Interim Wildlife Management Guidelines

for the

Western Ringtail Possum, *Pseudocheirus occidentalis.*

DRAFT

Department of Conservation and Land Management
Science and Information Division

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1. Overview

There is a clear need for management action to ensure conservation of the western ringtail possum.

The western ringtail possum is a declared threatened species. It has shown a contraction in range and abundance, and is now almost exclusively restricted to coastal peppermint woodland and coastal peppermint/tuart vegetation associations.

The impact of land management practices is poorly understood. However, clearing of coastal peppermint woodland, particularly in the Busselton area, is contributing to fragmentation of habitat and should be seen as a threat to the security of existing coastal populations.

The conservation value of isolated populations of ringtails within coastal areas from Bunbury to Albany is unknown.

Predation by foxes has been implicated as a threatening process.

The species taxonomic status is poorly defined.

The impact of forest management practices such as burning and timber harvesting is not known.

The degree of genetic variability within and between Western Australian populations is not known.

2. Background

2.1 Description of the Species and General Biology

The western ringtail possum is an arboreal marsupial. A maximum body weight up to 1 130g has been recorded for both sexes (de Tores and Rosier personal observations). Average mature adult weights are 820 - 1 020g for both sexes (Jones *et al.* 1994b; de Tores and Rosier personal observations).

The pelage is variable in colour. The most commonly observed pattern is a dark brown to rufous head, back, limbs and first half of the tail; a paler ventral surface varying from light brown to almost white; the last half of the tail is usually cream to white.

The tail is prehensile and often used as a fifth limb and for carrying nest materials.

Young have been recorded as being born throughout the year (Jones *et al.* 1994b; de Tores and Rosier personal observations), with peaks recorded in April to July and September to November (Jones *et al.* 1994b) and May to June (de Tores and Rosier in prep.). Litter size is usually one, with litters of two not uncommon.

The western ringtail possum is readily distinguished from the common brushtail possum (*Trichosurus vulpecula*) by its smaller size, shorter (usually darker) fur, smaller rounded ears and absence of a brush tail.

In coastal peppermint (*Agonis flexuosa*) habitat the western ringtail possum builds dreys as nesting/resting sites and uses tree hollows where available (e.g. tuart, *Eucalyptus gomphocephala*, and marri, *E. calophylla*).

Where protection from introduced predators is provided, the range of nest sites used includes low shrub thickets (e.g. *Spyridium globulosum, Acacia saligna, A. rostellifera*) and sedges and rushes (ringtails have been commonly recorded nesting on the ground under *Lepidosperma gladiatum*) (de Tores and Rosier in prep.). In the absence of predator control and in the absence of peppermint or other nesting/drey material, tree hollows and hollow logs are used almost exclusively.

The diet of the western ringtail possum is variable. When available, peppermint forms the majority of the diet. In the absence of peppermint the dominant myrtaceous species are preferred (Jones *et al.* 1994). In urban areas e.g. Bunbury and Busselton, ringtails are known to feed on a variety of garden species including rose bushes and flowers and a diversity of fruit.

The ringtails digestive system reflects adaptation to myrtaceous and other foliage of low nutritional value. Ringtails are hindgut fermenters (or more specifically, caecum fermenters) with a large caecum where fine digestive material is retained. Larger, coarse, less nutritious material is passed more rapidly. Ringtails are also caecotrophic (ingest

faecal pellets containing softer finer material derived from the caecum) (Hume *et al.* 1994; Hume and Sakaguchi 1993).

2.2 Taxonomy

There is inconsistency in the literature concerning the taxonomic status of the western ringtail possum. The species was first described by Thomas (1888) (see Walton 1988) from a specimen collected from King George Sound, Western Australia. The specimen described by Thomas (1888) was listed as a separate species, *Pseudochirus occidentalis*. Subsequent taxonomic classifications have listed the western ringtail possum as *Pseudocheirus peregrinus occidentalis*, a sub-species of the common ringtail possum of eastern Australia.

