ATLAS NEWSLETTER No.4

EDITED BY: ANNE TAYLOR, OCT 85

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REPORT ON BANKSIA ATLAS, JUNE - OCT '85

BY ANNE TAYLOR

An enjoyable but all too brief visit to South Australia and western Victoria during September was recently followed by a quick trip down south to "stir-up" volunteers in the Busselton and Denmark areas. Once again, my sincere thanks to all involved particularly those who offered their generous hospitality en route.

Most of my travelling is now over and from now until the end of the project I will be concentrating on analysing incoming data and providing feedback to contributors. It was hoped that a preliminary analysis of habitat and biological data would be ready for this newsletter, but the dreaded RSI (repetitive strain injury) has struck our computer programmer, which has imposed a temporary halt on any such developmental work.

On the brighter side, the latest maps are looking good. The areas for which no sheets have been received, are getting smaller, although significant "blank spots" do still exist. Information on these appears on pages 12-14 of this newsletter. Map Series II has just been compiled. It includes a map for each banksia species based on records received up until September 30th 1985. As with Map Series I, it is being distributed only to volunteers who have sent in at least one sight record sheet.

Since Newsletter No 3, another 115 people have joined the project bringing the current grand total to 940. Numbers for each state are as follows:

ACT (51), NSW (179), SA (28), NT (12), VIC (65), QLD (92), WA (484), TAS (29).

Since June, another 2,693 record sheets have been received from the following 167 contributors. Congratulations to both Les Gray and Alf and Esme Salkin, who appear to be competing for the award of "State co-ordinator completing most record sheets". Alf already has a head start from early on in the project, but I believe he's going away for 6 weeks so Les may yet catch up.

Joan & Laurie Adams	(13)	NSW
John Adams	(1)	WA
Elizabeth Addario	(1)	NSW
Jennie Allen	(30)	WA
Mr and Mrs S Allen	(4)	WA
Terry & Helen Allen	(30)	WA
Paul Armstrong	(13)	WA
John Baas	(2)	WA
Gary Backhouse	(17)	VIC
Heather Bambrick	(2)	QLD
Judith Barker	(4)	NSW
Mr & Mrs P Baxter	(1)	NSW
Jeff Beard	(1)	WA
Don & Barbara Bellairs	(3)	WA
Graham Bennett	(12)	QLD
Jo Benyon	(10)	ACT
Elizabeth Berndt	(6)	WA
Trevor Blake	(3)	VIC
Doris & Vic Blampey	(20)	WA
John Blyth	(5)	QLD
R Boulton	(1)	ACT
R & J Boyd	(2)	NSW
John Boyle	(10)	WA
Wendy Bradshaw	(4)	WA
Mary Bremner	(1)	WA
Peter Bridgewater	(4)	ACT
Clive Brownsea	(3)	VIC
Dick Burns	(14)	TAS
Keith & Ann Cairncross	(3)	NSW
Barry Carter	(3)	ACT
Don Carter	(14)	WA
John Chilvers	(14)	WA
Mrs H. Chinchen	(2)	NSW
Steve Clemesha	(19)	NSW
Sam Cook	(3)	WA
Ron & Margaret Cooper	(14)	NSW
Diana Cordiner	(1)	NSW
Doug Coughran	(1)	WA
Colin & Verna Cornford	(6)	QLD
Jenny Craigen	(2)	NSW
Ray Cranfield	(1)	WA
Christine Creighton	(29)	WA
Eileen Croxford	(23)	WA
Audrey Crutchfield	(5)	NSW
Robyn Cummings	(11)	NSW
Pat & Thelma Daniell	(6)	WA
Steve Dawson	(4)	WA
Harry Dejong	(11)	WA
Doris Dove	(4)	QLD
Greg Drake & Anne Knight	(5)	NSW
Lynn Dyason	(4)	QLD
Graham Edwards	(31)	WA
Robin Elkin	(8)	NSW
Peter Engler	(57)	WA
Barbara & Margaret Evans	(33)	WA
Lalage & John Falconer	(1)	WA
Ian & Gwynneth Fardon	(2)	NSW
Charles Felton	(1)	WA
Lee Fernie	(1)	WA
Lawrence Frizzell	(5)	WA

