

Working to
conserve the
**western
ringtail
possum**

by Paul de Tores, Suzanne Rosier,
Jennifer Jackson, Judy Clarke and Lizzie Aravidis

As development threatens western ringtail possum populations, translocation projects experience some success in establishing new populations of this threatened species.

The western ringtail possum (*Pseudocheirus occidentalis*) is a small to medium-size arboreal marsupial. The species was, until relatively recently, considered the same species as the common ringtail possum (*P. peregrinus*) from Queensland, New South Wales, South Australia and Tasmania. But in no way is the western ringtail possum 'common'.

In terms of its evolutionary strategies, the western ringtail possum is best described as naïve. It shows minimal predator avoidance and research by Phil Clark from Murdoch University and Felicity Bradshaw, a practising veterinarian in Busselton, has shown the western ringtail possum has very limited capacity to mount an immune response to infection. These two characteristics

immediately disadvantage the species, especially in an environment where introduced predators such as foxes and cats are recognised threats and where there is increasing risk of disease due to human disturbance to natural ecosystems and invasion by a suite of exotic species and pathogens. In addition, research by scientist Christine Cooper and honours student Hau Kung Yin from Curtin University confirmed what most wildlife carers and ecologists suspected—the western ringtail possum is not well adapted to cope with high temperatures. The pattern of evaporative water loss for the western ringtail possum is consistent with that for most other marsupials, but only up to an ambient temperature of 25°C. At ambient temperatures higher than this, evaporative water loss increases significantly. At ambient temperatures of 35°C, western ringtail possums easily overheat. Conversely, the western ringtail possum was shown to be well adapted to cooler conditions.

The conservation implications of these three things—predator naïvety,

limited ability to mount an immune response and poor adaptation to extremes in heat—are immense. The last of these is of particular concern given the predictions associated with climate change. However, the immediate major threat to the conservation status of the western ringtail possum is habitat loss from land clearing. Land clearing not only results in the immediate loss of habitat but has flow-on effects to surrounding environments including increased numbers of exotic predators such as foxes, cats and pet dogs, and a reduction in the amount of vegetative cover in patches of retained vegetation. The loss of vegetative cover results in increased water loss, making survival even more tenuous for a species which shows an increase in evaporative water loss at only moderately high ambient temperatures.

Therefore, it is not surprising to find the distribution of the western ringtail possum has contracted in the time since European settlement. In the 1950s the distribution extended to the southern

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Main Western ringtail possum.

Photo – Babs and Bert Wells/DEC

Inset Peg, a translocated western ringtail possum.

Photo – Judy Clarke

Below Western ringtail possum.

Photo – Marie Lochman





Above The common ringtail possum is not found in Western Australia.
Photo – Jiri Lochman

and eastern outskirts of Perth and as recently as the 1970s populations were known from near Pingelly. The western ringtail possum is now restricted to the wetter, south-west corner of Western Australia. Unfortunately for the western ringtail possum, this south-west corner is also experiencing an explosion in urban development.

Balancing nature and development

Improvements in infrastructure, new housing and new facilities such as aquatic centres, aged-care facilities, coastal resort complexes and housing estates by the sea, usually come at an environmental cost. The difficult decisions to ensure the environment remains capable of supporting as much of the natural biodiversity as possible, while still providing for the demands of an ever-increasing urban society, remain with planners and legislators. However, planners and legislators cannot make the relevant decisions without basic ecological information—or at least they can't make good decisions without this information.

