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The Australian flora has developed largely in isolation from that of the rest of the world and includes hundreds of species of unique, spectacular flowering plants. Its conservation is vital and there is much that the individual can do. The role of Australian Plants and the Society is a crucial one.

The Society is active and very involved in conservation issues. The reports in this issue from two areas of Western Australia are typical of active involvement at the local level. A more detailed statement of the Society's activities is presented on page 151. We are all, individually and as a group, deeply concerned and active in the preservation of our flora.

On a broader plain, and we think possibly the most critical and effective area in conservation, we are concerned with cultivation of the unique Australian wildflowers. Many plants will become extinct if positive action is not taken. It is also inevitable, that the natural habitat of certain species will disappear, usually due to the works of man, and in this event, the species will need to be re-established in a nature reserve. It is vital that we learn how to propagate and reliably cultivate the species involved.

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Continuing our commitment to present the vast range of the Australian flora in vivid colour and its application to horticulture, this issue presents plants and gardens in the vast hot dry interior (opposite), Central Queensland, suburbia Sydney, Victoria and Western Australia.

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COVER PLATE

Eremophila gilesii — An Emu Bush

Photography F. D. Hockings

A tidy little shrub from the mulga scrub to less than a metre high that, in ideal conditions, carries flowers for most of the year. For the cultivation of *Eremophila*, refer to page 162. Commonly known as Emu Bush, *Eremophila* are plants of the dry centre. Many have proven to be excellent garden shrubs for the hot situation.

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Wildflowers In The Hot Sun

by Andrew Mitchell
and Bill Payne

'Plants of the Arid Shrublands of Western Australia'* (see footnote) describes and illustrates the following plants. This may encourage you to buy the book to learn more and obtain the beautiful colour plates. The plants are suitable for gardens in a hot, hot, hotter situation and experiences with such a garden over many years are given on page 162. If you are gardening in a hot dry situation, please refer to No. 93 issue of Volume No. 12 — This introduction by the Editor.

The Poverty Bush Group or the Emu Bushes or *Eremophila*

Eremophila crenulata. A flat topped plant usually to one metre. The shiny dark green leaves, 2-4 cm long and to 1 cm wide, are oval to pear shaped with crinkled edges. The tubular light blue to pink flowers are 1.5 cm long.

Eremophila cuneifolia. A spreading shrub to 1.5 m. The olive-green wedge-shaped leaves are to 12 mm across, thickened warty and covered in very short hairs. The tubular deep purple to violet flowers are carried in abundance. The bush remains colourful when the flowers age, the petals falling off and the enlarged mauve calyx creating a second display.

Eremophila delisseri. A rounded shrub to 1 m tall. The spear shaped leaves in opposite pairs, have a covering of short white hairs and are 15 mm long and 6 mm wide. The purple flowers are up to 30 mm long and 8 mm wide.

Eremophila forrestii. A compact upright shrub to 2 m. The oval to oblong leaves are to 15 mm long and 10 mm wide, greyish-green and covered in a dense mat of hairs giving a dull appearance. The pale pink to light brown flowers are to 20 mm long with dark purplish spots down the throat.

Eremophila fraseri. A bright green shrub to 3 m. The leaves are to 8 cm long and 2 cm wide, very resinous and without hairs. The flowers are a brownish-red on the outside and pale lilac inside, finely spotted.

Eremophila freelingii. A flat topped bush usually to one metre. The dull green pendulous leaves are 10 cm long to 6 mm wide tapering to a fine point. The lilac to pale blue flowers are 3 cm long.

Eremophila granitica. An open thin leaved bush to 1.5 m. The bright green leaves are 4 cm long and 2 mm wide and sticky to the touch. The mauve, white or pink flowers are on stalks to 20 mm.

Eremophila latrobei. A grey to green shrub to 2 m. The alternate linear to oblong leaves, frequently warty, are 4 cm long to 4 mm wide with rolled under margins. The yellow and orange to red flowers are 3.5 cm long. ▷

*This book by A. A. Mitchell and D. G. Wilcox with photographs by E. Laidlaw. It is available for \$28.00 from The University of Western Australia Press, Nedlands 6009. A well presented book with 297 colour plates, it is excellent value as a reference to the arid shrublands flora. The book was prepared with the support of the Department of Agriculture, Rangeland Management Branch, the authors having been employed to assist the pastoralists in the proper management of their ranges. For this reason, the book is presented in easily read and understood terms with advice on which plants are stock feed, which are needed to be treated with care, and which indicate that the range has been overgrazed. To supplement the adequate description of the plant, there are two or more colour plates, one of the whole plant showing its general appearance, and one of flower or fruit. Because of this presentation the book will be of wider interest to our readers. — Editor



Eremophila bowmanii △

Photography W. H. Payne

▽ *Eremophila mackinlayii*





Eremophila obovata (above)

Photography by F. D. Hockings

A dwarf spreading shrub to less than a metre, the blue to pale purple tubular flowers being 2.2 cm long. It occurs across the dry centre from Queensland to the Tanami Desert, Western Australia.

Eremophila bowmanii (opposite top)

Photography by F. D. Hockings

A dwarf, spreading, upright shrub rarely above one metre high and usually less in cultivation. The light to dark blue flowers are 2.5 cm long. It occurs naturally in inland New South Wales and Queensland.

Eremophila mackinlayii (opposite bottom)

Photography by W. H. Payne

This beautiful shrub is growing in Noel Gane's garden, see page 156. This decorative plant occurs in Western Australia where it is known as Desert Pride.

Eremophila linearis. A compact dense shrub to 3 m. The bright green leaves are sticky, hairless, 5 cm long and 5 mm wide. The pink to red flowers are yellow inside the throat.

Eremophila macmillaniana. An upright shrub to 2 m. The lower leaves are spoon shaped while the upper ones tend to be spear shaped, 5 cm long and 1.5 cm wide and covered in fine felty hairs. The flowers are pink to dull red on the outside and yellow on the inside.

Eremophila maculata. A low dense shrub to 0.5 m. The dark green leaves are 4 cm long and 6 mm wide, have a rounded or pointed end and a glossy, hairless surface. The crimson flowers have throats spotted with brown flecks.

Eremophila maitlandii. An erect, many branched shrub to 3 m. The silver felty leaves, 7 cm long and 5 mm wide, have blunt yellowish green tips. The pale blue to lilac flowers are 2 cm long.

Eremophila margarethae. An open spreading shrub to 1.3 m. The grey leaves, 5 cm long and 3 mm wide, have a fine felty covering and are sulphur yellow when young. The mauve flowers have a fine hairy covering.

Eremophila oldfieldii. An erect tall shrub to small tree to 4 m. The upright dark green leaves are 10 cm long and 4 mm wide, flattened and coming to a point. The red flowers tending to yellow at the base, are on S-shaped stalks.

Eremophila platycalyx. An erect shrub to small tree to 3 m tall. The grey or green leaves are spear shaped, 5 cm long and 6 mm wide coming to a sharp tip that forms a hook. The pink, orange or cream flowers to 1.5 cm long have black spots in the throat.

Eremophila pterocarpa. A dense leafy, silvery bush to 3 m. The light grey velvety leaves are 3 cm long by 3 mm wide, pointed and crowded together along the stems. The pink to dull red flowers are yellow inside and 3 cm long.

Eremophila scoparia. A dense erect shrub to 2.5 m. The leaves, opposite in pairs are 20 mm long and 1 mm in diameter to form a tube, and are covered with minute silvery scales. The tips come to a hooked point. The lilac flowers, 10 mm long, have purple spots in the throat. Commonly known as Broom Bush, it is very similar to *Eremophila pantonii* and *E. arachnoides* also of the Murchison area where these species are restricted to limestone soils.

Eremophila spectabilis. A showy shrub to 1.5 m. The leaves are 8 cm long to 7 mm wide. The large pale to deep blue flowers on long stalks are to 3.5 cm long, frequently massed.

Saltbush *Atriplex*

A seemingly unlikely horticultural biennial, for harsh, hot, dry conditions they would add landscaping character. They could be used as ground covers in a little watered garden. Attractive shrubs to less than 0.5 m tall, the leaves are grey to bluish-grey, with shallow teeth on the margins presented usually in a dense rounded bush. The following are described and illustrated in colour. They are rarely eaten by stock and indicate poor range condition. *Atriplex acutibractea* (Toothed Saltbush). *Atriplex codonocarpa* (Dwarf Saltbush), *Atriplex holocarpa* (Pop Saltbush) and *Atriplex semilunaris* (Annual Saltbush).

The shrubby saltbushes are tolerant of hot dry, semi-saline conditions and mostly grow in clay soils. They are grey or bluish-grey shrubs varying from 0.3 to 2 m tall. They are generally of moderate stock feed value. *Atriplex amnicola* grows up to 1.5 m tall and has a spreading habit as stem tips peg down and is tolerant of water logging. *Atriplex nummularia* is an upright shrub that grows up to 2 m tall and has a silver appearance. It is widely grown in areas with saline waters as a wind break and hedge plant.

Cassia or Rattlepods

Of the eight species of *Cassia* described, four of special value for horticulture are described below. They are all shrubs which vary from 0.3 to 2 m tall and all have bright yellow 'butter cup' like flowers and flat pods.

Cassia hamersleyensis is a prostrate shrub to 0.3 m with bluish-green leaves and flowers that are produced on a very long (6 cm) common stalk. It naturally grows on clay soils and is currently under cultivation in gardens in the north-west of Western Australia.

Cassia helmsii is a shrub to 2 m tall with distinctive hairy grey leaves. They are 3-4 cm long and consist of up to five pairs of leaflets, each of which is blunt-tipped with rolled over edges. It is grown in gardens throughout Western Australia as it has startling grey foliage and produces masses of blooms.

Cassia nemophila grows to 2 m tall. It is a bushy bright-green shrub that produces masses of yellow flowers. The species is highly variable. The specimen shown in the book has very distinctive pairs of 'snake-tongue' leaflets.

Cassia oligophylla is a shrub to 1.5 m with an umbrella like canopy of greyish-green leaves. Each leaf consists of three pairs of leaflets. The grey colour is caused by a waxy bloom on the surface of the leaflets. Again, this shrub provides a mass of yellow flowers when in bloom.

Bluebushes — *Maireana*

Sixteen have been described in the book and all but one, *Maireana carnosa* are perennials. They vary from 0.1 m to 2 m tall and from grey to dark green in appearance but all have succulent foliage and seed cases that resemble flying saucers. They are a valuable source of forage for stock.

Maireana aphylla is a compact shrub to 1.5 m with very small leaves. It grows side branches that die off to become thorns. It is dark green in colour and its stems are pendulous. It has been grown successfully in gardens in the north-west of Western Australia, with a minimum of water.

Maireana georgei is a low compact shrub to 0.5 m and after flowering, produces masses of large (2 cm wide) golden fruit which gives it its name of golden bluebush.

Maireana glomerifolia is a low compact shrub that grows up to 0.4 m tall. It develops side branches that die off and become thorns. It has very attractive pink fruit with large processes protruding from the centre of each 'flying saucer' capsule. Its leaves are very peculiar. The stems are covered in grey-green balls closely pressed to the stem surface. Each ball is a group of leaves. It has been known to grow in cultivation but does not like over watering.