Ray Garston	(9)	WA
Howard & Dorrie Gibbs	(3)	WA
John Gibson	(6)	NSW
Grace Gibson	(1)	NSW
Lloyd Gibson	(17)	ACT
Anne Giblin	(5)	NSW
Allan Goodwin	(8)	VIC
Mal Graham	(10)	WA
Les Gray	(438)	SA
Murray Haby	(145)	VIC
Annette Hallpike	(34)	VIC
M V Hannah	(2)	NSW
Joy Harrop	(1)	WA
Jan Hay	(2)	WA
Frank Hebden	(2)	NSW
Cyril Henshaw	(10)	VIC
Grant Hewett	(1)	WA
Nigel Hewett	(84)	WA
Lynne Heywood	(5)	NSW
Graeme Hill	(6)	NSW
Joyce Hill	(1)	QLD
Maria Hitchcock	(5)	NSW
Margaret Holmes	(6)	NSW
Wade Howlett	(1)	VIC
Robert Jago	(3)	QLD
Rhoda Jeavons	(2)	NSW
Brendon Johnstone	(10)	WA
Wendy Kappelle	(12)	WA
Ian Kealley	(6)	WA
R Kefford	(3)	ACT
Bronwen Keighery	(5)	WA
Horace Knox	(2)	WA
Kowree Field Naturalists Club	(6)	VIC
Raymond Lacken	(3)	QLD
Carol Leggett	(3)	QLD
Pattie Leighton	(9)	WA
Malcolm Lewis	(5)	WA
Lenore Lindsay	(2)	QLD
Shirley Loney	(3)	WA
Enid Lowe	(1)	WA
Tim Lowe	(8)	WA
Philip Manley	(14)	QLD
Michael Marmach	(7)	VIC
Family Marrie	(1)	QLD
Cyril Marshall	(12)	NSW
Bill Martin	(5)	QLD
Gary Martin	(8)	WA
Neil Maxted	(1)	WA
Peter Mawson	(5)	WA
Marjorie May	(11)	ACT
Ian McAllan	(11)	NSW
Donna McDuff	(18)	QLD
Shaun McGowan	(16)	VIC
Ross & Bev McGuiness	(38)	WA
Helen McKensie	(1)	NSW
Robert McLure	(6)	VIC
Inez McLoughlin	(1)	VIC
Graham Mee	(2)	NSW
Col Middleton	(3)	QLD
Kevin Mills	(82)	NSW
Alan Moore	(19)	WA
Dick Mumford	(5)	WA
Lorna Murray	(8)	QLD
Jane Muir	(4)	WA
Murray Bridge SGAP Group	(2)	SA
Clive & Wendy Napier	(1)	WA
National Parks & Wildlife Service, NSW	(4)	NSW
Wynne O'Brien	(3)	NSW
Michael O'Keefe	(2)	NSW
Rosemary Opala & Evelyn Peacock	(41)	QLD
Michael & Karin Palmer	(8)	WA
Rodney & Rae Papenfus	(7)	WA
I G Paterson	(1)	QLD
Jim Paterson	(7)	TAS
Patricia Perrin	(2)	NSW
Maria Pesavento	(1)	QLD
Tony Phillips	(2)	VIC
Beryl Rainer	(2)	QLD
Frances Reay	(34)	SA
Victor Robertson	(8)	QLD
Alf & Esme Salkin	(448)	VIC
Paulette Savage	(3)	WA
George Schmidt	(18)	WA
Janet Semmens	(21)	VIC
Brian Shearer	(93)	WA
Mary Sherwood	(18)	WA
R K Shoosmith	(7)	WA
Margaret Smith	(1)	NSW
John Simpson	(2)	QLD
Basil Smith	(8)	WA
Andrew & Lois Sourry	(43)	NSW
Jim Steenson	(2)	NSW
Margery & Graham Stutchbury	(17)	QLD
Tim & Elizabeth Swainson	(14)	WA
SGAP Maryborough Branch	(5)	QLD
Tony Tapper	(7)	WA
Anne Taylor	(30)	WA
Helen Taylor	(7)	WA
Don Voigt	(17)	WA
Brian Walters	(12)	NSW
Peter & Carolyn Wardle	(6)	WA
Ross Weaver	(1)	WA
Beth Williams	(57)	WA
Keith Williams	(1)	WA
Don & Joy Williams	(6)	WA
Eleanor Williams	(1)	WA
Eric Williamson	(2)	QLD
Mae Willmot	(4)	NSW
John Wrigley	(4)	NSW

This list includes 81 new contributors which brings the number of people who have sent in at least one sheet to 285 (approx. 30%).

In recent months a number of people have indicated that they have been put off filling in record sheets due to insufficient time and/or knowledge to complete the entire sheet. Well, I have good news for you! Incomplete sheets are acceptable as long as they contain the following core data:

1. Observer code, state, date.
2. Name of banksia species.
3. Locality information - both Lat. and Long. and word description.

Of course, it is much better if you can fill in the habitat and biological information, but if you really can't, then send in the sheets with just the core data entered. Now, all you non-contributors will have to think of another excuse!

Remember, the last date for accepting completed record sheets is August 30th 1986. There are only 9 months left to chase up those records that you've been intending to do since the start of the project. Time is slipping away fast.

The Nullarbor banksia - Additional material of this banksia has now been collected. In leaf dimensions and appearance of fruiting cone it resembles B. praemorsa, a species that is restricted to the Albany area, a long, long way from the Nullarbor!

The Banksia spinulosa with entire leaves from northern N.S.W. (as reported in Newsletter No 3). More records received from Steve Clemesha, Maria Hitchcock, Kevin Mills, Beth Williams from areas such as Boonoo Boonoo, Gibralter Range and Werrikimbe National Parks.

B. integrifolia var. compar - Steve Clemesha thinks that there may be a new variety of B. integrifolia growing in mountainous parts of northern NSW. He notes that the common and floral bracts on the flower spike are quite different to usual. Also, the seed follicles do not show their usual tendency to open almost as soon as they have developed. Instead, they stay closed until the warmer months of Oct/Nov. Fruiting cones are black, rather than grey in colour and flower buds are pinky/grey.

Banksias and fire - It seems that sometimes a fire can be so hot that it literally incinerates whole plants including fruiting cones and seeds. Two reports have been received, both relating to the catastrophic Ash Wednesday bushfires of 1982. At Beaconsfield, Victoria, Doug Twaits reports that there is now no sign of the B. integrifolia or B. spinulosa that previously grew in the area. Also at Cox's Scrub Conservation Park, South Australia, Les Gray showed me areas which used to be rich in B. ornata, now totally devoid.

Banksias and frost - Another killer of banksias can be frost. In South Australia/western Victoria I was shown large areas of B. ornata killed by the severe frosts experienced in 1983. The areas I visited had suffered from bushfires in the summer of '81/'82 and it was the resultant seedlings that had succumbed to low temperatures 18 months later.

Further reports on either of these two phenomena would be welcome.

