THREATENED PLANT COMMUNITIES

ON THE SWAN COASTAL PLAIN

Bushland patches around urban areas are very important for conserving not only species diversity, but also unusual groups of plants and other organisms that occur together as communities (ecosystem diversity). The pressure from urbanisation and other land uses in the south-west of Western Australia is very great on the Swan Coastal Plain in areas close to Perth, and many of the unique communities that occur there are likely to be those most under threat. Here, we look at five of them.

BY
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Until recently, much of the south-west of Western Australia had not been well surveyed for ecological communities, so it has often been difficult to know how to define them, where they occur and how threatened they are. However, in 1994, an important regional survey of the plant communities on the southern Swan Coastal Plain was funded by the Department of Conservation and Land Management (CALM) and the Australian Heritage Commission, and completed by CALM staff in conjunction with a botanical consultant and a team of about 100 dedicated volunteers. Their report provided invaluable data for use in the threatened communities project being conducted by CALM's WA Threatened Species and Communities Unit (WATSCU), with financial help from the Australian Nature Conservation Agency (see 'Endangered' in *LANDSCOPE* Autumn 1996).

Many of these communities are in areas that had been extensively cleared, mainly for agriculture, and the remnants are now under threat from urban development, other clearing, weed invasion and other processes. These areas include wetlands in Kenwick and close to Rockingham; woodlands at Koondoola Open Space; and shrublands in the farming areas around Muchea, Gingin and Busselton.

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Main: Lakes and farmland in the Swan Coastal Plain showing fragmentation of bushland.
Inset: Chenille honey-myrtle, a typical species of the Muchea limestones that is more commonly found on limestones nearer the coast.
Photos – Jiri Lochman

Left: A new subspecies of blue devils (*Erygium pinnatifidum* subsp. *palustre* ms.) at the Brixton Street wetlands.

CLAY WETLANDS

About 75 per cent of all wetlands in the Perth metropolitan region were cleared, filled in or otherwise destroyed before their biodiversity and scientific value were understood. As a result, many of the plant communities once associated with these wetlands have become rare or may even have become extinct. In fact, wetlands make up more than 80 per cent of the total number of ecological communities in Western Australia already identified as threatened.

One of only ten known patches of one such wetland plant community, occurs in a small remnant near Brixton Street, in the Perth suburb of Kenwick. This 19-hectare site, which represents roughly 20 per cent of the remaining area of this community type, is surrounded by a rapidly expanding urban area. Although relatively unappealing for much of the year, the area blossoms from winter to late spring, and the very high level of diversity becomes apparent in the multitude of colours and forms of wildflowers. This small area contains an amazing 307 plant species, including numerous sundews, orchids, flannel flowers and trigger plants. Several species are threatened with extinction.

As the community is totally reliant on seasonal wetness, it is very important that this and the surrounding areas, which may act as catchment, be managed to maintain the quality and quantity of water received

Left: The yellow-flowered *Verticordia acerosa* and the white and red flowers of the variegated featherflower (*V. huegelii)* are two of several highly colourful species of featherflower that bloom in late spring in the Brixton Street wetlands.

Right: Banksia woodlands, looking down onto the diverse range of shrubs forming understory, including star fruited eremaea, pineapple bush, buttercups and Banksia incana.

Below right: Balga (*Xanthorrhoea preissi*) sedgeland, formed between two low sand dunes that are dominated by the coastal form of panjang (*Acacia lasiocarpa*), in the beach ridge plain wetlands.

by this patch of bushland. The Wildflower Society and a local Friends group have received a Community Conservation Grant from the Minister for the Environment to develop a management plan and to undertake weed control in the reserve. Such ideal support will help maintain this unique plant community for future generations to enjoy.

BEACH RIDGE PLAIN WETLANDS

An important sedgeland occurs in damplands (areas that are damp to inundated in winter) at Becher Point. Even before clearing for housing and other developments occurred, this community was restricted to a very small area. Much of what remains will become a conservation reserve in the near future. But additional steps will be necessary to help preserve the community.

It is an unusual community in that it occurs in rare circumstances—beach sands that were deposited by the ocean in layers during the last 7 000 years, very recent in geological time scales. The damplands occur between the dunes and provide an important geological record, showing how the dunes and wetlands have developed. Those most recently formed—during the last six hundred years—are closest to the shore, while those that formed 7 000 years ago occur up to several kilometres from the current shoreline.

Wildfires are frequent; 45 have occurred there since 1985, resulting in considerable weed invasion. In addition, it is thought that groundwater may be affected by current and planned land uses. A recovery team with a wide representation of people who can help ensure the conservation of these very special damplands has just been established.

SPECIES-RICH BANKSIA WOODLANDS

In the heart of suburban Koondoola, there is a highly diverse and unusual banksia-dominated community that occurs on sandy soils. It is so rich that two small plots, 10 metres by 10 metres, contain 87 plant species. This diversity is a result of the huge variety of shrubs that occur in the understorey, and is one of the characteristics distinguishing this community from others dominated by banksia.

