

Name That Plant



A unique network provides isolated Landcare and conservation groups with easy access to the CALM flora database.

BY NEVILLE MARCHANT



By the mid-1990s, Department of Conservation and Land Management (CALM) botanists at the Western Australian Herbarium were faced with a dilemma. How could they meet the increasing demand for information about WA's incredible flora? Landcare groups wished to know the names of the local plants they regarded as ideal for rehabilitation; they needed to know if it was native or a weed, where else it grows, what soil it prefers, and any special features. CALM regional staff and tourism groups needed to label plants on nature trails, and conservation groups wanted to know about rare species. And an increasing number of individuals and community groups simply wanted to know their local plants.

Five years later, there are 85 regional groups forming a network of Landcare and conservation-oriented collectors. They are helping CALM fill in gaps in knowledge about the State's plants. In return, groups can access CALM information: each group has a reference herbarium of dried plant specimens computer-linked to the State collection in Perth.

It is well known that the native flora of WA is rich and varied and thus very difficult to name. The flora of the south-west has developed in splendid isolation, and for various reasons there has been an evolutionary explosion of



species, which started about 30 million years ago and has continued to the present. Our legacy is that there are often only subtle differences between species, and so many look similar to so many others that the only reliable way for most people to identify plants is to compare them with other specimens.

We simply don't have many published up-to-date plant handbooks for the interested public to identify our plants. There are too few trained botanists working in the field of taxonomy or plant classification. Besides, long experience or a high level

of training is needed to use the jargon in these publications. Photographs may help, but the discriminating characteristics are often small and not easily seen on a photograph, so naming is not always certain.

Also, knowledge is changing so rapidly that published field guides to plants are out of date from the day they are sent to the printers. Botanists to date have recorded 12,500 plant species from Western Australia (most in the south-west), but there may well be more than 15,000.

THE NEED TO KNOW

To document a species, we first need a reliable scientific name for it. There are too many species in the State for

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Main: A Regional Herbarium workshop.
 Photo – Neville Marchant/CALM
Inset: New *Leucopogon* species from near Badgingarra.
 Photo – Mike Hislop/CALM

Above: Participants from the Esperance workshop learn the correct procedures in collecting and recording notes of dune plants.
 Photo – Coral Turley/Esperance Herbarium

Left: The Narrogin Regional Herbarium's new quarters in the Agriculture WA building. It was officially opened by Dr Neville Marchant (right), pictured with members from Narrogin and volunteers from Perth.
 Photo – Patricia Gurry/Volunteer



common names to be reliable; for example, there are many hundreds of paperbarks and gums and wattles, and only the best-known have common names. In many cases we are not quite certain which common name refers to which scientific name. Often, only those species with commercial value have a 'fixed' popular name that is used consistently.

With increased interest in plants and in general conservation of our biota, there is a demand for information about the State's flora. CALM's WA Herbarium collections reach back to an orchid collected near Albany by the botanist Robert Brown when he visited with Captain Flinders in 1801, nearly 200 years ago. Since then, collectors have added nearly a half-a-million specimens to the collection. These have all been databased so that their name, classification, geographic location, and habitat have been captured electronically.

Because of the richness of the flora of WA, and the dearth of taxonomists working on WA plants, it is very difficult to identify plant species. Yet our need to do so is becoming increasingly important. There is widespread community concern about loss of biodiversity, degradation of ecosystems and extinction of species. There are also problems with developing satisfactory prescriptions for managing bushland, including weed identification, specific control measures and rehabilitation. Plant names mean we can store relevant information about that plant and then we can make it available to users.

Landcare and conservation groups have difficulty in obtaining sound botanical advice on environmental issues, including remnant vegetation management and revegetation for Landcare. There is a lack of information on flora survey methods, and insufficient knowledge about threatened flora and threatened ecosystems.

How can these groups identify plants? A method used in the past was to collect small samples, name them and then paste them into a field book. Many of these field herbaria formed the basis of the regional collections, but there has been a considerable amount of work needed to correct misidentifications and to update the collections.



THE VOUCHER SYSTEM

The identification error rate, changes of names, and changes to the boundaries by which botanists distinguish related species, mean that, in time, any field herbarium not computer-linked to CALM's WA Herbarium will have less value as an identification tool. Its collections will have 'fossilised' names, which will perpetuate identification errors and deny access to users.

The only satisfactory way of providing up-to-date names is to link each specimen in a field herbarium with a 'voucher' specimen in the State Collection. Any changes can easily be captured, and even specimens in remote community groups can be updated accordingly.

All scientists or amateur botanists studying plants need to collect specimens and identify them. They also need to retain the specimens as

Top left and right: The Murchison Museum Regional Herbarium has established a botanical walk complete with rest places and information display boards to help visitors enjoy their natural environment.