Establishing the balance between development and retaining biodiversity values is not simple. In the case of the western ringtail possum, State and Commonwealth legislation offers considerable protection. The Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires any developer to refer proposals to the Commonwealth where the proposal is "likely to have a significant impact on a matter of

Right Bushland being bulldozed for roads and housing development in the south-west.
Photo – Brett Dennis/Lochman Transparencies

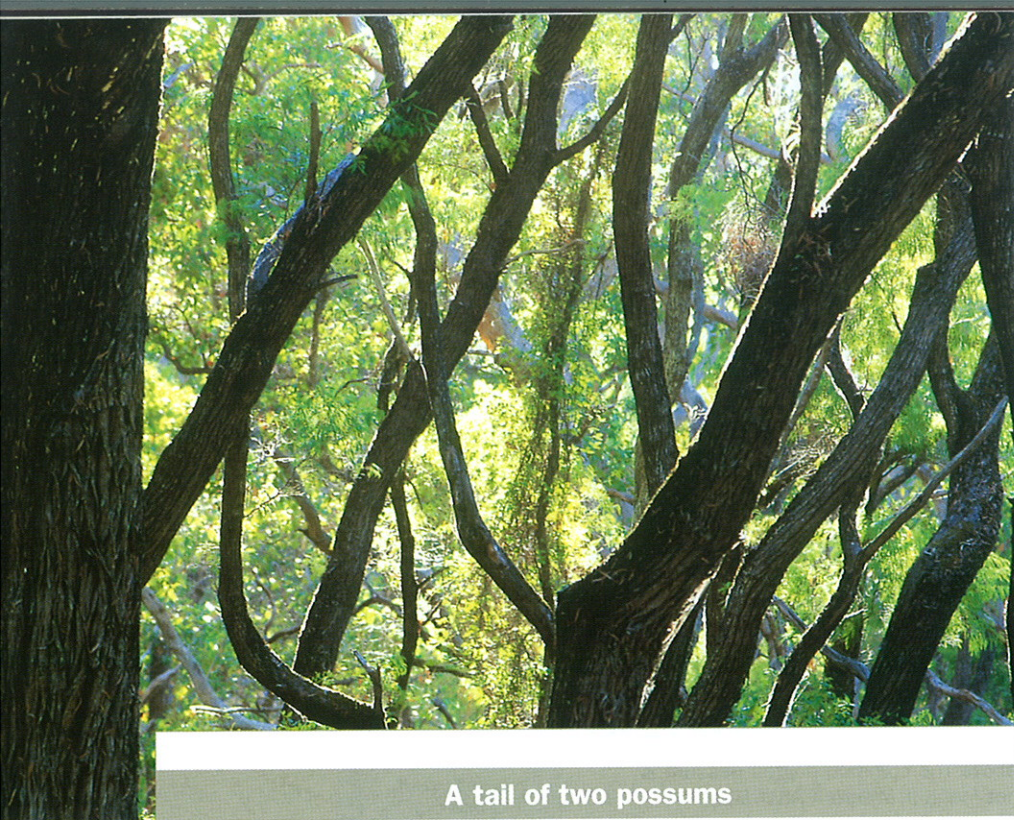
national environmental significance". The EPBC Act recognises seven matters of national environmental significance. One of these is "threatened species and ecological communities". The western ringtail possum is listed in Western Australia, nationally and internationally, as a threatened species and clearly meets the criterion. However, it is less clear what constitutes a "significant impact".

To answer this satisfactorily requires an understanding of which populations of the western ringtail possum are critical for the long-term conservation of the species. This requires knowledge of the population size, population structure, breeding capability, dispersal patterns and an understanding of the genetic structure of these populations. This information is not available at the detail required for local, state and national decision makers. In recognition of this, the Commonwealth Government has supported a pilot study to assess the conservation significance of a suite of western ringtail possum populations in the Busselton area. The Department of Environment and Conservation (DEC) is conducting the research, in collaboration with ecologists and



geneticists from Murdoch University. Completion of this study will provide only part of the information required, but will be a major step in achieving better understanding of areas and populations of conservation significance for the western ringtail possum.

