



The Plant Press

Western Australian Regional Herbaria Newsletter



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Regional Herbaria Network Up and Running!

Over the past six years the Regional Herbarium Network Project has brought about a very fruitful collaboration between the WA Herbarium and the community. The project now has CALM funding and has appointed permanent staff to serve the network of regional herbaria.

The project was initially funded in 1999 by the Natural Heritage Trust on the understanding that it became self-funding after 2003. At workshops and in this newsletter we asked that Regional Herbaria seek funding. For various reasons this was not possible and the project was scaled down. The WA Herbarium was determined to continue technical support and, with the enthusiasm of the WA Herbarium volunteers and the achievements of the regional volunteers to date, the scaled-down project continued. CALM allocated bridging funds to continue the project beyond 2001, and now we have been granted recurrent funding of \$30,000 to continue the project into the future.

It is now time to recap some of the history of the project and try to highlight the way forward for the Regional Herbaria so they can continue their valuable work.

It has become obvious that Regional Herbaria are often the chief custodians of plant biodiversity information and skills at the local level. They are highly motivated and have the hands-on experience and knowledge critical to setting conservation priorities at local and regional levels. Biodiversity conservation is an urgent issue in our south west, and accurate information about indigenous plants and weeds is a basic requirement underpinning the chances of success.

There are currently serious gaps in our knowledge-base which undermine our potential to address the biodiversity conservation crisis in south west W.A (see Biodiversity Audit findings p.3). Government agencies alone cannot gather and disseminate the information needed as effectively as possible without community involvement. **The quiet achievers of the Regional Herbaria are increasingly recognized more widely as key stakeholders in natural resource management in their respective regions.**

If Regional Herbaria are to create a more secure future for themselves and the vital work they do, it is mandatory that they become more integrated with their local Natural Resource Management umbrella groups.

(Continued on page 2)

STOP PRESS: FUNDING OPPORTUNITY COMMUNITY CONSERVATION GRANTS - CLOSE 17 OCTOBER 2003

The Minister for Environment and Heritage, Dr Judy Edwards, will allocate community conservation grants to help projects involving flora and fauna conservation, land rehabilitation of environmental benefit and fauna rehabilitation. Individuals, local community groups or organisations may apply. State Government agencies and local authorities are ineligible to apply directly for these grants but may participate by forming partnership groups. Applications are invited from three categories:

- Major conservation organisation support grants (\$100,000)
- Fauna rescue and rehabilitation grants (\$17,000)
- Nature conservation project grants (\$78,000)

Application forms are available from the Wildlife Branch of the Department of Conservation & Land Management, phone 9334 0455, email sharonp@calm.wa.gov.au. If you are interested in applying for funding under this scheme please contact us immediately. Applications close at the Minister's office on Friday 17 October 2003.

(Continued from page 1)

A second application to NHT for funding to extend the project and to collect lower plants (lichens, mosses and fungi) was unsuccessful. However we did receive a further NHT grant in 2001 for the Weed Information Network (WIN) designed as an adjunct to the Regional Herbaria focussing on naturalized alien flora. To everyone's surprise and disappointment the funding for WIN was abruptly withdrawn (without a satisfactory explanation) before the first reporting period for the project had elapsed. However, the project had already ignited the minds of some WA Herbarium volunteers who continued on with part of the project, despite the funding cut. They have now produced an impressive set of weed taxa descriptions (available in Florabase2) for identifying weeds (see page 88). Unfortunately, without funded professional support there is ultimately a limit to the project which falls sadly short of its original aims.

As mentioned above, Federal funding for the Regional Herbaria Network was always intended to be just seeding money to establish the protocols and provide initial training for the volunteers involved. It was always envisioned that Regional Herbaria should become self-sustaining. The information they gather and maintain locally is of very high quality and crucial for the environmental soundness and cost-effectiveness of many local conservation activities. This needs to be recognized by funding bodies interested in supporting best practice, integrated management of local biodiversity. Many workshops were held by the WA Herbarium in regional centres demonstrating the skills and assets that Regional Herbaria could bring to local natural resource management projects and grant applications.