Until recently, ringtail possums have been included within the Petauridae. Although there has been no published taxonomic review, recent phylogenetic literature (for example Baverstock *et al.* 1990; Springer *et al.* 1992; Springer 1993) included ringtails, along with the greater glider (*Petauroides volans*), within the Pseudocheiridae. The raising of Pseudocheirinae to family is outlined by Smith (1984).

Pseudocheirus is one of five extant genera recognised within the Pseudocheiridae. Within the genus *Pseudocheirus*, *P. peregrinus* has been referred to as a species group (McKay 1984) or recognised as a single species (McKay 1983) with up to 5 sub-species. In the latter, the western ringtail has been referred to as *P. peregrinus occidentalis*. McKay (1988) noted that many distinct differences occur within the *Pseudocheirus peregrinus* group and that *"a taxonomic rearrangement is forthcoming"*.

Strahan (in press) has recognised the western ringtail possum, *P. occidentalis*, as a separate species.

These interim management guidelines refer to the western ringtail possum as a separate species, *Pseudocheirus occidentalis*, and recognise the need for its taxonomic status to be clarified.

2.3 Distribution

The distribution of *P. occidentalis* has contracted from what appears to have been a patchy distribution covering the south west of Western Australia from Geraldton[1] to the Nullarbor[2] with the most inland recording from Tutanning Nature Reserve (Shortridge 1909; Sampson 1971; Christensen *et al.* 1985; How *et al.* 1987; Baynes 1987; A. Baynes pers. comm.; A. Main pers. comm.) (see figure 1).

Its distribution encompassed a variety of vegetation types including coastal peppermint (*Agonis flexuosa*), coastal peppermint/tuart associations (*A. flexuosa/Eucalyptus gomphocephala*), eucalypt associations of jarrah/marri/wandoo (*E. marginata/E. calophylla/E. wandoo*) (Christensen *et al.* 1985), casuarina (*Allocasuarina huegeliana*) (A. Main pers. comm.) and presumably eucalypt woodland, mallee and mallee heath from the Hampton Tableland (Baynes 1987)[2].

It is now almost exclusively restricted to coastal peppermint woodland and coastal peppermint/tuart associations from the Australind/Eaton area to Two Peoples Bay. The only known extant inland populations are in the lower Collie River valley, Perup Nature Reserve and surrounding forest blocks near Manjimup. Perup and the surrounding forest blocks are the only known sites where *P. occidentalis* occurs in the absence of peppermint. *Pseudocheirus occidentalis* is thought to have become locally extinct at all other former inland locations. However, there are unconfirmed reportings from inland near Pingelly and from the swan coastal plain as far north as Yalgorup National Park.

The known former occurrences and current known populations are shown in Figures 1 and 2.

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1 Surface cave deposits from the Geraldton area indicate that *P. occidentalis* was part of the original mammal fauna of the area (i.e. at the time of European arrival) (A. Baynes pers. comm.).

2 Skeletal remains are recorded from cave deposits from the Hampton Tableland indicating that *Pseudocheirus peregrinus/Pseudocheirus occidentalis* was part of the original mammal fauna of the area. Radiocarbon dates of samples indicate an age of 390 ± 210 years. Current vegetation of the area is eucalypt woodland, mallee and mallee heath (Baynes 1987).