In the interim, development applications need to be assessed and decisions made. To date, development applications have been assessed with the best information available. If DEC and the Department of the Environment, Water, Heritage and the Arts approve



Left Peppermint trees provide important western ringtail possum habitat.
 Photo – Dennis Sarson/Lochman
 Transparencies

A tail of two possums

The western ringtail possum has acquired its common name from its ability to use its tail as an additional limb. The tail is truly prehensile. This characteristic makes it immediately distinguishable from the brushtail possum (*Trichosurus vulpecula*) with which it often cohabitates. The tail of the ringtail is approximately equal to its head-body length, whereas the brushtail possums' tail is considerably shorter than the head-body length.

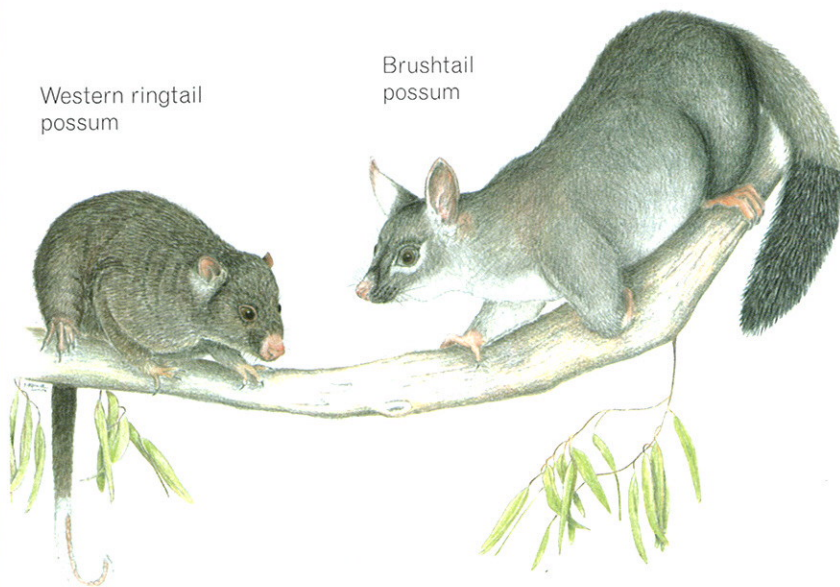


Illustration – Nadine Guthrie/DEC

translocation as an appropriate response, developers must pay the cost of capture and removal of animals from the development sites and must also contribute to the costs for monitoring at the translocation release sites.

Does translocation work?

Translocation is not always the preferred option as a wildlife management tool. In the case of the

western ringtail possum in south-west of Western Australia it is preferable to maintain healthy populations in their existing habitat. Where this is not achievable, translocation has become a tool to mitigate the effect from development. Although not a perfect solution, translocation does provide some respite to a situation which would otherwise most likely result in the loss of local populations. For western

ringtail possums, translocation has resulted in establishing new populations within secure conservation estate.

The translocation project for the western ringtail possum began in 1991. The translocated animals had been held by wildlife carers and were deemed sufficiently rehabilitated to be released into the wild. Most of these possums had been found injured, orphaned or simply suffering from heat stress and then passed on to carers.

The initial release site was Leschenault Peninsula Conservation Park, immediately north of Bunbury. These releases were to peppermint (*Agonis flexuosa*) dominated habitat within the park, where a fox baiting program had been implemented and been maintained. By 1995, the western ringtail possum population had increased and additional sites were identified for release of possums rehabilitated by wildlife carers and those displaced by approved developments. By 1998 the Leschenault population had appeared to meet all the criteria for translocation success.

Additional sites were established in Yalgorup National Park and Lane Poole Reserve. Most of the released possums came from development sites, where the possums were caught immediately before clearing. Monitoring from these sites indicates all have met with some translocation success.

Positive conservation benefits from the translocation research include the establishment of what appear to be viable populations at two sites within Yalgorup National Park—Preston Beach Road and White Hill Road. Monitoring has confirmed the populations have survived and there has been continued recruitment of young. Spotlight monitoring in 2006 resulted in 24 western ringtail possum sightings. At least 21 of the animals sighted were offspring from the original translocated possums. This is clear evidence of successful breeding at both sites. More recent data suggests a similar pattern has occurred at Martin's Tank and Lake

Pollard—the third translocation release site within Yalgorup National Park.