It is likely that this community would have been restricted in distribution to the tops of some sandy knolls in and around Perth. Much of it would have been cleared for housing, and now only eight patches remain covering a total of about 120 hectares.

Most of the patches of this community have been burnt too frequently in the last few years, resulting in weed invasion. Frequent fires will also favour plants that can survive fire and regrow by resprouting, so the plants that dominate a community can be changed. Many of the species that characterise this community are highly susceptible to dieback disease, which spreads very rapidly in these sandy soils. Both frequent fire and dieback reduce the diversity and alter the structure of the community. To tackle these problems, an area of about 140 hectares, about 30 hectares of which is banksia woodland, has been set aside for classification as Koondoola Regional Bushland, and a management plan is being prepared. Fencing and rezoning is being carried out, and a Friends Group has been formed.

MUCHEA LIMESTONES

A very unusual soil type occurs near Muchea, north of Perth. Soils derived from limestone normally occur near the coast. But here, limestone has been deposited by watercourses in black heavy clay soils further inland. As a result, we find plants normally associated with coastal soils occurring up to 35 kilometres inland. These heavy soils are excellent for agriculture and, consequently, more than 90 per cent of the area originally covered by this interesting community has been cleared for farming, and only four isolated pockets, about 35 hectares in total, still remain.

This plant community ranges from a dense shrubland, dominated by chenille honey-myrtle (*Melaleuca huegelii*), in heavy clay soils, to an unusual marri woodland, also with chenille honey-myrtle, where the limestone occurs with lighter soils. In this instance, a range of 'sub communities' occurs within the community—much the same as sub-species or varieties can sometimes be identified within a species.

One six-hectare patch of the community, and perhaps the best remaining example, occurs in Gingin, about 30 kilometres farther north, on very heavy black soils containing lumps of limestone. This site was identified in a joint effort by CALM staff, botanical consultant Bronwen Keighery and Natalie Thorning of the Department of Environmental Protection, with advice

Above: Blue tinsel lily (*Calectasia grandiflora*), another species from the Brixton Street wetlands that is rarely found on the Swan Coastal Plain.

Above left: Water-filled claypan in the Brixton Street wetlands in which are found the aquatic plants, stalked water ribbons (*Aponogeton hexatepalus*), aquatic pennywort (*Hydrocotyle lemnoides*), both of which are declared rare species, and *Villarsia capitata*.

Centre left: A granite boronia, *Boronia cymosa*, from the Brixton Street wetlands. This boronia is rarely found on the Swan Coastal Plain, being more common near granite on the Darling Range.

Left: *Dryandra nivea* subsp. *uliginosa*, is a mound-forming dryandra confined to the ironstone soils in the southern ironstone area.

Above: One of the spectacular jewel beetles on an un-named *Astartea* growing in the clay wetlands.

Above: McCutcheon's grevillea, regarded as the most threatened plant in Australia, is found only on a degraded road verge in the northern ironstone community.

Above left: *Banksia incana*, one of many understorey shrubs in the species-rich banksia woodlands, here at the southern margin of its range.

Below: The proposed rare *Grevillea elongata* is a tall, spectacular shrub confined to the southern ironstone community.

from experts in soil science from Agriculture WA. The community was found to be on private property which was for sale. CALM and ANCA have jointly funded the purchase of this important conservation reserve. The block contains a variety of attractive plants including chenille honey-myrtle, obtuse grevillea (*Grevillea obtusifolia)*—a pretty species which is quite common in gardens around Perth—and the lilac hibiscus (*Alyogyne huegelii)*.

SOUTHERN IRONSTONE COMMUNITY

Ironstone soil types are extremely restricted in distribution and appear to have been historically associated with bogs—the iron being deposited by water percolating through the soil. This particular community occurs in an agricultural area around Busselton that has been extensively cleared.

Its highly unusual plant community contains a variety of very restricted and often rare plants. Many of its threatened plant species are at the southernmost tips of their ranges. These include McCutcheon's grevillea (*Grevillea maccutcheonii*), recognised as one of the most threatened plant species in Australia. It was probably always restricted to a very small area (see 'Endangered', *LANDSCOPE*, Summer 1995–96). Many of the other species are extremely susceptible to dieback and occur in only one of the remaining patches. One small occurrence of the community is currently being treated with the chemical phosphonate in an attempt to combat dieback.

Most of the patches have been burnt in wildfires or illegal fires in the last two years. Too-frequent fire has the potential to totally alter the community, as many of the plants can only reproduce by seed, and need time between fires to mature. With every fire, more weeds invade the patches.

