

**Approved Conservation Advice for  
*Pseudocheirus occidentalis* (western ringtail possum)**

(s266B of the *Environment Protection and Biodiversity Conservation Act 1999*)

This Conservation Advice has been developed based on the best available information at the time this Conservation Advice was approved; this includes existing and draft plans, records or management prescriptions for this species.

### **Description**

*Pseudocheirus occidentalis* (western ringtail possum), family Pseudocheiridae, also known as the ringtail possum, Ngwayir, Ngora, Nguarer, Ngwarer or Wamp, is a medium-sized, nocturnal marsupial weighing between 700 and 1300 grams (de Tores, 2008). The length of the head and body is 30-40 cm, and the tail is also 30-41 cm long (de Tores, 2008), slender, and strongly prehensile (DEC, 2012). The western ringtail possum is immediately recognisable, with short fur, deep chocolate brown to grey above, creamy white below; the tail fur is very short, creamy white towards the tip (de Tores, 2008). The ears are short and rounded (DEC, 2012).

*Pseudocheirus occidentalis* is one of only two medium-sized arboreal marsupials from the south-west of Western Australia. This species is clearly distinguished from the common brushtail possum (*Trichosurus vulpecula*), which also occurs in the south-west, by its smaller rounded ears, and its thin prehensile tail, which is as long as the rest of the body (de Tores, 2008).

### **Conservation Status**

*Pseudocheirus occidentalis* is listed as vulnerable under the name Western Ringtail Possum. This species is eligible for listing as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) as, prior to the commencement of the EPBC Act, it was listed as vulnerable under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

The species is listed as vulnerable in Western Australia under the *Wildlife Conservation Act 1950*. The species is also listed as vulnerable and with a decreasing population trend under the IUCN Red List of Threatened Species (IUCN, 2013).

### **Cultural Significance**

The western ringtail possum has been a food source for the Noongar Indigenous people in the Leeuwin-Naturaliste Region of south-western Australia for tens of thousands of years (Dortch et al., 2012). The species was traditionally hunted by Noongar men (Dortch and Wright, 2010).

### **Distribution and Habitat**

The current distribution of the western ringtail possum is patchy and largely restricted to the moister south-western corner of Western Australia (de Tores, 2008), especially near coastal areas of peppermint (*Agonis flexuosa*) woodland and peppermint/tuart associations from the Australind/Eaton area to the Waychinicup National Park (DEC, 2012). Important populations occur in urban Busselton (de Tores, 2008). The Upper Warren area east of Manjimup is the only place the western ringtail possum survives in the absence of coastal peppermint (DEC, 2012).

Nineteenth century surface cave deposits show that the western ringtail possum was widely distributed throughout the south-western forests of Western Australia (de Tores, 2008) from 120 km south-east of Geraldton to the southern edge of the Nullarbor Plain, with inland

records as far as Tutanning Nature Reserve (DEC, 2012). It was first reported to be in decline in 1909, and the pattern of decline was local and patchy at first, but by 1980 it had contracted to less than a quarter of its original distribution (Jones, 2004; DEC, 2012). Local extinctions have been most extensive in inland areas, occurring as recently as 1950-1970. As recently as the 1970s it was known to occur in Casuarina woodland habitat in reserves in the Wheatbelt (de Tores, 2008). Farther away from the coast, *P. occidentalis* occurred in Jarrah, Wandoo and Marri forests (de Tores, 2008).

In 2007, the extent of occurrence was estimated to be 7 155 km<sup>2</sup>, and the area of occupancy was estimated to be 3 700 km<sup>2</sup> (DEC, 2007). Population numbers are unknown, and accurate estimates are elusive as the species occurs in fragmented and scattered subpopulations and is difficult to trap (DEC, 2007). Number or density of dreys (nests) is an unreliable index of abundance, because an individual possum can have several dreys within its home range, and because possums can also utilise tree hollows instead of dreys (Thompson and Thompson, 2009). The species has undergone significant decline, resulting in local extinctions and fragmented distribution, particularly in inland areas (DEC, 2007, 2012). The western ringtail possum has been translocated to Leschenault Conservation Park, Yalgorup National Park, Lane-Poole Reserve and Karakamia Sanctuary (DEC, 2012), although whether success has been achieved has been demonstrated at only one site (de Tores et al., 2004).

