

## Effects of logging on the Western Ringtail Possum (*Pseudocheirus occidentalis*)

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The Western Ringtail possum or Ngwayir (*Pseudocheirus occidentalis*) is listed as rare or likely to become extinct under the *Wildlife Conservation Act WA* (1950), as vulnerable under both the Federal *Environmental Protection and Biodiversity Conservation Act* (1999) and by the IUCN.

The Australian Government's Department of Sustainability Environment Water, Population and Communities (SEWPAC) describes the vulnerability of this species and the need to protect all remaining populations to enable their recovery and survival.

Given the low breeding capacity, relatively short lifespan and susceptibility to predation of this species, **all known populations are considered essential for the species recovery and long term survival (DEC 2007).**

Timber harvesting and burning operations are specifically listed by SEWPAC (2012) as key threats to their survival and population recovery;

**Timber harvesting and burning operations can also threaten Western Ringtail possum populations;** such actions result in loss of habitat, habitat fragmentation, loss of nest trees and refuges, loss of canopy and population displacement. This has been an issue with the Manjimup populations in particular and in the Dardanup Shire (DEC 2007; de Tores et al. 2004; Wayne et al. 2000).

**An experimental study in Kingston Forest near Manjimup in 1997 found that logging kills Western Ringtail possums and disturbs Western Ringtail possum communities (Wayne et al. 2000; Burrows et al. 2002).** The study showed a severe decline in the population with only 31 per cent of the treatment animals alive two weeks after the logging, compared with 80 per cent of the control animals who were not subject to the logging operation. Up to 17.6 per cent of the individuals died from the falling of their refuge sites during the logging process (Wayne et al. 2000). **Within 20 months of the logging 12 of the 17 radio collared animals had all died (Burrows et al. 2002).** A later study by Wayne and colleagues in 2006 was consistent with these findings (SEWPAC 2012).

During the study logging occurred under the 'gap creation' prescription. This style of logging is the most intense form practised in the jarrah forest, removing almost all of the trees in a 10 hectare area and leaving a 100 metre strip between logged 'cells'. Since the Kingston study the prescription has changed to require the retention of 5 primary habitat trees per hectare (as opposed to 3 which were required under the previous Forest Management Plan) and a further 6 secondary habitat trees. Despite this increase in retention of trees in logged areas the factors causing deaths during and after logging operations remain;

- ⤴ The majority of hollow-bearing trees are removed causing immediate deaths as refuge sites fall, as well as significantly reducing availability of shelter and nesting sites into the future.
- ⤴ Fragmentation of habitat and disconnection between trees in the canopy increase predation by forcing Ngwayir onto the ground (Jones et al 2008; Wayne et al 2000).
- ⤴ The post logging burn affects Ngwayir in the same ways it did during the studies.

Predation by foxes and cats was the primary cause of death for both the treatment and control groups (Wayne et al. 2000). Predation is known to increase following logging and is a particular threat to Western Ringtail possums (Wayne et al. 2000). In their 2001 Kingston Study Progress Report CALM Science Division's Wayne and colleagues write;

**Habitat modification as a result of harvesting would necessitate Ngwayir to spend more time travelling along the ground rather than by their preferred means through the canopy. This would increase their vulnerability to predation. The survivorship expectation of Ngwayir within harvest areas as a result of increased predation is evidence for this (Wayne et al. 2000).**

Fire, including routine post logging burns, is also a key threat to this species. SEWPAC (2012) connects these two threats saying;

As felling operations in Jarrah forests have increased, this has lead to increased debris and

ground fuel which in turn resulted in more severe fires over greater areas.

The three ways in which fire can have a negative impact on Western Ringtail Possums (Wayne et al. 2006) are;

- ^ by reducing the availability of food resources,
- ^ through the loss of shelter sites,
- ^ by directly or indirectly killing individuals.

Climate change is also recognised as a major threat to the species. SEWPAC (2012) describes the specific threat to the Western Ringtail Possum as follows;

Species which have very specific habitat requirements and a poor ability to migrate have lost large areas of habitat because of clearing etc, Animals with a small genetic base are all listed as being at certain risk to due to climate change. Brereton and colleagues (1995) list the Western Ringtail possum among those animals.

DEWHA(2009) note that important areas for the Western Ringtail possum are those that afford sufficient connectivity to allow genetic exchange. As the Western Ringtail possum is unable to cope with high temperatures, clearing of habitat with cooler micro-climates is an important threat (de Tores et al. 2008).

**Wayne and colleagues (2005) looked at the relationship between the abundance of threatened arboreal marsupials and anthropogenic disturbances in the south-west forests. The study clearly shows that present day logging has a significant detrimental impact on the Western Ringtail possum and that habitat retention is necessary for their recovery and survival.**

While many jarrah forest areas that support remaining high abundances of the Ngwayir have been incorporated into reserves, conservation of Ngwayir habitat and populations outside reserves also will be essential for the recovery and long-term viability of the species.

Warrup Forest where logging is current (March 2012), is a part of the Greater Kingston Area where studies on Western Ringtail possums have been conducted. SEWPAC (2012) classifies the Greater Kingston population as Stable-Declining and as 'considered to be at risk'. Surveys conducted within Warrup forest where the logging is now underway between 1995 and 2001 routinely recorded Western Ringtail possum sightings (Wayne et al 2001). A single sighting was recorded in 2006 during a much less thorough survey (pers comm Adrian Wayne 2012). Surveys since then have been lacking. It can be assumed that the species continues to inhabit the area (SEWPAC 2012).

Wardell-Johnson and colleagues' 2006 research reasons that the relatively low impact of logging and fire in the Perup area (Wardell-Johnson 2004), which is adjacent to Warrup forest, is a significant factor explaining the continued existence of diverse mammal populations there (Wardell-Johnson et al. 2004). This explanation holds for the adjacent Warrup forest which is known to contain an unusually high number of threatened species of native fauna including the Woylie, Brush-tailed Phascogale, Forest Red-tailed Black Cockatoo, Baudin's Cockatoo, Carnaby's Cockatoo, Numbat, Chuditch and Western Ringtail possum.

Warrup forest acts as a corridor in the landscape between the adjacent Tone-Perup Nature Reserve to its East and areas of forest to its south and west that fauna will need to migrate to as the climate continues to become warmer and drier and the Tone-Perup Nature Reserve becomes less viable habitat.

**According to the scientific research on the impacts of logging on the Western Ringtail possums and the recommendations by scientists and the Federal Government's department SEWPAC, logging should cease where Western Ringtail possum populations exist to prevent certain deaths and potential extinction.**