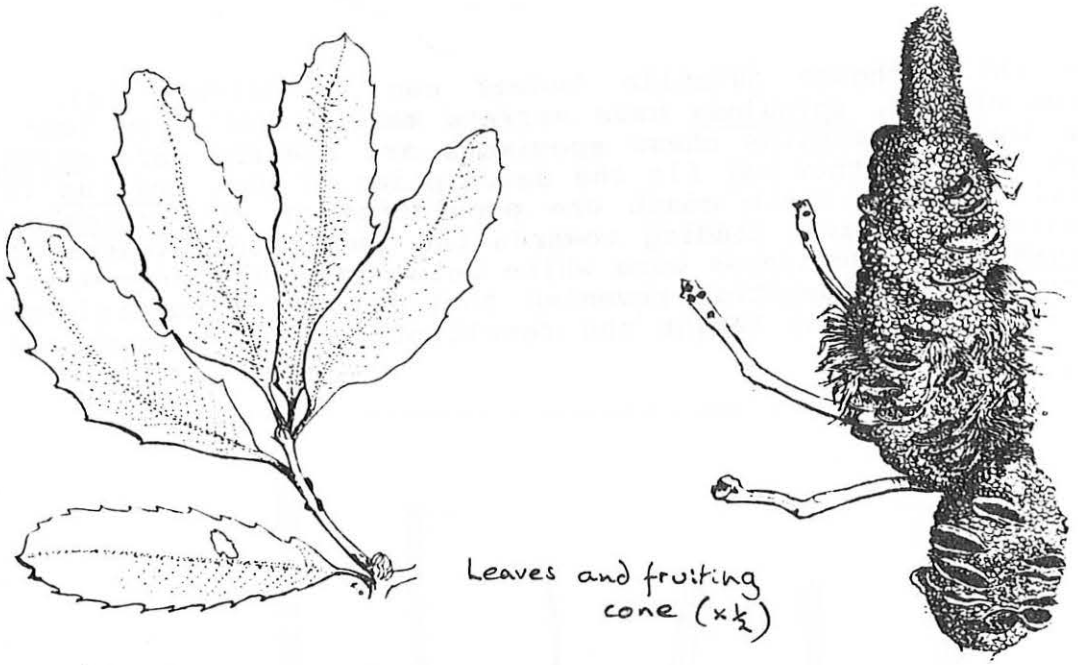
Northern-most B. aemulas under threat - Prior to the Banksia Atlas, B. aemula was known to occur as far north as Bundaberg. This limit has now been extended some 70 km by Margery and Graham Stutchbury. Unfortunately the newly discovered sites are all zoned for housing development. It is likely that these plants will be lost unless some small reserves can be created.

Reports of some unusual flower colours - maybe you can add to these:

red B. seminuda
yellow, and bronze B. menziesii
yellow B. praemorsa
cream B. occidentalis
ginger B. ornata
lemon yellow B. spinulosa var. cunninghamii

Some reported hybrids

robur x oblongifolia
ericifolia var. ericifolia x spinulosa var. cunninghamii
paludosa x integrifolia
a possible oblongifolia x integrifolia
ericifolia var. ericifolia x spinulosa var. spinulosa



A hybrid Banksia robur x oblongifolia from Caloundra, Queensland. Illustrated by Rosemary Opala.

Note that the leaf size is approx mid way between that of B. oblongifolia and B. robur. Fruiting cone retains some but not all of its old flowers.

Very many thanks to Greg Barrett, Les Gray, Kevin Mills, Andrew and Lois Sourry, and Brian Walters who sent in the articles inlcuded in this newsletter, also to Rosemary Opala for her delightful illustrations which have produced many a laugh at Wanneroo. The next newsletter - March/April 1986 will be the last newsletter before the end of the project and therefore your last chance to get your name in print! Write and let me know what you think of "atlassing" and in particular, the Banksia Atlas. It can be whatever length you like - from a few words to a couple of paragraphs.

SOME NOTES ON LEAF VARIATION IN THE BANKSIA SPINULOSA COMPLEX IN NEW SOUTH WALES

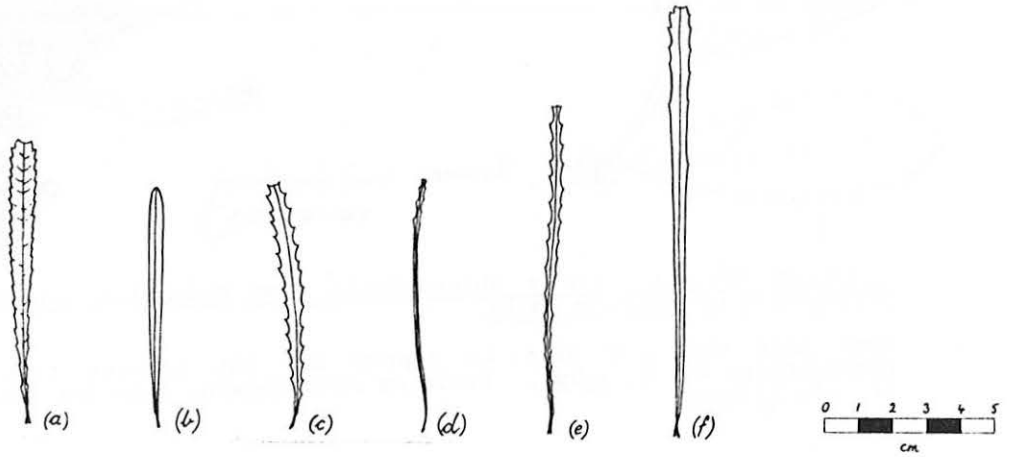
by Kevin Mills

Three distinct varieties of Banksia spinulosa have been described by George (1984) and are also featured in the Banksia Atlas Instruction Booklet.