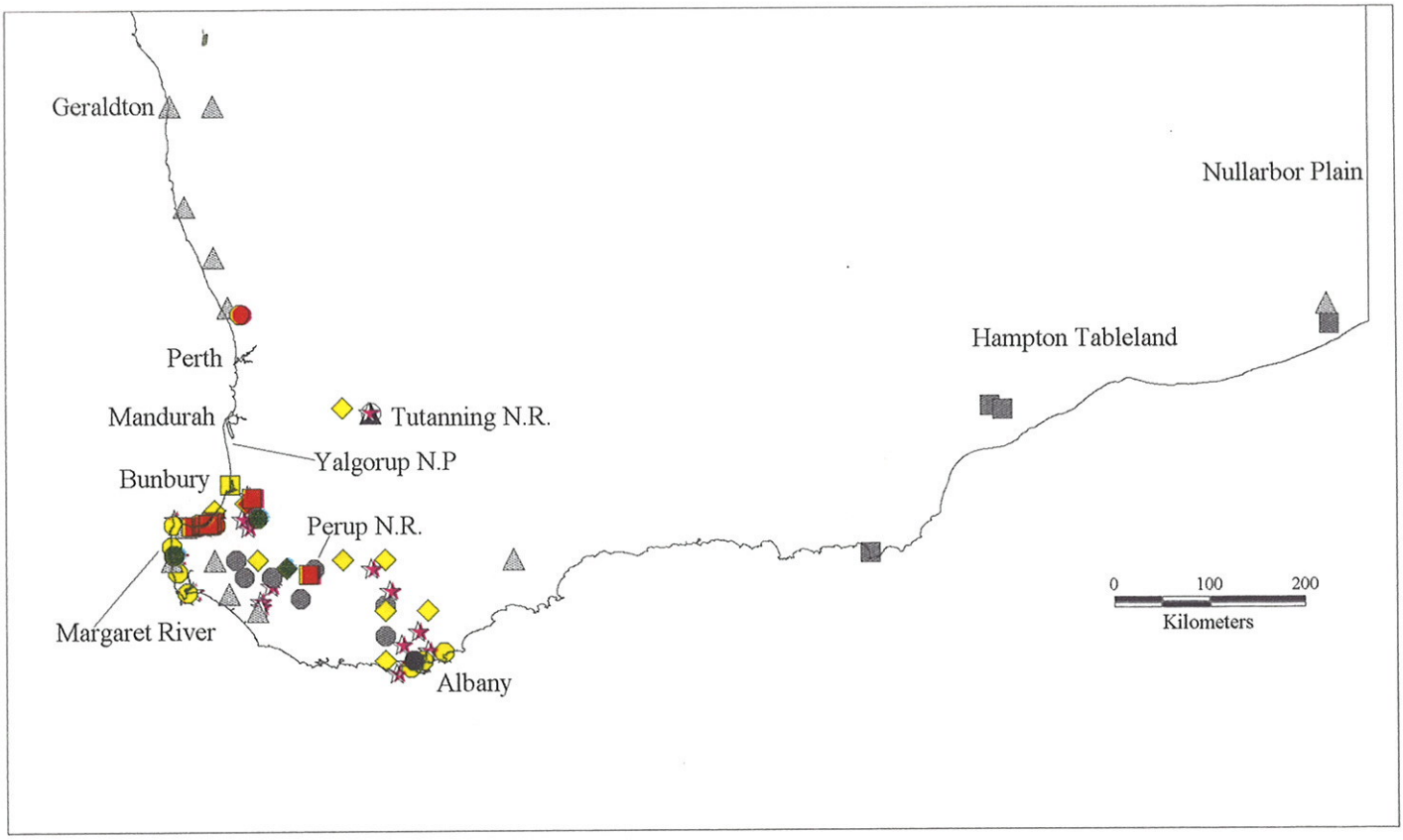

Figure 1: **Record of known occurrences of *Pseudocheirus occidentalis* from 1904 to 1994 and from surface cave deposits where *P. occidentalis* is thought to have been part of the original mammal fauna.**

Code

- Western Australian Museum Records (WAM)
- Jones et al (1994a)
- A. Baynes (pers. comm.)
- A. Baynes (pers. comm.) *
- A. Main (pers. comm.)
- Archer (1974) *
- R. Brazell (pers. comm.)
- Shortridge (1909)
- Christensen et al (1985)
- Baynes (1987) *
- Sampson (1971)
- Walton (1988)
- K. Morris (pers. comm.)
- P. de Tores (current research-translocated population)
- P. de Tores (personal observations)

