LINKING THE LANDSCAPE

A project in the South Coast region of Western Australia is making it easier for native animals to move from one reserve to another, increasing their chances of long-term survival in land that is now mostly cleared.

by Peter Wilkins

Today, much of our natural heritage within agricultural regions of Western Australia is represented by national parks and nature reserves that are isolated from each other by cleared landscapes. Concern about the long-term future of animals that reside in these reserves has led to a recognition that wildlife corridors linking protected areas are likely to significantly benefit nature conservation goals.

Many wildlife species need to move from one place to another to breed, feed, disperse from changes in habitat quality, or to recolonise regenerated habitats. Recent changes in land use and pressure from introduced plants and animals have forced many native wildlife species into smaller and more isolated refuges and now cannot readily move across the landscape. Such animals are in real danger of local extinction.

NATURE IN THE FUTURE

It is difficult to imagine what the world will be like in 10 or 50 years' time. It is even more difficult to think in the longer term. Who knows what the world will be like in 100 or even 1,000 years' time? But in terms of nature conservation, we need to think long term, because the effects of changes in the natural environment may occur very slowly and will often go unnoticed for many decades.

Previous page
Main: The Stirling Range National Park is isolated from other reserves by cleared agricultural land.
Photo – Bill Bachman
Inset: White-tailed black-cockatoo. Widespread loss and fragmentation of feeding and breeding habitat has dramatically reduced the population of this Western Australian endemic.
Photo – Bill Belson/Lochman Transparencies

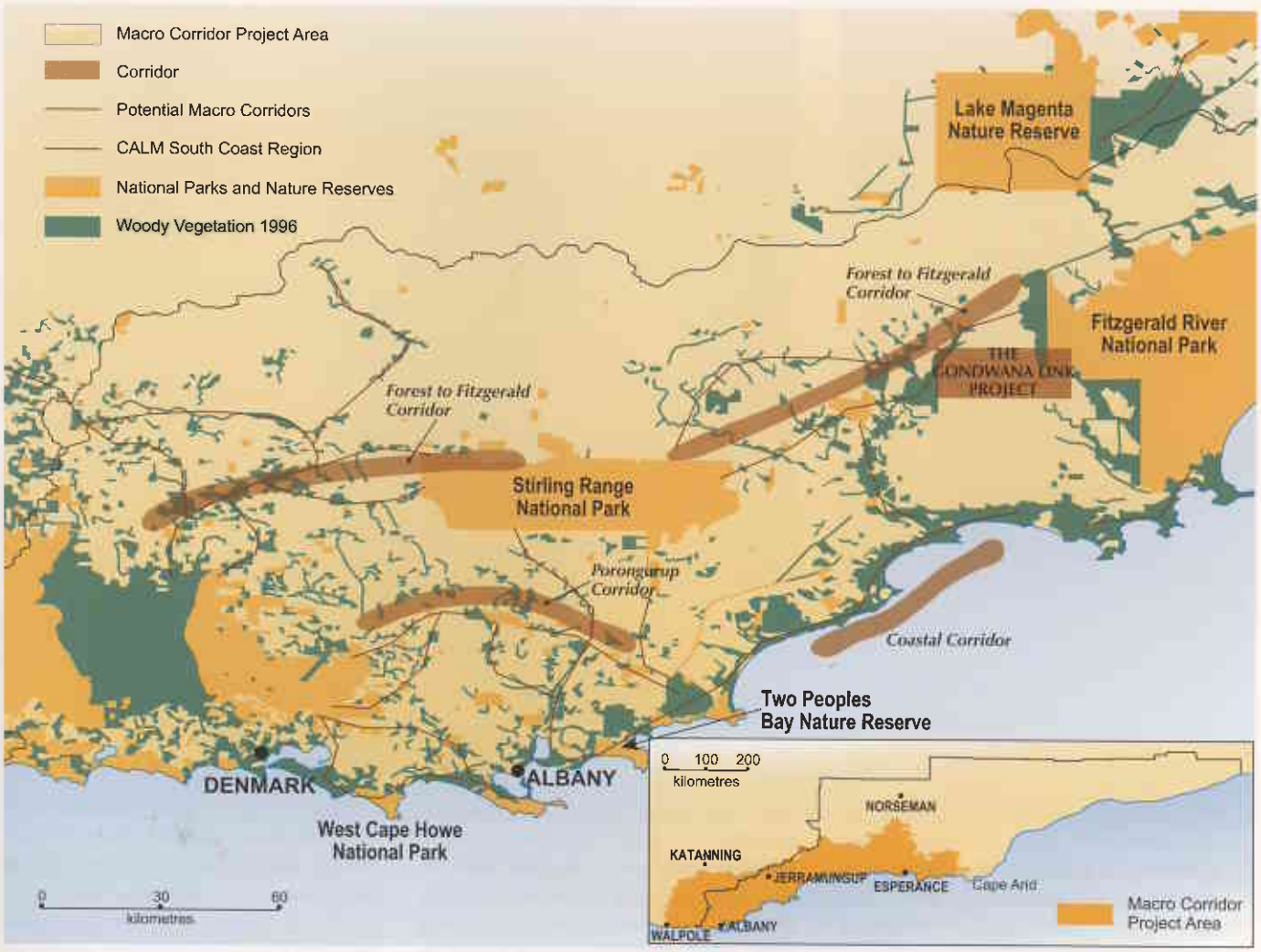
Left: Greenskills find out what wildlife lives in macro corridors as well as assisting farmers to fence off native vegetation and remove weeds.
Photo – Peter Wilkins

