

Flora & Fauna Guarantee Action Statement

#19

This Action Statement was first published in 1991 and remains current. This version has been prepared for web publication. It retains the original text of the action statement, although contact information, the distribution map and the illustration may have been updated.

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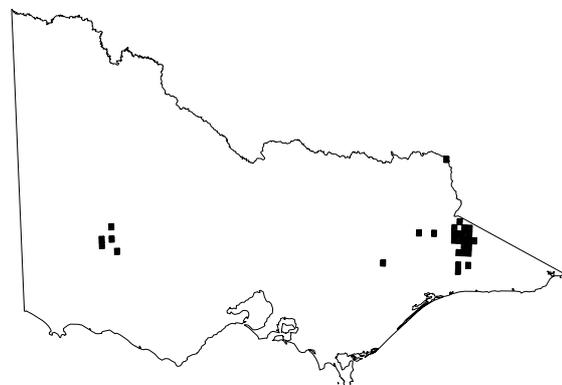
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Brush-tailed Rock-wallaby *Petrogale penicillata*



Brush-tailed Rock-wallaby (*Petrogale penicillata*)
(Illustration by John Las Gourgues)



Distribution in Victoria (DSE 2002)

Description and Distribution

The Brush-tailed Rock-wallaby (*Petrogale penicillata penicillata*) is a small wallaby, adults of which weigh up to 7.5 kg. It is the only rock-wallaby in Victoria. Several species of rock-wallabies occur throughout Australia in suitable habitat. It lives on cliffs and other steep rocky areas and can move quickly and surely over its precipitous habitat. The soles of its feet are extensively granulated to grip steep surfaces (Maynes & Sharman 1983). Brush-tailed Rock-wallabies have a generalist diet. They prefer grasses and forbs, but in times of food shortage will eat a wide variety of grasses and shrubs, a useful adaptation for living in one area for most of their lives (Short 1989, Lim et al. 1987, Copley & Robinson 1983). Females produce a single pouch young and breeding may be continuous. There are no data on breeding for the Victorian populations. Once the pouch is permanently vacated, the female leaves its offspring in a rock shelter. The possession of such a shelter may be important for

successful breeding (Joblin 1983).

The Brush-tailed Rock-wallaby has a coastal to sub-coastal distribution, ranging from just north of Brisbane to western Victoria (Maynes & Sharman 1983, Short & Milkovits 1990). Its range has declined substantially, particularly in the west and south. Only two populations remain west of the Great Dividing Range and both of these are endangered (Short & Milkovits 1990). South of Canberra, the Brush-tailed Rock-wallaby is now very rare (Short & Milkovits 1990, Lobert 1988, Norris & Belcher 1986). Brush-tailed Rock-wallabies occur in Gippsland and in the Grampians in western Victoria. Norris & Belcher (1986) located four populations of rock-wallabies in East Gippsland, three in the Snowy River, and one on a tributary of the Suggan Buggan River.

The westernmost record in Gippsland is of scats from Mt. Kent (R. Bilney, pers. comm.). There are no records from central Victoria. There appears to be only one extant population in the Grampians, at Red Rock in the north-west of the National Park.

There is a possibility of another population at the head of Potters Creek (Lobert 1988).

Conservation Status

Current Status

ANZECC (1991) Vulnerable
The Brush-tailed Rock-wallaby has been listed as a threatened taxon on Schedule 2 of the Flora and Fauna Guarantee Act 1988.

Reasons for Conservation Status

Brush-tailed Rock-wallabies were once widespread within the catchment of the Snowy River south to the Murrindal River near Buchan (Wakefield 1954, 1961, 1963), at Tintaldra in the upper Murray (Wakefield 1961), and near Omeo and Mt. Tambo (Wakefield 1954). K. Rogers (in Wakefield 1954) reported that 1200 were shot on the Suggan Buggan River in northeastern Victoria during a single winter around 1903. By the late 1950s K. Rogers knew of only 10 populations in East Gippsland (in Wakefield 1961, 1963). After recent surveys, Norris & Belcher (1986) reported that seven of these populations are now extinct, though they did discover one new population. The total population size is now likely to be fewer than 100 animals (P. Kelly, pers. comm.). Rock-wallabies were formerly widespread and probably common in parts of the Grampians and the Black Range. In recent times they occurred as far west as Mount Arapiles. The decline in this population may have begun in the 1920s or 1930s (Lobert 1988). Estimates of the size of the Grampians population have varied from a minimum of three in 1970 (Wakefield 1971) to 12 in the mid-1970s (Close 1984).

