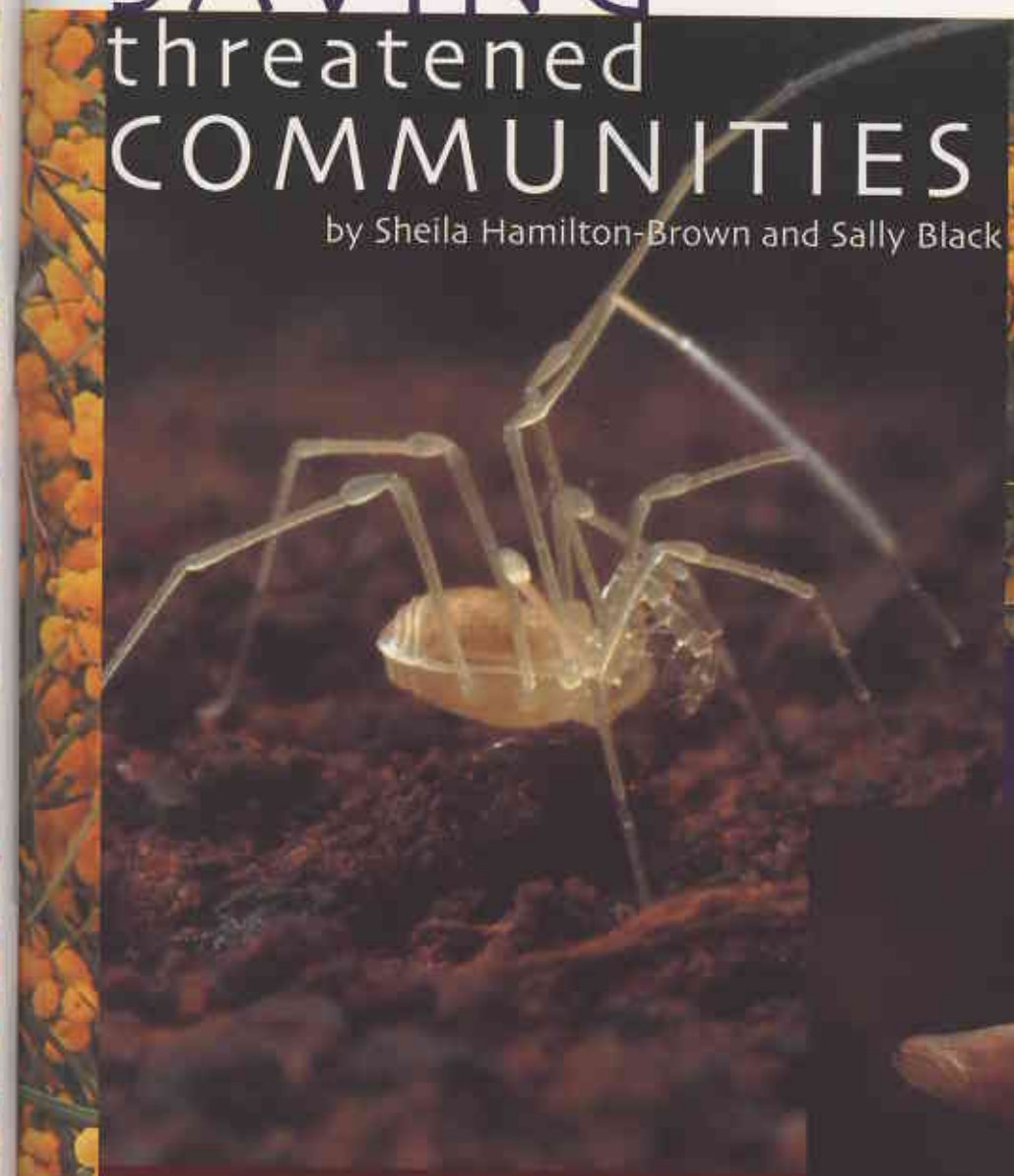
SAVING threatened COMMUNITIES

by Sheila Hamilton-Brown and Sally Black



All over the State, recovery teams, community groups, landowners and wildlife enthusiasts are helping to save Western Australia's threatened ecological communities.

Species, genes, ecosystem—different layers in the hierarchy of biological diversity—all require conservation effort.

Until recently, most effort aimed at conserving threatened elements of biodiversity focused on saving individual species. Individual species exist within communities; if the community is disturbed or altered, the species within it may be threatened. So, by conserving ecological communities, or groups of species that inhabit a particular area, we can eliminate some of the difficulties inherent in preserving numerous individual species.