Monitoring has been less intense at Lane Poole Reserve, but the trends in the data are similar to those from Yalgorup National Park. Ringtails released at Lane Poole have survived to produce young, have established regular use of tree hollows and constructed nests. The data from Lane Poole Reserve and Yalgorup National Park were the first to reveal western ringtail possums regularly use grass trees as rest sites during the day.

Offspring from the Lane Poole population have been observed, but none of these has been radio-collared. However, one of the possums translocated to Lane Poole Reserve has resulted in a longevity record for the western ringtail possum (see 'Possum antics' on page 60).

Monitoring through the use of radio-telemetry requires capture and recapture of individual possums. Western ringtail possums are not easily caught using conventional

trapping methods. The most effective technique is capture through the use of a tranquiliser dart gun. Possums are darted at close range, the tranquiliser takes up to two minutes to take effect and the possum is caught in a blanket as it falls from the tree.

Reports of western ringtail possums have now become a regular occurrence from numerous locations north and south of the translocation release points within Yalgorup National Park. These reports are further indications of translocation success. Through the use of DNA analysis we are now able to determine if these new sightings have originated from dispersal of individuals from the translocation release sites.

Why the translocation concern?

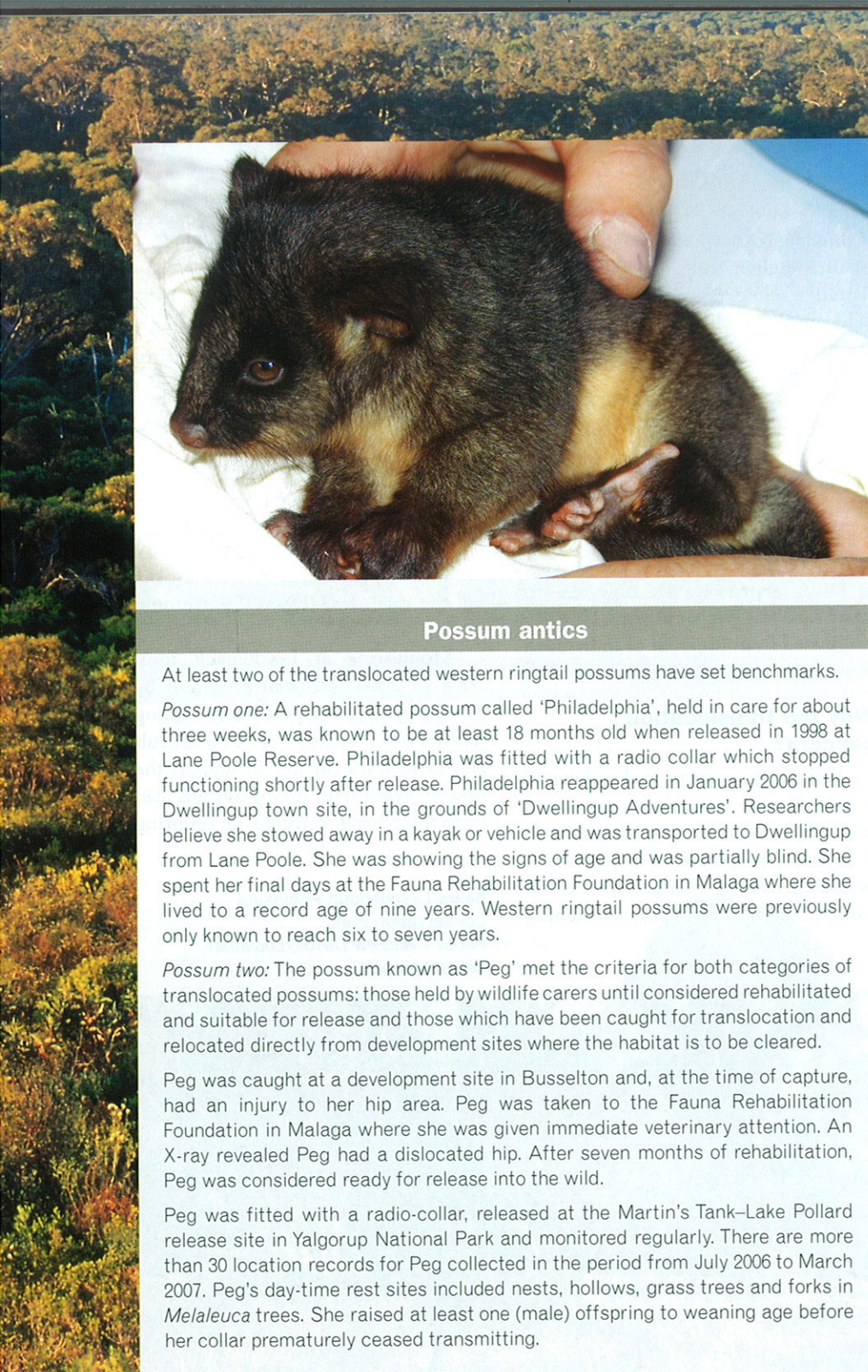
Follow-up surveys at Leschenault in 2002 showed the population had declined. Several hypotheses have been proposed to explain this, including disease, changes to the fox baiting regime and prey switching