*** From cave and/or rock shelter deposits.**

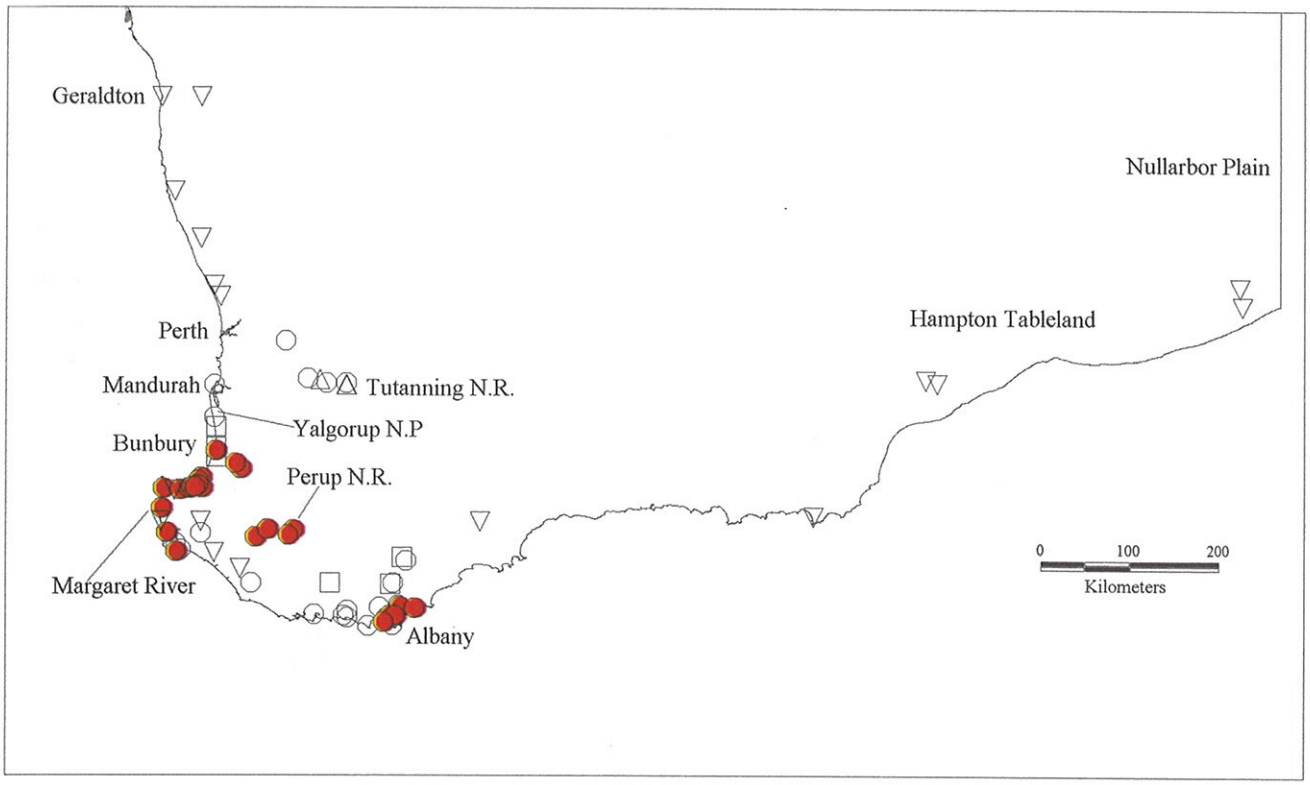

Figure 2: *Pseudocheirus occidentalis* recordings showing:

● Known extant populations:

Source:

Western Australian Museum (WAM) records
Christensen *et al.* (1985)
Jones *et al.* (1994)
K. Morris (pers comm.)
R. Brazell (pers. comm.)
P. de Tores (current research - translocated population)
P. de Tores (pers. observations)

□ Unconfirmed reportings

O Locations surveyed in the period 1990-1992 where no evidence of presence was detected (Jones *et al.* 1994)

Δ Former known locations where populations are thought to be locally extinct

Source of original recorded locations:

Baynes (1987)
Sampson (1971)
A. Main (pers. comm.)

∇ Former locations where populations are considered locally extinct. Locations known from cave and rock shelter deposits (Archer 1974; Baynes 1987; A. Baynes pers. comm.)

