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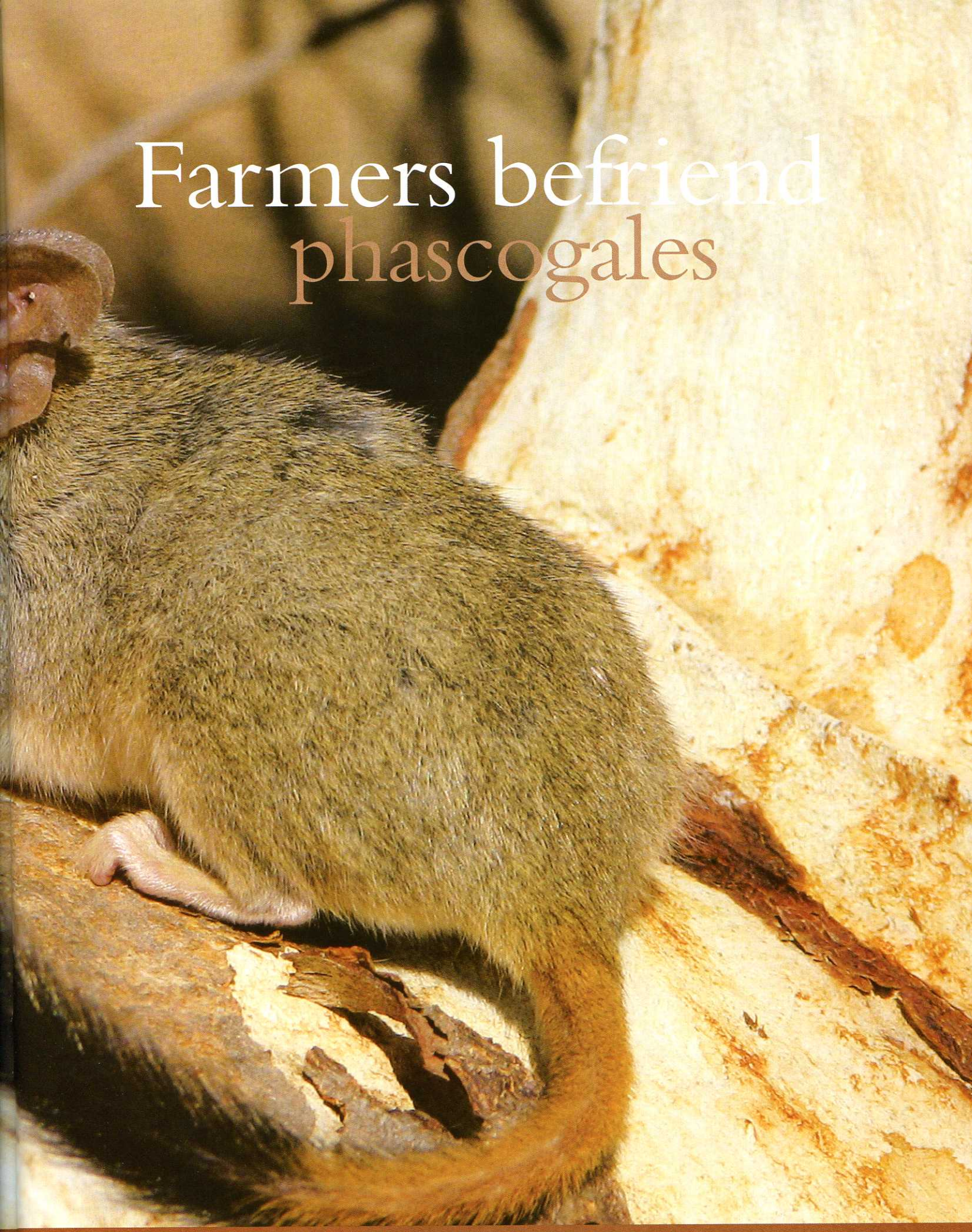
The endangered red-tailed phascogale is clinging to life in the Wheatbelt thanks to the combined efforts of farmers and conservationists.

by Jeff Short and Megan Stone



Farmers befriend phascogales

The red-tailed phascogale (*Phascogale calura*) is a small, squirrel-like, carnivorous marsupial that spends its nights hunting and its days curled up in the hollows of old-growth eucalypts. It is the size of a large mouse (typically 25 to 50 grams), is ashy grey on top, with a white underside and has a long tail that is a rich chestnut colour with a black brush at the end, leading one of the original European collectors to give it the name 'handsome tailed phascogale'. This unique tail makes it easy to tell apart from its closest relative, the brush-tailed phascogale (*P. tapoatafa*), and from other species of small rodent or marsupial. It has prominent large ears and eyes—vital attributes for its nocturnal lifestyle and for escaping its myriad of nocturnal predators.