At present the main threat to this species appears to be the successive extinction of the remaining small, isolated populations following a natural catastrophe such as a wildfire or drought. Predation, in particular by the Red Fox (*Vulpes vulpes*) and possibly feral Cats (*Felis catus*), has reduced the likelihood of successfully recolonising areas where populations have become extinct. In addition, the carrying capacity and thus the size of each population may now be smaller because of competition with Goats (*Capra hircus*) or Rabbits (*Oryctolagus cuniculus*) (Hill 1991). Small populations are more likely to be totally eliminated by a fire or drought, and thus have a greater probability of extinction than larger populations (Lacy & Clark 1990). A population viability analysis (Hill 1991) indicated that the Bush-tailed Rock-wallaby has a high (45%) likelihood of becoming extinct in Victoria in the next 100 years. High mortality of young, small population size and reduced migration between isolated populations are the main likely causes of extinction.

The Scientific Advisory Committee has determined that the Brush-tailed Rock-wallaby is:

- in a demonstrable state of decline which is likely to result in extinction,
- significantly prone to future threats which are likely to result in extinction.

Major Conservation Objective

The major conservation objective is to enhance the present known distribution and population size of the species in Victoria. Specifically, the conservation objective is to maintain or establish a sufficient population to ensure a greater than 95% chance of the species persistence within Victoria over 100 years. A total of 1000 Brush-tailed Rock-wallabies is likely to be adequate (Shaffer 1991) - the key life-history and population data required to produce quantitative targets for minimum viable population size will be collected in implementing this action statement.

Management Issues

A more exhaustive discussion of the key threatening processes that affect the conservation status of Brush-tailed Rock-wallabies in Victoria is given in Norris & Belcher (1986), Lobert (1988) and Hill (1991).

A major management issue is the lack of information on the Gippsland populations in particular. For example, the number of occupied sites and the characteristics of habitat which determine whether or not a site will support Brush-tailed Rock-wallabies is not known. Before sites can be actively managed, it is essential to answer these questions and to know whether dispersal between populations is restricted, what factors limit the size of existing populations, the relative impact of predators and the genetic difference between populations. Foxes have been implicated in limiting habitat choice and population size of a number of medium-sized marsupials, including the Black-footed Rock wallaby (*Petrogale lateralis*) (Kinnear et al. 1988), Rothschild's Rock-wallaby (*P. rothschildi*) (Kinnear et al. 1984), Yellow-footed-wallaby (*P. xanthopus*) (Lim et al. 1987), and *P. penicillata* (Rogers in Wakefield 1954, Wakefield 1961, Short 1982, Lobert 1988). The arrival of foxes coincided with the decline of Brush-tailed Rock-wallabies in north-eastern Victoria (Wakefield 1961), and with the decline and extinction of Brush-tailed Rock-wallaby populations in the New England Tablelands (Wright 1971 in Jarman & Johnson 1977). Brush-tailed Rock-wallabies are more likely to be caught by foxes when moving out from their rocky habitat. They are probably particularly vulnerable when dispersing away from their natal site (Hill 1991). Because wild Dogs (*Canis familiaris*) may suppress fox numbers (I. Newsome pers. comm), control of wild Dogs near Brush-tailed Rock-wallaby sites in Gippsland would be undesirable unless Red Fox numbers could be simultaneously and continually suppressed. Fox control was the most important management action recommended to improve the status of Brush-tailed Rock-wallabies in the Grampians where wild Dogs are uncommon (Lobert & Waters 1988).

Feral Cats may be a significant predator of young and juvenile Brush-tailed Rock-wallabies (Hill 1991). Spencer (1991) reported that during a period of nine months, a single feral Cat killed 45.5% of the young, 14.2% of the subadults, and 4.6% of adults of a population of Unadorned Rock-wallabies (*Petrogale assimilis*).

There is evidence of competition for food between feral Goats, Rabbits, and Yellow-footed Rock-wallabies (Dawson & Ellis 1979, Lim et al. 1987). Short & Milkovits (1990) concluded that competition with Goats was probably a significant cause of the

decline of Brush-tailed Rock-wallabies west of the Great Dividing Range.

Carrots are very attractive baits for Brush-tailed Rock-wallabies. There is strong but unconfirmed evidence from local graziers that 1080 poisoning of Rabbits with carrot baits played a major role in the recent decline of some rock-wallaby populations in East Gippsland.

Two diseases have been suggested as possible significant causes of mortality in Brush-tailed Rock-wallabies.

Toxoplasmosis is a protozoan parasite invariably causing death in marsupials (R. Norman, pers. comm., Christian 1988). Transmission is via cysts in the faeces of Cats. Small inbred populations, or populations under some environmental stress such as drought, may be particularly vulnerable to this disease because of a depressed immune system (R. Norman pers. comm.).

Hydatidosis has been recorded in Brush-tailed Rock-wallabies (Close 1984). Hydatid cysts can cause mechanical damage to organs and muscles leading to death. The primary host may be foxes or Dingos/wild Dogs (*Canis familiaris*), and secondary hosts include Sheep (*Ovis aries*). R. Close (pers. comm. in Lobert 1988) has suggested that hydatidosis may be partly responsible for the selective disappearance of Brush-tailed Rock-wallabies from sheep-grazing areas (Short & Milkovits 1990).

