fertility, were not sought for agriculture until more desirable country was taken and unavailable. As a result, granite areas have been added to the Park System in the latter half of the 20th Century. It is often these landforms that have incredible botanical diversity and beauty.

Some of the plants to be seen include *Telopea aspera* which is endemic to the Gibraltar Range National Park. Originally thought to be a subspecies of the Sydney Waratah, it has recently been given species status in its own right.

It has characteristic leathery leaves that are harsh to touch and prominent dark red involucral bracts as well as the characteristic Waratah inflorescence as shown in the photos.

Another species of the Gibraltar Range is *Grevillea acerata*, which grows in heath on granite and in dry sclerophyll woodland. It has some similarities to the *Grevillea buxifolia*.





Above: *Thelionema grande*

Top right: *Prostanthera teretifolia*

Right: *Boronia granitica*

Below and bottom: *Acacia torringtonensis*

See page 267

Photos: J. Nevin



Many endemics occur in the Torrington area, including *Prostanthera teretifolia*, recently returned to its old name after a brief stint as *Prostanthera staurophylla*, the latter recently being rediscovered on Mt. McKenzie and realised as a separate species of mint bush. Photo on opposite page.

Boronia granitica, as its name suggests, is fond of granite outcrops and has interesting pilose branches. Although a recovery plan is in place for this rare species, it is difficult to propagate and is rarely, if ever, found in cultivation. Photo on opposite page.

Acacia torringtonensis is a low arching wattle to 1–2 metres with whorled clustered phyllodes and bright yellow ball inflorescences. Photos on opposite page. It has some similarity to *Acacia ruppia* and would make an excellent addition to a rockery or small garden.

Thelionema grande is a strap leaved low growing plant to 0.5–1 metre with an affinity for granite outcrops. Its spectacular bright blue flowers would have enormous appeal as a rockery plant. It is fond of higher altitudes, above 800 metres. Photo on opposite page.

Finally, *Mirbelia speciosa*, a low growing plant to 1 metre, with its blue/purple corolla stands out from the oranges and yellows of the other pea flowers of the granite belt. It is also a great addition to the smaller garden. Photo below.

We will be visiting some of these areas on the New England Tour in association with the Biennial ASGAP Meeting in Newcastle and hope to see many of these plants.



Left: *Mirbelia speciosa*

Below: *Mirbelia speciosa* habitat, Washpool

Photos: J. Nevin

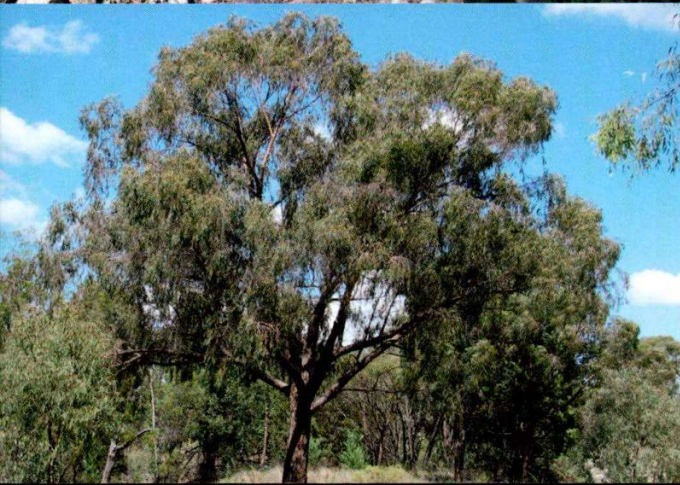




Woodsreef Serpentinite Flora

The 2007 ASGAP pre-conference tour to New England will visit the Woodsreef Serpentinite area. Bill Hardin, with the help of John Hoskin explains what makes this area so special.

Photos: B. Hardin



Top:
Woodsreef Asbestos Mine

Centre left:
Triodia scariosa

Above: *Pimelea linifolia*
subsp. *linifolia*

Left: Unnamed Woodsreef
stringybark *Eucalyptus* sp.

See Page 270

Photos: B. Hardin



Top left: *Boronia ruppii*
Above: *Boronia ruppii* habitat
Top Right: *Acacia leptoclada*
Right: Unnamed Woodsreef Callistemon
Below: Woodsreef Asbestos Mine
 See Page 270 Photos: B. Hardin



Woodsreef Serpentinite Flora

Bill Hardin

APS Tamworth, with information from John Hosking

Woodsreef is an area north of Tamworth and east of Barraba that contains a serpentinite outcrop that arose from the Peel Fault about 300 million years ago, as a result of major geological upheavals. Today this outcrop lies between Warialda and Forster, an area that also contains the infamous abandoned Woodsreef asbestos mine, the old workings of which have all been fenced off.