Differentiation of the three varieties is based largely on plant habit, leaf and indumentum characteristics. The criteria used for separating the varieties are summarised in the accompanying table. Leaf variation is however wider than that indicated for each variety in the table, and difficulty is being experienced by some people in assigning a varietal name to specimens in some cases. Recent observations by myself in the field and of specimens in the National Herbarium of New South Wales Sydney are the subject of this note. Hopefully these observations will help other Banksia watchers in eastern Australia. I would be interested to hear from anyone with further information.

The accompanying figures show some of the variation in Banksia spinulosa in New South Wales observed by the author. Figure (a) shows typical var. collina, (d) typical var. spinulosa, and (f) typical var. cunninghamii from south of Sydney (further north it is not, see later). Banksia spinulosa var. collina from the higher altitude areas on the Northern Tablelands (eg. Gibraltar Range N.P.) has entire leaf

margins (b) although juvenile leaves can be serrate (c). Some specimens of var. spinulosa have serrate margins (e). In leaf shape and the inrolled margins these specimens are clearly var. spinulosa, although at first they may fit the description of var. collina in some respects. On the south coast one population of var. spinulosa was found which has leaves tending towards the long, broad leaves of var. cunninghamii. These leaves were white below and the plants were up to 3 metres tall. Inspection revealed that they were multiple-stemmed with a lignotuber, the height the result of not being burnt for some time.



Leaf Variation in Banksia spinulosa Complex, New South Wales.

(a) Banksia spinulosa var. collina
Crowdy Bay National Park, North Coast.

(b) B. spinulosa var. collina
Gibraltar Range National Park, Northern Tablelands.

(c) B. spinulosa var. collina (juvenile leaf)
Gibraltar Range National Park, Northern Tablelands.

(d) B. spinulosa var. spinulosa
Tianjara Plateau, South Coast.

(e) B. spinulosa var. spinulosa
Mogo, South Coast.

(f) B. spinulosa var. cunninghamii
Woronora River, Central Coast.

Inspection of herbarium specimens clarified some points and made the situation more complex in others. Coupled with the field observations the following picture emerges.

B. spinulosa var. spinulosa in its typical form, has very narrow, linear leaves with inrolled margins, with little of the under surface visible. This variety can, however, have leaves which are serrate, white below and quite broad for var. spinulosa. These populations occur in the following locations: north-west of Sydney, Richmond-Putty Road area; the Mount Budawang-Monga area on the Southern Tablelands; and single specimens from near Mogo, South Coast (author) and a specimen from near Green Cape, south of Eden, South Coast, noted as coming from a young plant (collected by A. George in 1974). The common leaf features of these specimens distinguishing them from var. collina are the lack of obvious lateral veins, inrolled margins and linear shape.

B. spinulosa var. collina appears to be fairly typical over its range (at least in New South Wales). The leaf shape, which is narrow ovate, and the evident lateral veins (especially when dried) are usually enough to distinguish it from the other varieties. Some herbarium specimens have quite long leaves. There appears to be populations of var. collina from north of Tenterfield (herbarium specimen) to the New England tablelands (apparently occurring at higher altitudes) which have entire margins but otherwise resemble typical var. collina from the coast. Leaves do tend to be smaller and serrate juvenile leaves were observed (see drawing). These specimens differ from var.

cunninghamii by not having a brown, or even buff, leaf under surface and being a low shrub with a lignotuber. Lateral veins were not prominent in the specimens collected by the author.

B. spinulosa var. cunninghamii occurs in New South Wales north from the Shoalhaven River to Queensland and near Eden and Nadgee on the far south coast (herbarium specimens). The leaves of specimens south of Sydney appear to be larger and paler on the under surface than those from further north, some of which are very brown on the leaf under surface.

As long as the variation in the Banksia spinulosa complex is appreciated there is usually little trouble assigning a specimen to one of the varieties. Some specimens can, however, be a bit tricky!

TABLE 1: DIFFERENTIATION OF BANKSIA SPINULOSA VARIETIES (AFTER GEORGE, 1984).

Variety	Growth Habit	Leaves	Additional Comments
var. spinulosa	Shrub to 3 metres, multi-stemmed with lignotuber.	Linear, margins revolute, shortly serrate at apex. Under surface usually hidden.	Some forms have serrate leaf margins, others have long flat leaves with little serration. White under surface to leaves sometimes like var. collina.
var. collina	Shrub to 3 metres, multi-stemmed with lignotuber.	Linear to narrowly ovate, flat with serrate margins, lateral veins present.	Leaves from high altitudes on Northern Tablelands have entire margins.
var. cunninghamii	Shrub to 6 metres, single-stemmed, no lignotuber.	Flat, margins serrate to entire, lower surface pale brown.	Probably the easiest variety to identify. Leaves, apparently, are less variable than above types. Leaves from the north seem to be smaller and darker below than those south of Sydney.

Acknowledgement

The author would like to thank Jacqueline Jakeman for her drawings of the Banksia leaves and for companionship in the field.

Reference

George, A. (1984). The Banksia Book, Kangaroo Press, 240 pp.

Note from A. Taylor The B. spinulosa var collina described above from "north of Tenterfield to the New England Tablelands" are the same as the B. spinulosa with entire leaves reported in Newsletter No. 3.

AN INLAND POPULATION OF BANKSIA AEMULA – A WIN FOR CONSERVATION ?

by Brian Walters

The Cumberland Plain is the expanse of relatively flat land on which Sydney's urban sprawl is situated. It is comprised, mainly, of soils derived from shale, resulting in clay close to the surface in many suburbs.