Maireana polypterygia is a green compact shrub growing up to 1.5 m tall that after flowering produces masses of papery black seeds. ■



Eremophila longifolia

Photography by Steven Pearson

Wildflowers in Pictures

Editor

Most people like to look at beautiful pictures. For many, the beauty of our wildflowers is in the pleasing variety of form and colour. They are not especially interested in the vast amount of information we supply about the plants. Hopefully, they will enlarge their appreciation of the beauty of nature to include a more active concern about the preservation of our vast unique flora before it is too late and at least read the next few pages.

Australian Plants presents, in every issue, wildflowers in pictures. We are the leading reference in the world on "wildflowers in pictures", the many large clear colour plates making it a worthwhile purchase to admire and keep, just for the beautiful pictures. Only the well informed really realise that most of these colour photographs are of plants never previously published and are a priceless acquisition. Do they stir you to learn more of the Australian flora and raise a patriotic desire, or a surge of passion following a picture of beauty, to do something about the preservation of these plants? Without more public support they will disappear forever. Please read the next few pages.

Wildflowers in pictures, a collection over the years of pictures of hundreds of our wildflowers, is a major objective of Australian Plants and your continued support is vital for us.

To supplement this programme of presenting all our wildflowers in beautiful colour pictures, we have published a new book "Plants of Central Queensland" which includes over 400 colour pictures of all the wildflowers of Central Queensland. One of these pictures (reduced to suit our paper size) is reproduced above. See page 169 for details of how you can purchase this book. ■

Save our Wildflowers

Editor*

This issue is dedicated to the saving from extinction, our magnificent natural flora. Conservation is a difficult, complex problem and unfortunately concerned people are confused about what are the real issues, what needs to be done and what they can do to help. Those already engaged in some activity are often so committed, so deeply concerned on a personal level, that they can frighten you with their fervour and actions. Do not be deterred. You will not be asked to lie down in front of a bulldozer. Hopefully the following pages will assist you. Any large national objective, I prefer the word crisis, can only be solved by action on many smaller objectives by interested people contributing at the level available to them.

The Global Level

There is little doubt that the future of life on our planet is at risk due to many factors, some of which are a result of man's initiative to improve himself. This drive may be driven by power, greed, selfish interest or a desire to improve man's lot but it exists and will continue regardless of moralizing. It is up to us to do what we can to direct this drive towards solving the problems we have created and I have sufficient confidence in mankind, particularly the young yet to come to power, to be able to do this. The more well known of these horrors facing us are "The Greenhouse Effect" and "The Ozone Layer Defect". These matters require your continued interest, selective voting and persistent questioning and outcry.

The National Level

The nation is people and the resources they have inherited and manage; as the cynics could say the resources they abuse as they have done in the past. You will notice I have put people first. One reason is that the major factor for good or bad, for positive action or neglect, is people. It is ridiculous for conservationists to plan the maintenance and restoration of natural resources without considering people. It is unrealistic to expect people to efface themselves, to accept a lower standard of living or to discourage them from attempting to improve their way of life. With imagination and the shrewd use of technology and research, we can maintain progress to prosperity and a better way of life and still make this planet of ours more beautiful and satisfying. We can only achieve this with proper leadership and it is here that the public needs to be informed, inquisitive and selective in their voting. There has never been a better system of living together in the whole history of mankind, than we have in Australia; let us develop our system to conserve our natural resources better than we have in the past.

National Conservation Objectives

The range of objectives on a national level is so vast, we shall confine our interest here to the conservation of our magnificent flora. The whole global strategy of survival can be broken down to a myriad of smaller objectives, each of which need concerned people; people, while understanding the overall picture and doing what they can in the larger sphere, are directly involved in a specific area. You can affect the global problem by achievement in a specific area of the overall problem. Our specific objective is conservation of the Australian flora.

Conservation of the Australian Flora — The Survival of Man

Even this seemingly tiny factor that will contribute to the survival of man, assumes a major objective when you consider the magnitude of the problem and the many lines of action. As a practical, and many consider the most effective, even most critical plan of action, the Society has chosen to actively pursue the objectives outlined opposite. This does not indicate that other activities are not equally important or that they don't have full Society support. Many factors are:

1. **Political Action.** Politicians need your advice to keep them informed, to make decisions. He does not need to be a "greenie", but have the capacity and courage to act on well presented advice from "greenies" and this advice needs to come from you. Take an active interest in conservation issues and the various groups fighting for them.
2. **The Public Service.** We have inherited a large public service safely installed to achieve what? When we read of the work of Andrew Mitchell (page 143) and Steven Pearson (page 169) we get a feeling of satisfaction that the younger public servants at the "doing" level are "serving the public well". When we hear of such proposals as new sewerage ocean outlets at Emerald Beach, New South Wales, and a beautiful stretch of beach and inlets in Victoria, one wonders at the mentality of some of our senior public servants. Be active on the local group formed to correct each disaster and to agitate for a more responsible approach.
3. **Public Agitation.** The democratic way is to pester the politicians and for passive but forceful demonstrations. These are effective if supported as described on page 167, "The Green Revolution — The Pioneers".
4. **The Public Forum.** Television and the recent series on our planet and its range of creatures has been a major influence in conservation awareness. A more sympathetic and informed reporting by the printed media would be an improvement that we can hope for and agitate for. However, once again, it requires your involvement, not to agitate and whinge about its inferior quality but to be active in conservation groups and to produce informed articles for publication. This is the only way you can expect an improvement as reports are short of time (lazy).
5. **Research.** When you become involved in issues you will very quickly find out that you do not really know what to do in practical detail. We require the assistance of scientific researchers and for this we have The Australian Flora Foundation, see page 154.
6. **The Private Industry Sector.** The public image of a commercial undertaking is a valuable asset. Some industries have been shrewd enough to recognize the value of association with a community need. "The Quiet Achiever" is a classic example of unselfish investment in the nation's resources and the respect it receives in return. If there is a responsible company executive interested in Australia as well as his company's image, contact me and I am sure you will be delighted with the outcome.

The horticultural industry can make a significant impact with imaginative drive and initiative. A few in the industry are mentioned in this issue and I would welcome inquiries from others anxious to help.

*The Editor expresses here a personal opinion. After thirty years of producing Australian Plants I thought I was entitled to express an opinion on such a vital issue to us all. I regret space did not permit presentation of all the problems facing us in a more complete manner — W. H. Payne. ■

Conservation of the Australian Flora

A review of Society involvement by the Editor.

The Australian flora comprises thousands of species of unique plants, hundreds of these being spectacular in flower and form. Conservation of this flora is the primary role of this publication and the Society.

Being the largest conservation Society in Australia, we accept the obligation to be active and committed in the battle for conservation of the spectacular national asset. The challenge is so vast, so incredibly interwoven with local and national issues and even the survival of man, that, regardless of what is attempted there will be concern by many that not enough is being done, and by others that the action taken is misguided. At times, everyone wants to be a "greeny", after all it is now generally accepted that the future of our planet, and life on it, is at stake. But! Apparently a majority of these concerned people are reluctant to be active greenies or even to openly support the active greenies of recent years. The image projected by the media is of a band of unwashed, unshaven, near violent rabble with a few misguided radicals. (See page 167 for "Pioneer Conservationists"). It has been claimed that even this Society has adopted a dignified posture of non-involvement. Nothing could be further from the truth, except? No, no exceptions, it is simply that the Society has maintained a different stance. (Why, I am beginning to sound like a politician, to want the credit but to shy clear of committed involvement).

Local Conservation Issues

Political agitation and the creation of reserves is an important aspect that we are happy to leave, but with our active support, to specialist conservation groups. If you have a particular concern about a specific area there will be a local conservation group especially concerned with this area with detailed local knowledge and a direct line of action.

The strength of the Society is in the hundred odd local groups around Australia concerned and involved in local, even state wide issues (see other articles in this issue). If there is not a local group fighting for a piece of bushland that you treasure, contact the Society secretary for your state. The ultimate group formed may not be, formally, a branch of the Society as these decisions are left to the local group members, but the support of the Society at the local level will not be diminished even though it may seem we are not directly responsible. It is this policy of encouraging local autonomy rather than rigid central control from the state capital that is a feature of the Society operations and a major factor in its strength and membership. It has also led to the mistaken impression that the Society is not involved in an active committed way as are many of these local conservation groups. Members of these groups are often Society members but have decided that they can more effectively work not as part of the Society but with other associations or under a separate identity. This is quite acceptable to the Society without any diminishing of support or assistance. No national body, or state wide body, can effectively deal with the hundreds of local issues around Australia. The Society has a concerned conservation officer in each state to give support where they can. The Society governing body in each state cannot give the time and attention to all the very many local issues, even if they could get adequate local knowledge. The Society, as a whole, has a vital role in a totally different area.

National Conservation Issues

On broader, national issues, the degree of involvement varies in each state. There is a national conservation body, The Australian Conservation Foundation, adequately funded and with full time paid staff that does an excellent, competent job on many controversial issues. Naturally it also attracts some radicals (would this just be an extremely concerned citizen who wants to be active in this area) but all areas of thought are well catered for.

Conservation — The Society's Role

The contribution from the Society For Growing Australian Plants* towards the conservation of the Australian flora has been extremely important.

1. As an active society for thirty-three years, it has provided a focal point for action on conservation issues. With some ten thousand members, it is the largest horticultural/conservation society in Australia, possibly in the world.
2. A significant factor has been that the autonomous societies in each state have, at all times been active and very conservation conscious. Some members, not fully informed on what has been and is being done, have indicated some concern that this activity has not been more evident. It is a policy in most states, to encourage the creation of active conservation groups in all areas of concern and foster active participation by concerned informed people at the local, often more effective level.
3. A major strength of the Society is the nearly 100 local groups, active in most centres throughout Australia. These comprise local concerned people who are well informed, who are leaders of their community in conservation matters. The Society encourages a large measure of autonomy and local freedom of action and, for most of the group members, the Society is the local group.
4. Australian Plants has now been publishing for thirty years. It has received international status, but significantly, has been accepted on a national level, as a competent, authoritative reference to matters relating to the Australian flora. Australian Plants has played a vital role in providing unity and stability for the Society, and the effective conservation of the Australian flora.
5. The horticultural industry has received consistent support and pressure to maintain public interest in the use of Australian flora in horticulture. This is reflected in the wider use of our wildflowers in landscaping, especially in public places. The flora has been accepted as being a part of the Australian environment both in our gardens and in the bush.

*The Society For Growing Australian Plants is a grouping of completely autonomous societies in each state, co-operating for their mutual benefit. In Western Australia, they have chosen to call their state society, the Western Australian Wildflower Society but they have always been an active contributing society having their origin in the same period and with the same objectives as the Society in each of the other states. In fact, other states have often had cause for admiration of their dedicated thoughtful activities, especially their vigorous activity towards the conservation of their magnificent flora.

6. The efforts by the Society to develop the most pleasing forms of wildflowers for use in horticulture have had a significant effect in generating a world-wide awareness of the splendour and uniqueness of the Australian flora and its significance as one of the natural wonders of the world. We have moved from "let us save our flora" to "it is vital that the unique Australian flora be saved for the world heritage", what positive action is needed.