One valuable asset which each Regional Herbarium brings to any grant application as collateral is the notional value of specimens held by the WA Herbarium from the area. There are numerous records on the WA Herbarium database, dating back to the earliest flora surveys, of plants collected from each of the Regional Herbarium territories. These provide data on what is already known and highlights gaps in the knowledge. Large resources have been invested in collecting specimens, databasing, correct storage of specimens, and curation to maintain taxonomic currency of the records. The notional value of each specimen maintained in this manner is recognized by State herbaria throughout Australia to be in the order of \$52 per specimen. Unfortunately, at the height of the Regional Herbaria Network Project activity, the Federal funding bodies balked at the idea of valuing pre-existing knowledge as collateral in grant

applications.

Another poorly appreciated principle in the process of negotiating grants has been that of the importance of voucher specimens (see page 6). Any flora survey, species list, seed collection, rehabilitation trial or other work carried out with the flora should be documented by lodging voucher specimens in an accredited herbarium if the activity is to be scientifically validated. It is absolutely essential that specimens are collected and processed properly, their identification verified, and the resulting data electronically captured in order to ensure the project is based on sound, up to date, easily retrievable taxonomic information. It has been unexpectedly difficult to communicate this to funding bodies (even to personnel with science training). It is scientifically unsound and a waste of scarce public funds to allocate (substantial) grants to various bodies that do not have the means to document or scientifically identify the plants that their project is proposing to deal with.

The activities and values of Regional Herbaria need to be supported by coordinating groups in their regions that are recognized by funding bodies (such as the Natural Resource Management groups). The future of Regional Herbaria lies in regionalization and in the integration of their important assets, skills and objectives with the overall management of biodiversity in their greater regions. It is vital that Regional Herbaria promote themselves and what they have to offer and establish stronger links to local support systems. This may mean (for example) that Regional Herbarium members become active on the committees of the steering groups in their regions and perhaps lodge duplicates of their specimens with a central resource centre in their region as well as maintaining more localized collections.

The crucial role of the WA Herbarium (PERTH) remains the maintenance of currency of names and provision of new names as redeterminations and realignments arise from the taxonomic work centred there. PERTH is the world-wide custodian of data on the alien and indigenous flora of WA and maintains the national and international links to facilitate this. It will continue to provide the services to Regional Herbaria that it is best placed to do, such as databasing, confirmation of plant names and provision of training. However, it is up to the Regional Herbaria themselves to network and to reach out to the mainstream of the conservation movement in their areas. Show them what you have to offer and start to build a more sustainable future.

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Biodiversity Audit: Plight of South West Plants is a National Issue.

The National Land and Water Resources Audit recently released its *Australian Terrestrial Biodiversity Assessment 2002* amongst controversy due to prior leakage of the report to the press. This rigorous study confirmed what most already knew. It quantified a grim picture of decline and a large discrepancy between resources currently allocated and resources needed to adequately address biodiversity conservation. Due to the large scale of the study, local and specific issues were largely submerged in the big picture. Despite this, the South West of W.A. clearly stood out on a national scale with regard to the gravity of the threat to its plant biodiversity.

Two Australian plant groups (*Acacia* and the eucalypts) which are important for economic, environmental and scientific reasons were used in the audit as a case study to examine national plant biodiversity trends. Large areas of W.A. (in particular, the South West corner) were ranked by the report as "irreplaceable" with regard to these taxa. This reflected the exceptional combination of high species richness and endemism of our flora. (In other words the South West supports a large portion of the total species pool of *Acacia* and the eucalypts, and many of these occur nowhere else). The study

then superimposed the levels of landscape stress identified in the various regions of Australia over the map of the highly irreplaceable biodiversity zones Australia-wide. **Almost the entire area of the South West of W.A. fell into the worst case scenario.** It was by far the largest area in Australia in which highly irreplaceable biodiversity values were found under the highest levels of stress. The analysis clearly identified the plight of plant biodiversity conservation in South West W.A. as a national priority.

The report stated (with reference to the bioregions of Avon Wheatbelt, Mallee, Esperance Plains, Coolgardie and the Geraldton Sandplains):

"There is a general lack of data describing the population trends and conservation status of species in these subregions and bioregions ... This deficiency in knowledge should be addressed to assist their conservation."

To read the report follow the links to biodiversity on the following URL:

<http://www.environment.gov.au/atlas>.