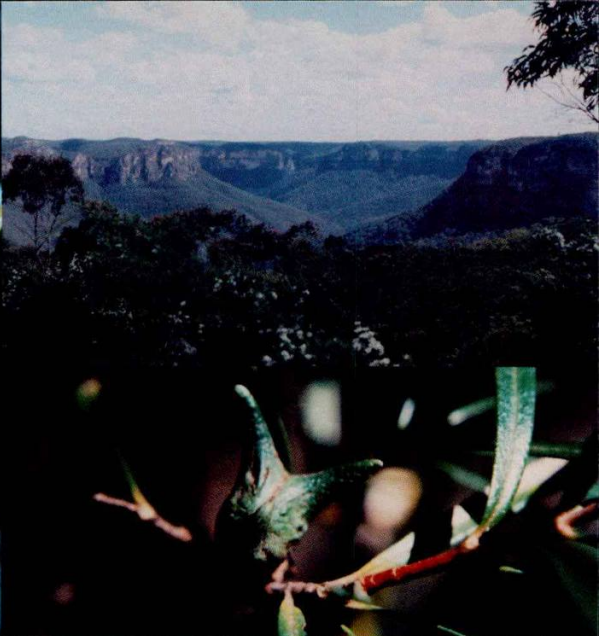
The vegetation is mainly grassy woodland, with the dominant tree a stringybark, *Eucalyptus* sp. (previously confused with *E. macrorhyncha*). Scattered trees of *Angophora floribunda* also occur and *Xanthorrhoea glauca* is locally common south of the mine. The shrub understorey is sparse and ground flora dominated by perennial grasses such as *Aristida ramosa*. An area east of the mine consists of a north-facing slope dominated by *Triodia scariosa*. Photo on page 268.

Soil here is mainly derived from serpentinite and hence is rich in magnesium and relatively deficient in calcium. Nutrients such as potassium, phosphorus and nitrogen are also generally low. These factors result in a unique flora.

Flora

There are at least 8 species endemic to this serpentinite area. They are:

1. An unnamed dominant stringybark eucalypt, previously confused with *Eucalyptus macrorhyncha*. Photo on page 268.
2. *Boronia ruppii* – named after Reverend Montague Rupp, a noted botanist. Rupp was vicar of St. Lawrence Anglican Church, Barraba from 1911 to 1914. He collected widely in the district, including many plants from the Woodsreef area. This endangered *Boronia*, with less than 300 known plants, is only known from serpentinite areas around Woodsreef. A small section next to the mine has been fenced to protect about 15 *Boronia* plants from feral goats. Photo on page 269.
3. *Hovea cymbiiformis* – This species is not common at Woodsreef, though it is more common on other serpentinite areas to the south. It is rather difficult to see, when not in flower.
4. An unnamed *Callistemon* – This serpentinite endemic is only known along drainage lines in Woodsreef and Upper Bingara, where it is common. Photo on page 269.
5. *Walwhalleya pungens* - This is a grass with rigid leaf tips, only known from Woodsreef and Upper Bingara areas.
6. *Asperula* sp. - An unnamed woodruff known only from this area. It has small white flowers that are sometimes confused with *Asperula cunninghamii*.
7. *Minuria scoparia* - A small flowered daisy, endemic to serpentinite areas.
8. *Schoenus* sp. - An unnamed sedge only known from serpentinite areas. It has been confused with *Schoenus centralis* which occurs more to the west.



The Blue Mountains World Heritage Area

See pg. 273

Lambertia formosa – symbol of the Blue Mountains

Top left: Flower

Photo J. Carnes

Above: Fruit

Photo M. Thompson



Rare Blue Mtns plants

Far Left:

Eucalyptus burgessiana
Faulconbridge Mallee Ash
plant habit & habitat,
flowers & fruits

Photos: M. Esson

Left:

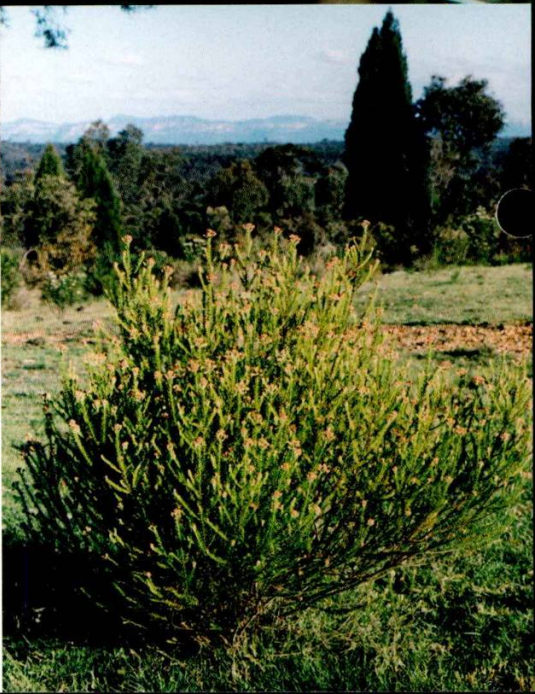
Acrophyllum australe

Below:

Actinotus forsythii

Photos: J. Dark





The Capertee Valley See pg 275

Top: Mt Airly and Mt Genowlan Mesas with *Acacia buxifolia* in the foreground.

Above left and right:

Grevillea obtusiflora ssp. *fecunda*

Right: *Ozothamnus diosmifolius* with *Callitris endlicheri*, Black Cypress Pine

Below:

Phebalium bifidum

Photos: M. Thompson



The Greater Blue Mountains World Heritage Area

Merle Thompson

Introduction

The Greater Blue Mountains World Heritage Area covers 1.03 million hectares from the Hunter region to the Southern Highlands of New South Wales. Inscribed on the World Heritage list in late 2000, it incorporates seven national parks – Blue Mountains, Wollemi, Yengo, Gardens of Stone, Kanangra-Boyd, Nattai and Thirlmere Lakes - and the Jenolan Caves Karst Conservation Reserve.

The biological diversity and, in particular, the great number of eucalypt species (90) which occur in the area were major factors in assessment for world heritage status. The diversity relates to the many geological/geographical landforms and the associated vegetation types. There are at least 1,500 plant species, some which are rare and endangered, including the Wollemi pine (*Wollemia nobilis*), which has created so much interest.