Below: View from Point Ann, looking over St Mary Inlet, Mt Barren and Thumb Peak, Fitzgerald River National Park.
Photo – Bill Bachman

The South Coast region of Western Australia has a relatively good system of conservation reserves that are 'comprehensive' and 'representative' of natural environments according to national conservation guidelines. For example, all major bioregions are well represented in South Coast conservation reserves. It also appears that the reserve system is 'adequate', at least in the short term. For example, populations of some species of threatened fauna are vigorously bouncing back from the edge of extinction, thanks to the Western Shield fox-baiting program (see *LANDSCOPE*, Spring 1998) in many conservation reserves.

Whether the conservation reserves of the South Coast are adequate for the long term remains to be seen. It is difficult to believe, for instance, that animal populations in large areas such as the 330,000-hectare Fitzgerald River National Park (see *LANDSCOPE*, Spring 1997) or the 116,000-hectare Stirling Range National Park are at risk. However, catastrophic events like large wildfires can bring perceptions of long-term adequacy into perspective.

On a hot summer day in December 1989, a single lightning storm over the Fitzgerald River National Park ignited a series of wildfires that burnt 149,000 hectares (almost 50 per cent) of the park. Most of this was burnt in only eight hours. Ecosystems within the Stirling Range National Park have frequently experienced large wildfires in recent years. Most recently, in October



2000, wildfires burnt approximately 30,000 hectares (more than 25 per cent of the park) within six days.

Other threats to biodiversity within the current reserve system include soil salinity, waterlogging, dieback disease (caused by *Phytophthora cinnamomi*), weeds, feral animals and even subtle climatic change. Cumulatively, these impacts are likely to cause the loss of some species from 'protected areas' in the future.

MACRO CORRIDOR PROJECT

The Department of Conservation and Land Management (CALM) received a Natural Heritage Trust Bushcare grant to help fund a position for two years to work on the South Coast Macro Corridor Project. The project, which was instigated by John Watson, CALM's South Coast Regional Manager, aims to improve the long-term future of native fauna within national parks and nature reserves, by maintaining existing bush corridors and generally improving bushland connections between major protected areas like the Fitzgerald River National Park and Stirling Range National Park. The wider community and relevant government agencies are working together on the macro corridor project.

The project area extends some 700 kilometres, from Walpole to the Cape Arid National Park east of Esperance, encompassing an area of about 5.5 million hectares.

Left: Dibbler populations within the Fitzgerald River National Park are benefiting from both the Western Shield fox-baiting and the large expanse of continuous native vegetation.
Photo – Babs & Bert Wells/CALM