2.4 Conservation Status

Pseudocheirus occidentalis was included on the W.A. list of declared threatened fauna in 1983 (Section 14(2)(ba) Western Australian Wildlife Conservation Act). It is listed as an endangered sub-species (*P. peregrinus occidentalis*) in Schedule 1 of the Federal Endangered Species Protection Act 1992 and is included on the ANZECC list of threatened sub species.

Kennedy (1992) noted that whatever the taxonomic status of the western ringtail possum,

> *"its conservation status should be separately assessed because of its geographical isolation."*

The known existing populations reflect a significant contraction of the former, wider, patchy distribution of *P. occidentalis*. Continued contraction of range and further fragmentation of existing populations should be seen as a significant threat to the long term conservation of the species.

Very few populations exist within conservation estate.

The value of individual, isolated populations (in terms of their importance to the long term conservation of the species) is unclear.

2.5 Causes of Decline

Pseudocheirus occidentalis falls within the Critical Weight Range (CWR) suite of fauna. The term Critical Weight Range (CWR) is used to describe the suite of non-flying mammals with mean adult body weights between 35g and 5.5kg. It is this suite of fauna that has shown the most dramatic decline in range and number (Burbidge and McKenzie 1989).

The pattern of decline in range of the western ringtail possum is consistent with that recorded for other CWR fauna. Factors thought to have contributed to this decline are habitat loss and/or modification, changing fire regimes and predation by introduced predators.

Results from release of rehabilitated ringtails (see Section 3.1) implicate predation by foxes as a threatening process.

3. Background to Management and Implications for Future Management

3.1 Management of "derelict" western ringtail possums

Until recently, ringtail possum management in Western Australia has been directed towards individual derelict animals. The term derelict has been used to describe injured, orphaned and nuisance *P. occidentalis* in the Busselton and Albany areas of Western Australia where the species is locally common. Derelict possums within these areas have usually been passed on to wildlife carers for rehabilitation and release.

Before the commencement of a release program at Leschenault Peninsula Conservation Park, the rehabilitated derelict *P. occidentalis* from the Busselton area were released where and when wildlife carers saw fit. The fate of these possums was unknown.

A pilot study to assess the fate of released possums was undertaken in 1990-91 by the Western Australian Museum (WAM). Six rehabilitated possums were released at Locke Estate Nature Reserve, near Busselton. All 6 were fitted with radio collars and their progress monitored. All released animals were dead within 6 weeks of release. The condition of retrieved carcasses indicated predation as the cause of death (Jones pers. comm.).

In eastern Australia, predation by exotic predators has also been reported on wild populations of *P. peregrinus* (How *et al.* 1984; Pahl 1987; Seebeck *et al.* 1991; Rose *et al.* 1993; Smith *et al.* 1993) and fox predation was considered responsible for low survival rate to sexual maturity for a *P. peregrinus* population in southern Victoria (Pahl 1987).

In September 1991 a release program for rehabilitated *P. occidentalis*, with a concurrent fox control program, commenced at Leschenault Peninsula Conservation Park. Monitoring of released animals was initially on an ad hoc/opportunistic basis and has recently been formalised as part of a research program.

The results have shown that rehabilitated *P. occidentalis* can be released in the presence of fox control and that released animals survive and produce young. Young produced

have been shown to survive to dispersal. Males have been shown to disperse from the natal home range, survive to sexual maturity and establish home ranges. Females have been shown to survive to sexual maturity and produce young.

Release into peppermint woodland habitat, in the presence of predator control, should now be seen as a viable management strategy for rehabilitated derelict ringtails. Protocols for release and monitoring of rehabilitated derelict ringtails are now available.

Further research is being undertaken to :

- determine if survivorship of released rehabilitated ringtails is comparable with a wild population in similar habitat; and
- determine the suitability of release into different (non-peppermint dominated) habitat.

3.2 Translocation

Leschenault Peninsula was also the release site for 11 *P. occidentalis* translocated from a development site near Busselton in May 1994. The translocation was carried out as a condition of development approval.

Numerous other development proposals and rezoning applications within the Busselton area are currently being assessed.