Much of the area is wilderness or closed catchment but it is also traversed by the two major roads from Sydney to the west, the Great Western Highway and Bells Line of Road, and by the Putty Road from Windsor to Singleton to the north. Settlements occur along the western roads in what is called ribbon development - a succession of villages/towns. Both local government areas, Hawkesbury and Blue Mountains, see great promise in the declaration, the latter describing itself as *the city within a world heritage area*. The term Greater Blue Mountains, embraces a much wider area than that popularly known as the Blue Mountains.

Overseas visitors sometimes wonder at the use of the word 'mountains' as the area does not comply with their concept of mountains, particularly as the climb is gradual and mountains do not tower in front of them. As the roads follow ridgelines the visitor tends to look from the ridges down into valleys.

*The area does not contain mountains in the conventional sense but is described as a deeply incised sandstone plateau rising from less than 100 metres above sea level to 1300 metres at the highest point. There are basalt outcrops on the higher ridges. The plateau is thought to have enabled the survival of a rich diversity of plant and animal life by providing a refuge from climatic changes during recent geological history.*¹

The name 'Blue Mountains' is applied because of the blue haze created by eucalypt oils in the air, a feature also apparent in many other areas of Australia. To the first European settlers looking west from Sydney it was a new phenomenon.

Biological Diversity

The submission for world heritage status included the following statements:

This isolation, together with the complex, dissected landform of the area, has allowed a unique Australian biota to evolve, while earlier remnant species from the time of Gondwana survive in sheltered refuges. Diverse eucalyptus-related vegetation dominates the area, typifying the scleromorphy evolved across the continent under dry climatic regimes, nutrient deficiency and high fire frequency.

The area's continuing ecological and biological processes of adaptation are significant in the evolution of highly diverse ecosystems and communities of plants and animals. It has also provided significant habitats for the in situ conservation of biological diversity, including, in recessed canyons and perpetually moist areas, ancient and threatened species of outstanding value. The crux of the case for its World Heritage listing could be said to lie in the outstanding universal significance of eucalypt-dominated vegetation, of which it represents the best single example through its outstanding richness of species in a protected area with large components of wilderness.

Some of the biological features of significance are:

- The combination of a large proportion of scleromorphic plants with relict primitive species with Gondwanan affinities, such as *Wollemia nobilis* and *Microstrobos fitzgeraldii*
- The high level of species diversity of eucalypts
- Local endemism with 114 endemic plant species/ subspecies
- A high level of endemism at generic level e.g. *Acrophyllum*, *Rupicola*
- Complex mosaics of different vegetation areas resulting from the variety of soil environments. More than 70 plant communities have been recorded, 56 of which are eucalypt dominated open forests or woodlands. Other significant plant communities include rainforest, tall open forest, mallee scrublands, heaths, swamps and sedgelands.
- The presence in the area of around one-tenth of the vascular plants found in Australia from 152 families and 484 genera.
- More than 120 rare or threatened vascular plant species/ sub-species
- Animal life is also diverse with over 400 vertebrate species including 52 native mammals, 12 which are rare or vulnerable, 265 native birds and 30 species of frogs and a high level of diversity of invertebrates.

Eucalypts

Supplementary documentation to the nomination discussed the universal significance of eucalypts as a *monophyletic group of exceptional diversity in its species richness, physiognomy and ecology* and says that eucalypts *rank amongst the most diverse woody overstorey taxa globally*. The genus *Pinus*, a principal overstorey genus in many parts of the world, has only 210 species, whereas there are 700 species of eucalypt. In this context eucalypts encompasses the genera *Eucalyptus*, *Corymbia* and *Angophora*. It is also significant that most of Australia's 25,000 taxa occur with eucalypts.

The Capertee Valley

Merle Thompson*

*We saw the wild beauty of Capertee Valley
As slowly we rounded the base of the Crown*

Song of the Old Bullock Driver Henry Lawson

Introduction

The Capertee Valley, 140 km north-west of Sydney as the crow flies, 200 by road, has been described as the largest sunken valley in Australia, the second largest in the world, after the Grand Canyon of USA, and the best bird watching site in Australia. At points it is over 30 km wide, narrowing to a 1 km gorge with 600 metre rugged cliffs towering above and wilderness behind. 'Spectacular' and 'rugged' are frequently used words and are apt.

Near the small village of Capertee is the Pearson's Lookout which affords a view, described by a motorist encountered there recently, as 'the best view in Australia'. The mesa, Pantoney's Crown, rises sharply and solitarily with the Valley spreading into the distance beyond it, or to quote Carol Proberts, *you reach the crest of a hill and suddenly a broad panorama opens up, an immense canyon rimmed by golden cliffs and punctuated with the occasional mesa-like mountain.* (www.bmbirding.com.au/valley)

It is the furthest point of the Hawkesbury – Nepean catchment area and the western edge forms the divide between this catchment and that of the Murray – Darling system. The Valley borders the western rim of the Wollemi National Park and the northern rim of the Gardens of Stone National Park.

Much of the Valley is in a rain-shadow with low annual falls around 600 mm. In the floor of the Valley agriculture and the Glen Davis shale oil mine have resulted in clearing of vegetation but on the rugged ridges, the tops of the mesas and in remnant areas in the valley, the vegetation is largely untouched.