Photo – Meg Officer/Murchison Herbarium

Above: Val Crowley of the West Arthur Regional Herbarium surveys a population of *Synaphea flabelliformis*.

Photo – Vera Putland/West Arthur Herbarium

references, so that other scientists can refer to them and add their knowledge to develop greater understanding of each species and the vegetation types of which they are a part. The system of vouchering is the essential process to enable progress of knowledge. It is absolutely necessary, for example, to collect and retain a specimen used as a seed source for rehabilitation; there are already too many examples where a



Left: Mark True, CALM ranger for Fitzgerald River National Park, and Enid Tink of Ravensthorpe Regional Herbarium at an identification workshop. Photo – Gillian Smith/Volunteer

Below left: Gwennyth Warren of the Narrogin Regional Herbarium with a plant of *Lysiosepalum aromaticum*, a new species. Photo – Sandra Fincham/Narrogin Herbarium

REGIONAL HERBARIA HAVE UP-TO-DATE NAMES

The regional volunteer collects two specimens of the species from the one site. Notes are made about the habitat, and both specimens are labelled and pressed. One is sent to Perth, the other retained for the local herbarium. The identification of the specimen is confirmed at Perth by volunteers and the NHT-funded botanist. The Perth specimen is databased and a copy of its barcode and its correct name are sent to the regional herbarium.

CALM botanists or visitors can study the voucher specimen in the CALM Herbarium, or it may be sent on loan to a specialist who adds the correct name. Any re-identifications or changes can easily be sent to the regional herbarium at any time in the future.

weed or other unsuitable plant has been used for rehabilitation.

For more than 100 years, botanists have been documenting the State's flora. This means that anyone interested can name plants in order to record information useful for conservation, agriculture, horticulture or for general interest. The CALM WA Herbarium has nearly half-a-million specimens of WA native plants and weeds, yet this is only a small collection compared with the size of the State and its incredible number of species. We are still finding many new varieties of the 12,500 kinds of plant so far recorded. Each year, many new species are discovered in the bush; some are recognised from the Herbarium collections.

The work of naming and re-naming species is increased by the number of visitors researching the area, quite apart from local scientists and volunteers. Because the CALM WA Herbarium is one of a chain of herbaria throughout the world, and because Western Australian flora is renowned, a number of researchers are keen to visit the State each year to study it. Many use DNA and other molecular techniques to reveal plant relationships and to unravel their evolutionary history. The outcome is a number of new names each year and the consequent renaming of hundreds of specimens lodged in the CALM WA Herbarium.

This is a wonderful achievement, but it adds to the dilemma with which we began: how do we make accurate information on this incredibly varied subject easily available to anyone who needs it, wherever they may be?

THE SOLUTION: REGIONAL HERBARIA

CALM botanists have now solved this dilemma. The entirely databased





CALM WA Herbarium (see 'From Here to Eternity', *LANDSCOPE*, Winter 1998) is the focus for a new initiative, which empowers regional conservationists to extend their knowledge of local flora as well as contribute to State knowledge. The regional herbarium project is a world-class system to deliver significant amounts of information to the State's conservation and natural history groups. This information is recorded in FloraBase, already available on the CALM NatureBase website (<http://www.calm.wa.gov.au>). In scope, ease of use and sophistication, FloraBase is the world leader in its field.

Landcare and natural history groups and individuals can now find out the scientific name from the common name, see a map of where the species grows, read a short description and, in some cases, view a colour picture of the flower and distinguishing parts of the plant. It is also possible to determine what particular species with a certain flower

Above: Distribution maps for 12500 WA species are available in FloraBase. Maps are updated when new specimen records are added to the CALM Herbarium.

Above right: A screen view of a part of FloraBase where all species records and the correct name and conservation status of the mountain bell genus *Darwinia* have been asked for. The coloured buttons are used to access details of each collection, maps, photographs when available and a short description of each species.

Right: Photographs of WA species are slowly being added to FloraBase to provide easy identification of the 12500 species so far recorded in the State.

| Family | Plant name, author and reference | Details | Maps | Photos |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|------|--------|
| 277 | <i>Darwinia acerosa</i> W.Fitzg. J. W. Austral. Nat. Hist. Soc. 2 (1):17 (1904) Taxon 5904 is <u>current</u> . Conservation Status R Common name: Fine-leaved Darwinia | 🔍 | 🗺️ | 📷 |
| 273 | <i>Darwinia apiculata</i> N.G.Marchant <i>Nuytsia</i> 5:63-65 Fig.1 (1984) Taxon 3925 is <u>current</u> . Conservation Status R Common name: Scarp Darwinia | 🔍 | 🗺️ | 📷 |
| 275 | <i>Darwinia calothamnosoides</i> N.G.Marchant & Keighery ms Taxon 14989 is <u>current</u> . Conservation Status P1 | 🔍 | 🗺️ | 📷 |
| 272 | <i>Darwinia capitellata</i> Rye <i>Nuytsia</i> 4:423-426(1983) Taxon 5905 is <u>current</u> . | 🔍 | 🗺️ | 📷 |

colour and habit occur in various regions. Botanists are now well on the way to producing a simple identification system. Stage One, FloraBase, will be supplemented in the near future by an easy-to-use identification tool enabling recognition of Western Australia's 1,330 plant genera.

