Wheatbelt Wildflowers: A Rich Heritage

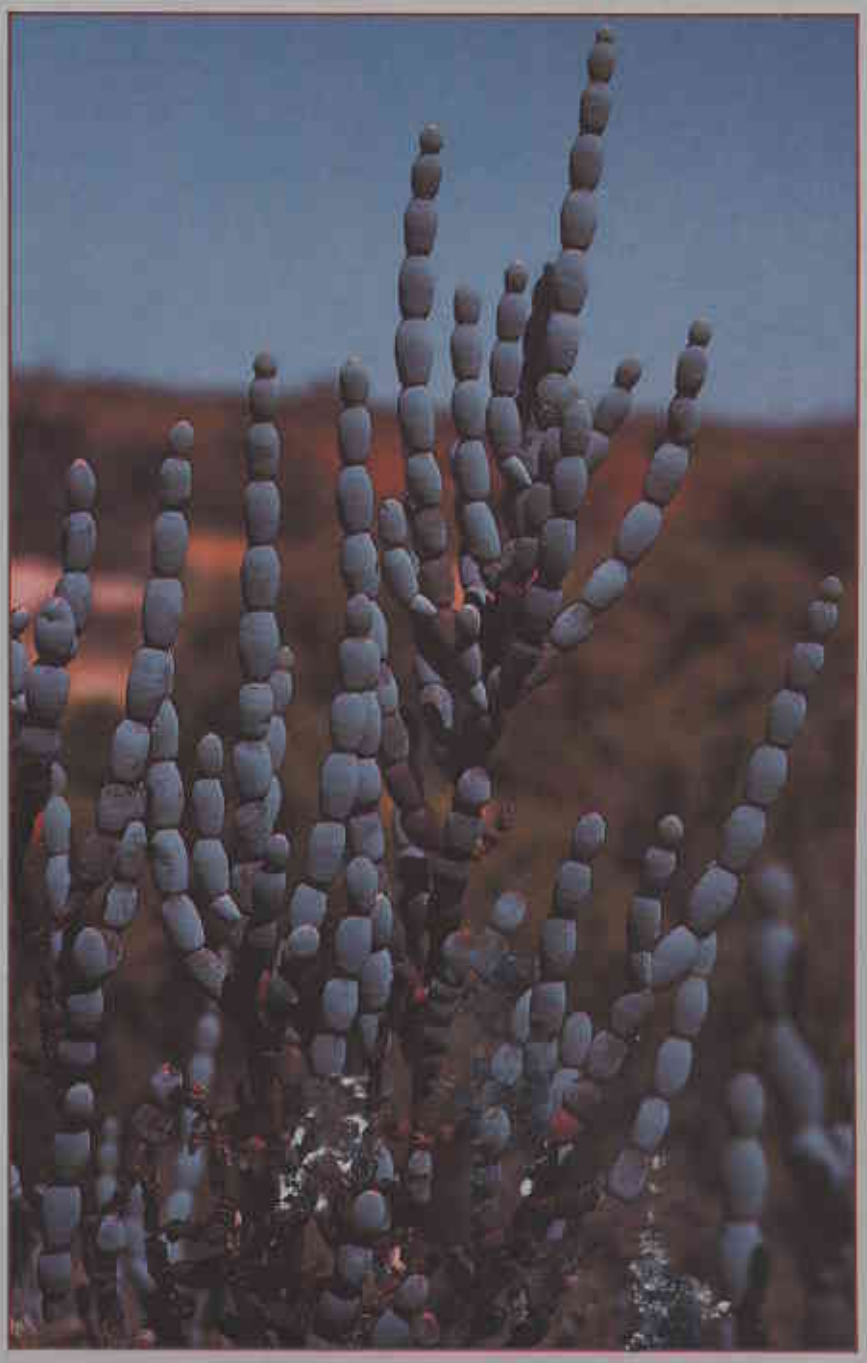
by Dr Steve Hopper

S. D. Hopper

W.A.'s wheatbelt arcs from the lower reaches of the Murchison river southwards, and extends eastwards some 1 100 km to Cape Arid National Park. Although largely cleared of natural vegetation, it contains one of the highest concentrations of rare and threatened native plants in Australia.

EVOLUTIONARY biologists are actively researching the reasons for the occurrence of so many rare and localised species in the wheatbelt. Turbulent climatic fluctuations over the past few million years are considered one major contribution to this prolific development of species. Substantial tracts of wheatbelt vegetation remain to be surveyed by botanists; the State is many decades away from having a complete inventory of the wheatbelt's flora.

The conservation problems caused by this lack of knowledge were highlighted recently by a survey of the mallee belt between Ravensthorpe and Cape Arid National Park. The mallee belt was proposed for major new agricultural land releases. Vehicle access was difficult until the mid 1960's



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Hakea neurophylla, a rare and endangered species that is protected on Don and Joy Williams' farm at Badgingarra (left).