On the extreme west of the Cumberland Plain, not far from the Hawkesbury River, is an unusual area of deep sand. Here a plant association can be found which is somewhat reminiscent of that to be seen on coastal sand dunes. This area is located at Agnes Banks, about 5 km south of Richmond and some 50 km inland. The vegetation is quite distinct from that of the surrounding heavier soils although, of course, there are some common elements.

Of particular interest to banksia fanciers is the occurrence of four species ... B. spinulosa var. spinulosa, B. oblongifolia, B. serrata and, most surprisingly B. aemula. The first two are quite common on the surrounding heavier soils and B. serrata can be found on sandstone not far away across the Nepean River. B. aemula, however, is generally restricted to coastal dunes and to find it here, so far inland, is quite unusual.

The scientific value of the deep sand vegetation at Agnes Banks has been recognized for many years. Unfortunately the economic value of the sand has also been long recognized as it is one of the few sources of good mortar sand close to Sydney. Not surprisingly, sand mining has already effected a large portion of the deposit and development proposals were recently submitted to the local council covering most of the remaining untouched areas outside the dedicated Agnes Banks Nature Reserve.

The Nature Reserve occupies some 60 hectares and was gazetted to preserve a representative sample of the sand dune vegetation. It is totally inadequate!! Of the original 600 hectares of sand deposit vegetation less than 20 are reserved within the Nature Reserve. The balance of the reserve preserves a sample of the adjacent flora on the heavier soils (also inadequately). Thus less than 4% of the original sand deposit flora is currently reserved - how's that for a "reasonable" compromise between the needs of conservation and those of development?! Fortunately B. aemula does occur within the present Nature Reserve; B. serrata (and here it has some of the largest specimens you'll see) is not so fortunate.

The recent development proposals for further sand extraction stimulated local residents and the local SGAP groups into action. Support in opposing the development was sought and received from the National Parks and Wildlife Service and from the National Trust.

This combined opposition now appears to be bearing fruit. Recently, the Minister for Planning and Environment placed an Interim Conservation Order on the remaining undeveloped sand deposit lands. This effectively stops any further extraction for two years during which time it is to be hoped that sufficient evidence can be accumulated to ensure that the boundaries of the Nature Reserve are increased.

A win for conservation?? Perhaps, but the battle is not quite won!

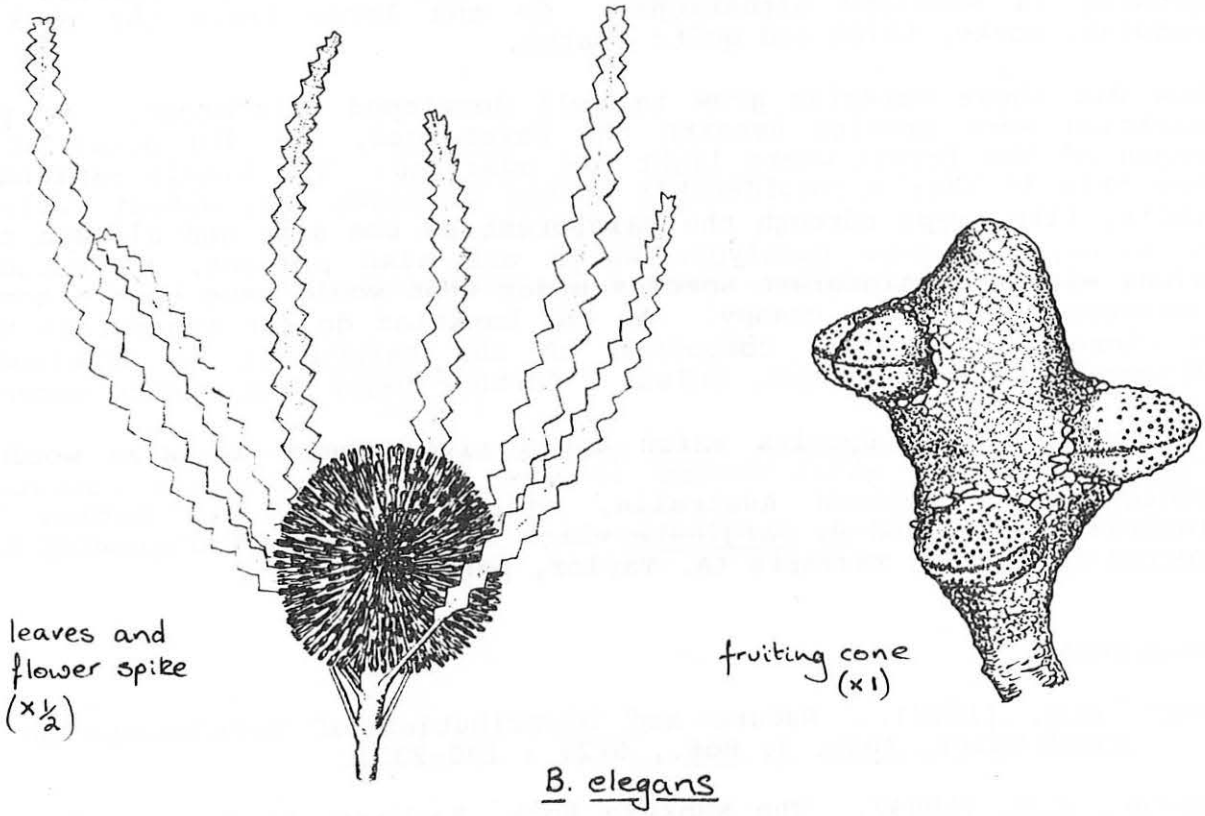
TWO RARE BANKSIAS FROM WESTERN AUSTRALIA

By Greg Barrett

Two interesting and contrasting Banksias, B. chamaephyton and B. elegans, grow in the sandplains north of Perth.