The regional herbarium project is funded by CALM and the Natural Heritage Trust (NHT). It trains community groups to collect two sets of each specimen. One of these is sent to Perth for databasing, while the other remains in the local herbarium collection. The Perth specimen is carefully identified by NHT staff with the assistance of trained volunteers. It is databased and incorporated into the State Collection, where it can be

compared with other specimens and studied by taxonomists. The regional herbarium receives, by mail or Internet, an initial identification and then a barcode number for each specimen. Thus they are prepared for any future re-identifications or name changes. They then change the label on their specimen so that it is in accordance with the parent one in the Perth herbarium. The regional group can then access other available information based on an up-to-date name.

The CALM Herbarium arranges a number of workshops each year to train country volunteers to collect voucher specimens and to document the habitat details. As well, there have been several identification workshops to teach regional groups how to use available



information to identify their own plant specimens. A key ongoing training topic is the use of computers to identify species and access conservation information.

KNOWLEDGE GAINS

Linking field herbaria to the State Collection will also increase the collections. This provides a more complete range of samples of the flora of the State and provides even more comprehensive information.

Local knowledge of the regional herbarium groups allows us to gather comprehensive information about local floras. The regional collectors know their local habitats and can access areas a visiting botanist is likely to miss. In addition, they can return to a site on a number of occasions, so we are able to build up a better picture of what occurs, when it flowers, what the fruits look like, and when the seeds are mature.

From 1996 to 1999, the regional herbaria network discovered 10 new species. As well, they discovered many new populations of rare plants, surveyed hundreds of previously unrecorded areas and added thousands of specimens to voucher their studies. All of these specimens have added to general knowledge about the plants of WA, which is available to all other groups.

An extremely important contribution of regional collectors is being made to weed studies. This aspect of the regional Herbarium program is currently in need of financial support. It has the potential to develop a comprehensive weed-watch program, providing a huge resource to combat the reduction of biodiversity by weeds.

A most important outcome is that every group can access information, which will assist rehabilitation. There is increasing information about salt tolerances of native plants that will be of inestimable value in ensuring that the best possible species are used for salinity control.

The WA Herbarium and associated regional herbaria form a unique, dynamic, State-wide team. Together they gather, manage, research and communicate information on the geography, systematics and biology of our unique and precious flora on behalf of all members of the community.



Above: Participants in the Corrigin workshop use a dissecting microscope to identify plant species.
Photo – Stan Armstrong/Volunteer

Right: Ravensthorpe Regional Herbarium members developing a walktrail from Ravensthorpe to Hopetoun.
Photo – Merle Bennet/Ravensthorpe Herbarium

Below right: *Goodenia* sp. *scadden*, a new species from Esperance.
Photo – Coral Turley/Esperance Herbarium



A POWERFUL CONSERVATION ASSET

The network enables:

- Regional weed surveillance
- Monitoring of rare flora threats
- Discovery of species and varieties new to science
- Service to ecotourism modular field guides
- A major contribution to documenting the State's plants

Dr Neville Marchant is the instigator of the regional herbarium project and the manager of CALM's Western Australian Herbarium. Jan Cathie is the coordinator, and Margaret Lewington assists and is responsible for publicity. Mike Hislop is the project botanist who names specimens and leads the identification team. They can be contacted on (08) 9334 0587 or via e-mail (margl@calm.wa.gov.au).

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One of the best selling books from CALM has recently been fully revised. See 'The Best of the South-West' on page 10.



A new weapon against the scourge of feral cats was recently tested on Hermite Island. See 'Isle of Cats' on page 18.



In the far north of WA, there is evidence of not one, but two cosmic impacts. See 'Cosmic Impacts in the Kimberley' on page 28.



Satellite imagery is helping us to fight maritime pollution. See 'Looking Through the Surface' on page 41.



A unique network links volunteer groups and regional herbaria with the CALM flora database. See 'Name That Plant' on page 35.

C O V E R

Western Australia is aptly described as the Wildflower State. Some 12,500 different species are known from the wild, with a huge range of colours, shapes and characters. But many species once found are lost again, and it's always an event when a species thought to be extinct is rediscovered. See 'Lost Jewels in the Bush' on page 23.



Illustration by Philippa Nikulinsky

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