(rabbit numbers have been reduced and the major predators may have switched from preying on rabbits to other predation-sensitive species such as the western ringtail possum). The phenomenon of mesopredator release has also been suggested as a cause for the decline. Mesopredator release is where a reduction in the dominant predator (foxes) allows other, subordinate predators such as cats, pythons and chuditch, to increase in number and add predation pressure on other species (see 'Will curiosity kill the cat?', *LANDSCOPE*, Autumn 2007).

Monitoring at Leschenault from 2004 to 2006 indicated predation by cats and pythons was potentially limiting translocation success at Leschenault and there was evidence to support the disease hypothesis (toxoplasmosis had previously been detected in offspring

Below Leschenault Peninsula Conservation Park.
Photo – Andrew Davoll/Lochman Transparencies





Background left Yalgorup National Park.
Photo – Gordon Roberts/DEC

Left The male offspring of the translocated possum 'Peg', from Yalgorup National Park.
Photo – Helen McCutcheon/DEC

Possum antics

At least two of the translocated western ringtail possums have set benchmarks.

Possum one: A rehabilitated possum called 'Philadelphia', held in care for about three weeks, was known to be at least 18 months old when released in 1998 at Lane Poole Reserve. Philadelphia was fitted with a radio collar which stopped functioning shortly after release. Philadelphia reappeared in January 2006 in the Dwellingup town site, in the grounds of 'Dwellingup Adventures'. Researchers believe she stowed away in a kayak or vehicle and was transported to Dwellingup from Lane Poole. She was showing the signs of age and was partially blind. She spent her final days at the Fauna Rehabilitation Foundation in Malaga where she lived to a record age of nine years. Western ringtail possums were previously only known to reach six to seven years.

Possum two: The possum known as 'Peg' met the criteria for both categories of translocated possums: those held by wildlife carers until considered rehabilitated and suitable for release and those which have been caught for translocation and relocated directly from development sites where the habitat is to be cleared.

Peg was caught at a development site in Busselton and, at the time of capture, had an injury to her hip area. Peg was taken to the Fauna Rehabilitation Foundation in Malaga where she was given immediate veterinary attention. An X-ray revealed Peg had a dislocated hip. After seven months of rehabilitation, Peg was considered ready for release into the wild.