WILDLIFE CORRIDORS

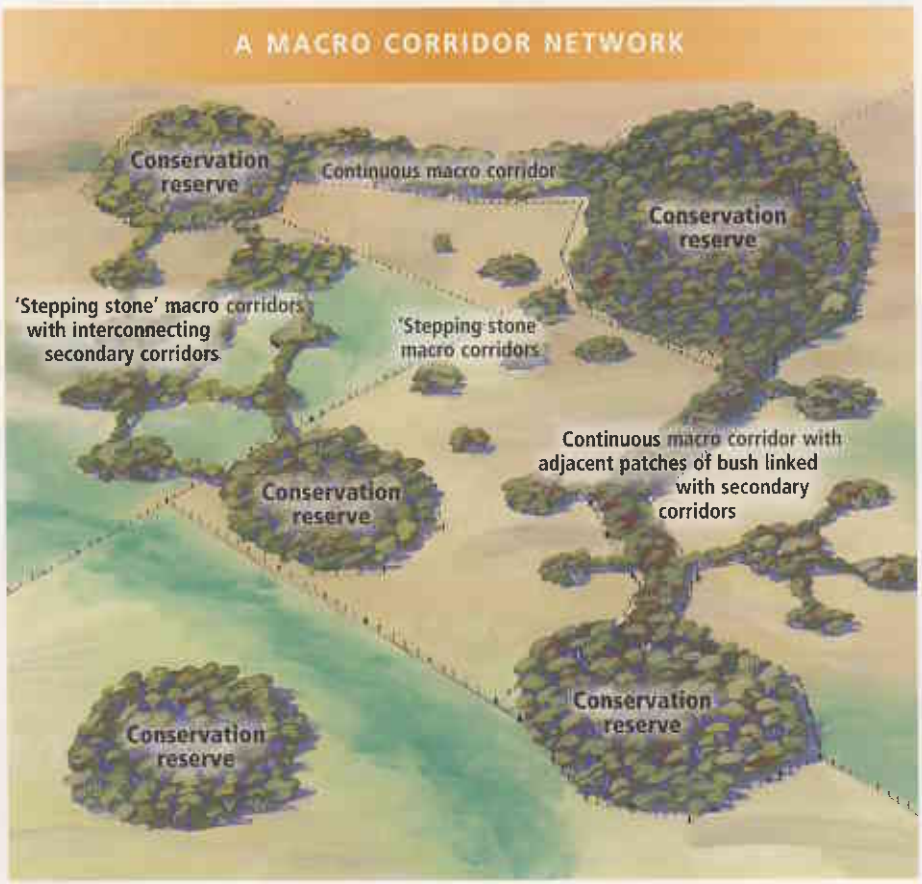
Wildlife corridors provide an avenue of movement between habitats, reducing the level of isolation and improving the potential for colonisation, ultimately reducing the risk of local extinction.

The ability of wildlife to move along corridors varies with the form of the corridor, its vegetative structure, plant species composition and its dimensions, as well as the mobility of the animal concerned.

Corridor width is important as it reduces 'edge effect'. Weed invasion, sand drift, increased sunlight and the action of wind all affect the edges of corridors. Widening corridors can reduce the edge effect by increasing the 'core area' of unaffected bush within the corridor. A larger core area creates better habitat, which is more likely to encourage animals to use the corridor for longer periods. Buffering corridors with other vegetation also helps to increase the core area by reducing the influences of wind and so on, on the edges of corridors.

From a biodiversity conservation viewpoint, it is best to use local plant species when revegetating, as these species offer the best food and shelter for local native animals. Planting local species also consolidates the natural plant diversity in the area.

The structure of a corridor should replicate those that are found within the areas of bush that are to be reconnected. The structure of a plant community is a general description of the plant community itself—for example, tall woodland with thick understorey or open mallee with an understorey of scattered shrubs and grasses. Examples of complete vegetation communities can usually be found within the nearest nature reserve or national park. If you are planning to create a corridor, you should seek expert advice from your local CALM office when deciding which plant species to use.



Above left: Quenda dig busily for underground foods, inadvertently aerating soils for plant seedlings. The health of plant communities will improve as quenda re-establish new populations via wildlife corridors.

Above: Predation by the introduced red fox may be more of a barrier for the chuditch than cleared land between suitable habitats. More research is needed to understand fully the interactions and limitations of wildlife ecology in fragmented environments.

Photos – Babs & Bert Wells/CALM

MICRO AND MACRO CORRIDORS

Most of us are familiar with local or farm-scale corridors. These vary in width and composition from a simple line of an exotic tree species (which usually offers very limited corridor value to wildlife) up to a 100 to 200-metre-wide corridor that contains a variety of native plant species. Corridors of this scale could be termed secondary or 'micro corridors'.

A macro corridor is significantly larger in scale and provides regional connectivity across a range of major climatic zones, botanical provinces and fauna zones. Macro corridors are at least several hundred metres wide and may be tens or hundreds of kilometres long. They ideally contain broad tracts of continuous native vegetation, to maximise ecological functions for as many wildlife species as possible.