The phascogale has a remarkable reproductive strategy whereby all the males die off after a frenetic mating period in July at the end of their first year of life. With only one chance to contribute to the future generation, the males put a mighty effort into their single breeding season, covering vast distances to seek out as many females as possible. Within a month of mating the males all die, exhausted from their efforts at just 11.5 months of age. Females, on the other hand, can live to breed for a second and sometimes even a third year.

A friend in need?

The first red-tailed phascogale specimen known to European science was collected in Williams, 120 kilometres south-east of Perth, in the 1840s by John Gilbert—it was brought in by a domestic cat. Some 10 years later, Aboriginal people collected specimens from hollow limbs of trees on Gol Gol Creek, in New South Wales, for collector Gerard Krefft. This site, some 15 kilometres north of the junction of the Murray and Darling rivers, was at the then frontier of pastoral settlement. Hence, the phascogale was a species that once spanned arid Australia.

However, it has now contracted to less than 10 per cent of its former range and appears to be contracting still. It currently persists only in the southern half of the Western Australian Wheatbelt, where it coexists uneasily with intensive farming and associated extensive land clearing as well as a bevy of introduced species. Compounding these issues, the ongoing destruction and thinning of roadside vegetation is increasingly limiting their ability to move around the landscape. Consequently, the phascogale is one species that definitely needs a helping hand if it is going to persist.

Threats

Feral and domestic cats are likely to have played a large part in the demise of red-tailed phascogales across Australia. The few sparse recordings of red-tailed phascogales in the past 150 years beyond the Western Australian Wheatbelt occurred at about, or shortly after, the feral cat's arrival in the area and included the Murray-Darling junction in the 1850s, central Australia in the 1900s, and on the Canning Stock Route at the junction of the Great Sandy and Gibson deserts in Western Australia in the 1930s.

Their demise in these areas may also have coincided with the disruption of traditional Aboriginal land management resulting in a shift from small-scale, low-intensity fires set by Aboriginal people to large-scale, high-intensity wildfires.

Previous page
Main A red-tailed phascogale after release on a wandoo tree. Old-growth wandoo trees are an important source of nesting hollows for phascogales.
Inset A community volunteer releasing a red-tailed phascogale after trapping.

Above Red-tailed phascogale.

Left The prominent black brush and the brick-red base of the tail are distinctive features of the red-tailed phascogale.
Photos – Andrew Hide

Above left Community volunteer Brian Price with a captured cat at Wadderin Sanctuary.
Photo – Jeff Short

Above At least six phascogales sharing a nest in a nest box near Wagin.
Photo – Danielle Perrie

Right Local volunteers and octogenarians Brian Price and Mel Bristow repairing a fox-proof fence at Wadderin Sanctuary near Narembeen.
Photo – Jeff Short