7. Scientific research is essential. The Society founded The Australian Flora Foundation and has largely funded it to the present. The Flora Foundation is completely independant, being administered by leading scientists of Australia. They are now well established and are selecting major priorities for research. We desperately need sponsorship, an Australian or an Australian company who appreciates the contribution the Australian flora can make to the future of man and the tremendous prestige that can be generated. ■

Rare or Threatened Australian Plants

A Review by
The Editor

This is the title of a book by J. D. Briggs and L. H. Leigh of the C.S.I.R.O. Division of Plant Industry, sponsored and available from The Australian National Parks and Wildlife Service (Special Publication No. 14, 1989). The book is essentially a list of plant species that are regarded as critically endangered (E), vulnerable (V) and rare (R), grouped in areas of occurrence.

Depending on the state, the percentage that occur in national parks and reserves varies from 45% to 83% and this highlights the crucial stand taken by this publication and the Society. It is not sufficient to complacently rely on nature and a reserve fence to assure the continuance of all species of life. It is essential that we find reliable methods to assure healthy growth.

Natural reproduction? A critical factor is the vigour of the pollination agents, be they bird or insect, and this requires the maintenance of a balanced ecosystem for all forms of life naturally found in a particular area. It is clear that the contributing conditions are numerous, the biggest ones being the presence of man and his introduced pets/pests.

The publication of such a book listing endangered plant names has produced varying responses. Fortunately it has become a rallying focus for action by many. The establishment has been able to use it to increase the level of funding for non-revenue raising (and as such very low-priority to some) projects associated with our flora conservation. The politicians now find it politically expedient to show at least a noticeable interest in the earth's ecology and this is a book "to be seen with".

An initiative in New South Wales came from the Education Department that has developed a "plant and save" programme sponsored by K-Mart. It encourages school children to propagate and plant native species that are losing a root-hold in the state. The book has been the primary source of information in choosing which plants to propagate. Two hundred schools have become involved. One sincerely hopes that the expertise and planning offered to them is equal to the enthusiasm available.

We have a lot to learn and Australian Plants hopes to foster this effort. ■

Conservation and Research

From the preceding articles it will be noted that the Society has placed major emphasis on scientific research. Not research that confirms what we already know, how bad the devastation is, not surveys of areas to amass schedules of data and lists of scientific names (there has been enough of this comfortable hackwork), not lists of endangered plants (we now have this, see page 153), but research leading to practical solutions. The Federal Government has at last realized (just prior to election time), their obligation to at least make a token start on global issues such as air and water pollution, land degradation and the restoration of tree cover. Your support of The Australian Conservation Foundation and Greening Australia should be active, as these bodies will never stop informed agitation on all national issues.

On our chosen battle front, the preservation of the Australian flora, our hopes rest with the Australian Flora Foundation. To date the government has ignored this active body of practical scientists so that it relies on public and corporate funding. This has meant funding by readers of Australian Plants and it is an example of how the average citizen with small donations can make a large impact. If you feel that you want to contribute to the conservation of the Australian flora in a practical way send your tax-free donation.

We need to know how to reliably grow plants that have developed in the wild and never been tamed. Unlike animals, we do not want plant zoos (the plant in this cage once grew on what is now wheatfield plains and this specimen is one of the few survivors). We want healthy colonies of plants growing in natural areas, competently managed.

If certain plants can receive a good price on the market we support banning of the present practice of ravaging the surviving plants in the wild, but rather than a plant hunters police squad to attempt to curtail the inevitable illicit trade that is developing, why not a commercial plant farm where the farmer can grow and harvest even better plants than found in the wild. This means research as described opposite, *Conospermum* — The Smoke Bush — Its Conservation and Development as a Cut Flower.

Support this form of conservation by sending your tax free donation of \$100.00 to The Australian Flora Foundation, 28 Buderim Avenue, Kareela 2232. ■

Scientific Research — Mickey Mouse Research

An important note

The above research project was announced in our No. 118 issue. I thought I made it clear that this research is on two levels. The major commitment is competent scientific research by The Australian Flora Foundation. This is the application of science by scientists only to solve a problem using scientific research. We may give them the money to do the work and find suitable specimens for them to work with, but we lesser mortals are not involved in their mystical operations. On an entirely different plane, selected Society members are involved in Mickey Mouse Research. Working entirely independently, we are collecting specimens, propagating plants and growing them on. Why should we not get a part of the fun/action. You can join in if you wish with the Smoke Bush Project or any of the many other plants the Society is working on. After all, this is what we are all about.

This note is to calm the agitation of some scientists who did not read the objectives as published and were upset at having Mickey Mouse on the scientific team — Editor.

Conospermum — The Smoke Bush

Its Conservation and Development as a Cut Flower

Our article in the No. 118 Issue of Australian Plants has inspired comment and concern. It seems there are many Australians concerned about the conservation of our unique flora and its exploitation by commercial flower pickers. Fortunately, there are also many who take a positive view — by all means discourage the bush despoilers but let us accept some responsibility for our heritage and learn how to manage it and to grow those species with a commercial market, in wildflower farms.

The Australian Flora Foundation is leading this crusade of a scientific approach to development and management of our flora, see opposite. A number of individuals with some skills and facilities have also offered to start work on a study of the *Conospermum*, Smoke Bush, Project. It is a pity that they should have to start on such a difficult genus and it will certainly be a challenge.

We have an offer from a reader with some horticultural experience and a property in New South Wales that has a rich red soil resembling a sandy clay loam, with good drainage, hot summers, cold winters, low humidity and a rainfall of 10 inches per annum. This looks ideal. What is needed, is for readers in Western Australia to undertake to send propagation material from selected plants.

Western Australians, will you please look around you. Decide which of the species of Smoke Bush described in our No. 118 issue look the best and advise the Editor, Australian Plants. I will advise how to take propagation material that will not harm the plant and where to send it. I know there are many people in the west very concerned about their flora. This is a chance to do something about it. ■

Conservation of Western Wildflowers on Road Verges

Mary Sherwood

In the December, 1988, No. 117 Issue of Australian Plants it was stated that much of our flora is dependent on road verges and inadequate measures were being taken to conserve the road verge flora. In the Albany area the Conservation and Land Management and the Main Roads Departments have a plan in operation.

Wildflower societies and conservation groups are working on a verge management plan. A survey is underway listing wildflowers along as many roads as possible. The information gained is being used by the Main Roads Department, to reseed areas with the same type of plants, where necessary, should these be disturbed during road widening.

In our great southern area, Max Hardacre of the Main Roads Department, has worked with the Albany Branch of the Western Australia Wildflower Society in reseeding many road verges. Hundreds of kilometres have been planted on Chester Pass Road, Albany Highway, and Hassell Highway, to name a few, and our Society has planted thousands of trees and shrubs in disused gravel pits and other areas where they are needed.

Our Albany and Denmark Shire Councils have now put a ban on commercial picking of verges and reserves and there is now more interest in farming of wildflowers. As a community we are well aware of our responsibility in preserving the unique wildflowers of our area and we hope we are not too late. ■

Conservation of Western Australian Flora

Mt. Lesueur is a typical example of the dilemma facing mankind. The natural wilderness area between Jurien Bay Road and Green Head Road west of the Brand Highway is the home of over 800 species of Australian flora; not just Western Australian wildflowers, but a part of a diminishing world heritage. Generations have enjoyed the area in the belief that it was safe as a wild area, being preserved by responsible government. Someone can now see a short term profit in development that will prejudice the future of the whole area.

Conservation in Western Australia has had its champions in the past, some with success. To mention anyone will no doubt do a disservice to many due to my relative ignorance, but reports indicate that the concern of Western Australians is escalating. A fortunate few have made big money exploiting the natural reserves. Are there no Dick Smith's among them? ■

My Garden — 3

Noel Gane

An absorbing hobby for over thirty years has been my wildflower garden — of course this might be second to the achievements of the Balmain Tigers football team. To potter around the garden and watch plants grow, the buds develop and the flowers unfold, has a fascination all of its own, for me — or do I get a greater thrill taking struck cuttings out of the frame. Shut in the shadehouse for a few minutes each morning and night while I water the young plants, provides peace and pleasure, a refuge that has sustained me over some very difficult times in the past few years.

I always had a desire to grow plants but natives were only grown by people who wanted to grow something different. Some thirty odd years ago, I had a lucky break when I called into the local nurseryman, Norman Denovan, to have a chat. This started a new relationship, a fascination with our wild plants and a friendship with an ex-sailor cum nurseryman with a continual urge to go bush, and an equally crazy mate (now departed) Viv Hopkins. This was the start of a rewarding growing circle of wildflower friends in this marvellous Society for Growing Australian Plants.

The message Norm gave me was to build up the beds at least 30 cm if possible, to allow good drainage and a good depth of soil. Like every person starting out, I wanted to grow everything that we now regard as difficult.

The garden pictured opposite was an early achievement. I cleared a piece of lawn between the clothesline and the house, that we could admire through the kitchen window. We had the inspiration to create the informal shape. With a concrete footing, rocks were purchased and stood on edge. This we filled with bush sand purchased for the purpose and the result is as shown. The same soil exists now in this rocked enclosure as was first deposited nearly thirty years ago. There being no trees in the vicinity, there has never been a problem with root competition.

We have had considerable success with a wide range of heath plants, some of which are shown in the photograph. The only concession to feeding the plants and maintaining the nutrition of the soil, is the placing of a low phosphorus complete fertilizer below each planting and occasional drenching of the soil with a liquid "Aquasol" type of fertilizer watered directly onto the ground. In fairness, the number of plants planted over the years was very large and these would have been growing in a pot of composted soil. In any event, we were successful.

Noel's Kitchen Garden (opposite top)

Photography by W. H. Payne

How to establish a garden in a lawn between the clothes line and the house (outside the kitchen window) on a flat block of clay is described opposite. This photograph was taken when the garden was far from its best, but you can get some idea of the spectacle it has been for 15 years. New plants have been planted in the front but as shown, the front plants are Flannel Flower, *Actinotus helianthi* with *Brachyscome iberidifolia* (mauve flowers) on the right, and *Boronia thujona* on the left. Further back is *Boronia megastigma* 'Lutea', *Boronia crenulata*, *Boronia denticulata*, *Grevillea* 'Shirley Howie', more *Brachyscome* spreading down over the rock edge, *Eriostemon myoporoides* (white), *Phebalium bullatum* (yellow), and *Boronia anemonifolia*.

Eremophila laanii (opposite bottom)

Photography by Carl Hubner



Noel's Kitchen Garden △

▽ *Eremophila laanii*



The front garden pictured on page 161 has always been maintained as our showpiece to the public. Initially, we concentrated on what we were told were heavy soil plants such as *Melaleuca*. The soil was built up with vast quantities of *Casuarina* needles that I collected over the years and I found that any native that could be grown in areas of lighter soil, would also grow here. We have had enjoyable displays of *Grevillea* and *Lechenaultia*.

I now hope to help make *Eremophila* a popular genus to grow, see page 162.

Compost has also played an integral part in the build up of the soil. It consists mainly of vegetable refuse, small quantity of buffalo lawn clippings, soil and a few handfuls of Dolomite. I have two bins .9 m × .9 m high, when one fills it is transferred to the adjoining bin. This compost is used for backfilling when planting out and for potting on struck *Eremophila* cuttings after being sieved. A little coarse sand may be added. No Osmocote or fertilizer is used in the pots except for a soluble fertilizer such as Aquasol or Thrive, this is applied mainly in autumn and winter. For the garden, fertilizer is used when planting out. This is spread over the bottom and around the side of the hole which is usually about twice the size of the potted plant. A little compost then to cover the bottom and, after planting, backfill with compost. There has been nothing to suggest that this native plant fertilizer which has a low phosphorous content has had any adverse effect on any of my plants. However, the main source of food for *Eremophila* in my case is undoubtedly stable manure, the more the better.