Plant Communities within the Valley

Woodland is the dominant vegetation type, the plant communities varying according to geology/geomorphology and rainfall, including those termed Capertee Valley, White Box, Talus-slope and scribbly gum woodlands. Eucalypts prevail but in some areas Black Cypress Pine (*Callitris endlicheri*) is dominant and the Kurrajong (*Brachychiton populneus*) is conspicuous. Occasionally there are dense stands of the grass tree *Xanthorrhoea glauca* ssp. *angustifolia*.

Two very special communities are Dry Basalt Cap Woodland on the tops of the sandstone mesas, which stand out above the surrounding valley, and Pagoda Rock Complex where plants have adapted to grow on these locally characteristic exposed rocky beehive shaped outcrops.

* Merle has written about this area which will be visited as part of a 2007 ASGAP conference tour. She fell in love with the scenery of the area over 30 years ago and is now a property owner and part-time resident.

Rare Plants in the Valley

A number of rare or threatened plants occur, some of which are endemic to the Valley.

Phebalium bifidum has only been found in two sites along one road. It was discovered in 1998, when there were 230 plants, and described in 2004.

Grevillea obtusifolia* ssp. *fecunda occurs principally on that road and one other. It is differentiated from subspecies *obtusifolia* by the fact that it sets seed which the latter has never been known to do.

Prostanthera cryptandroides is a local endemic from near Glen Davis. Robert Miller, leader of the Prostanthera and Westringia Study Group, describes collecting this species in the Group's publication, *Lasianthos* Number 3, July 2002.

Prostanthera hindii occurs on pagoda rock formations and was named after Peter Hind, former leader of the Fern Study Group.

Apatophyllum constablei (Celastraceae) is a very restricted local endemic on the cliff line at Glen Davis.

Leucochrysum graminifolium (Asteraceae) grows only on pagoda rock formations in crevices where there is virtually no soil.

Rupicola decumbens (Epacridaceae) is found on the cliffs at Glen Davis and in the Cudgegong Valley to the north.

Some Other Interesting Plants

Rice flowers, considered to be ***Ozothamnus diosmifolius***, but not formally identified, are conspicuous from spring into summer. Some have been found with flowers which are pale to deep pink in bud (pictured) but open to white.

Dodonaea viscosa attracts the eye along the Capertee to Glen Davis Road.

Astroloma humifusum forms small dense mats.

Monotoca scoparia which, when growing in larger numbers in an area, and densely covered with flowers in October, can attract bees to the extent that it is almost deafening.

Stypantra glauca can be a dominant plant in some open areas.

Planting projects in the Valley

The Valley's reputation as a bird watching site is based on the fact that over 235 species have been recorded. It is an area where both coastal and inland species can be found and has been nominated as an Important Bird Area on the Register of Birdlife International.

At least 18 threatened species have been sighted, including two which have a rating of 'IUCN Red List Endangered'. One of these is the Regent Honeyeater of which there may only be 1000 individuals remaining. The Valley is regarded as its most important breeding ground. A major program has been under-way for a number of years to re-plant trees which are important for its breeding.

The Capertee Valley is scenically and scientifically a rewarding place to explore, whether one's interest is in plants, birds, animals or insects, or in mining and industrial history.

Native Plants Endemic to the North Coast

And their Cultivation

John Wrigley

Like most other regions of Australia, the north coast of NSW has its share of endemic plant species. Many of them have considerable horticultural significance and a few that have proved successful in cultivation are described here. These species and many others are the subjects of a new book just completed by several members of the Coffs Harbour Group of the Australian Plants Society entitled **Growing Native Plants on the North Coast of NSW**.

A complete list of the native plant species endemic to the north coast of NSW, prepared by Barry Kemp is appended to the end of this article.

Davidsonia jerseyana together with the north Queensland species *D. pruriens* are known as Davidson's Plums and together with the very rare *D. johnsonii* (also north coast) are the sole representatives of the family Davidsoniaceae. *D. jerseyana* occurs in sub-tropical rainforests of the Brunswick and Tweed Valleys and forms a sparsely branched small tree to 10 m. The pinnate leaves are up to 60cm long with 11-17 oblong leaflets with a conspicuous toothed stipule at the leaf base. The reddish flowers are borne in short panicles on the main trunk and are followed by large blue-black fleshy fruits about 4 cm diameter, each containing 2 flattened seeds. The fruits are very acid but make excellent jam. It is hardy in cultivation, appreciating a well mulched loam and will tolerate full sun or part shade but is unlikely to withstand heavy frosts. *D. jerseyana* may be used as an indoor plant while small. Propagation is easy from fresh seed which should be washed free of the fleshy pulp prior to sowing.

Pultenaea maritima (family Fabaceae). This prostrate pea flower occurs on the exposed coastal headlands north from Newcastle. It forms a prostrate shrub some 80 cm diameter with light green, elliptical leaves about 5 cm long. The yellow pea flowers are borne for an extended period from late winter to early summer. It will grow in most well drained soils in full sun and is resistant to salt laden winds. It is also tolerant of heavy frosts. Propagation is easy from cuttings but may also be grown from seeds treated with boiling water prior to sowing.

***Growing Native Plants on the North Coast of NSW** has been written by four experienced native plant growers of the Coffs Harbour Group of the Australian Plant Society. It consists of almost 200 pages, 59 colour plates, 49 accurate line drawings and many other illustrations. More than 700 native plant species suitable for the area are described. Photographs and drawings have also been supplied by local members. The book covers such topics as plant propagation, water feature construction, garden management and lists the many native plant specialist nurseries in the area between Taree and the Queensland border. The book is available for \$31.50 plus postage from Australian Plant Society, P.O. Box 1639, Coffs Harbour, NSW, 2450.