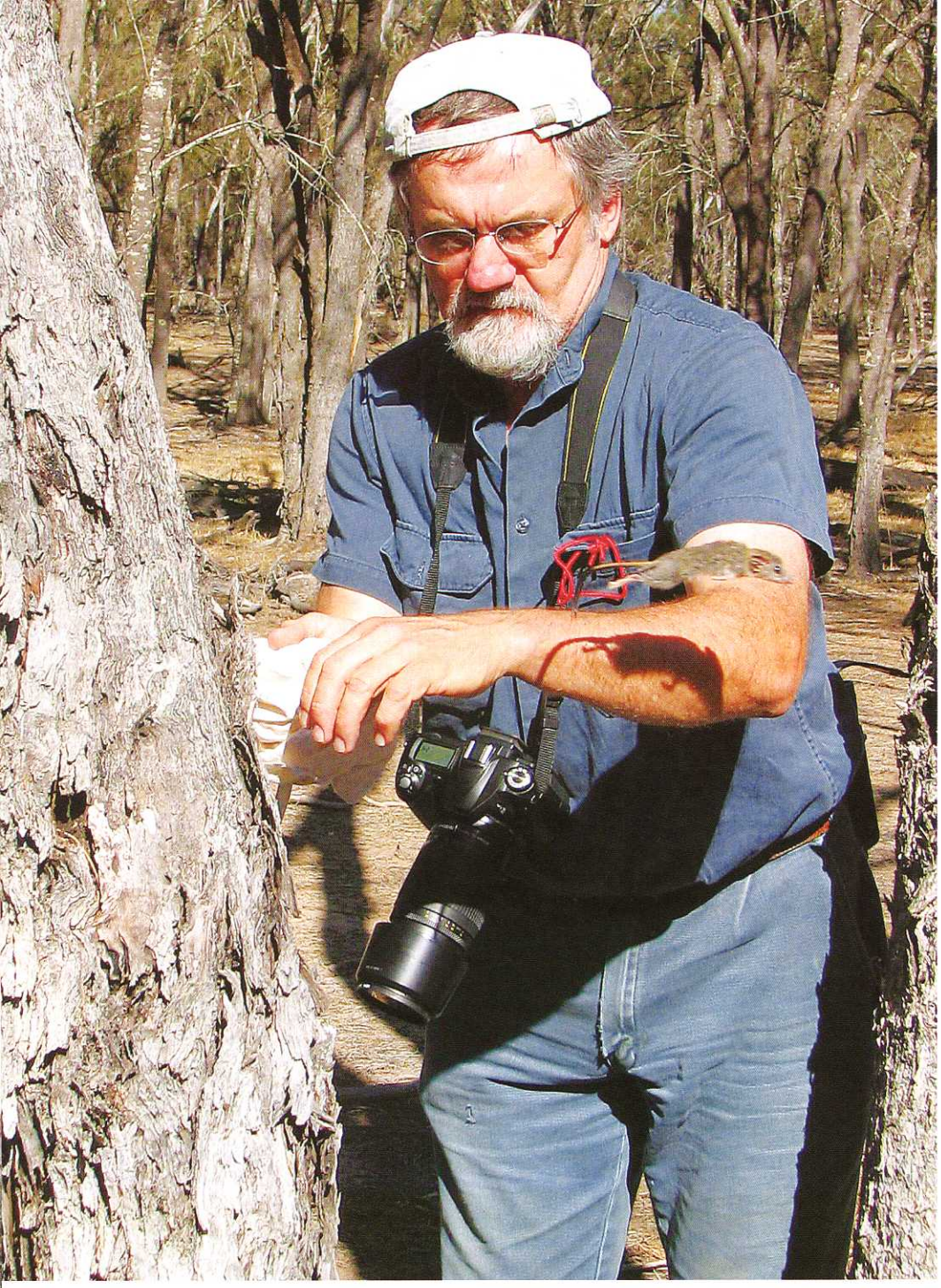
Other key threats likely to have impacted on the red-tailed phascogale, particularly in south-west WA, are the spread of the fox into this area in the early 20th century and the wholesale land clearing that has occurred within the Western Australian Wheatbelt in the past 100 years, leaving only small and often isolated remnants of vegetation.

Pioneering work by Western Australian Museum scientist Darryl Kitchener in the 1970s suggested that phascogales could only persist in the largest of Wheatbelt remnants. However, we now know that that is not the case as phascogales are regularly caught in remnants as small as 20 hectares. Kitchener emphasised the importance of the presence of poisonous pea plants of the genus *Gastrolobium* in excluding stock and rabbits, and reducing the likely impact of foxes and cats. He also expressed concerns about fire. Scientists from the then Department of Conservation and Land Management (now the Department of Environment and Conservation—DEC), Tony Friend and Gordon Friend, later stressed that the species is likely to be severely affected by fire because of its dependence on highly flammable sites for nesting and refuge. However, though it remains a threat, fire no longer appears to be a significant issue in the Wheatbelt. Farmers now actively and effectively suppress fire in Wheatbelt remnants, in contrast to their extensive use of fire during the pioneering phase of land clearing before the 1970s.