Noel's Garden

Comments by the Editor*

I have organized the "My Garden" series of articles to show readers how easy it is to grow a native garden with spectacular success. A major requirement is that the garden be illustrated in colour so we can see for ourselves what has been achieved. I feel there is also a lesson to be learned by all because not all of us have such good gardens. Why not?

What is Noel Gane's secret to success? He had all the natural disadvantages, a flat block of poorly drained soggy clay, an oppressively hot situation in summer with no shade; he still does not have any shade from trees. As he has pointed out, the hot, still, breathless days can be relieved by fierce funneling winds. He has created raised gardens of composted soil sitting on top of the clay. The remaining area of lawn and concrete paths just manages to drain the surface water away as it collects. This is unless the Georges River floods and his block gets covered. The first lesson is that anyone can create this raised garden situation, provided you drain away surface water at the level where the garden soil sits on the clay.

Noel is a dedicated user of his compost heap, see above.

Possibly his natural disadvantages are really his assets. In summer it is hot. You feel the need to find some shade. The small heath plants he grows cannot move out of the sun but seem to revel in it. With the soil sitting on top of the moist nutrient rich clay, there is a moist fresh area deep down apparently ideal for root nourishment. He supplements this deep well-drained soil, nourished with compost and resting on a nutrient rich clay, with a good deep mulch blanketing the top. He prefers Eucalyptus bark chips for the front show garden, but horse manure for the *Eremophila* garden.

But, now he is growing *Eremophila* in a rich mixture of horse manure. *Eremophila* are plants of the dry, hot desert, and Noel is growing them to perfection, possibly even better than in the desert.

The photograph on page 165 shows three *Eremophila* growing in this garden. He clears the plants out every few years and starts again, the plants being so well grown that they start to crowd each other and are not shown to the best advantage. The "soil" in this garden at the moment would be 30-40 cm deep but would be 60% uncomposted horse manure, straight from stable to garden. When the garden is planted out he then mulches it to a depth of 10 cm with pure horse manure dumped on top and raked flat. He uses stable manure from the nearby trotting track. The horses never get on a paddock and graze on weeds. There is an initial germination of rye grass but these are easily plucked out and then — no weeds.

There is bound to be a lesson here. Could it be that it is not the horse manure/soil mix the roots of *Eremophila* are growing on, but again the sweet, cool, fresh layer on top of the clay that has the nutrients from the manure being slowly leached out of the mixture above? Almost an aqua-culture system?

Eremophila, the desert or Emu Bush, are obviously not greatly different from other plants, they love nutrition deep down. Naturally, it also relishes the hot, hot, hot sun. The wet, far from hot, summers in Sydney in the last few years have encouraged Noel to use grafting for special species but with the return of hot weather he will, once again, be less dependent on this recently introduced innovation.

***Eremophila* In Containers**

Plants in containers is another favourite way of growing *Eremophila* for Noel (visitors to Society flower shows marvel at them). What does he use, just composted soil? The plants grow and flower well! What is his secret? The compost is as he says, mostly kitchen wastage. My compost is never as crumbly as his. One day I walked in on him and discovered his secret. He sieves the output of the compost bin. To do this he spreads the compost out on a plastic sheet in the full hot sun. It is baked dry and crumbles easily for sieving. But, this may be the secret. I believe the sun is the best sterilizer; no not sterilize, it just reduces the level of pathogens; tiny creatures that live off plant tissue, to the level that a plant's root system can get a fair go. Why don't you try this method of producing your own potting mix. He uses nothing else.

After twisting his arm a little more, I find he uses a liquid fertilizer, the cheap look-alike to Aquasol available in the supermarket. He feeds in three really heaped teaspoonfuls of this into a 10 litre watering can of water and waters his pots 2-3 times a year. He pours it on until it starts gushing out the bottom of the pot.

An apology is due to Noel here. The photographs used to show his garden were not taken over the extended period when it was at its best. It was when I found the time and remembered to take the camera. His garden really is a picture for long periods each year. ■

"I have introduced this series "My Garden", provided it is illustrated with colour photographs (to let us see what you say you can grow) as a study into the reasons for success by good gardeners. In each case I follow this with my study of what has been said and achieved. I believe there are lessons to be learned by us all but it means that I will repeat, in some cases, what the author/gardener has said, highlighting what I consider are the significant points. I hope I do not bore you but I, at least, am keenly interested in finding out their secret. In this case the author/gardener, Noel Gane, has another article on the following page arranged to fit around the colour plate pages. My comments will apply to this article as well, please excuse them being before the article and not after it.—Editor.





My Front Garden — Noel Gane

Photography by W. H. Payne

This garden has been successfully entered into garden competitions. Noel does not groom the garden for competition, but because he loves our wild-flowers and he enjoys gardening. Every few years this garden is torn apart and most plants replaced. Over the years it has featured many plants such as *Grevillea*, *Lechenaultia*, Everlastings, and here, featuring *Eremophila*. The dominant plant in the centre is *Eremophila nivea* (the upright pale grey plant). It is to my shame that I did not get a good photograph of this plant at its peak. It was breathtaking, the large mauve flowers seeming to glow in the backdrop of silvery-grey foliage.

The smaller grey foliage plants, one on each side, are *Eremophila pterocarpa*. In front of *Eremophila nivea* is a small rock pool and the gravel path along the front, parallel to the front fence makes a stroll through this garden a delight.

My Garden from the House (opposite top)

Photography by W. H. Payne

The plants used may be more easily noted. A well-formed, rounded bush of *Acacia pilosa* is next to the front gate and coming towards the house adjacent to the driveway is *Grevillea* 'Pryor's Hybrid', *Grevillea* 'Poorinda Queen', *Eremophila denticulata* and *Grevillea baueri*. The centre garden around the large grey bush of *Eremophila nivea* is *Eremophila pantonii*, *Eremophila glabra* 'Murray River', *Eremophila pachyphylla*, *Eremophila carnososa* and a *Helichrysum* from South West Rocks, New South Wales.

Eremophila maculata 'Nyngan Form' (opposite bottom). A favourite plant of Noel Gane growing in his garden. For photographs in colour of the various forms of *Eremophila maculata* refer to page 13 of Volume No. 12.

How I grow and propagate *Eremophila* in Sydney

by Noel Gane

My methods of growing Australian plants vary quite a lot from other growers due to the weather conditions in our part of Sydney. Over the past couple of years the weather appears to me to have changed. The winters have got warmer and the summers have less heat, but more rain.

After being in the Society for over 30 years, I have tried to grow everything from difficult to what the experts term easy species. I have grown *Grevillea*, *Lechenaultia*, *Hakea* and *Melaleuca* with reasonable success, but still not achieving what I wanted.

Starting off with *Eremophila maculata* Nyngan Form and gradually building up to sixty plus species over the years, I have found growing *Eremophila* very rewarding. My main object was to plant species that grew no more than two metres. The smallness and flatness of my home site makes it very selective in what I can grow, the fall in the width of the land being 7.5 cm and only 15 cm in the length of the block. This meant that all beds needed to be raised at least 30 cm to improve drainage. Rather than buy soil I embarked on a build up of leaf mould, *Casuarina* needles and masses of stable manure, obtained from trotting stables nearby. I use this type of manure as it is weed free. The horses are not allowed out to graze in the paddocks. Thus you only have to dispose of the oats when it germinates and this is easy. The leaf mould was collected nearby over a period of time and the needles used as a mulch finally breaking down into the soil. Due to lack of storage space, as the manure is obtained it goes straight on to the garden. At times it may be 10 cm deep or even more over the entire garden. If rain has not fallen for a week or so I give the new plants a good watering. A circle of 15 cms around the base of the plant is usually kept clear of manure.

When pruning, in most cases, you can cut and shape regularly. You may lose some flower but it will achieve the desired result, a compact, well flowered bush. One exception appears to be *Eremophila viscida*. It dislikes hard pruning.

Because of the exposed position of my home, all *Eremophila* are staked. The west and south-west winds particularly can be very severe on shrubs. I get them to grow so well, leafy and compact and this will aggravate wind damage at the base of the plant. I prefer staking to the placement of sandstone rocks around the base of the plant as I believe they are kept much firmer in the ground. Paint the stake dark green and it is hardly noticed.

Eremophila maculata is available in many forms, all of which would be welcome additions to any garden. This applies especially with the 'Nyngan' Form (photograph on page 160), which has an abundance of dark red flowers. Another reliable form from South Australia has a smallish pale pink flower but it grows into a nice compact shrub attaining a maximum height of one metre.

Eremophila pterocarpa makes an outstanding contribution to a garden with its grey foliage and pink flowers; it will grow a nice shrub to a metre high.

Eremophila pantonii is another grey foliage plant that has never reached more than one metre high for me. To make a nice show, plant two together for greater effect. If *Eremophila pantonii*, is unavailable, try *Eremophila platycalyx* which also has grey foliage. The flower varies from orange to cream.

My two favourites are *Eremophila nivea* and *Eremophila maculata* var. *brevifolia*. The first named can be used as a focal point in your garden with spectacular foliage and mauve flowers. However, it does not tolerate pruning too hard and I usually replace it after two or three years. *E. maculata* var. *brevifolia* is really spectacular with dark green foliage and rich cerise flowers.

Others that have grown well are the various forms of *Eremophila glabra*, *E. decipiens* with its fine foliage, *E. drummondii* with its abundant violet flowers, *E. oppositifolia*, *E. psicalyx*, *E. racemosa*, *E. gargentii* and *E. barbata*.

The dismal summer of 1988 in Sydney encouraged me to try my hand at grafting. I was successful so most of you could be also. *Eremophila macdonnellii* has four very attractive forms one of which is shown in the photograph on page 165. This is grafted onto a *Myoporum* root stock. This indicates a new era in the cultivation of *Eremophila* if we can get material from good forms.

The editor has asked me to comment upon the *Eremophila* species from the arid shrublands of Western Australia, as described on page 143 of this issue. You will note that I have described *Eremophila maculata*, *E. platycalyx* and *E. pterocarpa* above, as growing well in my garden in Sydney. Of the others I have tried *Eremophila delisseri*, *E. freelingii*, but without notable success. One problem is getting a good plant. Once I can get a plant established to the stage where I can take cuttings, the success rate goes up noticeably. If I could get well-grown plants of any of the species listed in the article I feel I could be reasonably successful. Of the others listed, I have grown:

Eremophila granitica is a small plant to 0.5 m with pale blue large flowers that show out nicely on the bush.

Eremophila latrobei has not been successfully grown in my garden. I would love to get a good plant. I saw a magnificent plant in a pot in a member's garden in Blacktown, New South Wales. With its pink to mauve flowers, it was a spectacular sight. Grown in a pot, you may query? I grow most *Eremophila* in pots but the plant in the ground is more pleasing. ▷

The *Eremophila* Garden (photograph next page)

Photography by W. H. Payne

The three plants shown in the garden on the next page are one year old. This garden, one year ago was bursting with the large *Eremophila* plants described above. These plants are growing in "soil" with at least 60% fresh horse manure direct from the stables.

In the centre above the blue/mauve flowered shrub is *Eremophila macdonnellii* with *Eremophila fraseri* (pink flowered) at the rear and *Eremophila maculata* × *Eremophila duttonii* the orange/yellow plant on the front left. Each of these flowers is shown in more close-up on the other three photographs. Details of these plants are given in the article above.



