Grants aid Flora Surveys in the Wheatbelt and its Margins

by Dr. Stephen Hopper, Research Officer, W.A. Wildlife Research Centre

Grants totalling $70 000 have been awarded by the Australian Heritage Commission and by the Australian Biological Resources Study to the W.A. Wildlife Research Centre to enlarge the State's programme of flora surveys in the wheatbelt and adjacent areas. These regions contain many rare or poorly known plants found nowhere else in the world and whose conservation status is uncertain.

The grants will be used to engage consultant botanists to search the wheatbelt and adjacent land areas for rare native plants and prepare detailed reports on their work. The reports will provide maps of the roads and tracks traversed and of locations of the rare plant populations found. In addition, they will review the literature on each species surveyed, provide photographs, and give detailed accounts of the associated vegetation, the number of plants counted in each population, the presence of seedlings, pollinators, disease, response to fire, ownership of the land and threats to the plants' conservation.

This information will then allow administrative and field staff of the Department of Fisheries and Wildlife to notify landowners about the rare plants on their properties. Where rare plants are located on Crown land, the survey information will enable steps to be initiated to acquire the land as nature reserves set aside for flora and fauna conservation. Should this not be possible, the authorities in whom the land is vested can at least be notified so that their activities may be planned to minimise accidental destruction of the rare flora.

The survey reports will also provide important baseline information so that future changes in abundance may be monitored. Such baseline data are essential for management planning.

◀ *Banksia cuneata*
Quairading Banksia, is one of only two species of the genus that has its flowers in small erect clusters rather than aggregated in a globular or cylindrical spike. It is an ancient species, a living missing link, with features intermediate between most banksias and the related genus *Dryandra*. It favours yellow sandplain, and has been reduced to a few remnant populations due to clearing of light lands in the central wheatbelt. (Photo S.D. Hopper)

Australian Heritage Commission Grant

The Australian Heritage Commission has awarded a total of $45 000 to the project, $20 000 of which was spent in 1982. The remaining $25 000 will be used over the triennium 1983-85.

▲ An open low woodland of *Eucalyptus stoatei* in vacant Crown land being considered for release for new farms. Although this ornamental tree of the Ravensthorpe district is abundant, it has a geographical range of only 50km, and only about 200 plants are known to occur on existing nature reserves. (Photo S.D. Hopper)

Work completed in 1982 included collation and mapping of all available information on wheatbelt plants thought to be rare or to have geographical ranges of less than 100km. The accompanying map shows areas where these plants are concentrated. Included are farming districts centred on Mogumber-Bindoon, Wongan Hills, Pingelly, Cunderdin, Quairading, Mt Lesueur, Geraldton, Northampton, Ongerup, and Ravensthorpe.

Following this collation of available information, specific areas were selected for survey by consultants K.A.G. Millar, M.A. Burgman and S.J. Patrick. Usually two or three plants occurring in the same area were selected for detailed work, and and watchful eye was maintained for a number of others that could turn up in the same area. Several of the plants surveyed are illustrated in the accompanying photographs.

Cunderdin-Quairading Survey

Ms K.A.G. Millar searched for three rare and three presumed extinct species in this area during July and August of 1982. Of the three rare species, *Hakea aculeata* (Column Hakea) was found to be the most endangered. Sixteen populations, containing an estimated 375 plants, were located, all on road verges or small areas of bush on private property. Careful management of these areas will be essential if this species is to survive in the wild. *Casuarina fibrosa* (Wooley Sheoak) failed to turn up anywhere other than its only previously known location, which is in a flora reserve. Some 550 plants of this small pine-like sheoak were counted. A total of 450 *Banksia cuneata* (Quairading Banksia) were found at five locations—four on road verges and one (containing 300 plants) on a nature reserve vested in the Western Australian Wildlife Authority. Provided the status of this reserve remains unchanged, this species will be relatively safe from extinction.

The status of the three presumably extinct species that were searched for *(Hakea tamminensis, Hemigenia viscida* and *Melaleuca arenicola)* regretably remains unchanged, as none were seen during the survey.

Mogumber Survey

A survey of nine rare, restricted or poorly known plants in the Mogumber area was undertaken by Ms Millar in October and November 1982. *Darwinia acerosa* (Fine-leaved Darwinia) was located in areas of exposed granite rock at six locations. An estimated 3 400 plants were seen. All occurred on farming property, so

▲ Consultant Botanist E.A. Griffin examines a clump of *Eucalyptus carnabyi* near Cataby on the day of its discovery in 1982. It grows on a road verge, and overlooks thousands of hectares of recently cleared farmland all of which was made available without prior botanical survey. The recently initiated wheatbelt rare flora surveys will improve the chances of plants like *E. carnabyi* being included in nature reserves in new land areas. (Photo S.D. Hopper)

◀ An unnamed species of *Darwinia* from the Carnamah region. The most famous darwinias are the mountain bells of the Stirling Range, but the genus has several representatives scattered throughout the wheatbelt. Some, like the one illustrated, have only recently been discovered, and persist precariously as small remnant populations along road verges or on farms (Photo S.D. Hopper)