The Department of Conservation and Land Management's WA Threatened Species and Communities Unit (WATSCU) has been identifying, coordinating and promoting the conservation of threatened ecological communities since 1992. After a successful project to identify and conserve threatened ecological communities in the South West Botanical Province (see *LANDSCOPE*, Spring 1996), two more projects were funded jointly by the Natural Heritage Trust and the department. These projects concentrated on identifying and conserving threatened ecological communities in the Wheatbelt and the area outside south-west WA (the rangelands).

UNDER THREAT

In general, threatened ecological communities fall into two categories of scale.

The first is where species assemblages were once widespread or locally

common, but have declined greatly in distribution and area occupied. This broad-scale decline in extent is largely brought about through clearing for agriculture and other development. These communities may also be threatened by degrading processes such as salinity and grazing. An example of this is the summer scented wattle (*Acacia rostellifera*) forest with scattered river red gum (*Eucalyptus camaldulensis*) on the Greenough River alluvial flats, south of Geraldton, that once covered 133,000 hectares. Because this community occurred on very fertile soils, most of it has been cleared, and only three tiny, weed-infested examples totalling 2.2 hectares remain. The integrity of these tiny communities is threatened by increasing weed invasion, grazing and frequent fire.

Secondly, some threatened ecological communities occur within ecosystems that are naturally restricted; although small in area, they may be rich in species not found elsewhere. As a consequence of their small extent, such communities may be highly vulnerable to disturbance. For example, two fauna communities on Cape Range Peninsula comprise subterranean invertebrates such as small crustaceans and arachnids, and each is confined to a single known site; one in a cave and the other a water-filled sinkhole. Threatened plant communities scattered across the Kimberley region include several types of monsoon forest on spring-fed soaks, scree slopes, and coastal sand dunes, as well as forests and sedgelands associated with organic mound springs (peaty soaks). Most occurrences are in the process of degradation due to grazing and trampling by domestic cattle or feral animals, frequent hot fires, and competition from weeds and exotic animals.

The approaches used to identify threatened ecological communities are similar to those used to identify threatened species: information is gleaned from literature, wildlife enthusiasts, landcare groups, scientists, government and non-government organisations, and field research. The Department of Conservation and Land Management has established a Threatened Ecological Communities Scientific Advisory Committee. The committee assesses all the information gathered on a proposed community (evidence that it is a distinct community, thoroughness of survey and threatening processes) and assigns it a conservation category (see box on page 53). If it is identified and endorsed as threatened (either critically endangered, endangered

Previous page
Background: Summer scented wattle populations, south of Geraldton, have been reduced to tiny communities through clearing.
Photo – Jiri Lochman
Insets clockwise from top left: A troglobitic harvestman (*Glennhuntia glennhunti*) that occurs only in Camerons Cave as part of the Camerons Cave troglobitic community.
A blind gudgeon fish (*Milyeringa veritas*) from Camerons Cave troglobitic community.
Photos – Douglas Elford/WA Museum
An isolated patch of monsoon forest on a mound spring complex in the Kimberley region.
Photo – Sally Black

Left: Members of the local catchment and Merredin Threatened Flora Recovery Team monitoring tree health.
Photo – Sheila Hamilton-Brown

or vulnerable), the conservation program begins. This includes writing recovery plans and finding resources for research and on-ground works. On-ground work is coordinated by recovery teams, and mostly carried out by catchment groups, wildlife enthusiasts, school groups and the owners of land on which threatened communities occur, as well as by departmental staff.

Recovery teams advise, develop and oversee the implementation of recovery plans for threatened ecological communities. Recovery team members include district staff from the Department of Conservation and Land Management, WATSCU staff, representatives from State government agencies such as Main Roads WA or Westrail, local government representatives, Catchment or Land Care District Committee (LCDC) representatives including landowners, and members of non-government conservation groups. While most vegetation-based threatened ecological communities are dealt with by the Department of Conservation and Land Management's District Threatened Flora Recovery Teams, other threatened ecological communities may have a separate recovery team.

WHEATBELT WETLANDS

Wooded wetlands with extensive stands of swamp sheoak (*Casuarina obesa*) and swamp paperbark (*Melaleuca strobophylla*) were once widespread throughout the Wheatbelt. However, these communities are now very rare, owing to increasing salinity and higher groundwater levels. Toolibin Lake—a critically endangered threatened ecological community—(see *LANDSCOPE*, Spring 1994) was long thought to be the only example of this community left. The actions taken, under a recovery plan intended to restore this wetland community and its catchment, have received much publicity. Partly as a consequence of this publicity, another occurrence was found near Dowerin, 200 kilometres to the north.