The *Eremophila* Garden of Noel Gane $\triangle$ Photo W. H. Payne ∇ *Eremophila maculata* $\times$ *E. duttonii*





Eremophila macdonnellii △

Photography by W. H. Payne

▽ *Eremophila fraseri*



Eremophila scoparia is a plant with similar flowers to *Eremophila pantonii*, although not as large, and with smaller foliage. It grows here to one third of a metre high.

Eremophila gillesii on the front cover has been grown here. It strikes quite easily. One of those not so difficult plants that you ignore and suddenly they have died out and there is no material for more cuttings.

Eremophila bowmanii has not done so well for me. I have a form from Jindah, Queensland that is half a metre high but does not look well. I would like to try a different form.

Eremophila mackinlayii (photograph on page 144) is shown growing in my garden. This plant is three years old and about one third of a metre high. It tends to lose its lower leaves detracting from it as a spectacle, the flowers are quite beautiful. One must remember to tip prune regularly.

Propagation of *Eremophila*

The propagating system is simply a plastic sheeted frame with a hinged lid to enable watering and inspection. Size and height of the box can vary, but a good size has a bottom of 900 mm long and 500 mm wide, the back frame 500 mm high $\times$ 900 mm long and the front frame 450 mm high $\times$ 900 mm long. The lid is hinged at the back and fastened on the front by a cabin hook either end. This box is placed in a position facing north getting full sun for as long as possible during the day. A sarlon cover is placed across the lid on extremely hot days. The bottom is covered with 15 mm of sand which is always kept moist. By using plastic in lieu of glass, the plants are getting plenty of heat whereas with glass, in the summer months they would get excessively hot.

Another easy method uses a foam fruit container, easily obtainable from the greengrocer. Make an arch from a light gauge wire mesh then cover with a large plastic bag. Sand on the bottom of the container can be helpful if kept moist.

All cuttings are placed in individual 75 mm $\times$ 50 mm tubes in a mix of two parts coarse sand, one part peat moss and half of perlite, all measured by volume. The ideal length of the cutting is up to 100 mm, with smaller plants it is a case of accepting what you can get. From the frame they go into a larger size tube, eventually repotted into 150 mm or 200 mm pot.

Grafting is growing in appeal especially among the difficult species. I have tried two different methods, side graft and top wedge graft. One side graft I managed to strike developed into a shrub with great appeal namely a form of *Eremophila macdonnellii*.

There are quite a few species suitable for home gardens, the many forms of *Eremophila maculata*, *Eremophila glabra*, *E. nivea*, *E. racemosa*, *E. platycalyx*, *E. polyclada* and *E. pterocarpa*. One particular form of *Eremophila maculata*, the variety *brevifolia*, is a plant that everyone will notice when in flower.

A nice sunny position in your garden is all that is required for you to appreciate the value of *Eremophila*. ■

The term "greenie" covers a wide range of committed, active, concerned Australians. Over the years there have been many lone agitators desperately trying to bring to the attention of new Australians, the magnificence of our unique native flora. It has been destroyed and plundered as a cheap source of income but it has only been recently that mankind has begun to realise that the future of the planet depends upon a delicate balance of nature's resources, especially plant life.

The early "loner" pioneers are not sufficiently known to me and it is up to someone else to record their work. Here I am concerned with conservation of the flora in our time and it seems appropriate to mention just a few who changed the lone ignored "greenie" image into a political force. To my limited knowledge, there were two significant incidents in eastern Australia.

Nan and Hugh Nicholson were influential in the "Terania Creek Stand", the first spirited successful stand against the authority of "destruction for development", ten years ago. No doubt there were skirmishes before this and there have been many since but this one seems to be the turning point towards enlightenment. Nan and Hugh have since created a nursery for rainforest plants and have supported the replanting of many areas by thousands and thousands of their plants. They have provided a focal point for other young concerned "greenies" by their example of determined action and positive, practical approach to the replanting of areas. They have published two books on "Rainforest Plants", Part 1 and Part 2, each being available from them for \$11.95 plus \$1.50 postage (from Terania Creek Nursery, Terania Creek Rd, The Channon, NSW 2485). Why not send for a copy. On every page is a large colour photograph of a rainforest plant that would grace your garden.

Bob Brown and the Tasmanian Wilderness Society represent the major hope for sensible, practical conservation of the Australian natural scene. Not only was he, and his colleagues, successful in saving a magnificent wilderness section of Tasmania known to many as the Franklin River, but he changed the image of the "greenie" from irresponsible ruffians to concerned citizens exercising their democratic right to publicise an injustice, a tragedy, a new era in man/nature relationships. By the term "the major hope for sensible, practical conservation" (above), I mean that he has gained the confidence of the citizens of Tasmania to the extent that he is a responsible member of their parliament, a dedicated but intelligent, practical man that can guide them to overcome the dilemma — we love our garden island and its natural beauty — we acknowledge that past generations have severely damaged it — we want to continue with our hard won prosperity and pleasant way of life — we need to reconcile these desires, in fact work towards the survival of man — how? The rest of Australia, maybe the world is waiting.

Conservationists will be upset if I stop here as I have not mentioned possibly a score of comparable noble Australians. A turning point must have been the formation of The Australian Conservation Foundation, undoubtedly the leader on conservation matters over a vast range of issues. Milo Dunphy and his father come to mind, but this is a separate story. One can only wish them every success and be grateful for any opportunity to assist them. There must have been a turning point in Queensland in the conservation of The Great Barrier Reef and their rainforest. Please excuse me if I stop at this point with the thought — "there is a need for more Nan Nicholsons and Bob Browns and certainly the need for radical demonstration, why don't you get up and get involved in issues you consider are important". ■

Australian Plants — Quality Control

Thank you to the hundreds of readers throughout Australia who have expressed delight with the present high standard achieved with Australian Plants. This issue means that I have been doing the job for thirty years now and I hope you will forgive me for having so much to say in it. I regard conservation of our flora as such a critical issue of our time, it is overdue that something was said. It is the quality of presentation, printing and colour printing that I wish to draw particular attention to and for this we are deeply indebted to Ivor Beatty and his competent staff. It is inevitable that an odd bad issue will get through. Believe me, all but a very few of the 10 000 issues printed are of exceptional quality. **If you have received a defective issue, please, please, please return it to me for replacement.**





Petalostylis labicheoides (above) 1 cm

Butterfly Bush

An erect shrub to two metres. The plants form into large clumped canopies of feathery foliage along roadsides toward Comet and Emerald and on the Blackdown Tableland of Central Queensland. Like most plants from the wild, they do not grow as leggy in the garden, being more compact and floriferous. The plant is an easily grown garden plant.

Mirbelia pungens (opposite) 1 cm

Prickly Mirbelia

A small erect plant to 20 cm of the family Fabaceae. The long narrow leaves are spin-tipped. The yellow and red flowers form in clusters at the leaf axils. It grows in heaths on the Blackdown Tableland and in many other distant areas. Please note that from the above scale, the photograph shows the plant about twice natural size.

Plants of Central Queensland

by Steven and Alison Pearson

The colour plates shown here are reproduced from a very valuable book that illustrates all the plants of Central Queensland, covering the national parks of Blackdown Tableland, Carnarvon Gorge, Mt Moffatt, Salvator Rosa and Eungella. With 460 colour plates such as these, you will see that it is incredible value for so many quality, clear colour plates. Perhaps I made a poor choice as to which colour plates to reproduce as I now see that the scale line beside the name indicates that the plants are reproduced larger than they occur in the wild. This is not the pattern through the book but at least it draws attention to one feature of value, all plants illustrated have an indication of actual size.

The intention of the book is to assist a visitor to the Central Queensland area, to be able to identify every plant they find by simply counting the number of petals and looking in an index under flower colour, or even more simply, to flick through pages of the book until you see the flower. For this reason, the authors insisted that all flowering plants, ferns and cycads, be illustrated in colour, not just the showy ones. A study of the book will show that all the plants have a beauty and attraction of their own and it is the first time hundreds of plants have ever been published in colour.

A valuable reference book to the Australian flora? Undoubtedly. You will learn much from the colour plates of little known genera you find in the bush rambles of your area as there is probably a similar plant in Queensland. This will give you the first or generic name of the plant in your area and suddenly plant lists of scientific names become readable.

"Wildflowers in Pictures" on page 148 under another colour plate from this book, describes a plan for Australian Plants to present all our wildflowers in full colour pictures. Plants of Central Queensland was produced as part of this scheme and between this book and the hundreds of issues of Australian Plants (available in bound volumes), we have now illustrated thousands of beautiful wildflowers in colour.

Central Queensland plants for use in horticulture? This is not the intention of the book. It is a valuable reference and a desirable companion for anyone visiting Queensland. However, a check through the plants illustrated by a horticulturist will reveal that many of these plants are already well known in suburban gardens and do quite well there. The climate on top of the Blackdown Tableland is not so different from that say of Sydney so this book becomes a package of treasures for the pioneers in horticultural application of the unique Australian flora.

The authors of the book have invested their lives' savings to produce it so let us acclaim the fine job they have done for Australia by purchasing a copy. Send \$35.00 plus \$5.00 postage to Shirley Hopkins, 9 Risien Street, North Rockhampton, Queensland 4701, for your copy. For a 416-page book, containing 460 colour plates, it is a steal at this price. ■

Acacias of Australia

by Marion Simmons
and W. H. Payne

The article "Decorative Wattles" on page 101 of our last issue, describes many wattles, mostly dwarf in stature, recommended for the garden. One could readily expand this list as there are so many *Acacia* not generally known and grown. One species recommended is *Acacia amblygona*. A feature of this plant is the bright yellow balls of flower heads along branches, often prostrate, carrying small triangular to lance shaped phyllodes (leaves) that present the flowers well.

The sheer volume of species, over 800, tends to overwhelm one but at last we have some order. We can group similar species. "Acacias of Australia" has grouped 300 species and *Acacia amblygona* is in Group 4. As shown in the sketch opposite, these plants have flowers in globular heads on simple stalks usually singly (although some are in pairs or clusters) the phyllodes (leaves) attached to the stem with a tiny stalk, are flat, $\pm$ triangular, curved on the top margin with one or several nerves. Illustrated in "Acacias of Australia", in a similar manner to *Acacia amblygona* opposite, are the following species of Group 4.

Acacia acuarua — A dense spreading rigid shrub usually less than one metre high, the narrow-linear phyllodes 12 mm long, without stalks, the characteristic dark brown seed pods being curled and twisted.





Acacia intricata, the bush ▽

▽ the flowers Photo J. Simmons



Acacia acutata — A mound-like scaly shrub (sometimes spindly) to about one metre, the green to grey-green thick rigid phyllodes, often curved downwards, with a prominent raised upper margin and the mid-nerve nearest the lower margin, tapering to a fine sharp point.

Acacia bidentata — A hardy, long-flowering, long-lived species, usually prostrate but sometimes a dense dome-shaped shrub to three metres. The unusual characteristic is the dull green, wedge shaped phyllodes with upper margin enlarged to form a blunt angle.

Acacia chrysocephala — A decorative small, rigid, compact shrub to one half a metre high, with dark green, often crowded, obliquely triangular phyllodes. Closely related to *Acacia biflora*, this species has brighter coloured flowers on short stalks.