Short (1982) reported that Brush-tailed Rock-wallabies retained body condition and continued to breed successfully during a season of 50% below-average rainfall. In contrast, Kinnear et al. (1988) reported a significant decline in adult survival of Black-footed Rock-wallabies during a period of drought. Spencer (1991) reported a substantial drop in population size of Unadorned Rock-wallabies during a period of prolonged drought and high Cat predation. The survival rate of pouch young during this time was very low (R. Delaney, pers. comm.).

The survival of dispersing Brush-tailed Rock-wallabies is likely to be affected by the management of the land between populations. Roads, fences, or cleared land may be obstacles to movement (Bennet 1991, Opdam 1990) and policies for Dog/Dingo and fox control in the intervening land will affect predator densities and thus mortality rates.

Wider Conservation Issues

Brush-tailed Rock-wallabies may once have been an important vertebrate herbivore in the extensive rocky habitats in Gippsland and Victoria. Their successful reestablishment into new areas may have unknown impacts on the conservation of the plant communities in this environment.

Tiger Quolls (*Dasyurus maculatus*), a vulnerable species in Victoria, occur at all rock-wallaby sites in East Gippsland. Controlling introduced predators for rock-wallaby conservation is likely to benefit local populations of Tiger Quolls.

Social and Economic Issues

All known populations of Brush-tailed Rock-wallabies occur within land reserved for nature conservation and managed by the Department of Conservation and

Environment (DCE). Rock-wallaby habitat is largely unsuitable for economic development and currently there are no land-use proposals incompatible with rock-wallaby conservation.

Protecting rock-wallaby habitat from fire, as occurs in the Grampians, and the possibility of using fire to manage rock-wallaby habitat, may require minor modification to existing fire-protection management plans in East Gippsland.

Most Brush-tailed Rock-wallaby sites are very remote, so few people visit them. Nevertheless, it may be necessary to restrict visitor access to the five known sites because anecdotal evidence indicates that the Brush-tailed Rock-wallaby is sensitive to human disturbance.

If, as suggested by local graziers, Brush-tailed Rock-wallabies formerly travelled considerable distances to graze on introduced pastures, then Rabbit poisoning with 1080 in carrots will need to be stopped or modified in some areas. This could increase the cost of local Rabbit control to DCE and a few graziers.

Management Action

Previous Management Action

- Three studies of the ecology of wild populations of Brush-tailed Rock-wallabies have been carried out, in central and northern New South Wales and southern Queensland (Short 1980, Scholz 1980, Job 1983). These data will facilitate the interpretation of data collected from Victorian populations. In Victoria, previous work has mainly been surveys and monitoring.
- From the 1930s to the 1970s, Keith Rogers of Black Mountain, with the assistance of Norman Wakefield from the National Museum of Victoria, searched most of the extensive rocky outcrops in the Snowy River Catchment.
- Wakefield (1971) announced the discovery of the small population at Red Rock in the Grampians. From then until the mid-1970s, staff from the Fisheries and Wildlife Division monitored the colony.
- In 1983 and 1985 a systematic survey was carried out by Close (1984, et al. 1988). This established that Brush-tailed Rock-wallabies had been widespread in the Grampians. Close captured two animals and using cytological techniques unequivocally identified them as *Petrogale penicillata penicillata*. Similar studies are in progress for the East Gippsland populations. Preliminary results indicate that this population has diverged substantially in karyotype from all other populations of *Petrogale penicillata penicillata* examined (R. Close pers. comm.).
- In 1988 a detailed survey of the Grampians National Park and Black Range State Park by Lobert (1988) failed to locate any new populations of Brush-tailed Rock-wallabies. Lobert & Waters (1988) made recommendations for research and management of the species in this region, especially Red Fox control.
- At Red Rock, fox control has been carried out monthly for the past three years. Rock-wallaby activity is monitored by collecting scats from permanent plots.

The chances of wildfire at this site are reduced by fuel-reduction burning and a vigilant fire-suppression policy.

- East Gippsland was surveyed for rock-wallabies in 1986 (Norris & Belcher 1986). Only three of the ten populations found by Rogers and Wakefield were still extant. A fourth previously unknown population was located.
- Suppression of wildfire at rock-wallaby sites in eastern Victoria has a high priority.
- In 1991 a Recovery Plan was produced by DCE for Australian National Parks and Wildlife Service. This plan gave details of research priorities and costs (Hill 1991).

Intended Management Action

Critical habitat Determine the critical habitat of Brush-tailed Rock-wallabies in Victoria. This will require surveys, particularly in Gippsland.