Cryptocarya williwilliana (family Lauraceae). Known as Small-leaved Laurel, this tall shrub is confined to dry rainforest on limestone in the Macleay River valley. It forms a rounded plant to 4–5 m and has ovate leaves 3–4 cm long, shiny on the top side. The tiny flowers are white and are followed by black, globular fruits about 1 cm diameter. Its odd species name was chosen from the Willi-Willi caves near where it was found. Although growing on limestone, it adapts readily to normal garden conditions in slightly acid soils and survives well in full sun or part shade. It is slow growing but its neat foliage and reasonably dense habit makes it a useful screen plant. Moderate frosts are tolerated. Propagation is from fresh seed.

Syzygium anisatum (family Myrtaceae). (syn. *Anetholea anisata*, *Backhousia anisata*). This tall rainforest tree from the Bellinger, Orara and Nambucca valleys is known as Aniseed Tree for its aromatic foliage that has been used in cooking and in drinks. Caution is advised here as some clones are reputed to have a toxic component in their oils. It has a spreading crown and the glossy, lanceolate leaves are about 8–11 cm long. The small, flowers are borne in terminal or axillary panicles and have white petals and stamens. They are seen in late spring. The small greenish fruits are surrounded by persistent sepals. Mature trees may be seen near the creek behind the playing fields at Bellinger. In cultivation, the species is slow growing and performs best in rich loam provided with ample moisture and a little shade. Moderate frosts are tolerated. Propagation is from fresh seed or cuttings.

Uromyrtus australis (family Myrtaceae). Peach Myrtle derives its name from the flowers which are said to resemble peach blossoms. It forms a small tree rarely exceeding 6 m, occurring in warm temperate rainforest in the Nightcap Range west of Lismore. The glossy, ovate leaves are up to 5 cm long and the young growth is reddish. The pendent flowers are borne on slender stalks 5–10 mm long in the leaf axils. The five petals are rounded and about 5 mm long, opening white and aging to deep pink. They are seen from spring to early summer. The fruit is a globular berry 5–9 mm diameter. It is best grown in a rich, well composted loam in semi-shade, where it will flower when quite small. It will tolerate mild frosts. Propagation is from fresh seed or cuttings.

Hakea archaeoides (family Proteaceae). Occurring in sclerophyll forest of the coastal ranges between Landsdowne and Wauchope, this tall, erect shrub may reach 7 m high but is usually less in cultivation. The narrow-elliptical to lanceolate leaves are strongly veined and up to 25 cm long with the young growth a bronze colour. Flowers are borne in crowded racemes of about 60 individual flowers on the old growth in spring. The perianth is yellowish-green and the style maroon. The ovoid fruits, about 2 cm long, are seen in clusters. It will accept most reasonably drained soils and will tolerate both sun and part shade. Moderate frosts are accepted. Birds are attracted to the flowers and as it grows quickly it is a useful screen plant. Propagation is from seed.

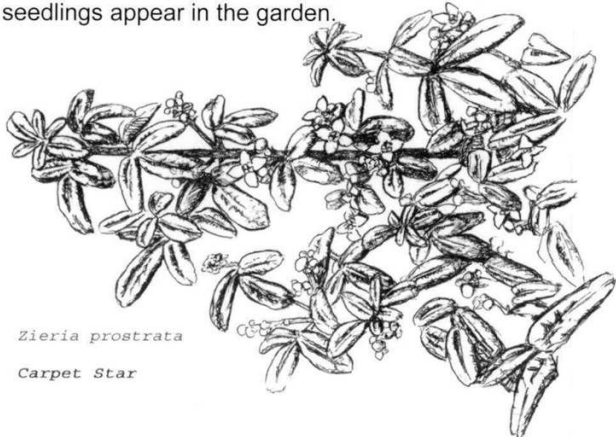
Isopogon mnoraifolius (family Proteaceae). Restricted to heath areas east and north west of Grafton, this low, bushy shrub is usually less than 1 m high. The divided leaves are reminiscent of a menorah, the seven branched candelabrum used in Jewish ceremonies and this explains the unusual

specific name. They are light green and 3–8 cm long with the undivided section twice as long as the divided part. The creamy yellow flowers are borne in terminal rounded heads about 3 cm diameter in spring. Fruits are globular 15–18 mm diameter. This species adapts readily to cultivation accepting most well-drained soils in full sun. It will tolerate heavy frosts. Propagation is from seed or cuttings.

Boronia chartacea (family Rutaceae). This spectacular *Boronia* is found in moist gullies and along creek banks in sclerophyll forests between Wauchope and Grafton. Although growing to 2.5 m in its natural environments, in cultivation it can be readily restricted to 1.5 m in full sun or part shade. The simple leaves are narrow oblong to about 5 cm with a slightly warty surface. They are strongly aromatic. The 4-petalled flowers are bright pink, about 15–20 mm diameter, and borne singly in the leaf axils in spring. This is one of the hardier *Boronia* spp. to grow and very rewarding. It prefers a well-drained soil with reasonably constant moisture and will respond to regular light pruning after flowering. It tolerates at least moderate frosts. Propagation is from cuttings.