Acacia dilatata — A small spreading shrub to one half a metre high, the green, rigid, $\pm$ triangular phyllodes being 1-2 cm long and wide with thickened margins. The phyllode shape is similar to those of *Acacia truncata*.

Acacia divergens — An open ornamental spreading shrub to two metres tall with stiff, green, triangular phyllodes ending in a fine, long, sharp point.

Acacia gunnii — A small, straggly, often spreading to prostrate shrub to one metre tall with rigid, triangular phyllodes tapering to a long, fine point. It is tolerant of a wide range of growing conditions.

Acacia huegelii — A low semi-prostrate to erect bushy shrub to less than one metre high with flat, curved, oval to elliptic phyllodes often with a slightly wavy edge.

Acacia idiomorpha — A shrub 0.2-1 m tall with stiff spiny branches, green, usually softly hairy, obliquely oval phyllodes to 2.5 cm long with a prominent mid-nerve and wavy, nerve-like margins, ending in a sharp point.

Acacia inaequiloba — A low-growing, many stemmed, compact shrub to one metre tall. The grey-green, stiff elongated-triangular phyllodes have prominent off-centre mid-nerve, ending in a fine, sharp point.

Acacia intricata — A prickly, often mound-like shrub to one metre. The dull green, flat, oval phyllodes taper to a fine, sharp point. Masses of tiny, bright yellow balls of flower 3-4 mm diameter appear in spring along the branches in pairs, crowding at the ends of the branches. It is related but not really similar to *A. erinacea* which has phyllodes and flat broad pods as distinct from the curled pods of *A. intricata*. Photograph on page 172.

Acacia maitlandii — An open, erect, prickly shrub to three metres. The rigid, lance-shaped, flat phyllodes, 2 cm $\times$ 2-5 mm, end in a fine, very sharp point. Previously known as *A. patens*.

Acacia orbifolia — The deep green, shining, rather thick, round phyllodes (5-12 mm) are a feature of this compact, dark green shrub of over one metre high. The new growth is often a deep red and the branches are grey. It is similar to *A. bidentata* but differs in its larger, rounded phyllodes, longer flower stalks, much larger cream flowers and different calyx.

Acacia phaeocalyx — An intricately branched, spreading or compact shrub to one metre tall with green to grey-green rigid, leathery, $\pm$ triangular phyllodes with a yellowish main nerve near the lower margin. The distinctive feature of this interesting attractive foliaged shrub, is large flower heads of a few flowers (4-8).

Acacia truncata — A small, dense, dome-shaped shrub to over two metres high, suitable for coastal planting or in clay. The medium to dark green, hairless, wedge-shaped phyllodes, usually 25 mm long and up to 16 mm across the top of the wedge, end in a firm, not sharp point. It is similar to *A. littorea* but has longer narrower phyllodes.

*"Acacias of Australia" by Marion Simmons is available in two volumes, Volume 1 for \$29.95 and Volume 2 for \$50.00 from your bookseller. The best guide to Australia's wattles, these large books are well presented and easily read. Each of the three hundred species, are described on a full page opposite a full page, life-size detailed sketch making identification quite simple. ■

Seeds of the Future

by Joanna Seabrook

This article is based upon a handbook compiled using the experience gained by members of the Eastern Hills Branch of the Western Australian Wildflower Society during the growing of a prototype seed orchard in the Mundaring Shire. This project won the Greening Australia (WA) John Tonkin Tree Award for Community Group Achievement in 1986.

A seed orchard in the sense referred to here, is a plantation of native Australian plants grown specifically for the purpose of obtaining seed to be used in regeneration projects. I hope to encourage others to establish similar orchards. Seed of much of Australia's natural vegetation is a resource which is fast diminishing, aided by the power of bulldozers and the encroachment of non-native weeds into bush areas and road verges.

Each district has its own distinctive flora much of which is specific to limited areas. If we don't move to preserve this heritage it will be lost and with it will go the birds and other life forms which depend on it. NOW is the time to act. There is a great deal of glib talk about revegetation and rehabilitation but not much understanding of the practical difficulties involved in achieving an effective result. It has become obvious that ways and means need to be devised. The establishment of a seed orchard to grow wildflower shrub seed to be used in direct seeding or any other means of revegetation is one practical way an individual or group of concerned people can help. If you want advice on how to go about this, write to me.

One may look about the countryside and see patches of what appear to be bushland. The appearance is deceptive, as most of these areas are unfenced and consist of trees over grass which have been grazed by stock for many years. The trees are probably already in various stages of degradation and there is little chance of regeneration occurring naturally. When these trees have disappeared, as they inevitably will, the land will be very bare, bare. Natural roadside vegetation is also gradually diminishing as roads are widened and what vegetation remains becomes infiltrated by weeds and grasses.

Vegetated roadsides, together with a mosaic of plots of land, set aside can be important wildlife corridors harbouring the remaining flora and fauna in many districts, and providing a sanctuary for birds. How many of us are aware of the crucial role birds play in the ecology? Or that the different species of birds often have specific roles to play? For example, tiny pardalotes are birds which live amongst the leaves of trees and help to keep them free of damaging insects. Honeyeaters help pollinate flowers of trees and shrubs while they are gathering their nectar. Tree-creepers fish out grubs and borers from under the bark of trees and shrubs.

Birds have a very fast metabolism and need a surprising amount of food for their size. Often they need to move about a great deal to find enough food. Many species of birds are more nomadic than we realize, as they must follow the food source. They cannot move about unless there is food and shelter on the way, and nesting will not be undertaken unless food and suitable habitats are available.

We must revegetate and we must do it now, while the seed resources are still available.

Advantages of Growing Local Plants

In revegetation projects, then, it is desirable that trees and shrubs from a local seed source should be used wherever possible, since these will have genetic adaptations which suit them for survival in local conditions. The birds and other creatures in the local ecosystem will already be oriented towards feeding and nesting in these plants, so will have no difficulty in utilizing such areas. Some native animals are not particular in their habitat requirements, but for others they are very specific. For such animals loss of, or alteration to, local vegetation can have fatal consequences. A number of birds and animals live solely on a particular species of plant, and they are often the only agents responsible for its pollination and therefore its reproduction, while the plant is the only source of life for them. The advantages are summarized as follows:

- They are well adapted to local soils and climates.
- The form of species remains true (hybridization and possible retrogression of species is not likely to occur).
- The chance of introducing a new weed to an area is avoided.
- The plants retain the local character of an area.
- They provide habitats for local animals.
- Many species of plants which might otherwise be lost could be saved.

NOTE: In particular cases where there is a need for salt tolerant plants, bushy plants for shelter belts or fodder plants and so on, the most suitable plants for the purpose, not necessarily "local" plants, could be considered.

Revegetation

The raising and setting-out of young plants by hand is expensive and time-consuming and plants are often lost. Such a laborious method cannot compare with plants grown naturally in situ from seed and cannot produce the variety and random effect of broadcast seed. There will always be a place for the hand-planting of trees and shrubs, but I believe that if we are to achieve any significant revegetation, direct seeding is the only answer.

Some Hints on Direct Sowing

Sow after the first real winter rains in a weed free situation. If in a situation where weeds may be expected, the first germination should be allowed to sprout and should be eradicated prior to seeding.

Do not broadcast too early as the seed may be carried off by ants or birds. It is noticeable that ants appear to become sluggish and to cease collecting their winter stores as the weather becomes cooler and wetter.

Do not cover the seed as even slightly too much soil over the seed hinders germination. After all, in nature, seed just drops on the ground.

Do not expect immediate results. Germination often takes many weeks so do not give up hope if you do not see any plants until spring. When they do appear they will be hardier and stronger than potted stock.

Many varieties of seed have a dormancy factor, which is more likely to be overcome in the natural and varied conditions experienced on open ground than in conventional propagation techniques.

Keep a list of the seed sown, its date of seeding, methods used, date of germination and any other interesting factors. Such records can be invaluable both to yourself and any other interested persons. ■

Native Plants of the Sydney District

— An Identification Guide

by Alan Fairley and Philip Moore

The Sydney district is one of the great wildflower regions of Australia. With over 2000 native plant species, it compares favourably with other recognized wildflower areas, such as the sand-plains of south-west Western Australia, the Grampians in Victoria, the wallum heathlands in Queensland and the arid Centre after rains. This book illustrates and describes nearly 1500 of these plants. It is an identification guide that includes all the common and conspicuous native species, many rare and restricted plants and most of the small and inconspicuous herbs and shrubs that are often overlooked.

The area covered by this book extends from Newcastle in the north to the Shoalhaven River in the south and from the coast in the east to the Great Dividing Range in the west. This area of about 23,000 square kilometres includes most of the geological unit known as the Sydney Basin and encompasses the catchment area of the Nepean-Hawkesbury Rivers (except the upper Wollondilly River). Boundaries in the north and west are determined by dividing ranges. The Watagan Mountains and the complex of sandstone ridges and plateaux running westward through Bucketty along the Hunter Range, north of Howes Valley to Mount Coricudgy (1254 m) separate the north-flowing streams of the Hunter system from the south-flowing streams of the Hawkesbury system. This natural boundary has been extended in the north-east to include the southern portion of Newcastle and those small creeks and slow-moving rivulets which flow into Lake Macquarie. From Mount Coricudgy to west of Wombeyan Caves, the Great Dividing Range forms a natural boundary between the Sydney district and the central west.

This is an identification guide, not just to flowering shrubs, but to the full range of native plants in the area. Its coverage extends beyond the flora of the sandstone areas to include plants of the rainforests, fresh water and saline swamps, the drier western mountains and the ancient eroded rocks of fringe areas. The introductory section includes a detailed account of the ecological and geographical features of the area, a geological outline and a discussion of plant communities. This is followed by the main section consisting of illustrations and descriptions of individual species. They are arranged in families, in a modern system of classification. Family descriptions highlight similarities between genera in a family and the probable relationship of the family to other families. Generic and specific descriptions are designed to aid identification by pointing to those characteristics that help distinguish one genus from another and one species from another. Although botanical terms have been kept to a minimum, they cannot be avoided entirely, especially when describing ferns, eucalypts, sedges and grasses which need specific attention to details for which botanical terminology is the most efficient. Simple identification keys are provided, together with a glossary and an index of names. The keys are based on readily observable features and require no special botanical training.

Photographs have been chosen on the basis of their assistance in identification, not necessarily because they are "pretty pictures". Photographs showing habit, leaves and fruit may be more useful than closeups of flowers. A colour photograph from the book is shown on page 188. Plant names follow the latest nomenclature. Previous names of recently revised genera are cross-referenced in the index.

Each species description is followed by notes on habitat, distribution and flowering time. This information is based on records, research and personal observation over 20 years; however, plants seldom conform to strict categorization and these records must be regarded as a guide only. Details of distribution beyond the Sydney district are also given for completeness and to make the book useful to those who live or travel beyond the area's boundaries.