Conservation actions

Despite their troubles, it is not all doom and gloom for the red-tailed phascogale. Wheatbelt farmers and the local community have rallied to assist this species, which is now endemic to the area. Funding from the Australian Government via the South West Catchments Council has enabled widespread trapping surveys to help establish where phascogales occur, while also enabling some remedial actions to start. A key part of actions has been developing an increased awareness of the phascogale and its plight within Wheatbelt communities.

Farmers and local community members in and around the Wheatbelt towns of Wagin and Narembeen have been particularly active in working to conserve the phascogale. Farmers in Wagin and surrounding districts have provided access to their farm remnants for trapping surveys; reported sightings of phascogales for entry into a community sightings database and erected nest boxes to provide additional shelter in areas where natural hollows are limited. They have also enacted on-ground works such as fencing to exclude stock from remaining farm remnants and planting corridors of trees and shrubs to enable phascogales to move around the landscape. Farmers at Narembeen have created fox-free habitat in an area where phascogales have long been absent to permit their reintroduction.



Left Jeff Short releasing a phascogale after trapping in York gum–swamp oak habitat near Wagin.
Photo – Andrew Hide

Above Researchers inspecting natural hollows in a stag of York gum on salt-affected land along Arthur River near Wagin.
Photo – Jeff Short

Southern Wheatbelt

A trapping program has been carried out in the biggest remnants of native vegetation on farms in an area centred on Wagin and extending to Narrogin, Katanning, Darkan and Wickepin. Trapping in these remnants has revealed that the red-tailed phascogale is widespread throughout this area where suitable habitat of wandoo (*Eucalyptus wandoo*) and rock she-oak (*Allocasuarina huegeliana*) occur. This is often in areas high in the landscape removed from the threat of encroaching salinity. Another habitat stronghold is the extensive fringing vegetation along Arthur River and Wagin Lakes—much of this is highly affected by rising water tables and salt. However, while rising salt may kill the original woodland trees, their dead stags remain. Often these are hollowed by termites, providing shelter for phascogales. In addition, dense salt-tolerant swamp she-oak (*Casuarina obesa*) often establishes to replace the former vegetation. This combination of hollow-bearing stags and a dense mid-storey canopy of swamp she-oak is ideal habitat for the phascogale.

In the same area, the Wagin Woodanilling Landcare Zone, in partnership with Wildlife Research and Management, has been instrumental in establishing and maintaining a register of community sightings of red-tailed phascogales. Its members have actively worked to raise the profile of this species in Wagin and surrounding districts. They have gathered some 90 sighting records over a five-year period. This data provides insights different from that gained through the trapping program. For example, nearly 50 per cent of community records of this species come from specimens bought in by domestic cats, highlighting their vulnerability to predation by exotic predators. Records are often in tiny fragments of retained vegetation or in and around farm or other buildings in an extensively cleared landscape—not sites one would ever consider trapping. This suggests we may have underestimated the ability of this species to move around a highly modified landscape.

Community records that are particularly valuable are those of nesting

Above A community volunteer releasing a phascogale after trapping.
Photo – Andrew Hide

Above right Local volunteer Arthur Kershaw from Wagin about to erect one of many nest boxes he has constructed for phascogales.
Photo – Jeff Short

Right Nest of a red-tailed phascogale in a newly erected nest box.
Photo – Andrew Hide

phascogales. One such record was of a phascogale nesting in a 1960s schoolbag (complete with original school books) discarded in a woolshed. Another was of a phascogale nesting in the wall cavity of a local church. These records suggest an apparent shortage of suitable nest sites in the natural environment, and the highly specific requirements for nesting. Phascogales require a large cavity to accommodate their football-sized nest of wool, feathers and grass and a small entrance to exclude other species of competitors and predators. Phascogales must leave their still-naked young in the nest while they forage so they need a secure and warm refuge for their nest if the young are to survive

Another key activity has been the provision of nest boxes for phascogales. In many patches of remnant bush in the Wheatbelt there is abundant foraging habitat but no trees with hollows available for refuge. This is because they were cleared at some time in the past and, although now regrown, typically consist of dense rock she-oak and some young wandoo. However, because it takes about 125 to 300 years for a hollow to form in a eucalypt, there are often none or very few hollows available. In locations like these, nest boxes can be used to provide much-needed homes for phascogales.