The species occurs within the Esperance Plains, Jarrah Forest, and Warren IBRA Bioregions, as well as the South West and South Coast Natural Resource Management Regions.

The distribution of this species overlaps with the following EPBC Act-listed threatened ecological communities:

- *Corymbia calophylla* - *Kingia australis* woodlands on heavy soils of the Swan Coastal Plain
- *Corymbia calophylla* - *Xanthorrhoea preissii* woodlands and shrublands of the Swan Coastal Plain
- Shrublands and Woodlands of the eastern Swan Coastal Plain
- Shrublands on southern Swan Coastal Plain ironstones
- Claypans of the Swan Coastal Plain

The Department of the Environment has prepared survey guidelines for *Pseudocheirus occidentalis*. The survey guidelines are intended to provide guidance for stakeholders on the effort and methods considered appropriate when conducting a presence/absence survey for species listed as threatened under the EPBC Act.

<http://www.environment.gov.au/epbc/publications/threatened-mammals.html>

## Threats

The main identified threats to the western ringtail possum are:

- Habitat loss and fragmentation. Clearing of coastal peppermint (*Agonis flexuosa*) in the Bunbury-Augusta and Albany areas is contributing to habitat fragmentation (DEC, 2012). Clearing occurs for residential development and expansion of regional centres (de Tores, 2008). Research at Jarrah forest sites suggests that habitat fragmentation is a threat at the landscape scale (de Tores, 2008). Logging is also associated with a decline in the western ringtail possum, with greatest abundance of possums recorded in predominantly unlogged forests (Wayne et al., 2006). The species is also sensitive to logging intensity and recency, such that abundance is greater in forests logged at lower intensity and when logged more than forty years ago (Wayne et al., 2006).
- Predation, especially by introduced predators. In most coastal populations foxes are the main predator of the western ringtail possum as shown by monitoring of re-introduced

populations. Where fox control has been implemented, predation by cats and carpet pythons limits the success of translocations (DEC, 2012). Research at Jarrah forest sites suggests that predation by foxes is a threat at the landscape scale (de Tores, 2008).

- Changing fire regimes. Prescribed burning in the Bunbury-Augusta and Albany areas needs to be managed to maximise population survival and enhancement, because even low intensity fires can elevate ringtail mortality, by enabling predation (DEC, 2012). Recent research for Jarrah forest sites suggests that fire intensity is a threat at the local scale (de Tores, 2008). Fire impacts the western ringtail possum in three main ways: reducing the availability of food resources, loss of shelter sites (from frequent fire of any intensity), and directly or indirectly killing individuals (Wayne et al., 2006).

The main potential threats to the western ringtail possum are:

- Climate change. There has been an approximate 20% decline in rainfall in the south-west of Western Australia over the 30 years to 2004 (Timbal, 2004). Modelling of future climate change scenarios for this region suggests a drying trend in winter over the next fifty years, as well as reduced spring rainfall, and a reduction of extreme rainfall events; i.e. heavy rainfall days and long wet spells (Timbal, 2004). Very low rainfall years are projected to increase by a factor of five (Timbal, 2004). As stated above, the western ringtail possum is now largely restricted to the moister south-western corner of Western Australia, and this climate change scenario is likely to lead to further contraction in the species' range. A drying trend with increased temperature will reduce the current extent of coastal peppermint, as will the likely increases in frequency and intensity of bushfires.
- Competition with the brushtail possum (*Trichosurus vulpecula*). Some competition and/or habitat partitioning is thought to occur between sympatric populations of the two species, although the nature and extent is unclear (de Tores, 2008).
- Road traffic. This may contribute to the decline in abundance of the species near roads. There are occasional reports of western ringtail possums through the collection of roadkills (e.g. Trimming et al., 2009).
- Loss of coastal peppermint trees from dieback caused by *Phytophthora cinnamomi*, insect attack, and myrtle rust (*Puccinia psidii*). Myrtle rust was first recorded in Australia from a cultivar of *Agonis flexuosa* in New South Wales, and so the coastal peppermint is a known host of this introduced rust (Carnegie et al., 2010). Myrtle rust causes lesions on young, actively growing leaves and shoots, as well as on fruits and sepals of plants from over 30 genera in the Myrtaceae (WA DAF, undated). Although the disease has spread to Victoria and Queensland, it is not present in Western Australia (WA DAF, undated). It is likely that the disease will seriously affect coastal peppermint in Western Australia if it spreads to that state.