This large 420-page book is beautifully presented to make a marvellous gift for Christmas. Normally priced at \$80.00, a special introductory offer by mail for \$70.00 plus postage of \$5.00 in New South Wales and \$7.00 interstate, orders being sent to Bowerbird Books, P.O. Box 104, Winmalee, New South Wales 2777. ■

Native Peaflowers

by Dorothy and Colin Woolcock

A Field Guide to Native Peaflowers of Victoria and south-eastern Australia is the full title to this valuable little book. With 130 pages of a size suitable for a field guide to be carried around during bush rambles, Colin Woolcock has illustrated ALL the peaflowered plants of Victoria, many of which spread out into other areas of south-eastern Australia. You will note the sketches by Colin of *Pultenaea* on the following pages of this issue. In the book the sketches take more room, the habit sketches are upright and to scale. In fact, this is the pattern of the book with sketches of two species per page accompanied by the delightfully simple but clear and accurate descriptions by Dorothy. The 152 species illustrated and described are of all the peaflowered plants of Victoria, the *Bossiaea*, *Daviesia*, *Desmodium*, *Dillwynia*, *Eutaxia*, *Glycine*, *Gompholobium*, *Goodia*, *Hardenbergia*, *Hovea*, *Indigofera*, *Kennedya*, *Lotus*, *Mirbelia*, *Oxylobium*, *Phyllota*, *Platylobium*, *Psoralea*, *Pultenaea*, *Sphaerolobium*, *Swainsona*, *Templetonia*, *Trigonella* and *Viminaria*. They are all there for you to readily identify any peaflowered plant you find, and yes, the common names are there for those still wary of the scientific names.

An excellent buy from your bookseller at \$14.95. There are colour plates also. ■

***Gastrolobium* — A group of pea-flowered plants in the plant family Fabaceae**

Dr M. Crisp

The last issue of Australian Plants outlined the changes in scientific names in the closely related genera *Oxylobium*, *Nemcia* and *Gastrolobium*. It may round off the presentation to list the existing species of *Gastrolobium* still recognized in that genus:

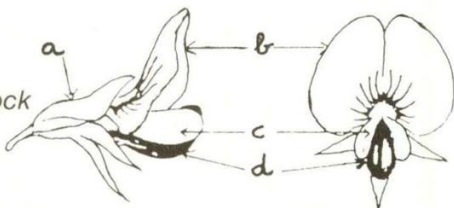
Gastrolobium appressum, *G. bennettsianum* (not to be confused with *Oxylobium bennettsii*), *G. bilobum*, *G. brevipes*, *G. callistachys*, *G. calycinum*, *G. crassifolium*, *G. densifolium*, *G. floribundum*, *G. forrestii*, *G. glaucum*, *G. grandiflorum*, *G. hamulosum*, *G. laytonii*, *G. microcarpum*, *G. ovalifolium*, *G. oxylobioides*, *G. parvifolium*, *G. polystachyum*, *G. propinquum*, *G. pycnostachyum*, *G. rotundifolium*, *G. spinosum*, *G. stenophyllum*, *G. tomentosum*, *G. trilobum*, *G. velutinum* and *G. villosum*. ■

Bush Peas

The Genus *Pultenaea* —

Part 11 by C. E. & D. T. Woolcock

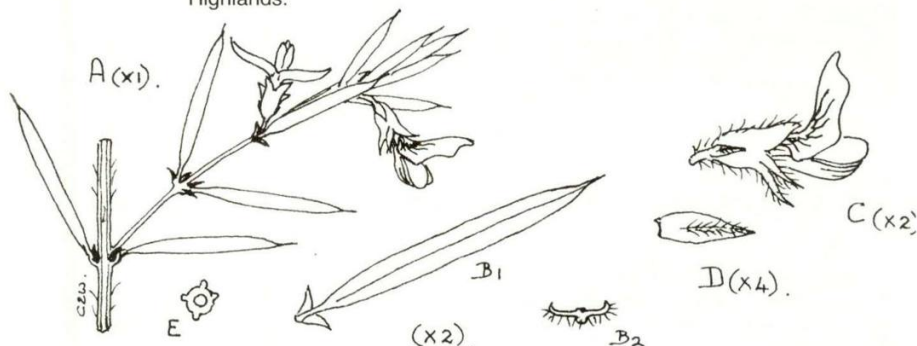
a — the calyx cupping the flower
b — large petal — the standard
c — two petals — covering keels
d — two petals — boat shaped keel



This is the final group of *Pultenaea* species. All the plants in this group have the leaves arranged in a ring (a whorl is the technical term) of three leaves around the stem. This is shown in all the sketches although it is not clear in the colour photographs. What an easy way to identify a wild pea-flower, just look at the arrangement (or shape of the leaves as in the case of the preceding groups) and you can determine the species name by checking against the small number of sketches in each group. —Editor.

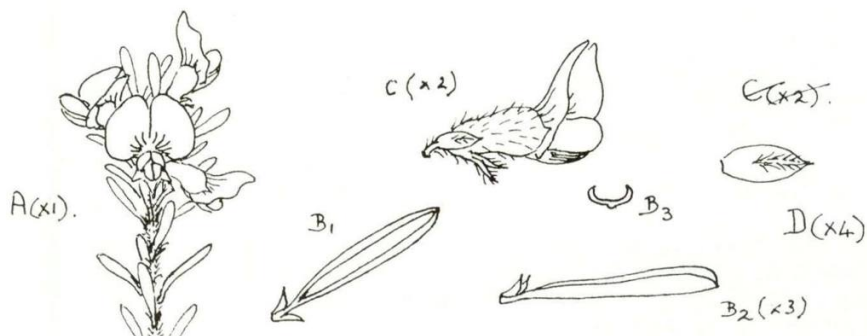
Pultenaea blakelyi* Joy Thompson*Blakelay's Bush-pea**

- Habit:** Erect shrub to 2 m high, sometimes higher (A); stems ridged (E) and young branches sometimes sparsely pubescent.
- Leaves:** Linear to narrow oblong, predominantly opposite, 15-30 mm long, glabrous above, silky beneath, with prominent mid-vein; slightly concave, definitive mucro. Stipules small, c. 1 mm long. (B₁, B₂).
- Flowers:** Solitary in upper axils of branchlets. Calyx with short appressed hairs, calyx lobes acuminate and lower ones as long as the tube; pedicel 1-2 mm long. Keel yellow (C).
- Bracteoles:** Lanceolate, shorter than calyx tube; some hairs on the midrib; attached at base of calyx. (D).
- Flowering:** September-October.
- Distribution:** NSW — coast and adjacent plateaus south of Sydney and Illawarra Highlands.

***Pultenaea calycina* (Turcz.) Benth.**

Photograph on page 184 by Colin Woolcock

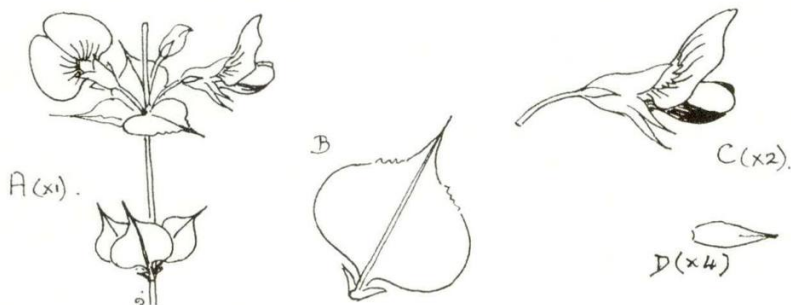
- Habit:** Upright shrub to about 60 cm high, pubescent branches.
- Leaves:** Oblong-linear to slightly cuneate, 7-10 mm long $\times$ 2-3 mm wide, concave, mainly glabrous, obtuse, irregularly opposite or in whorls of three. Petioles c. 1 mm long; stipules small, c. 1 mm long. (B₁, B₂, B₃).
- Flowers:** Crowded in upper axils, subsessile or small pedicels, small stipular bracts. Two upper calyx lobes very large and obtuse, sparsely hairy, lower three lobes shorter, subulate, hairy. (C).
- Bracteoles:** Small, linear-lanceolate, with some scattered hairs, attached just beneath calyx. (D).
- Flowering:** August-September.
- Distribution:** W.A. — South coast, Albany to Hopetoun.



***Pultenaea cunninghamii* (Benth.) Williamson**

Grey Bush-pea

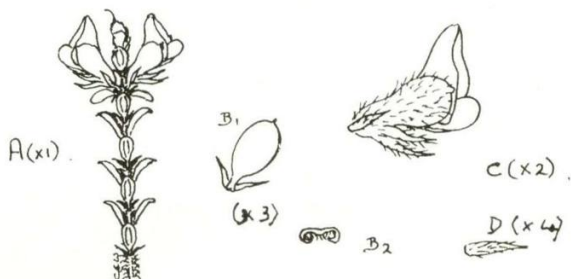
- Habit:** Erect but sometimes spreading shrub, 1.5-2 m high. Mainly glabrous. (A).
Leaves: Broadly ovate or rhomboidal, mostly opposite or in whorls of 3, flat, glabrous, to 20 mm long, pungent mucro. Prominent midrib. Stipules 1-2 mm long. (B).
Flowers: Solitary in upper axils with pedicels to 5 mm long, large and showy. Calyx and pedicel glabrous; calyx lobes acuminate, longer than the tube. (C).
Bracteoles: Lanceolate, glabrous, attached at base of calyx and shorter than the tube. (D).
Flowering: October to December.
Distribution: From S.E. Queensland to N.E. Victoria in hilly country.



***Pultenaea elachista* (F.Muell.) Crisp**

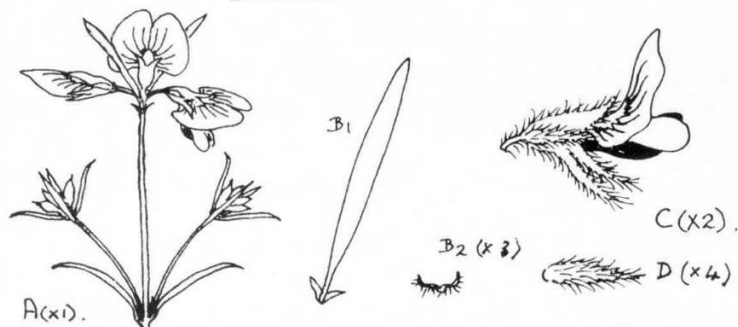
(Syn. *Pultenaea cymbifolia* J. M. Black)

- Habit:** Small rigid shrub, branchlets tomentose. (A).
Leaves: Opposite, decussate, crowded, rigid, oblong-ovate, 3-4 mm long, mucronate with revolute margins; becoming glabrous above, hairy beneath. (B₁, B₂).
Flowers: Axillary, subsessile, few at end of short branchlets. Calyx pubescent, c. 8 mm long, deeply divided, with upper lobes large, obovate, the 3 lower ones shorter, narrow-acuminate. Petals yellow, scarcely exceeding the calyx. (C).
Bracteoles: Lanceolate, short, inserted at the base of the calyx, pubescent. (D).
Flowering: May-September.
Distribution: W.A. — from Israelite Bay east to Eucla; S.A. — Kangaroo Island, Fowlers Bay and Eucla.