Boronia umbellata (family Rutaceae). Another local *Boronia* sp. that has proven itself in cultivation, this one occurs in wet sclerophyll forest west of Coffs Harbour and will reach 2 m high by 2 m across. It has aromatic pinnate leaves to 5 cm long with 3 to 5 elliptical leaflets. The 4-petalled flowers, about 15 mm diameter, vary from pale to deep pink and are borne in clusters of 2–6 in the leaf axils. Some flowers are seen from mid-winter but peak flowering is in spring. Most reasonably drained soils are suitable and plants will tolerate full sun or part shade. Tip pruning is recommended after flowering in order to maintain a good shape. At least moderate frosts are accepted. Propagation is from cuttings.

Zieria prostrata (family Rutaceae). Sometimes sold as Carpet Star, this prostrate plant is found on several headlands just north of Coffs Harbour. It will spread to 1 m with its dark green, glossy, trifoliate leaves making an excellent ground cover. The small 4-petalled, pale pink flowers show out well against the dark, aromatic foliage. It is very hardy in cultivation, making a fine rockery plant or specimen for a hanging basket. Most soils are suitable and full sun is preferred. It is tolerant of heavy frosts and resistant to salt laden winds. Propagation is usually from cuttings but it is not unusual to see seedlings appear in the garden.



Zieria prostrata

Carpet Star

Drawing:
Ann Sheppard

A List of North Coast Endemic Plant Species

Prepared by Barry Kemp

As listed below, there are about 83 native plant species or subspecies believed to be endemic to the North Coast of NSW. It does not include some which have their main occurrence on the North Coast, but extend marginally into adjacent areas (e.g. *Alloxylon pinnatum*). Ongoing research may result in description of new taxa or the discovery of populations outside the nominal boundaries, here defined as from the Hunter River valley to the Old, border and inland to the 800 metre contour.

CYCADS

Zamiaceae

Macrozamia fawcettii. Small Burrawang with no above ground trunk. Grafton area to the Richmond Range.

M. montana. Burrawang with trunk to 3 metres, Wingham to west of Grafton area.

DICOTYLEDONS

Apocynaceae

Parsonsia dorrigensis. Climber to 4 m, mainly rainforest, Dorrigo-New England areas.

Asclepiadaceae

Marsdenia ilisae. Climber to 5 m in rainforest or wet sclerophyll forest. Hastings River northward.

Asteraceae

Olearia flocktoniae. Ephemeral daisy bush to 2 m high in the Dorrigo area.

O. stilwelliae. Small short-lived daisy on sandstone west of Woolgoolga to Richmond Range.

Casuarinaceae

Allocasuarina defungens. Shrub to 2 m in tall heath, Nadiac to Glenreagh area.

A. simulans. Shrub to 3 m in heath, Nadiac to Crowdy Bay.

Davidsoniaceae

Davidsonia jerseyana. Slender tree with large compound leaves and edible purple fruit. Brunswick to Tweed valleys.

Dilleniaceae

Hibbertia acuminata. Shrub to 50 cm. West of Woolgoolga to the Richmond Range.

H. marginata. Shrub to 1 m, Coffs Harbour to Mt. Warning.

Elaeocarpaceae

Elaeocarpus williamsianus. Small rainforest tree. Burringbar Range to near Byron Bay.

Ebenaceae

Diospyros mabacea. Small rainforest tree in the Tweed valley.

Euphorbiaceae

Fontainea australis. Tall rainforest shrub, Tyalgum to the Nightcap Range area.

F. oraria. Tall rainforest shrub near Lennox Hd.

Fabaceae Faboideae

Desmodium acanthocladum. Small spiny shrub of streambanks.

Jacksonia sp. 'Little Plain'. Shrub to 2 metres near Woodenbong and Kooreelah.

Pultenaea alea ms. Erect shrub in forests near Casino.

P. maritima. Prostrate shrub with yellow flowers on headlands.

P. rostrata. Small shrub with bright yellow flowers, on sandstone from Coffs harbour north.

Fabaceae Mimosoideae

Acacia bulgaensis. Tall shrub with variable phyllodes, Singleton area.

A. chrysotricha. Small tree with bipinnate foliage, Kempsey to southwest of Urunga.

A. courtii. Small tree near Laurieton with long, narrow phyllodes.

A. ruppii. Narrowly upright shrub to 3 metres with 2-4 cm long phyllodes, NW of Grafton to the Richmond Range.

Lamiaceae

Plectantherus cremnus. Aromatic herb on coastal headlands.

Lauraceae

Cryptocarya dorrigensis. Rainforest tree with large dark blue fruit, Dorrigo area only.

C. williwilliana. Small tree restricted to limestone areas west of Kempsey.

Endiandra floydii. Small rainforest tree of the Tweed valley and nearby areas.

E. introrsa. Rainforest tree with large purple fruit, Dorrigo area only.

Monimiaceae

Daphnandra melasmena ms. Rainforest tree from Bellinger River to Border Ranges.

D. micrantha. Small rainforest tree, Manning River to the Richmond Range.

Myrsinaceae

Myrsine richmondensis. Small rainforest tree, Richmond River area.

Myrtaceae

Angophora paludosa. Small tree with narrow leaves, Coffs Harbour area to Lismore.

A. robur. Small tree with broad leaves, Coffs Harbour to north of Grafton.

Babingtonia prominens. Shrub to 2.5 m, white flowers, Nymboida area.