New Staff at the Western Australian Herbarium

The Department of Conservation & Land Management has recently made available recurrent funding of \$30,000 to support the Regional Herbaria Network. This has made possible the appointment of two new staff members each working part-time on the project.

Dieter Pistol has taken the identification work associated with Regional Herbaria formerly dealt with by Mike Hislop. Dieter hails from South Africa but has spent the last few years working in Berlin and, more recently, in Brisbane in the bio-medical field. He is an experienced botanist. During his stint as a volunteer at the WA Herbarium prior to his work in Berlin Dieter developed a grant knowledge of and love for WA's unique and diverse flora. In the remainder of his time Dieter will be working as a curatorial botanist in the research collections.

Rob Davis will already be familiar to many of you as an energetic field botanist with a truly astonishing knowledge of the state's flora. He has worked with the WA Herbarium for several years in connection with Bioprospecting. Rob will be broadly responsible for the liaison and administrative work necessary to support the Regional Herbaria Network, duties similar to those formerly carried out by Jan Gathe.

Coastal Flora Wrap Up

The SWALE project, conducted by the WA Herbarium in collaboration with four Regional Herbaria and Coastwest/Coastcare, was successfully completed in March with the release of the report *Surveying Western Australia's Land Edge- reference transects in coastal vegetation at Geraldton, Port Kennedy, Bunbury and Esperance*.

The project focussed on eight cameo sites of high conservation value that displayed some of the dramatic variety present in the landforms and vegetation of our south west coast. Recently formed beachridges at Drummond's Cove (Geraldton) and the gently undulating cusped plain (Port Kennedy) were a sharp contrast in age and topography to the ancient eroding granite hillsides at Cape Le Grand. Likewise, the huge dunes built of calcium-rich remains of marine creatures at Greenough (near Geraldton) and Dalyellup (Bunbury) were a kingdom away from the "pocket beach" at Hellfire Bay (Esperance) that consisted of pure quartz sand. Coastal wetlands were also included in the study. These ranged from Ramsar-listed freshwater sedgeland (Port Kennedy) to our most southerly mangrove forest growing in water of marine salinity at the remains of the Preston River Delta (Bunbury).

Apart from surveying floristics, the aim of the project was to create a model for community groups to monitor vegetation change in habitats that are often much abused. Effective monitoring systems need thoroughly documented baselines. Therefore permanent monitoring transects were established and a quantitative measure of abundance of all taxa found in quadrats was recorded. An exhaustive collection of voucher specimens was compiled to validate taxonomic determinations. In addition, groundwater levels in several wetlands in the transects at Port Kennedy were also monitored each month for a year to link a hydrological baseline to the vegetation data.

A total of 248 taxa were recorded by SWALE from its eight transects. The specimen names were verified by Mike Hislop at the WA Herbarium and 496 voucher specimens were databased onto Florabase and incorporated into the herbarium. The taxonomy of the voucher specimens lodged by SWALE is kept current as part of WA Herbarium curation protocols with all the information easily retrievable from the Florabase website.

The SWALE project methods were partly based on a study of WA seashore vegetation by J. Sauer published in the Australian Journal of Botany

in 1965. Sauer recorded 110 taxa from 50 transects along the coast between the Port Hedland and Albany regions. Unfortunately he vouchered all his specimens in USA herbaria and about 30% of the plant names he used have since lapsed as valid names in the official Western Australian flora census (or are otherwise inappropriate). If we now wanted to assess how the flora of the Sauer transects had changed over time, firstly we could not be sure exactly which taxa were there in 1965 (without seeing his vouchers) and secondly it would be a time-consuming process to research the taxonomic changes which have taken place since 1965 to align his names with current flora WA flora concepts.

It soon became apparent that many elements of the coastal flora of this region were not well known. Even the relatively well-studied Quindalup Dunes that flank much of the coast between Bussleton and Geraldton yielded three undescribed taxa of *Calandrinia* (Portulacaceae). The survey collected many taxa that are poorly represented in the WA Herbarium collection, several new populations of DCLM Priority Species and some very significant range extensions. For example *Platysace haplosciada* (Apiaceae), found by SWALE in the Cape Le Grand transect, was the first WA Herbarium collection of this species from outside the Margaret River to Bussleton area (a range extension of many hundreds of kilometres).