This small, 20-hectare wetland is the only wetland in its catchment to remain predominantly fresh. It fills only after the main creek overflows following heavy rainfall. The landholders fenced the wetland to prevent grazing and erected a diversion bank to prevent salty water from entering it. This bank was only breached during significant floods. Presumably, under natural conditions, the wetland would have filled more regularly: both the landholders and WATSCU staff were concerned about the health of the lake bed vegetation and/or adequate regeneration.

WATSCU staff discussed ideas with the landholders and, with money provided by the National Heritage Trust, contracted an independent hydrologist to design an adjustable barrier controlling inflow to the lake. The barrier will keep out highly saline water (usually early in the flow cycle) and can then be opened to allow fresher water to inundate the wetland. The landholders liked the idea so much that they funded and erected the diversion barrier themselves! WATSCU also obtained funds from BankWest's *LANDSCOPE* Conservation Visa Card Trust fund to monitor surface water and groundwater.

To interpret the effects of surface water and groundwater on the wetland vegetation, members of the local catchment group and the Merredin Threatened Flora Recovery Team are monitoring the wetland vegetation,

Top: Paperbarks (*Melaleuca cajuputi*) over mangrove ferns (*Acrostichum speciosum*) occur in the centre of a mound spring on the edge of the Great Sandy Desert.

Above: This mound spring community occurs within an ecosystem that is naturally restricted.
Photos – Sally Black

measuring tree size, diameter and canopy condition, and establishing a number of understorey monitoring plots. Meanwhile, the catchment group has just completed an intensive catchment revegetation program that began in 1992 and included revegetating the creekline. This program is intended to overcome long-term salinity problems in the catchment and will, hopefully, help the threatened wetland near Dowerin by reducing the amount of salt being carried in creek flows.

Some beneficial results are already evident in the catchment in that the spread of salt patches has been halted.

BANDED IRONSTONE HILLS

The 5,500-hectare Koolanooka and Perenjori banded ironstone hill ranges are part of the 'vulnerable' Koolanooka System, originally described by plant ecologist John Beard. The hills have specific plant associations peculiar to the soil type and profile of the hills. A subspecies of sandplain mallee (*Eucalyptus ebbanoensis* subsp. *ebbanoensis*) over mixed *Acacia* scrub occurs on the summits and upper slopes of the hills. Tamma (*Allocasuarina campestris*) and rock sheoak (*Allocasuarina huegeliana*) scrub grows on the middle and lower slopes, and York gum (*Eucalyptus loxophleba*) woodlands are seen on the footslopes.

Little detailed survey work has occurred on these mainly privately-owned hills, although the landholders were very supportive of attempts to determine the suites of plants found within them. One of us (Sheila) planned to establish 10 quadrats in two days; but because of the rocky and rough terrain, only succeeded in establishing two. Fortunately, the Central West College Land Management class had recently located a new population of Hoffman's spider orchid (*Caladenia hoffmanii* subsp. *hoffmanii*) and, buoyed by their success, were keen to assist, so they helped to establish nine more quadrats on the hills. Surveys of these quadrats are helping to better define the plant associations, and the data collected will aid rehabilitation and restoration work. As a result of this work, another association was found—a gimlet (*Eucalyptus salubris*) woodland associated with gullies.

TROGLOBITES

A threatened community of troglobites—blind, sometimes white, translucent or colourless, cave-dwelling creatures—inhabits Camerons Cave near Exmouth on the eastern coastal plain of Cape Range Peninsula. This unique community, described by scientists from

Top left: Swamp sheoak and swamp paperbark wetland in Dowerin.
Photo – Rebecca Evans

Above far left: Dowerin Wetland diversion banner.

Above left: Central West College Land Management class erecting quadrats on Koolanooka Hills.
Photos – Sheila Hamilton-Brown

Left: Swamp Sheoak and swamp paperbark wetland—Toolibin Lake.
Photo – John Blyth

Above left: Camerons Cave pseudoscorpion (*Hyella* sp.).

Above: A troglobitic micro-whipscorpion (*Draculoides* sp.).