Samphires are commonly seen lining salt lake systems throughout the wheatbelt. *Halosarcia bulbosa* is one of the rarest and most beautiful; its large blue bulbous stems are only seen at a few locations near Geraldton (right).

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A rare starflower, *Urocarpus grandiflorus*, flowers in July on a nature reserve near Toodyay.

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The stems and flowers of the rare Wongan cactus (*Daviesia euphorbioides*) exemplify the bizarre shapes often found in wheatbelt wildflowers (above).

Eucalyptus pendens on the Williams' farm (below).

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Crimson snakebush (*Hemiandra gardneri*), a beautiful groundcover confined to a small area of yellow sandplain near Moora.

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when tracks were cut for soil surveys to assess the agricultural potential of the land. The flora was poorly known. A survey funded by the Australian Biological Resources Study was, therefore, initiated.

During the two years of the flora survey, consultant botanist Mark Burgman collected 3 635 plant specimens. With the help of specialists in the W.A. Herbarium and elsewhere, these specimens were identified, and a list of 1 220 taxa (species, subspecies or varieties) was produced.

A significant proportion (18 per cent) of these taxa could not be matched with any known species, suggesting that the plants were new to science. Moreover, it was estimated that 20 per cent of the plants in the study area were not collected because of sampling restrictions, hence the above figures are conservative.

Of particular importance is that 188 species (15 per cent of the total) were considered rare and localised, 21 (2 per cent) were endangered and 37 (3 per cent) were vulnerable if agricultural clearing continues at present rates.

Burgman's findings are typical of the wheatbelt. Recent surveys in regions such as Ongerup-Fitzgerald River National Park, Wongan Hills, Jurien-Eneabba, Stirling Range, Geraldton-Northampton and on wheatbelt granite outcrops have all yielded discoveries of numerous localized species, many new to science. Even many named wheatbelt plants have been seen and recorded only once or twice since their discovery. A number have remained lost to science since their original collection by colonial botanist James Drummond or noted visiting collectors such as Ludwig Preiss.

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Rose mallee, *Eucalyptus rhodantha*, has flowers up to 8 cm across. It is known in significant numbers from only one location, on a farm left uncleared by an owner interested in conservation.

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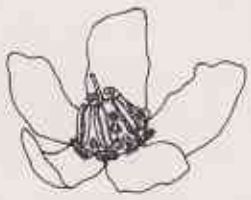
The nut of fishbone banksia (*B. chamaephyton*) emerges from soil on a farm near Badgingarra.

Two of the presumed extinct plants of the Wheatbelt of Western Australia.



Thomasia gardneri

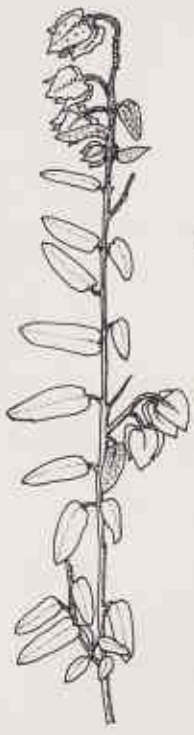
lepidote stem

ovary

ovary

hair clusters

petal



Gastrolobium lehmannii

calyx

flower

underside of leaf

pod

Drawings by Susan Patrick

A. P. Brown

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Spider orchids have some of the most intricate flowers seen in the wheatbelt, many adapted for pollination by sexual deception of male wasps. *Caladenia integra* is seen sporadically on rich soils in the western wheatbelt (above).

An unnamed species of spider orchid from the Morseby Range-Kalbarri area, which was recently found several hundred kilometres south-east near Pingaring (left).

Eremophila virens, with its unusual green flowers adapted for bird pollination, is one of the wheatbelt's rarest wildflowers. It is now known from only two locations, both adjacent to granite outcrops (below).