Many of the areas subject to development proposals and rezoning applications are occupied by isolated populations of *P. occidentalis*. The conservation status of these isolated populations is unknown, however, the abundance and distribution of *P. occidentalis* may decline if no action is taken to minimise the impact of developments resulting in habitat loss and/or modification.

The preferred management option is to conserve ringtail populations *in situ*.

In the case of clearing and development applications that have the potential to result in ringtail habitat loss and/or modification, *in situ* conservation provisions may be incorporated as conditions of development approval. For example, conditions of development approval may include:

- retaining stands of peppermint within the development site;
- retaining links/corridors of peppermint stands within and outside development areas;
- strategic plantings.

In all cases, prior to granting clearing and development approval, it is essential that the potential impact from development is assessed and the conservation value determined for *P. occidentalis* populations at proposed development sites. Approval should only be given to development and/or rezoning proposals where:

- conservation can be achieved *in situ*; and/or
- the impact on *P. occidentalis* populations is minimal; and/or
- development does not result in compromise to the conservation of *P. occidentalis*; and/or
- developments incorporate appropriate *P. occidentalis* conservation strategies.

Translocation is one such mechanism whereby conservation can be achieved other than *in situ*. Recently, proposals have advocated translocation of resident *P. occidentalis* populations from areas subject to development applications.

The results of releases from Leschenault Peninsula clearly show that translocation has the potential to establish or re-establish *P. occidentalis* in peppermint habitat within its former range. In some circumstances it may be appropriate to translocate populations from coastal areas subject to habitat loss or modification as a result of approved development. However, translocations should only be undertaken where conservation cannot be achieved *in situ*. Such translocations should only be to sites where predator control can be initiated and maintained.

Research is currently being undertaken (through translocations to Yalgorup National Park and Karakamia Sanctuary) to determine the suitability of release into non peppermint habitat. Prior to the finding of this research, all translocations should be to peppermint dominated habitat and are to be undertaken in accordance with CALM's Policy Statement No. 29 *Translocation of Threatened Flora and Fauna* (draft) (CALM 1994).

3.3 Impact of Forest Management Practices

Minimal research has been carried out to assess the impact of forest management practices such as burning and timber harvesting.

Potential impacts from forest management practices that may pose threats to the conservation status of existing ringtail possum populations are:

- deaths and local reductions in population density. In the case of significant disturbance events that result in a decrease in population density and fragmentation there may be a considerable reduction in the ability of populations to be maintained or restored by recruitment through immigration;
- short and long terms loss of food resources. At inland sites, this may be a result of other factors such as jarrah leaf miner infestation; and
- loss of suitable nest sites. This may be of particular significance at inland, non-peppermint sites, where tree hollows are used.

4. Management Guidelines

4.1 Management Objectives

The objectives for management are:

- to ensure the conservation of *P. occidentalis*;
- to assess the conservation status, distribution and range of *P. occidentalis*;
- where possible, to preserve all existing populations *in situ*; and
- to re-establish populations within the species former range and habitat.

4.2 Research Actions

(i) Determine the taxonomic status of the western ringtail possum.

(ii) Undertake broad scale survey work throughout the existing range of *P. occidentalis* and identify:

- the extent of fragmentation of populations;
- the range of habitat occupied;
- the conservation value of isolated populations;
- the security of land tenure of known populations; and
- threats to existing populations.

(iii) Assess the impact on ringtail populations from forest management practices, particularly those that can result in:

- direct reduction in population size (e.g. ringtail deaths as a result of burning and timber harvesting);
- fragmentation of habitat and populations;
- long term and short term reduction of food resources; and
- long term and short term reduction in nest sites.

(iv) Determine whether *P. occidentalis* can be successfully translocated from coastal, peppermint dominated habitat to similar coastal habitat within its former range.

(v) Determine whether *P. occidentalis* can be successfully translocated from coastal, peppermint dominated habitat to non-peppermint habitat within its former range.

(vi) Subject to (iv) and (v) above, establish protocols required for successful translocation and effective monitoring of *P. occidentalis*.