B. chamaephyton (see cover of Interim Map Series 1) is the only prostrate Banksia to occur north of Perth with all others being found near the south coast. It has fern-like leaves and the stems grow laterally underground. It is a gazetted rare species although now seems to be a little more common than originally thought. Many of the known populations, however, are on farmland or road verges. Volunteers should keep a lookout for more populations, especially on reserves around the Mogumber area. Any reports of pollinators would be of great interest. The species is almost always found in shallow sand over laterite in low heath and flowers from late October to early December. Its known range is from Mogumber to Eneabba.

B. elegans is an unusual species which has been creating interest for a long time. Most populations set no seed whatsoever. In the few populations which do form follicles about 90% of the seed is aborted. A small number of seedlings raised in a greenhouse were weak and grew very slowly. Pollen viability is lower than in other Banksias. The species does, however, send up suckers from lateral roots, especially after fire, and this seems to be essentially the only means of reproduction in the field. Although B. elegans can be locally common it is certainly not widespread. Reports of populations, especially with follicles or seedlings, would be welcomed. Plants occurring north of Dongara appear to have larger flowers than others and these are of particular interest. B. elegans occurs from Diamond of the Desert Springs, near Cockleshell Gully, to as far north as Walkaway. It is found in deep sands often fringing lakes or winter-wet depressions and flowers in October and November.



B. elegans

PERHAPS THE LARGEST BANKSIAS

by Kevin Mills

While travelling recently through northern New South Wales, I came across what might be some of the largest banksia species in existence. The species is Banksia integrifolia var. compar.

This variety of B. integrifolia occurs in mountainous country between the Blue Mountains in New South Wales and central coastal Queensland, where it is also found at lower altitudes along the coast (George, 1984). The coastal variety, B. integrifolia var. integrifolia, ranging from Victoria to southern Queensland, is probably better known to most people.

B. integrifolia var. compar is commonly found in association with rainforest vegetation, usually on the edges of, or within, disturbed rainforest. The species is also found in the snow gum (Eucalyptus pauciflora) woodlands of the tablelands. In the southern end of Washpool National Park (29°28'S, 152°19'E) B. integrifolia var. compar can be found growing amongst rainforest regeneration following logging and other disturbances as well as in more mature rainforest.

In the vicinity of Coombadjha Creek specimens of this banksia were found growing in well developed coachwood (Ceratopetalum apetalum) warm temperate rainforest. A similar situation has been described by Baur (1957) for a Schizomeria ovata - Banksia integrifolia association occurring on Mt Lindsay in the MacPherson Ranges on the Queensland border.

The specimens observed in the Washpool area were, for banksias in general, very large. A number of trees were estimated to be more than 30 metres tall, some possibly as tall as 35 metres. From a sample of trees, the six largest circumference measurements recorded were (cm at breast height): 262, 216, 209, 162, 160 and 158. The diameter at breast height of the largest tree was almost one metre. The bark of these large specimens was somewhat different from the smaller trees growing in woodland situations. On the large trees the bark was reddish, corky, thick and quite coarse.

How did these banksias grow in well developed rainforest. No young banksias were growing beneath the rainforest, but did occur at the edges of the forest where light was admitted. The likely explanation for this is that a considerable number of years ago, almost certainly 100's, fire swept through the rainforest on the site and allowed these banksias, and some eucalypts which are also present, to establish along with the rainforest species under what would have been a heavily disturbed rainforest canopy. As the banksias do not regenerate below a closed canopy this component of the rainforest is destined to disappear from the forest, unless a further major disturbance occurs.

The only banksia species which could rival these for size would be Banksia seminuda which occurs in the tall Jarrah-Marri forests of south-western Western Australia, which grows to 25 metres tall (George, 1984), and B. marginata which has been reported growing to 30 metres in western Tasmania (A. Taylor, pers. comm.).

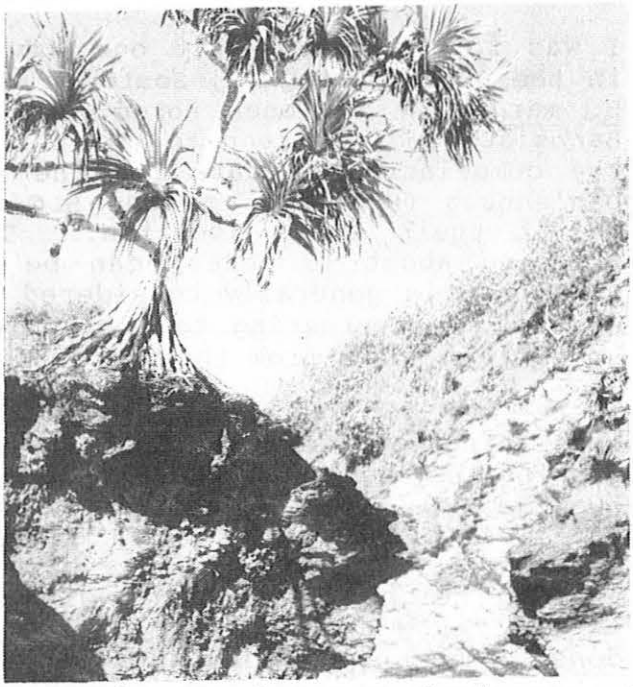
References

Baur, G.N. (1957). Nature and Distribution of Rainforests in New South Wales, Aust. J. Bot., 5(2) : 190-233.

George, A.S. (1984). The Banksia Book, Kangaroo Press & Society for Growing Australian Plants.