## Research Priorities

Research priorities that would inform future regional and local priority actions include:

- Designing and implementing a monitoring program or, if appropriate, support and enhance existing programs. Monitoring the status of the translocated population at Karakamia Sanctuary is a high priority.
- Assessing the vulnerability of the western ringtail possum to climate change. Endemic species with restricted range are particularly susceptible, and the inclusion of this species would be a high priority in a regional assessment of vulnerability and conservation planning in response to climate change in the south-west of Western Australia (Gibson et al., 2010).
- Clarifying the interaction between the western ringtail possum and the common brushtail possum. Determine the extent of interspecies competition and habitat partitioning (de Tores, 2008).
- More precisely assessing population size, distribution, ecological requirements and the relative impacts of threatening processes.

- Undertaking survey work in suitable habitat and potential habitat to locate any additional populations/occurrences/remnants.
- Investigating strategies for reducing roadkill (DEC, 2012).
- Identifying any diseases affecting the western ringtail possum, and investigate the impacts of these diseases on populations.

## **Regional Priority Actions**

The following regional priority recovery and threat abatement actions can be done to support the recovery of the western ringtail possum:

### Habitat Loss, Disturbance and Modification

- Investigate formal conservation arrangements, management agreements and covenants on private land, and for crown and private land investigate and/or secure inclusion in reserve tenure if possible.
- Minimise the incidence of land clearing for urban development, especially in the Busselton area (DEWR, 2007).
- Conserve existing populations within public lands managed by the Western Australian Department of Environment and Conservation (DEC, 2012) and private conservation reserves.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.
- Re-create, retain and improve habitat characteristics, including corridors (DEC, 2012).
- Manage any other known, potential or emerging threats, such as road traffic. Incorporate research findings regarding strategies for reducing road kill (DEC, 2012).
- Captive breeding may be necessary should this species prove as sensitive and exposed to climate change as predicted and decline continues.

### Animal Predation

- Develop and implement a management plan to control the adverse impacts of foxes (*Vulpes vulpes*) and cats (*Felis catus*) in the region (de Tores, 2008).

### Fire

- Develop and implement a suitable fire management strategy that lessens impact on the western ringtail possum and its habitat.

### Diseases, Fungi and Parasites

- Continue applying the interim biosecurity measures implemented by the Department of Agriculture and Food WA under the *Biosecurity and Agriculture Management Act 2007* to minimise the risk of myrtle rust being introduced into Western Australia (WA DAF, undated).
- Develop and implement suitable hygiene protocols to protect known sites from further outbreaks of toxoplasmosis, and other diseases affecting this species once they are identified.
- Develop and implement suitable hygiene protocols to protect known sites from dieback caused by *Phytophthora cinnamomi*, and insect attacks.

### Conservation Information

- Raise awareness of the western ringtail possum within the local community, including a campaign to drive with care at night to reduce incidence of road kill (DEWR, 2007), and controlling domestic pets (DEWR, 2007).
- Engage with private landholders and land managers responsible for the land on which populations occur and encourage these key stakeholders to contribute to the implementation of conservation management actions.

- Plant native species in gardens to provide habitat and food for native species, particularly peppermint trees in western ringtail possum areas (DEWR, 2007).