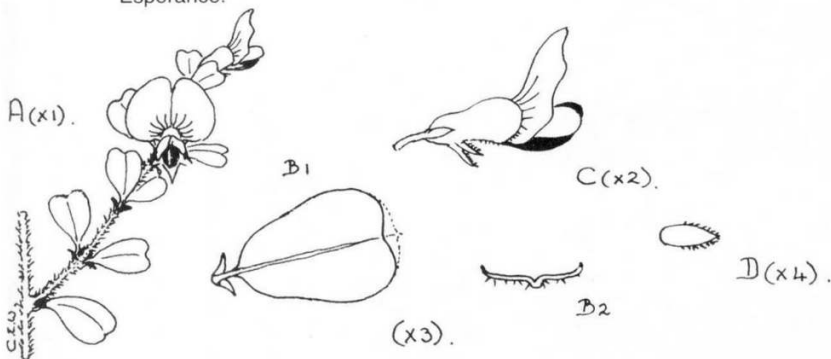
Pultenaea luehmannii* Maiden*Thready Bush-pea**

- Habit:** Diffuse trailing undershrub of damp places — branchlets glabrous. (A).
Leaves: Narrow lanceolate, mostly opposite, incurved, distant, 10-15 mm long, glabrous above but silky beneath. Stipules minute. (B₁, B₂).
Flowers: Several in a terminal head; short pedicels (1-2 mm long). Calyx silky; lobes subulate, longer than the tube. Keel shorter than wings. (C).
Bracteoles: Lanceolate, silky, about the length of calyx tube, attached at base of tube. (D).
Flowering: September-October.
Distribution: Victoria — southern Grampians.

***Pultenaea obcordata* (R.Br.) Benth.**

opposite — Photography, Colin Woolcock

- Habit:** Erect shrub 1-2 m high; branchlets with short appressed hairs. (A).
Leaves: Obovate to obcordate, truncate to emarginate, mainly flat, opposite or in whorls of three, usually glabrous but sometimes pubescent beneath on young leaves, 7-10 mm long $\times$ 5-8 mm wide. Petioles 1-2 mm long; stipules small c. 1 mm long or less. (B₁, B₂).
Flowers: Solitary, axillary, often clustered near end of branchlets giving appearance of terminal head, peduncles to c. 3 mm long. Calyx glabrous except for a few sparse hairs on margins of lobes, calyx tube short. Upper two calyx lobes large and orbicular, lower three lobes smaller. (C).
Bracteoles: Brown, lanceolate, mainly glabrous, very small, attached at base of tube. (D).
Flowering: August-October.
Distribution: W.A. — Widespread on coast and near coastal areas from Albany to east Esperance.





Pultenaea rotundifolia △

Photography by Colin Woolcock

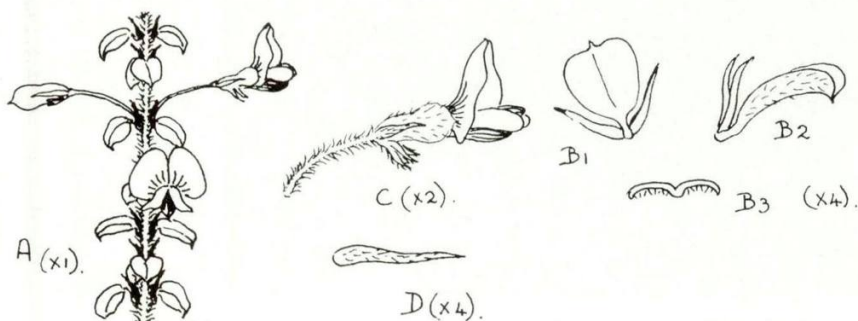
▽ *Pultenaea obcordata*



***Pultenaea rotundifolia* Benth**

(See also Group VIII)

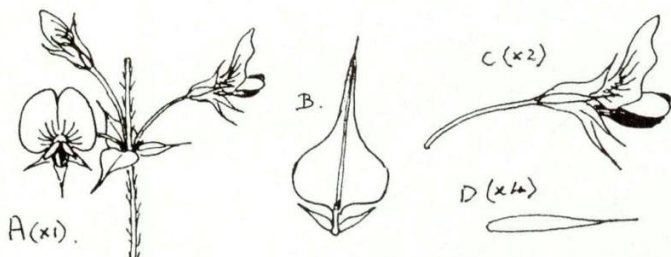
- Habit:** Small diffuse shrub with slender pubescent branches. (A).
Leaves: Obovate to orbicular (B_1), opposite, small (about 3×2 mm), not crowded, mainly glabrous above, sparsely hairy beneath, slightly recurved margins (B_3) recurved mucronate tip (B_2). Very small petiole, stipules subulate c. 1-1.5 mm long. Photograph, page 181, by Colin Woolcock.
Flowers: Small, axillary, on pubescent pedicels longer than the leaves. Calyx slightly pubescent, tube very short; the upper two lobes large, obtuse; the lower three shorter, lanceolate. (C).
Bracteole: Attached just below the calyx, linear-lanceolate, longer than the tube, sparsely hairy. (D).
Flowering: Early spring.
Distribution: W.A. — South coast — Albany to Esperance.



***Pultenaea spinosa* (DC.) Williamson**

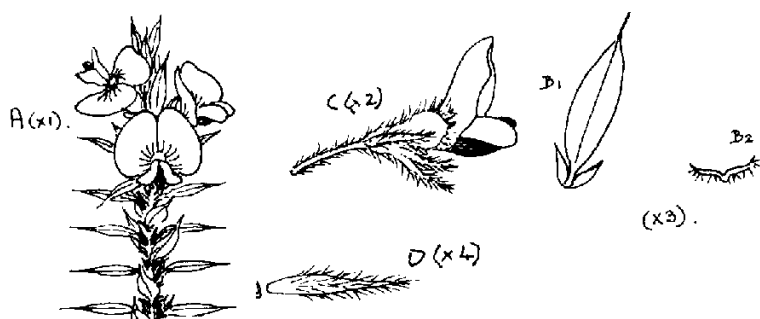
Spiny Bush-pea

- Habit:** Spreading pungent shrub 1-1.5 m high. Stems with scattered appressed hairs. (A).
Leaves: In whorls of 3 or opposite, ovate, sessile, pungent, glabrous, 3-8 mm long $\times$ 3-6 mm wide. Stipules c. 2 mm long, subulate. (B).
Flowers: Solitary, pedicellate (pedicels 5-10 mm long) in upper axils. Pedicels and calyx glabrous, calyx lobes spinescent. Keel dark red. (C).
Bracteoles: Linear-lanceolate, longer than the tube and spinescent; attached at base of calyx. (D).
Flowering: Late winter-spring.
Distribution: Northern NSW, S.E. Queensland in forests on poor soils, coast and tablelands.



***Pultenaea spinulosa* Benth.**

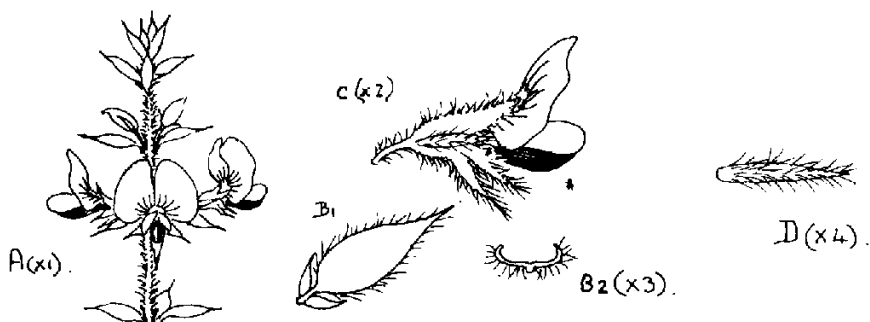
- Habit:** A small low diffuse shrub — slightly hairy branches. (A).
Leaves: Lanceolate, opposite, crowded, slightly incurved with definite mucro, slightly pungent, usually glabrous above, lightly hairy beneath on younger leaves, moderately reticulate, c. 8 mm long $\times$ 3 mm wide (B_1 , B_2). Petioles small, stipules lanceolate, c. 2-3 mm long.
Flowers: Small, axillary, on pedicels 3-5 mm long. Calyx villous, tube short, the 2 upper lobes large, obtuse with mucronate tip, the 3 lower lanceolate-subulate. (C).
Bracteoles: Lanceolate, attached at base of calyx, longer than the tube, ciliate. (D).
Flowering: September-October.
Distribution: W.A. — South coast from Bremer Bay to Israelite Bay.



***Pultenaea subternata* Williamson**

Downy Grey Bush-pea

- Habit:** Bushy shrub usually about 1 m high, branchlets pubescent. (A).
Leaves: Lanceolate, opposite or in whorls of three, incurved, mucronate, pungent, hairy on under surface, 5-8 mm long (B_1 , B_2). Stipules c. 2 mm long.
Flowers: Solitary in upper axils, on pedicels about 3 mm long. Pedicel and calyx with spreading hairs; lower calyx lobes acuminate and longer than tube. Keel dark red. (C).
Bracteoles: Linear-lanceolate, inserted towards base of tube, exceeding the tube and usually with spreading hairs. (D).
Flowering: October-November.
Distribution: NSW — Central Western Slopes and Central Tablelands.





Pultenaea tenella △

Photography by Colin Woolcock

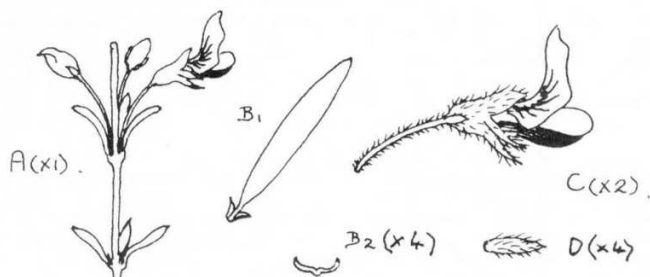
▽ *Pultenaea calycina*



***Pultenaea tenella* Benth.**

Delicate Bush-pea

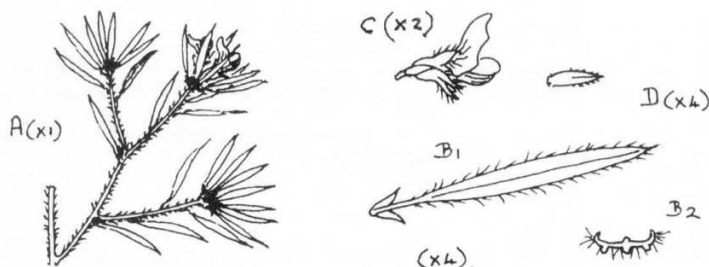
- Habit:** Procumbent shrub 60 cm high, slender glabrous capillary branchlets. (A).
Leaves: Linear-elliptic, concave, mostly in whorls of three, 5-7 mm long, obtuse, wholly glabrous except for a few sparse hairs on undersurface of new leaves (B_1 , B_2). Stipules minute.
Flowers: Pedicellate (to 10 mm long) in upper axils. Short appressed hairs on calyx lobes, tube and pedicel; lobes acuminate, as long as tube. Keel yellow. (C).
Bracteoles: Linear, much smaller than tube, with short appressed hairs, attached at base of calyx. (D). Photograph opposite by Colin Woolcock.
Flowering: February-March.
Distribution: Alpine bogs in N.E. Victoria.



***Pultenaea trichophylla* Williamson**

Tufted Bush-pea

- Habit:** Dwarf, slender shrub, stems pubescent. (A).
Leaves: Linear-lanceolate, incurved, acute but not mucronate tip, glabrous above, 3-nerved and hairy beneath, 8-10 mm long. Petiole 2-3 mm long, stipules c. 1 mm long. Branchlets naked except for whorl of terminal leaves. (B_1 , B_2).
Flowers: Very small, on short pedicels, two or three within the whorl of leaves. Calyx pubescent on the acuminate lobes. (C).
Bracteoles: Lanceolate, c. 1-2 mm long; about as long as the calyx tube and inserted just below it. (D).
Flowering: Spring.
Distribution: Rare species — appears to be known only near Port Lincoln, S. Australia.



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