Callistemon acuminatus. Shrub to 3m, red fls, rocky areas, Port Stephens to the Clarence River

Eucalyptus ancophila. 35 m high ironbark, Kempsey to Bellingen areas.

E. canaliculata. 30 m high grey gum, Hunter River to Kempsey area.

E. fracta. Mallee ironbark, near Cessnock.

E. glaucina. Juveniles glaucous, Taree to Casino, scattered.



Top Left: *Boronia umbellata*

Top Right: *Boronia chartacea*

Above: *Hakea archaeoides*

Photos: Colin Broadfoot

Right: *Syzygium anisatum*

Photo: Wayne Jeffery

See pg. 278



E. largeana. 40 m high box, Hunter valley to the Macleay River.

E. ophitica. 15 m high ironbark on serpentine north of Grafton.

E. placita. 30 m high ironbark, near Newcastle northwards.

E. psammitica. 20 m high stringybark, Coffs Harbour and Grafton areas.

E. rudderi. 40 m high box bark, small fruit, Taree to Gloucester area.

E. rummeryi. 'Steel box', tree to 40 m, Dorrigo to Casino area.

E. tetrapleura. 30 m high ironbark with narrow, 4-angled fruit. Grafton area.

Homoranthus floydii. Slender shrub restricted to a small area west of Woolgoolga.

***Kunzea* sp. 'Middle Brother'.** Tall shrub with white flowers, Taree to Kempsey.

Syzygium anisatum. Rainforest tree, leaves with aniseed aroma, Kempsey area to Orara valley.

Uromyrtus australis. Small rainforest tree in Nightcap Range area. Pink tinged flowers.

Olacaceae

Olax angulata. Small root parasite restricted to Yuraygir National Park

Proteaceae

Eidothea hardeniana. 'Nightcap Oak' (rainforest tree restricted to Nightcap NP).

Grevillea banyabba. Shrub to 1.5 m high, green and red flowers. Small area north of Grafton.

G. guthrieana. Shrub to 2 m high, maroon and green flowers, Bulahdelah area to Carrai Plateau.

G. humilis* subsp. *maritima. Variable semi-prostrate shrub, on coast south of Yamba.

G. masonii. 0.5 m high, pink and green flowers, restricted to a degraded area near Grafton.

G. virgata. Shrub to 2 m, white flowers, lower Myall River area.

Continued on page 283

Central Coastal Wonders

Diana Dean
APS Central Coast District Group

Delights that await participants of the Sydney by Nature and Design post ASGAP conference tour include beautiful floral displays along walks in Wyrabalong National Park and Warrah Reserve on the southern edge of Brisbane Water National Park.

In the Spring the coastal walks around Gosford are a sea of colour, with heathland flora in stunning abundance.

Starting at Crackneck Lookout near Bateau Bay, a track follows the coast south to Cromarty Hill. On the grassy slopes above the cliffs we have seen large numbers of the Tiger Orchid, *Diuris sulphurea*, mingled with the spikes of pink trigger plants, *Stylidium graminifolium*, and as a backdrop, the orangey-yellow peas of *Jacksonia scoparia*, with their grey-green branches.

Further along, under a forest canopy, are scrambling vines in flower, including *Kennedia rubicunda*, *Marsdenia rostrata*, *Eustrephus latifolius* and *Hardenbergia violacea*. Then the track passes through thickets of *Melaleuca nodosa* and *Exocarpus cupressiformis*, through which glimpses of the ocean can be seen. Little *Boronia polygalifolia*, a rare species, can be discovered hiding in grassy patches beneath.

Soon the soil becomes deep and sandy, and the density of the plants increases. Many species of *Dillwynia*, *Pultenaea* and *Phyllota* contrast their yellow with the tall Flannel Flowers, *Actinotus helianthi*, and white wedding bush, *Ricinocarpus pinifolius*. Beautiful *Eriostemon australasius* in many shades of pink attract the eye. There are an amazing variety of forms and colours in the lower shrubs, with a taller background of Grass Trees, Banksias and Tea Trees.

All this profusion can be seen in a level walk of less than 1 km. On reaching the rest seat, there is a great view out over the ocean below. This is a good point to turn and retrace our steps, although the walk goes on for another kilometre to the next headland. The return to the car park takes less than 20 minutes, although one could spend many hours identifying and photographing this floral wonderland.

Another rewarding place to walk is the ridge above the Hawkesbury River between Patonga and Pearl Beach. Warrah Trig is a good starting point, with a short climb to a great view over the inlets along the River. The wooden staircase connects with a stone-flagged path, which crosses the track to Pearl Beach and brings you out onto the cliff-edge lookout with a magnificent panorama of Cowan Creek, West Head, Barrenjoey Headland and the ocean beyond. Along the way are *Actinotus helianthi*, *Calytrix tetragona*, and *Isopogon anemonifolius* as well as *I. anethifolius*. Beneath the Angophoras and Scribbly Gums are the purple flowers of *Patersonias*, and several species of *Boronia* and *Hibbertia*. *Callistemon linearis* and *Kunzea ambigua* decorate the path to the lookout. *Allocasuarina distyla* grows throughout and there are stands of *Callitris rhomboidea*.

On the uphill track which circles back to the car park, seepage from the rocks above encourages the growth of the delightful *Epacris longiflora*, as well as many sedges and ferns. In the undergrowth are *Boronia ledifolia* and *B. pinnata*, *Eriostemon australasius*, and *Scaevola ramosissima*. Other beauties include the ruby pink flowers of Black Eyed Susans, *Tetradlea shiressii*, and *T. ericifolia*. Large bushes of *Prostanthera linearis* make a surprising showing from the rocks above.