4.3 Management Actions

4.3.1 Conservation of known extant populations and assessment of development and re-zoning proposals

(i) Establish mechanisms whereby CALM can and will work with State Government authorities and agencies, land owners and developers to ensure that populations of the western ringtail possum are conserved *in situ*. Where this is not possible and where a development has been given approval by the necessary authorities, CALM may give approval for translocation of animals from habitat that will be destroyed. Such translocations will be subject to the approval of a Translocation Proposal pursuant to CALM Policy Statement No. 29 and costs met by the developer.

(ii) As part of the above mechanisms, establish procedures for assessment of:

- the potential impact from proposed developments; and
- development proposals that incorporate impact amelioration measures and/or conservation management measures.

4.3.2 Management of "derelict" ringtails and liaison with wildlife carers

Release of rehabilitated ringtails at Leschenault Peninsula has involved extensive liaison with wildlife carers in Australind, Bunbury and Busselton.. There will be a continued requirement for care of injured, orphaned and nuisance ringtail possums. The efforts undertaken by wildlife carers provides them with the opportunity to be involved in wildlife

management projects with positive conservation benefits. The voluntary role is labour intensive and CALM is unlikely to be able to carry out this function without the assistance of wildlife carers.

A consultative and co-ordinated management approach is required to continue to achieve positive conservation benefits for the western ringtail possum and to ensure continued enthusiasm from wildlife carers.

The following management actions are required:

(iii) Establish a set of requirements for carers involved in rehabilitation of derelict ringtails. These guidelines are to detail:
- circumstances under which carers are permitted to take ringtails into care;
- circumstances and conditions under which ringtails can be held/retained;
- care requirements;
- reporting requirements; and
- release requirements.

(iv) Establish a system to record all ringtails taken into care by wildlife carers. The system is to detail:
- the date the animal was received by the carer;
- the name of the person presenting the ringtail to the carer;
- the reason why it was taken to the carer;
- the source (location) of each animal;
- circumstances under which each ringtail was received;
- each animal's general condition, including weight and description of any injury or illness;
- proposed treatment when in care; and
- estimated release date.

(v) Assess a range of sites within peppermint dominated habitat for their capability and suitability as release sites for rehabilitated derelict ringtails.

(vi) Co-ordinate release of all rehabilitated ringtails and ensure that all releases are to areas:
- in secure conservation estate; and
- where protection from predators has been undertaken prior to release and can and will be maintained.

(vii) Ensure monitoring of released animals is undertaken.

4.3.4 Interpretation, Communication and Education

(viii) Prepare an interpretation/communication plan to:
- increase public awareness of the conservation status of *P. occidentalis*; and
- promote conservation measures, particularly within the metropolitan areas of Busselton and Albany.

5 Implementation and Funding

Research actions (iv), (v), and (vi) are currently being implemented in accordance with CALM, Science and Information Division (SID) Science Project Plan (SPP) 93/0142 (revised September 1994) and the proposed translocation of *P. occidentalis* from the Port Geographe development site to Leschenault Peninsula Conservation Park, Yalgorup National Park and Karakamia Sanctuary. Funding for these research actions is through SID and external funds provided as a condition of development for the Port Geographe development, Busselton.

Also in accordance with (SPP) 93/0142, DNA techniques are currently being assessed for suitability in determining the degree of genetic variability within and between *P. occidentalis* populations and between *P. occidentalis* and *P. peregrinus* populations.

A recovery team comprising membership from CALM's Western Australian Threatened Species and Communities Unit (WATSCU), SID, Central Forest, Southern Forest, South Coast and Wheatbelt regions, and other members as warranted will be established to oversee management of *P. occidentalis*.

External funding will be sought to prepare and implement a recovery plan.

Some funding may be available through the CALM/BankWest Landscope Visa Card.

Subject to establishing a Recovery Team and its endorsement of priorities, external and Departmental funding will be sought to:

- undertake morphometric studies and investigate the suitability of karyotype and/or electrophoretic studies and/or alternative methods to address research action (i).
- undertake the survey work identified in research action (ii).
- undertake appropriate research to assess the impacts of forest management practices as identified in research action (iii).
- prepare and implement the interpretation/communication plan identified in management action (viii).

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