### **Local Priority Actions**

The following local priority recovery and threat abatement actions can be done to support the recovery of the western ringtail possum:

#### Habitat Loss, Disturbance and Modification

- Retain and conserve vegetation in the Quindalup Dune Vegetation Complex, which has high conservation value for the species (DEC, 2012).
- Retain and plant peppermint (*Agonis flexuosa*) trees (DEC, 2012).
- Control access routes to suitably constrain public access to known sites on public land.
- Suitably control and manage access on private land and other land tenure.
- Minimise adverse impacts from land use at known sites. Minimise the impact of land developments through in-situ conservation (DEC, 2012).
- Protect populations of the listed species through the development of conservation agreements and/or covenants.
- Conserve remnant bushland for the western ringtail possum by placing a covenant or voluntary management agreement on properties, and by fencing, controlling feral species and removing weeds (DEWR, 2007).

#### Animal Predation

- Restrain domestic animals in residential areas (DEC, 2012). Where fencing is required, ensure that it is at least 210 cm to reduce the risk of dog attack (DEC, 2012).

#### Fire

- Implement an appropriate fire management regime for local populations (de Tores, 2008), addressing frequency and intensity of fires.

#### Diseases, Fungi and Parasites

- Continue to monitor coastal peppermint populations and other members of the Myrtaceae for the presence of myrtle rust.

#### Conservation Information

- Ensure that injured or orphaned animals are rehabilitated where possible and released into the wild where chances of survival are maximised (DEC, 2012).

This list does not necessarily encompass all actions that may be of benefit to the western ringtail possum, but highlights those that are considered to be of highest priority at the time of preparing the Approved Conservation Advice.

### **Existing Plans/Management Prescriptions that are Relevant to the Species**

- English V and Blyth J (2000). *Corymbia calophylla* - *Xanthorrhoea preissii* Woodlands and Shrublands (Swan Coastal Plain Community Type 3c - Gibson et al. 1994) Interim Recovery Plan 2000-2003. Western Australian Department of Conservation and Land Management. Environment Australia, January 2000.
- *Interim Recovery Plan for the Corymbia calophylla* - *Kingia australis* Woodlands on Heavy Soil (Swan Coastal Plain Community Type 3a - Gibson et al. 1994) 2000-2003. (English and Blyth, 2000).
- *Interim Recovery Plan for the Eastern Shrublands and Woodlands* (Swan Coastal Community 20C) 2000-2003. (English and Blyth, 2000).

- Interim recovery plan no. 215. *Shrubland Association on Southern Swan Coastal Plain Ironstone (Busselton area) (Southern Ironstone Association)*. (Meissner and English, 2005).
- Background Paper to EPBC Act Policy Statement 3.10 - Nationally Threatened Species and Ecological Communities Significant impact guidelines for the vulnerable western ringtail possum (*Pseudocheirus occidentalis*) in the southern Swan Coastal Plain (DEWHA, 2009a).
- Nationally Threatened Species and Ecological Communities Significant impact guidelines for the vulnerable western ringtail possum (*Pseudocheirus occidentalis*) in the southern Swan Coastal Plain, (DEWHA, (2009b).

These prescriptions were current at the time of publishing; please refer to the relevant agency's website for any updated versions.

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Department of Environment and Water Resources (DEWR) (2007). *Australian Threatened Species 2007 fact sheet: western ringtail possum, Pseudocheirus occidentalis*. Available on the Internet at: <http://www.environment.gov.au/biodiversity/threatened/publications/tsd07-w-ringtail-possum.html>

Dortch J, Balme J and Ogilvie J (2012). Aboriginal responses to Late Quaternary environmental change in a Mediterranean-type region: Zooarchaeological evidence from south-western Australia. *Quaternary International* 264: 121-134.

- Dortch J and Wright R (2010). Identifying palaeo-environments and changes in Aboriginal subsistence from dual-patterned faunal assemblages, south-western Australia. *Journal of Archaeological Science* 37: 1053–1064
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- Western Australia Department of Agriculture and Food (WA DAF) (undated). Pest alert - Myrtle rust (*Puccinia psidii* s.l. syn. *Uredo rangeli*). Viewed: 24 October 2013 Available on the Internet at: [http://www.agric.wa.gov.au/PC\\_94039.html](http://www.agric.wa.gov.au/PC_94039.html)