Right: A troglobitic leaf hopper (*Phaconeura* sp.) from Camerons Cave community.
Photos – Douglas Elford/WA Museum

the WA Museum, is made up of at least 10 small aquatic and terrestrial invertebrates that are not known to occur together anywhere else. Four of these—blind gudgeon (*Milyeringa veritas*); Camerons Cave pseudoscorpion (*Hyella* sp.); Camerons Cave millipede (*Stygiochiropus peculiaris*); and Barrow Island draculoides (*Draculoides bramstokeri*), an ancient spider-like creature with large 'teeth'—are themselves listed as threatened species because of their highly restricted distribution (see 'Endangered' on page 48). Some of the animals in the cave probably had ancestors that lived five million years ago, when rainforest occurred in the area.

Camerons Cave extends down to the water table, which here consists of a narrow freshwater layer above salt water. The fresh water maintains high levels of humidity in the cave, on which the animals depend. Threats to the community include uncontrolled access to the cave, modification to or pollution of the area's groundwater or surface flows, and pollution or rubbish dumping in the cave. Last year, a local member of the WA Speleological Group, in cooperation with the Department of Conservation and Land Management and funded by a BankWest *LANDSCOPE* Conservation Visa Card grant, installed a new lockable and inconspicuous gate on the cave to protect the community inside. A new reserve to protect the cave and its surrounds has now been agreed to by the Shire of Exmouth.

FUTURE HOPE

These stories are encouraging. Successful programs have engendered further discoveries. Different kinds of support from many sectors of the community have meant that this important work continues.

And it's exciting! Biological diversity can be maintained. Numerous community members from all over WA have proven this. Their enthusiasm, energy and dedication in generously supporting efforts to conserve threatened ecological communities in various parts of the State means there is hope for the future of our environment.

If you think you know of a piece of remnant vegetation and/or bushland that may be unique to your area, please contact the authors.

CONSERVATION CATEGORIES FOR THREATENED ECOLOGICAL COMMUNITIES

Critically endangered	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.
Endangered	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.
Vulnerable	An ecological community that has been adequately surveyed and found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.
Presumed destroyed	An ecological community which has been adequately searched for but for which no representative occurrences have been located. The community has been totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

Sheila Hamilton-Brown and Sally Black are project officers for the Department of Conservation and Land Management's WA Threatened Species and Communities Unit at Woodvale. They can be contacted on (08) 9405 5100 or by email (sheilahb@calm.wa.gov.au) or (sallybl@calm.wa.gov.au).

Winner of the 1998 Alex Harris Medal for excellence in science and environment reporting

LANDSCOPE

VOLUME SEVENTEEN, NUMBER 1, SPRING 2001

Within 40 years, the numbat has risen from near extinction to endangered with 10 populations in WA and interstate. See 'Numbats Forever' (page 17).

The forces that shaped the geology and landforms of the south-west began more than 3,500 million years ago. Read the facinating story on page 10.

The Marine Community Monitoring Program is a new and ambitious program to involve the community in keeping our oceans clean. See page 35.

Shark Bay Marine Park provides spectacular opportunities for divers and snorkellers. No wonder it is called Bay of Delights. See page 23.

The history of Aboriginal occupation in the Leeuwin-Naturaliste region spans 50,000 years. Find out more in 'History from the Caves' (page 40).

FEATURES

REGULARS

COVER

Leschenaultias are some of the most widely known and recognisable plants in Western Australia. They have fantastic horticultural value and provide glorious floral displays. The wreath leschenaltia is a favourite with visitors during our wildflower season. See page 23.

Cover illustration by Philippa Nikulinsky

Executive editor: Ron Kawalilak
Editors: David Gough, Carolyn Thomson-Dans
Story editors: Verna Costello, Sue McKenna
Advertising copy and editorial assistance: Caris Bailey
Scientific/technical advice: Andrew Burbidge, Chris Simpson, Keith Morris, Paul Jones and staff of Science Division
Design and production: Tiffany Aberin, Maria Duthie, Gooitzen van der Meer
Illustration: Ian Dickinson, Gooitzen van der Meer
Cartography: Promaco Geodraft
Marketing: Estelle de San Miguel ☎ (08) 9334 0296 Fax: (08) 9334 0498
Subscription enquiries: ☎ (08) 9334 0481 or (08) 9334 0437
Colour Separation by Colourbox Digital
Printed in Western Australia by Lamb Print

Please do not send unsolicited material to *LANDSCOPE*, but feel free to telephone the editors.

Visit NatureBase at www.naturebase.net

Published by the Department of Conservation and Land Management, Dick Perry Avenue, Kensington, Western Australia

DEPARTMENT OF Conservation AND LAND MANAGEMENT
Conserving the nature of WA