Nest boxes are also useful in newly planted corridors between existing remnants where young trees have been planted but there are not yet hollows for shelter. They may also be useful in saline areas where swamp she-oak is coming up thickly, but there are no available hollows. Nest boxes can also be used to encourage the interest of local people if used in backyards or school sites adjacent to bushland.

Local Wagin identity Arthur Kershaw, supported by the Wagin Woodanilling Landcare Zone, has constructed more than 50 nest boxes which have been erected in and around Wagin. Often, phascogales will share nest sites and as many as six phascogales have been observed using a single nest box at one time in winter before the breeding season. It is likely that phascogales huddle together to reduce the energy required to keep warm. Other small carnivorous marsupials such as dunnarts and antechinus will huddle also.

Trapping for phascogales on Wheatbelt farms provides a way of engaging with landholders and encouraging them to become involved in landcare activities to benefit resident phascogales. Recommendations emanating from this trapping program

Above left Part of the 11.5-kilometre fox-proof fence erected at Wadderin Sanctuary near Narembeen.
Photo – Jeff Short

Above Tiny radio-collars were fitted to phascogales to enable tracking to monitor survival and movements.
Photo – Jeff Short

since 2004 have resulted in the Wagin Woodanilling Landcare Zone supporting the creation of 15 kilometres of tree corridors with 16,720 native seedlings connecting more than 1,500 hectares, including 35 kilometres of fencing which protects 500 hectares of previously unprotected habitat. These on-ground activities were funded by the South West Catchments Council. In addition, several land owners have agreed to voluntary management agreements on their remnant bushland where phascogales are present.

Central Wheatbelt

In contrast to the relative abundance of phascogales in the southern Wheatbelt, there is a scarcity or absence in the central Wheatbelt. Areas around Narembeen have been more extensively cleared, distances between remnant patches are greater, and often tree corridors along road verges are missing or incomplete. Sadly, phascogales present in large DEC reserves such as North Karlgarin, Bendering and Dragon Rocks nature reserves in the 1970s, were not trapped in surveys in the 1990s or since. The 1970s surveys were conducted in the latter phase of an extensive period of clearing following scientific advances that enabled soils deficient in trace elements to be used for cropping. Hence, the total area of bushland has declined and many of the former habitat connections have been severed. The reserves are now surrounded by vast paddocks of wheat that offer little opportunity for native species. The prognosis here for phascogales and other native fauna is grim.

However, members of the farming community in these areas often retain a strong connection to their district's immediate past. Typically, farms have been handed down within the family and a father or grandfather originally settled and cleared the land. Hence, there is a rich oral history of the fauna that used to occur in the district or on the farm. For example, retired Narembeen farmer Mel Bristow, now 84, can still remember bilbies (*Macrotis lagotis*) in the district from the late 1920s (see 'Remembering the dalgyte', *LANDSCOPE*, Summer 2002-03). The continuity of knowledge at Narembeen has encouraged local efforts to attempt to restore lost fauna.

Community members at Narembeen have banded together to create the 430-hectare Wadderin Sanctuary for the protection of native wildlife. They constructed an 11.5-kilometre fox-proof fence around an area of granite outcrops, salmon and York gum woodland and mallee shrubland. They now have ambitious plans to re-establish as many as eight native species. Foxes and cats have been eliminated and nest boxes have been erected within the sanctuary.

Communications company Exetel provided support for the translocation of 20 red-tailed phascogales from remnant bushland on farms at Wagin to Wadderin Sanctuary during May 2009. Six of the 20 phascogales were tracked using small radio-collars weighing just 1.3 grams. All collared animals survived the first four weeks of monitoring and 11 of the 20 individuals were known to definitely be alive going into the breeding season. However, the real test will be the survival of the females through spring and the successful rearing of their litters.

After more than a century of decline, it is encouraging that the phascogale is making a stand, with a little help from its farming and conservationist friends.

Dr Jeff Short provides ecological advice and practical support to remote and regional communities engaged in biodiversity conservation. He operates the consultancy company Wildlife Research and Management (www.wildliferesearchmangement.com.au).

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