The track then passes below a swampy area full of Dillwynias, *Epacris obtusifolia*, *Kunzea capitata* and *Restio* sp. as it completes the circle back.

This track is not long or difficult, although a little hilly, but the surface is either paved or on a wide fire trail, and the outlook from the Trig and the cliff edges is well worth it.

Not far from here, on the road to Patonga there are large patches of Waratahs. However, these suffered during recent bushfires, but are expected to be recovered by spring 2007. The nearby large stands of Woody Pear, *Xylomelum pyrifolium*, luckily remain largely unscathed, and during October 2006 had a wealth of beautiful rusty-pink flower spikes and bright reddish new leaf growth, as well as their old pear-shaped woody capsules.

A List of North Coast Endemic Plant Species Continued from Page 281

Hakea archaeoides. Tall shrub with green and red flowers, Lansdowne to near Wauchope.

H. ochroptera. Casuarina-like small tree, flowers white, east of Dorrigo.

Isopogon minorifolius. Small shrub with candelabra-like leaves. North and east of Grafton.

Persoonia conjuncta. Tall shrub in coastal ranges, Manning River to near Coffs Harbour.

P. katerae. Tall shrub in heath, Myall Lakes to Port Macquarie.

P. pauciflora. Spreading shrub restricted to the Hunter valley.

Rubiaceae

Asperula asthenes. Small trailing herb of damp sites, Taree to Bulahdelah.

Rutaceae

Boronia chartacea. Shrub to 3 m with narrow, opposite leaves. Wauchope to Richmond Ra.

B. haplophylla. 1 m high shrub like

B. rosmarinifolia, near Glenreagh to west of Grafton.

B. umbellata. 2 m high shrub, restricted to small areas north west of Coffs Harbour.

Bosistoia floydii. Small rainforest tree with 5 leaflets, Taylors Arm to Richmond Range.

Philotheca papillata. Recently named small shrub on rocky areas near Glenreagh.

Zieria floydii. Shrub to 2 m in Guy Fawkes NP.

Z. hindii. Shrub to 1 metre in Nightcap National Park and nearby areas.

Z. prostrata. Prostrate, only on headlands close to and north of Coffs Harbour.

Simaroubaceae

Quassia sp. 'Moonee Ck.' Shrub to 2 m. North and northwest of Coffs Harbour.

MONOCOTYLEDONS

Orchidaceae

Acianthis exiguus. A mosquito orchid found from Bundagen north to Wardell.

Chiloglottis anaticeps. A bird orchid restricted to west of Wauchope.

Diuris disposita. Yellow and brown orchid near Kempsey, now rare.

D. flavescens. Pale yellow orchid near Wingham, rare.

D. secundiflora. Yellow orchid on the Macleay River (possibly extinct).

Poaceae

Aiexfloydia repens. Mat forming grass in the Coffs Harbour area, mainly in the king tide zone.

Deyeuxia reflexa. Tufted grass in woodland near Dorrigo.



Top Left: *Kennedia rubicunda*
Above: *Melaleuca nodosa*

Top Right:
Eriostemon australasius

Above:
Diuris sulphurea

Left: *Jacksonia scoparia*
 See pg. 282

Photos: B Dean



Top left: *Epacris longiflora*

Above: *Patersonia sericea*

Left: *Eucalyptus haemastoma*

Bottom left:

Tetratheca thymifolia

Below: *Xylomelum pyrifforme*
flowers & new growth

See pp. 283

Photos: B Dean



Wildflower Nurseries in Queensland

Fairhill Plants and Botanic Gardens — Huge range: rainforest plants, grafted grevilleas, rare plants, wildflowers, ferns, orchids, revegetation trees. Extensive display gardens. Open every day 8.30 a.m. to 5.00 p.m. Fairhill Native Plants, Fairhill Rd, Yandina, Qld 4561. Tel. (07) 5446 7088.

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The Grevillea Book, volumes 1, 2 and 3 by Peter Olde and Neil Marriott, is a complete reference to all species of *Grevillea*. The Australian Plants Society NSW ensured that they were published to a very high standard with at least one large colour photograph of each of the 340+ species, an easily read description of each species and details of its occurrence and cultivation. They are available from the Australian Plants Society NSW, PO Box 744, Blacktown NSW 2148, at \$44 per volume plus postage and handling of \$9.50 for 1 volume and \$15.50 for 2 or 3 volumes within NSW.

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Secretary: Nina McLaren, PO Box 837 Nedlands WA 6009. E-mail echidna@tower.net.au

Online: <http://farrer.riv.csu.edu.au/ASGAP> is the national internet page for all the above

Societies, receiving thousands of 'hits' from all over the world. The wealth of information is augmented by a newsletter, Australian Plants Online, all free. Refer to it and enjoy.

PUBLISHED BY THE AUSTRALIAN PLANTS SOCIETY NSW LTD

Under the direction of the PUBLISHING COMMITTEE

Editorial Material: Editor, Australian Plants, PO Box 744, Blacktown NSW 2148

E-mail: edap@austplants-nsw.org.au Fax. (02) 9676 7603

PUBLISHING COMMITTEE: M Wagner (Convenor), J Caldwell, C Liber

All publication correspondence / feedback to: Publishing Committee, PO Box 744, Blacktown NSW 2148

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