Survey for new populations Survey areas of potential habitat in East Gippsland to locate new populations, and to describe the habitat at extant and extinct sites. These data will be used to reassess the status of the species in Victoria, to understand the causes of the population decline, and to identify additional habitat for survey and possibly reintroduction.

Control of predators Continue regular poisoning of introduced predators around the Red Rock colony in the Grampians and monitor the effectiveness of control operations by systematically recording the number, size (age class) and distribution of Brush-tailed Rock-wallaby scats.

Funding for research Strive to locate funds to implement the ANPWS Recovery Plan research phase via federal funds, DCE initiative or corporate sponsors. If this is not successful within one year of the publication of this action statement, DCE will investigate alternative solutions such as funding post-graduate research.

Other Desirable Management Action

The work proposed by Hill (1991) will cost about \$400 000 spread over four years. This can only be undertaken when funds are made available through the ANPWS Recovery Plan process or DCE initiatives. Until this work is conducted, appropriate informed management cannot proceed. This means that the major conservation objective of this action statement will not be met, and the species will continue its decline towards extinction in Victoria as indicated by all previous survey results and the population viability analysis.

Recovery team Establish a Recovery Team to guide, evaluate and review progress and then implement the results of the studies outlined below.

Population Study Assess whether or not feral predators are limiting rock-wallaby population size and/or growth during a two- to four- year study of populations, with and without the control of feral predators.

Dispersal Studies Collect data on the size, frequency and success of dispersal movements and the causes of mortality of dispersing animals during the population study.

Diet Studies Initiate a diet study if nutrition is suggested to be limiting population viability. Scat analysis will be used to describe the diet of rock-wallabies and other sympatric herbivores at two sites for a minimum of two years. Seasonal variation in diet will be quantified. The abundance of plant species within rock-wallaby feeding areas will be measured in each season and compared with the abundance in faeces.

Monitoring Investigate the validity of various indirect methods for monitoring population size and develop a monitoring program for Victorian Brush-tailed Rock-wallabies.

Genetics Study the genetics of animals captured during the population study to provide information on the amount of gene flow between existing populations, on individual reproductive success, the type of mating system, and the effective population size of rock-wallaby populations. These data will assist in assessing the probability of extinction of rock-wallaby populations and in setting population-size targets for the conservation of the species in the wild.

Re-establishment protocols It is likely that the long-term persistence of rock-wallabies in the wild will depend on establishing additional wild populations. Important issues will include

- whether it is necessary to translate animals to establish new populations and, if so, how successful this is likely to be;
- the source of the animals for reestablishment, i.e. harvested from wild populations or captive-bred,
- the location of new populations in relation to existing populations; and
- the management of the site before and after reestablishment.

Establishment of a captive population Healesville Sanctuary currently holds a population of Brush-tailed Rock-wallabies of unknown origin. It is desirable that when stock becomes available these animals be replaced with animals of Victorian origin. This will provide some insurance for Victorian stock and provide animals for reintroduction, even though this is not considered necessary at present.

Legislative Powers Operating

Legislation

Wildlife Act 1975 $\frac{3}{4}$ controls research, management and taking of protected wildlife.

Flora and Fauna Guarantee Act 1988 $\frac{3}{4}$ provides legal powers for the protection of the State's wildlife.

National Parks Act 1975 $\frac{3}{4}$ controls research and management activities in National Parks.

Licence/Permit Conditions

A permit for live trapping must be obtained from the Director, Flora and Fauna, DCE; each permit will require that animals be released at the point of capture unless they are to be removed to a captive facility with the approval of the Director, F&F. No permits will be issued unless the proposed work is within the broad parameters of the conservation program.

Consultation and Community Participation

In the past, a small number of dedicated people from the East Gippsland community have played a major role in locating populations of Brush-tailed Rock-wallabies. Such people can assist in the surveys proposed in this Action Statement. Acceptance by the wider community of any proposed management actions will be important for ensuring their success.

Implementation, Evaluation and Review

Implementing the Action Statement will be the responsibility of the Wildlife Branch, Flora and Fauna Division, and the Bairnsdale, Orbost and Horsham Regions. The results of research and experimental management will be known within six years of beginning this work. A Recovery Team will concurrently guide, evaluate, review and assist in the implementation of the studies.

Contacts

Species Management

Wildlife Branch, DCE.

Ecologist, National Parks and Public Lands, DCE.

Senior Wildlife Planners, Bairnsdale and Horsham Regions.

Biology

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J.Short, CSIRO Division of Wildlife Research.

Captive Breeding

D.Middleton, Healesville Sanctuary.

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Further information

Further information can be obtained from Department of Sustainability and Environment Customer Service Centre on 136 186.

Flora and Fauna Guarantee Action Statements are available from the Department of Sustainability and Environment website: <http://www.dse.vic.gov.au>

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