The ultimate corridor network would be made up of a multitude of local scale corridor systems linking patches of bush on farms and other reserves into a network of macro corridors, which in turn link major national parks and nature reserves on a regional scale.

There are several different forms of corridor (see illustration on facing page), each of which influence landscape connectivity at different levels. The worst-case scenario is a completely isolated conservation area or patch of bush. We can expect some animal species to become locally extinct in such isolated patches over time.

A 'stepping stone' corridor occurs where a number of isolated patches of bush create a sequence of habitat nodes between substantial areas of natural vegetation. These corridors usually benefit larger animals or those able to travel across open country in short periods of time, such as parrots, birds of prey and kangaroos. The best way to

Above: Southern kwongan. Plants can benefit from improved landscape connectivity.

Right: Narrow strips of native vegetation can provide habitat and corridors for some species.
Photos – Jiri Lochman

improve their function for small animals is to link the 'stepping stones' with a local-scale network of continuous bush corridors.

Tracts of bush that form continuous corridors or links between large areas of native vegetation are the most effective wildlife corridors.

WILDLIFE NETWORK

The macro corridor project has used a geographical information system (GIS) to plan a network of wildlife corridors. With the woody vegetation 1996 data, developed from CSIRO's Land Monitor Project, and a GIS, we have been able to select patches of bush of a minimum size and identify which patches are strategically placed in the landscape to help create a macro corridor. The project has identified the potential to create approximately 20 macro corridors in the region.

These range from extensive and nearly continuous corridors to sub-regional and regional scale 'stepping stone' corridors (see map on page 43).

STRATEGIC FRAMEWORK

The final GIS product is a regional-scale macro corridor framework. It has been used to assist community groups and others interested in bush protection and revegetation to target funds at sites that promise to benefit regional landscape connectivity.

For example, the community driven 'Gondwana Link' Project has used the framework to target a major gap in the 'Forest to Fitzgerald Corridor' (see map). This project has worked with local landholders to bridge the gap.

Above left: The noisy scrub-bird is known to use densely vegetated margins along wetlands and creeks and vegetated coastal dunes for population dispersal.

Centre left: Fire in fragmented habitats has severely reduced populations of the southern emu-wren in South Australia.

Bottom left: Research has found that a 45-metre-wide corridor linking two reserves contributes to the viability of a population of the western yellow robin in the central Wheatbelt.
Photos – Babs & Bert Wells/CALM

Above: Cleared land inhibits the movement of many wildlife species.
Photo – Jiri Lochman

The group plans to re-establish a one-kilometre-wide natural bush corridor between the internationally-recognised Fitzgerald River National Park and the proposed Peniup Nature Reserve.

Community projects like this promise to benefit long-term nature conservation objectives significantly.

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Peter was co-author of a paper with John Watson, published in the IUCN's protected areas journal, *PARKS*, October 1999.

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

LANDSCOPE

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Western Australian botanists are taking part in a global plan to store seed from 10 per cent of the world's flora by 2010. See page 23.

Mushrooms the size of a dinner plate can appear within 48 hours of a fire in the karri forest. Read about forest fungi on page 48.

The Pilbara's numerous islands are rich in history, wildflowers and wildlife, with prolific marine life in the surrounding waters. See page 34.

Discover the rich bird life and tranquillity of the Canning River Regional Park on page 17.

Many of WA's threatened marsupials can be seen in the south-west for the first time in decades. Read about their return to Dryandra Forest on page 10.

FEATURES

RETURN TO DRYANDRA
TONY FRIEND, CLARE ANTHONY & NEIL THOMAS 10

CAPTIVATING CANNING
CHRISTINE SILBERT 17

OUR FROZEN FUTURE
ANNE COCHRANE 23

SEA ANEMONES
ANN STORRIE 28

PEARLS OF THE PILBARA
DORIAN MORO & FRAN STANLEY 34

LINKING THE LANDSCAPE
PETER WILKINS 41

FRUITS OF FIRE
RICHARD ROBINSON 48

REGULARS

BUSH TELEGRAPH 4

ENDANGERED
VINE THICKETS ON DAMPIER PENINSULA 47

URBAN ANTICS
WHICH BANKSIA? 54

COVER

Paradoxically, the stinging tentacles of sea anemones—a group of carnivorous invertebrates that sometimes resemble colourful flowers—can also provide a safe haven for many underwater creatures. Anemonefish gain immunity to the stinging cells and live primarily in sea anemone tentacles. Other animals, such as crabs, carry a protective anemone on their backs. Turn to page 28.

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