The SWALE project was of necessity quite limited in scope. The WA coast is subject to high pressure from development, recreation, weeds, erosion and the uncertainties of climate change. A more comprehensive survey would be necessary to effectively classify the vegetation types and make an assessment of how adequately the present reserve system encompasses this diversity. However the transects established by SWALE can now be efficiently monitored over time by the community at various levels depending on the type of information required and the technical support available. For example, a re-survey of a transect (or a part of a transect) could be conducted after several years, supplemented by local records of fire, recreational usage of the land, rainfall and groundwater levels. This data could be statistically compared with the SWALE baseline and fed back into improved management practices. (Ideally all bushland with high conservation values should have monitoring systems like this implemented in them).

(Continued on page 5)

(Continued from page 4)

Alternatively, a more casual approach to monitoring could be adopted which would still provide an early warning system for potential problems. This could be done by periodically walking along the transect, noting presence or absence of originally recorded taxa and collecting voucher specimens of any new taxa (including weeds) which have appeared since the initial survey.

Copies of the hard copy SWALE report are now housed at the Geraldton, Rockingham, Bunbury and Esperance Regional Herbaria and the State Library Service. The report is also available on the new Florabase 2 website.

The WA Herbarium has received a number of inquiries from communit groups, botanists and a local authority with regard to establishing reference transects in other areas. The SWALE Project was recently honoured with a Coastwest/Coastcare award as a Statewide winner for Outstanding Coastal Project 2002 presented by Minister of Planning and Infrastructure Allannah MacTiernan.

Cate Tauss



Geraldton Regional Herbarium volunteers Jenna Brooker, Ena McNamara and Julie Firth prepare to survey the Greenough transect. Photo: Tony Brooker



Voucher Specimens and Science

A BOTANICAL VOUCHER SPECIMEN is:

Purposeful. For example Regional Herbarium voucher specimens are often the vital evidence that supports the definition of new species, the mapping of biodiversity distributions and the framing of conservation recommendations in one of the world's most important and poorly-known botanical regions.

Accompanied by sufficient notes to document its relevance to the collection. If it is not clear from the notes where it came from and why it was collected, the specimen dwindles rapidly to being just a curiosity of no scientific or conservation value.

Shows features of the plant that are essential for its identification e.g. flowers and fruit and is well preserved by appropriate means such as pressing and drying; and is

Lodged with an internationally-recognized herbarium. If the specimen is not available for perusal by the wide range of researchers who use the international network of herbaria it is not participating fully in the knowledge-building process.

One of the most thrilling but also humbling realities of well-conducted scientific research is that, as any particular topic is explored, typically the exploration raises more questions than it answers. There is a world of infinite complexity out there and every new scientific paper published is really just a mere progress report not the definitive answer set in stone for evermore!

The scientific method is the major philosophy that has evolved over centuries to guide scientists in their efforts to laboriously peg back the unknown. This method requires all scientific work to be objective, transparent in its methods, reviewed by the scientific community, reproducible, and backed up by evidence. It is just not good enough for scientists (unlike politicians and poets) to claim something on the basis of their reputation or a subjective impression. In the natural sciences such as botany, voucher specimens lodged with an internationally recognized institution such as a herbarium and thus available for peer review are part of this essential scientific evidence. Voucher specimens are needed to back up virtually all botanical conclusions or discoveries be they species concepts, DNA sequences, ecological trends, etc. They literally serve "to confirm or prove something" (Oxford English Dictionary) or, by extension, to disconfirm or

disprove something.

To tackle the urgent environmental problems we face, such as loss of biodiversity and degradation of vital environmental resources such as air, water and soil, we need a highly organized effort from scientists, government, industry and the community all working together. Rigorously documented, easily retrievable biological data is needed. We need to be able to check the evidence to see if scientific studies have made the right conclusions or not. Also constant review of the evidence supporting past conclusions needs to be done as new information comes flooding in via the many technological portals that are being created. Vouchering all biological studies is a keystone in this process.

Without appropriate collected, documented and maintained vouchers, the scientific value of a biological study is, at best, reduced to the level of an anecdotal and unsubstantiated report. At worst, it is little better than rumour!