▼ *Eucalyptus carnabyi*
One of the rarest eucalypts of the wheatbelts. Only eight plants are known from two locations 80km apart. Pink and white flowered forms have been recorded. This species is probably a hybrid between Motlecah *E. macrocarpa* and Drummonds Gum *E. Drummondii*. The plant illustrated is highly sterile, producing no nuts and with only 3% of its pollen developing normally. (Photo S.D. Hopper)

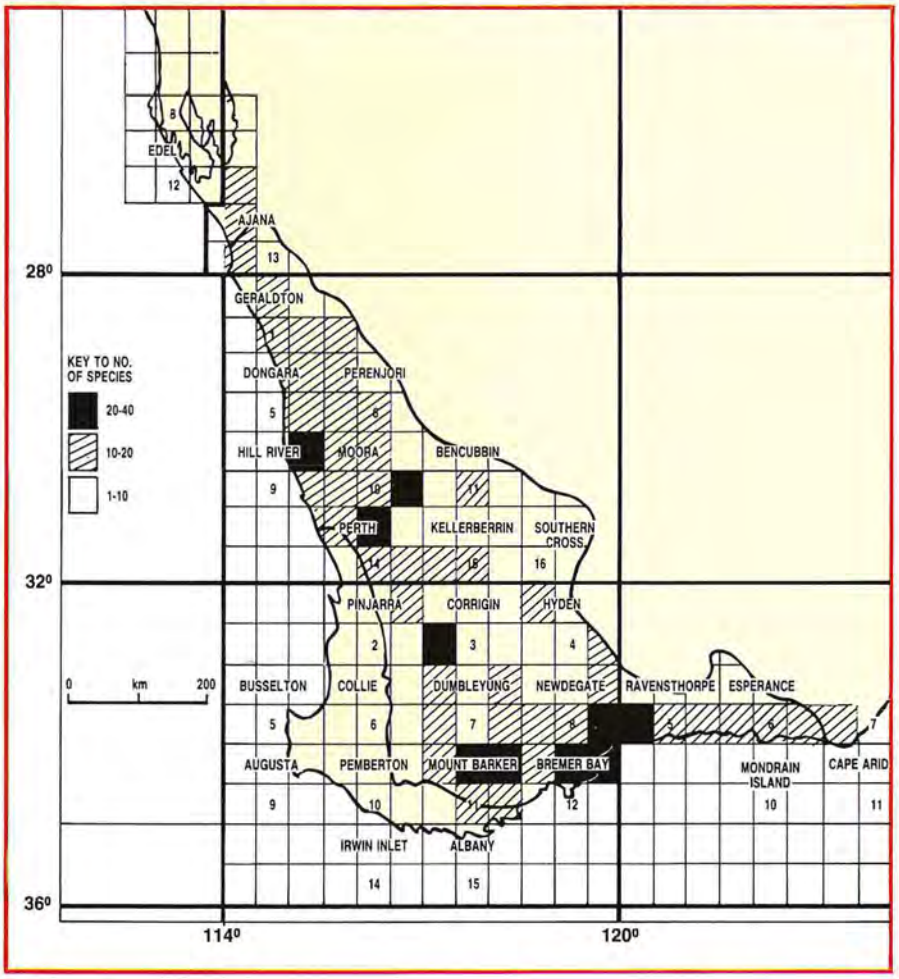
▲ *Eremophila microtheca*
Growing to 1 metre tall, this shrub has an acrid pungent odour that emanates from its foliage. It is very rare, being known only from a small population near Eneabba, where it flowers in August. It is one of eight wheatbelt eremophilas that are gazetted as rare or likely to become extinct under the Wildlife Conservation Act. (Photo S.D. Hopper)

Eucalyptus stoatei ▶
The decorative hanging flowers of this species have red bases 3cm long and 2cm in diameter. The yellow stamens never bend outwards, and thus restrict access to the nectar to a narrow central cavity lined with anthers. This unusual floral structure appears to be an adaptation favouring honeyeating birds as pollinators. For further details, see the *Australian Journal of Botany*, 1981, Volume 29, pages 625-638. (Photo S.D. Hopper)

▼ *Lechenaultia pulvinaris*
The cushion lechenaultia occurs in bare sandy soils in the Wickepin region of the central wheatbelt. It forms compact mats up to 50cm across. The attractive flowers appear in November. The species has declined due to clearing for agriculture, but faces no threat of extinction because it occurs on several nature reserves. (Photo S.D. Hopper)

▲ *Hemiandra gardneri*
A beautiful ground cover from yellow sandplain country in the Watheroo region. It flowers in August to October, and has foliage that is grey through to green. This rare species persists only on road and railway verges, and on small uncleared areas of farmland. (Photo S.D. Hopper)

▼ Map of the Western Australian wheatbelt showing the density of known rare and geographically restricted species in 30 minute latitude -longitude grid squares.



the long term future of this species is in doubt unless some populations are given total protection. *Darwinia carnea*, the prized Mogumber Bell, was not located in the survey area and is presumably extinct there. It persists in the wild as a small population on a farm near Narrogin.