THOSE DOMINANTS

by Lois & Andrew Sourry



There are limitless things to see in the field, when filling in banksia sight record sheets. Atlassing is conducive to exploration of the natural systems, and one can indulge oneself no end.

Take for example the dominant species at the record locality. Now, here's a chance to gaze at towering eucalyptus trees that soar into the sky, their leafy crowns 40 metres or more above the ground. For us, on the central coast of N.S.W. maybe its a Blackbutt, or a Sydney Bluegum.

However, there are occasions when the eye has to focus on dominants of much lower stature. Sometimes these prove to be strangely different to any others previously recorded. Such an example is that found on parts of Valla Beach on the mid north coast of N.S.W.

Here, on the ocean front, where rolling breakers crash onto the beach and suck at the steep clay cliffs, low growing Banksia integrifolia var. integrifolia (Coast Banksia), clings to cliff tops. And the dominants Pandanus pedunculatus (Screw pine), and Casuarina eqisetifolia var. incana (Horsetail Oak), the former with its weird prop roots firmly fixed at a rakish angle on cliffs, the latter with roots continually washed by seawater.

AN INTERESTING OCCURRENCE OF B. MARGINATA

by Les Gray

Banksia marginata must certainly be one of the most variable of the Banksia species. It has an extensive range and can be found from South Australia through to northern New South Wales, Tasmania and the islands of Bass Strait in a variety of soil types and environments. It is this extensive and variable habitat range that has caused it to evolve into a number of different forms. During the time I have been collecting data for the Banksia Atlas, I am continually surprised at the places I am finding marginatas and the different shapes and sizes.

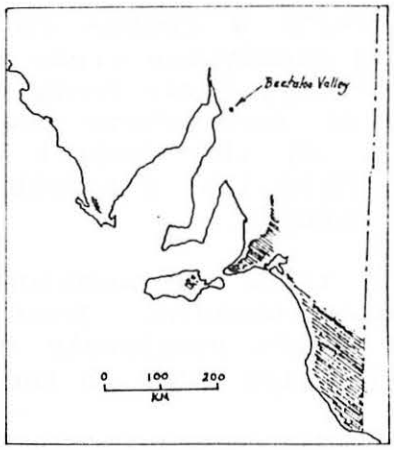
The tallest I have seen so far in South Australia are in McLaren Vale, where they occur in white sand and have grown to over 10 metres with broad trunks and are quite majestic trees. A little further south they number in the hundreds along the windswept hilltops north of Victor Harbor growing in shallow sand and often shaley clay, and have taken the shape of stunted round bushes with an average height of 1.5 metres, in fact in some areas they have almost taken a prostrate form. However the vast majority of B. marginata in this State occur as scruffy, spindly trees growing as an under-storey plant along with an assortment of other shrubs, beneath eucalypts that have been left along the roadsides in the Adelaide Hills and the South East after the adjoining land had been cleared for agriculture.

Another important factor determining the distribution of B. marginata is rainfall. It is generally accepted that they require an average annual rainfall of 400-1000mm. However I have discovered there are

small stands of old gnarled trees hanging on for survival just below this limit in a few places on the plains behind the Mt. Lofty Ranges.

I was fortunate to visit one extremely interesting location recently in the Beetaloo Valley, Southern Flinders Rangers. I had noticed that B. marginata had been noted as occuring there in "A Field Guide to Banksias" and was keen to see that these trees were not overlooked in the compilation of data for the Banksia Atlas, so I contacted Roger Dahlenburg (President of the S.G.A.P. Port Pirie group) who informed me of their exact location. This small stand of B. marginata, covering about 15 acres, can be found existing quite happily in an area that is generally considered one of the dryer parts of the State and it is interesting to contemplate just how they manage to survive some 170km north from the nearest group of marginatas.

There are two separate groups, each consisting of several hundred trees growing on the south facing slopes of two steeply faced gullies running parallel to each other in an east-west direction. These trees have an average height of 4 metres with some as tall as 9 metres. They are a very dense well shaped form, heavily laden with old cones and were flowering at the time of my visit in June. These stands of marginatas were so thick that they have excluded all other forms of native vegetation including casuarinas and various acacia and eucalyptus species, which cover the rest of the slopes quite liberally. The steep slopes had an angle of about 60° and whilst walking from the bottom of the hill to the crest a couple of kangaroos stirred and casually hopped away disappearing over the ridge. They made my efforts look somewhat clumsy as I scrambled to the top on grass made slippery by the heavy early morning dew. Another unusual feature was the soil in which they were growing; a sort of dark loamy clay overlaying limestone. At the bottom of the gully, it was approximately 20 cm deep and became progressively thinner nearer the crest where the limestone has been exposed in places by the effects of wind and rain, but still they hang on in the soil filled cracks in the rock.



Distribution of B. marginata in S.A. shown as shaded area.

On reaching the top and looking back down over the trees it became obvious why these banksias grow only on the south facing slopes of the gullies. The steep angle of the slope allowed the trees to remain in shade through the heat of the day, conserving whatever moisture was stored in the soil which was essential to their survival.

I looked southward down along the creekbed of the Beetaloo Valley and thought of how it must have been thousands of years ago when B. marginata was probably even more widespread than it is today, and how climatic changes must have forced it to recede to the south where it was cooler and rainfall was more consistant; and here as a reminder of those ancient times, this remnant population of marginatas clings to the side of a valley in this hostile environment, just like a fish trapped in a rock pool by the falling tide.

*AUTHOR'S NOTE: Since writing this article, I have recorded a small stand of 13 B. marginata situated near Sevenhill in the Clare Valley which is halfway between Beetaloo Valley and Tanunda 171 km to the South. The possibility of their existance was brought to my attention after reading an old book on the flora of the State.