Peg was fitted with a radio-collar, released at the Martin's Tank-Lake Pollard release site in Yalgorup National Park and monitored regularly. There are more than 30 location records for Peg collected in the period from July 2006 to March 2007. Peg's day-time rest sites included nests, hollows, grass trees and forks in *Melaleuca* trees. She raised at least one (male) offspring to weaning age before her collar prematurely ceased transmitting.

from the population at Yalgorup). In 2005 the then Department of Conservation and Land Management (now DEC), in collaboration with Murdoch University and the University of Sydney, successfully sought Australian Research Council funding. This program, together with funds from developers responsible for habitat clearing, is enabling two PhD students to examine the prevalence of disease in naturally occurring and translocated populations. The students, both qualified veterinarians, are also

examining survivorship, habitat use and the predators responsible for any predation events. A third PhD student is examining the role of pythons from a mesopredator release perspective, specifically the importance of python predation to western ringtail possum translocation success.

Predation by cats and pythons at Leschenault has now been clearly quantified and there is very strong evidence for the mesopredator release hypothesis. This is also supported by results from western ringtail possum

releases at the Australian Wildlife Conservancy's Karakamia Sanctuary in Chidlow, which is protected by a predator-proof fence and is free of foxes and cats. Translocated western ringtail possums have continued to increase in number within the privately owned sanctuary.

Pythons and western ringtail possums occur together naturally over much of the possums' range. Consistent with ecological theory and the principle of mesopredator release, DEC researchers have hypothesised translocated ringtail populations at Leschenault will be able to withstand some level of predation by pythons and, if cat density is reduced, the ringtail populations will become self sustaining.

Leschenault Peninsula Conservation Park has now been identified as a priority site for cat control. Before this can occur, the recently developed cat-control bait, Eradecat, will be tested to ensure native fauna from the south-west are not at risk from the effects of the bait. This testing will be carried out in 2008 using non-toxic baits at Leschenault. If there is no risk to the native species, toxic (1080) Eradecat baits will be deployed at Leschenault Peninsula Conservation Park later in 2008. DEC researchers and the Invasive Animals Cooperative Research Centre are also undertaking concurrent trials in the northern jarrah forest and anticipate broad-scale cat baiting research to start in the jarrah forest in 2009.

Future translocations

Translocation has been increasingly used as a mitigation measure for many threatened species. It may provide hope for populations otherwise doomed by habitat loss through clearing. If it can be shown to be successful over the longer term, it may well be an



Above A typical grass tree (*Xanthorrhoea preissii*) used as a day-time refuge by translocated western ringtail possums at Yalgorup National Park.
Photo – Paul de Tores/DEC

Above right Lane Poole Reserve.
Photo – Brett Dennis/Lochman Transparencies

Right Carpet python—a natural predator of western ringtail possums.
Photo – Marie Lochman



important component in the mix of management and planning options for improved conservation of the western ringtail possum.

The selection of translocation release sites now needs to take into account the consequences of global warming. We are unlikely to see the western ringtail possum translocated to sites in the wheatbelt where the species once occurred. Future translocations to sites within the temperate higher rainfall zones such as Lane Poole Reserve and Yalgorup National Park can provide an extension to the existing range of the western ringtail possum, thus contributing to the conservation of the species.

There are no quick fix solutions. Western ringtail possums are threatened by habitat loss, predation, fire, diseases and climate change. The use of translocation should not be regarded as a panacea for resolution of conflict between development and conservation, particularly where the habitats at risk are those of high conservation value for a threatened species.

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Suzanne Rosier is a DEC volunteer who has been actively involved in the western ringtail possum translocation research since 1991.

Jennifer Jackson is a Technical Officer, based at DEC's Wildlife Research Centre in Woodvale. Jennifer was involved in the translocation research from 2004 to 2006.

Judy Clarke is a veterinarian, now undertaking a PhD examining the outcomes from translocation of the western ringtail possum. Judy started her research in 2006.

Lizzie Aravidis is the President of the Fauna Rehabilitation Foundation (FRF), at Malaga. FRF volunteers have been involved in ensuring orphaned and injured western ringtail possums are appropriately rehabilitated and released into the wild.



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