Another community, occurring on similar ironstone soils, but characterised by different species, is restricted to an area roughly between Muchea and Gingin. This is known as the 'northern ironstone community'. Almost all of the original community has been cleared for agriculture, and it is now extremely restricted in distribution. The best known

Left: The everlasting, pink sunray (*Rhodanthe manglesii*), and *Tribonanthes australis*, flowering en-masse under swamp kunzea on the northern ironstones, the only area near Perth where massed everlastings may be seen.

Below left: A newly discovered form of granny bonnets (*Isotropis cuneifolia* subsp. *glabra* ms.) found only on clay soil areas in the northern ironstones.

occurrence is an open shrubland of swamp kunzea (*Kunzea* aff. *recurva*), over a herb layer, often dominated by everlastings. There are no examples of this community in any nature reserve.

MANAGEMENT OF COMMUNITIES

The communities on the southern Swan Coastal Plain were found to contain a total of 1 313 species, including 15 species of Declared Rare Flora—two of which were previously believed to be extinct—and 75 priority species. Many of the rarer threatened communities also contain a variety of unusual plant species. So, by conserving whole communities of species, we can also preserve unusual or rare plants. In addition, many other lifeforms, including insects, and other species too small to be seen with the naked eye, such as soil micro-organisms, can also be conserved. Some of these, singly or together, may provide critical functions such as pollination, litter breakdown and the capture of nutrients, thereby maintaining individual species, and whole communities of plants and animals.

After identifying such important areas of bushland, the next step is to determine the best ways of managing them. Recovery plans— similar to those written for threatened species, such as the woylie and rose mallee—are written, stating who is responsible for each step in the management process. The accomplishment of the aims of such recovery plans is the final step in preserving these communities into the long-term future.

People with local knowledge are in an ideal position to look after bushland in their area. Organisations such as Friends Groups, Land Care District Committees, the Wildflower Society and Naturalists Clubs are performing essential tasks including weed control, drainage works, erection of barriers and signs, rehabilitation works and essential research and monitoring. A number of cooperative projects are already proceeding. They involve local organisations, local government authorities, schools and tertiary institutions, landowners and State and Federal government departments and are improving the chances of survival of many threatened ecological communities.

The five examples we have looked at show these precious remnants can be conserved and that everyone can contribute to help maintain our common heritage. By identifying these rare and threatened plant communities and managing them, we can help ensure that future generations can enjoy the amazing diversity of species and ecosystems in the State's south-west.

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Major regional community types were defined in the report *A Floristic Survey of the Southern Swan Coastal Plain*. This report was prepared for the Australian Heritage Commission in 1994 by Neil Gibson, Greg Keighery, Allan Burbidge and Michael Lyons (CALM) and Bronwen Keighery (Consultant to Western Australian Conservation Council, the Wildflower Society of WA and CALM).

Photos by Greg Keighery. Main title and inset photos by Jiri Lochman.

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Rainbow lorikeets. Are they pests? Will they displace our native birds? Do we need to control their numbers, and if so, how? Find out more on page 17.

*A subspecies of granny bonnets (*Isotropis cuneifolia *subsp.* glabra*) found in a threatened community on the Swan Coastal Plain. See story on page 35.*

'The Magic of Magenta' co-author Mal Graham clearing an Aboriginal soak in Lake Magenta Nature Reserve. See our story on page 41.

A rat by any other name...? In 'Dinkum Aussie Rats' Andrew Burbidge discusses the use of common and Aboriginal names for native rodents.

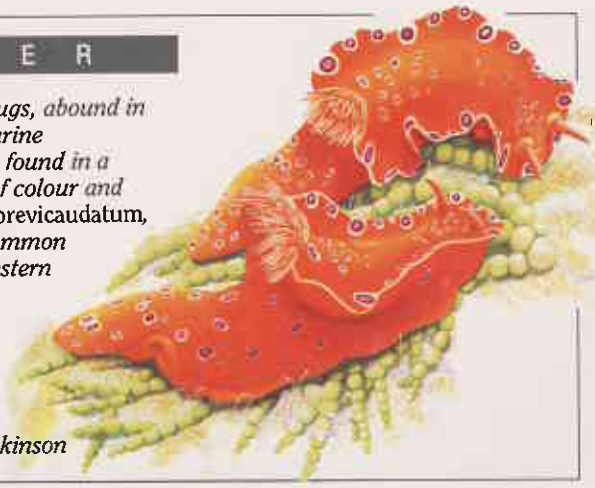
In 'Saving the Giants', read how a new Tree Top Walk in WA's south-west is set to become one of Australia's nature-based tourism icons.

FEATURES

REGULARS

COVER

Nudibranchs, or sea-slugs, abound in Western Australia's marine environment. They are found in a tremendous diversity of colour and form, the Ceratosoma brevicaudatum, *illustrated here, is a common inhabitant of south-western waters. See page 28 to learn more about the 'Slugs of the Sea'.*



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