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TABLE 1 RARE W.A. PLANTS THAT HAVE BEEN REDISCOVERED RECENTLY

Name	First Collection	Recent Collection
Acacia forrestiana	1901 L. Diels	1979 E. A. Griffin
A. vassalii	1935, E. H. Ising	1983 P. Roberts
		1984 R. Cummings
Actinotus rhomboideus	c. 1840 J. Drummond	1979 G. Keighery
Adenanthos cunninghamii	1827 C. Frazer	1973 E. C. Nelson
Angianthus axilliflorus	1904 M. Koch	1978 K. Newbey
A. connatus	1903 W.A. Fitzgerald	1980 P. Short
Boronia adamsiana	pre 1890 A. Adams	1984 A. S. George
Caladenia cristata	1923 E.J. Simpson	1977 D. Voigt
Daviesia ovata	pre 1884 J. Drummond	1982 Mrs D. Davison, Mrs B. Swainson
D. purpurascens	1891 R. Helms	1979 M. D. Crisp
Drummondita ericoides	1901 L. Diels	1980 G. Keighery, D. Mell
Eichlerago tysoniana	1892 I. Tyson	1984 R. Cranfield
Eremophila microtheca	pre 1870 Oldfield	1980 R. Chinnock
E. resinosa	pre 1860 T. S. Roe	1980 R. Chinnock
Eucalyptus steedmanii	1928 H. Steedman	1978 T. Tapper
Gunniopsis divisa	1898 I. Tyson	1983 S. D. Hopper
Gyrostemon ditrigynus	1909 L. Diels	1983 M. Burgman
Hakea tamminensis	1941 C. A. Gardner	1983 J. W. Wrigley
Hemigenia viscida	1920 Stoward	1983 R. Roberts
Hydatella australis	1904 L. Diels	1982 G. Keighery
H. dioica	1898 A. Morrison	1982 G. Keighery
Labichea eremaea	1931 C. A. Gardner	1982 P. S. Short
Lawrencia diffusa	pre 1863 J. Drummond	1983 N. Lander, K. Newbey
Lepidosperma rupestre	pre 1878 Oldfield	1985 A. Brown
Leucopogon obtectus	pre 1867 J. Drummond	1978 E. A. Griffin
Mitrasacme palustris	1902 M. V. Fitzgerald	1984 G. Keighery
Persoonia brachystylis	pre 1868 Oldfield	1980 P. Weston
Petrophile plumosa	pre 1856 J. Drummond	1984 B. Haberley
Platysace filiformis	1839 Preiss etc	1980 J. Green
Pomaderris intangenda	pre 1876 F. Mueller	1975 M. Trudgen
		1981 K. Newbey
Pultanaea pauciflora	1914 F. Stoward	1984 T. D. McFarlane
Rhizanthella gardneri	1928 J. Trott and J. H. Plant	1979 J. McGuiness
Rumicastrum chamacladum	1904 L. Diels	1982 G. Keighery
Schoenus indutus	pre 1878 J. Drummond	1979 K. Wilson
		1981 K. Newbey
Sellieria exigua	pre 1878 J. Drummond	1979 G. Keighery
Tetratheca aphylla	pre 1882 J. Drummond	1980 K. Newbey
Verticordia fimbrilepis	pre 1847 J. Drummond	1983 N. Stephens
V. helichrysantha	pre 1867 Maxwell	1968 K. Newbey
		1982 N. Stephens
V. hughanii	pre 1878 A. Hughan	1982 B. and M. Smith

Searches for such poorly known rare plants have increased markedly since 1977 when the Department of Fisheries and Wildlife (now Department of Conservation and Land Management) appointed staff and consultants to work on flora conservation. Surveys by these and other botanists have led to the recent rediscovery of 39 rare wildflowers.

The rediscovery of some of these plants (e.g. the Underground Orchid *Rhizanthella gardneri*) has attracted considerable publicity, whereas others have been unannounced until now. All have been significant to botany, and are a credit to the persistence and competence of the botanists involved.

Much remains to be done, however. A project funded by the Australian Heritage Commission, and recently completed by consultant botanist Susan Patrick, identified 52 wheatbelt species which may be extinct Despite surveys mounted specifically to find them, they have not been collected in the last 50 years. None of the surveys were exhaustive, however, and populations of some of these plants may still exist in remnant native vegetation yet to be surveyed.

Landholders can also play their part, for only about three per cent of the wheatbelt is set aside as reserves for wildlife conservation. A fine example of the effectiveness of individual contributions is found at Joy and Don Williams' Badgingarra farm. Four rare eucalypts (one on the rare and endangered list), *Hakea neurophylla, Banksia chamaephyton* (also on the list) and an unnamed Darwinia species are protected within a 350 ha reserve on the Williams' farm. That area is uncleared and free from grazing, and the Williams have half completed a 4 km fence around the reserve. Although the area contains some excellent farming soil at the base of the steep slopes, the Williams decided to set it aside to protect the flora and to avoid water erosion of the slopes.

The reserve contains many representatives of local species previously only known to occur at Mt Lesueur, a proposed nature reserve 25 km away. For one eucalypt, Badgingarra mallee (*E. pendens*), this farm has the largest single population - more than 3 000 plants. *Eucalyptus suberea* and the Mt Lesueur mallee (*E. lateritica*), brought to the attention of botanists by Don Williams, are only found on two or three other farms and around Mt Lesueur. Landowners in the wheatbelt are clearly custodians of one of the world's richest wildflower floras, a high proportion of which is found nowhere else.

The future promises ample rewards for further study of rare wheatbelt plants, provided they are protected, monitored and managed so as to prevent their extinction.

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COVER
Moonrise on wheat stubble.
Cover photo by Cliff Winfield.

Southern Brown Bandicoot drinking Shannon Waters.

The more outstanding a natural environment, the greater the number of its potential uses, the more heated is the debate about its management.
This principle holds true in Western Australia as much as in Queensland's Daintree Forest and Tasmania's Farmhouse Creek.