INTERIM MAPS November 1985

BY ANNE TAYLOR

Generally, the maps are looking very good. Within each State are a few areas which have been very well covered, but also many areas from which either few or no records have been received. These are listed below for each State. It is hoped that during the next few months volunteers may be able to visit, and hopefully record banksias from some of these poorly covered areas.

WESTERN AUSTRALIA

Well Covered

- Around Perth, except for corridor in north east e.g. Bullsbrook - Chittering Valley
- Around Augusta
- Albany east to Cheyne Beach
- Hopetoun and eastern edge of Fitzgerald River National Park (N.P.)
- Lower Murchison River
- The road from Hyden to Norseman, within 100 km of Hyden

Poorly Covered

- Arrowsmith Lake
- Arrowsmith Lake north to Kalbarri including Geraldton area
- North of Kalbarri National Park
- Coast between Arrowsmith Lake and Jurien Bay
- Coast between Cervantes and Seabird
- Nambung N.P. and inland to Moora
- Bullsbrook to Moora and eastwards
- East and south east of York and Northam e.g. Quairading and Kellerberrin
- Between Mandurah, Bunbury, Beverley and Wagin
- Busselton south to Blackwood River and east to Boyup Brook
- Augusta to Windy Harbour
- Augusta to Manjimup
- Northcliffe to Cranbrook and Mt Barker
- Boyup Brook through Kojonup and Broomehill to Jerramungup, north as far as Woodanilling and Pingrup, south as far as Cranbrook
- Fitzgerald River N.P. westwards of Hamersley River
- Between Frank Hann N.P., Hyden, Corrigin and Tarin Rock
- North eastwards from Hyden
- Between Munglinup Beach and Esperance
- Cape Arid N.P. except for Mt Ragged

SOUTH AUSTRALIA

Well Covered

- Adelaide Hills south to Cape Jervis and Victor Harbour

Poorly Covered

- South and east of Adelaide Hills to Victorian border
- Kangaroo Island

VICTORIA

Well Covered

- The Grampians
- Mornington Penninsula

- Coast from Philip Island to Sandy Point north of Wilson's Promontory
- Western edge of Great Dividing Range e.g. Kinglake, Upper Yarra Reservoir
- The Lakes area east to Orbost
- Mallacoota and Wingan Inlet

Poorly Covered

- West of the Grampians to S.A. border
- east and south east of the Grampians to Mt Macedon and Anglesea
- Coast between Portland and Peterborough
- Coast between Cape Otway and Anglesea
- Western side of Port Philip bay
- Melbourne to Leongatha to Sale including Latrobe Valley and Gippsland Hills
- Wilson's Promontory
- Coast between Orbost and Mallacoota
- South east Victoria-NSW border e.g. Nadgee Nature Reserve
- All Victorian alpine areas
- Murray River

NEW SOUTH WALES and AUSTRALIAN CAPITAL TERRITORY

Well Covered

- Ben Boyd National Park
- Tidbinbilla Range
- Coast from Batemans Bay to Newcastle
- Morton N.P., Shoalhaven River, Bowral area
- Coast Port Macquarie to Kempsey
- Coast Murwillumbah to Ballina
- Coffs Harbour to Yuragir N.P.

Poorly Covered

- Tathra to Batemans Bay and Goulbourn including Wadbilliga and Deua National Parks
- South of Katoomba e.g. Kanangara Boyd N.P.
- North, west and south of ACT except for Tibdinbilla Range
- Inland areas between Lithgow-Richmond and Armidale-Bellingen except for Armidale to Coffs Harbour Rd and New England N.P.
- Murwillumbah-Grafton inland to Bald Rock N.P. and Gibralter Range N.P.
- Coast from Ballina to Grafton
- Coast from Coffs harbour to Kempsey
- Coast from Myall Lakes to Newcastle

TASMANIA

Well Covered

- Georgetown area
- Derwent Bridge
- Rocky Cape N.P.
- North and south west parts of Bruny Island
- Ben Lomond N.P.

Poorly Covered

- South west of the Lyell Highway except for Hartz Mountain and Mt Wellington
- The north east from Cape Freycinet to Scotsdale

- Cradle Mountain-Lake St Clair N.P. and the Great Lakes area
- The north west except for Green Point West to Richardson and Smithton to Wynyard
- Tasman and Forestier Peninsulas
- South east coast except Freycinet Peninsula

QUEENSLAND

Well Covered

- Caloundra area

Poorly Covered

- Gold Coast to Brisbane
- West and south west of Brisbane
- Noosa to Bundaberg
- Baffle Creek (north of Bundaberg) to Rockhampton
- Rockhampton to Townsville
- Townsville northwards except for Palmerston, Jourama and Crystal Creek National Parks
- Bloomfield River to Cape Flattery
- Fraser Island

NORTH TERRITORY

ALL poorly covered

The least recorded banksias are as follows

	No. of Records		No. of Records
B. cuneata	1	B. meisneri var. meisneri	7
B. conferta var. penicillata	1	B. plagiocarpa	0
B. goodii	6	B. scabrella	1
B. laevigata subsp. laevigata	4	B. sphaerocarpa var. dolichostyla	1
B. laricina	6	B. tricuspis	2
B. lullfitzii	2		

From a farmer near Cooma (who shall remain anonymous)

"Around our area banksias are a pest. Recently we had some patches of banksia and other scrub bulldozed to clear it up but the banksias came back as thick as ever. I can't see why anyone would want to protect these bushes. If anyone wants ours, they can have them as long as they dig them out themsleves."

HAZARDS OF BANKSIA WATCHING (NOT GROSSLY EXAGGERATED!)