Urocarpus niveus, the Bindoon Starbush, is equally in danger of extinction. Only one population of two plants was located, and this is on a road verge. *Ptychosema pusillum* (Dwarf Pea) may already be extinct, as no plants were encountered despite a thorough search of the only known modern location and of suitable nearby habitat. Three other poorly known species, *Lasiopetalum rotundifolium, Lhotskya brevifolia* and *Petrophile plumosa*, also failed to turn up and are presumably extinct.

One population of *Acacia anarthros* containing 100 plants was located on a road verge and extended into adjacent private property. Although an intense search for this species was not made, the survey indicated that it is extremely rare. *Calothamnus pachystachyus*, the last species surveyed, proved to be very common (60 000+ plants in at least 26 populations) but had a geographical range of only 48km. Fortunately, some populations of this attractive plant were found on conservation reserves, so its future is relatively assured.

Watheroo-Coorow Survey

Consultant Mr M.A. Burgman searched for two rare and three poorly known but restricted species of this area during November-December 1982. *Gastrolobium appressum* (Scale Leaf Poison) was located in 14 populations containing as estimated 2 660 plants, all on road verges, uncleared farmland or railway reserves. *Hemiandra gardneri* (Crimson Snakebush) was equally at risk, with 2 200 plants counted in 6 populations on road verges, farms or railway verges.

Of the three poorly known species, *Regelia megacephala* was found at 5 sites containing an estimated 23 400 plants, all on private land. With a geographical range of only 10km, it is seriously at risk despite its local abundance. Both *Jacksonia*

eremodendron and *Adenanthos stictus* were found to be relatively safe, being widespread and well represented on conservation reserves within the study area.

Wickepin Survey

The beautiful aqua-blue *Lechenaultia pulvinaris* (Cushion Lechenaultia) was the main object of a survey of the Wickepin area by Mrs S.J. Patrick during November-December 1982. Previously only recorded from two localities, the survey recorded a total of 12 populations containing an estimated 4 400 plants. Some 3 000 of these plants occur on nature reserves, while one large population of 1 400 plants occurs on farmland deliberately left uncleared by the owner to conserve the Cushion Lechenaultia. Even though its geographical range has been reduced by agricultural development from 58km down to 19km, Cushion Lechenaultia is comparatively well protected for a rare wheatbelt plant.

A.B.R.S. Grant

The Australian Biological Resources Study awarded a grant of $25 000 to be expended in 1983 for a flora survey of the mallee belt on the inland margin of current farms between Ravensthorpe and Cape Arid National Park. This region has a flora that is poorly known but apparently rich in species of woody shrubs and mallees. Many of these (at least an estimated 20%) have not yet been named by botanists.

The mallee flora is under imminent threat of broadscale destructions, as extensive areas are being cleared for agriculture or are under consideration for release for this purpose. While a small percentage of land routinely is set aside for flora and fauna conservation in any agricultural land release, government officers responsible for defining boundaries of such reserves have been hampered in the past by a dearth of data on the presence and distribution of flora in specific areas.

Consequently, this newly funded project aims to engage a consultant botanist for two years to survey the mallee flora and to deposit extensive collections in the Western Australian Herbarium as a permanent record on which future studies of the naming, geography and conservation of the flora may be undertaken. Emphasis will be placed on poorly known and presumably rare plants.

▲ *Eremophila calorhabdos*
Named in 1905 by the German botanist Ludwig Diels, this attractive plant ranges across the margins of current farms in the Ravensthorpe to Esperance region. Its erect stems are up to 3 metres tall. (Photo S.D. Hopper)

During 1983, the botanist (M.A. Burgman) will survey the study area on general collecting trips revisiting sites at least twice (in autumn and spring), allowing two months field work during each season, and eight months for preparatory data collation, processing of specimens and initial appraisement of the collections made. It is estimated that the field work would entail approximately 30 000km travel. Provided additional funds are granted, areas of special interest would then be surveyed in 1984 to improve knowledge on poorly known and rare species. The final outcome will be a publication listing all the species found, discussing their distribution, and providing a series of maps with proposed reserve boundaries delineated.

A formidable task

Knowledge of the distribution and conservation status of rare wheatbelt plants will be considerably advanced by the allocation of these federal grants. However, it is sobering to reflect on the size of the task ahead. Some 510 of the known plants of the wheatbelt and its margins are either rare, have a range of less than 100km or their conservation status is poorly known. The total figure could reach as high as 600 when allowance is made for the estimated 20% of the flora that still remains to be discovered and named.

In 1982 it took an average of one month's work per species to complete a survey and write up the results. Detailed searches of 14 species were undertaken, and opportunistic information on an additional 20 species was acquired in the process.

Clearly, at current levels of funding, it will take a considerable number of years to complete a thorough survey. nevertheless, the recently awarded grants, when pooled with State funds, provide an opportunity to make a much needed start on tackling this major conservation problem.