Approved Conservation Advice for *Bettongia penicillata ogilbyi* (Woylie)

(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 plans, records or management prescriptions for this species.

Description

The *Bettongia penicillata ogilbyi* (Woylie) is a small potoroid marsupial weighing 1-1.5 kg. It has a distinctive black brush at the end of its tail. It uses its tail to carry nesting material (Troughton, 1973; Christensen, 1980). It rests during the day in a well-concealed nest, built over a shallow depression. The nest is most commonly built using long strands, of grasses, but other material such as strips of bark are also used (in the forest) or dried seagrass and/or triodia (in arid coastal areas) (Christensen and Leftwich, 1980; Armstrong, pers. comm., 2006 in Freegard, 2007). When disturbed from the nest, it will move quickly with head low and tail extended, sometimes colliding with obstacles in its haste to flee.

Other common names for *Bettongia penicillata ogilbyi* include Brush-tailed Bettong and Brush-tailed Rat-kangaroo. Indigenous names include Woylyer and Karpitchi.

Conservation status

Bettongia penicillata ogilbyi (Woylie) is listed as **endangered** under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). In 2008, the Minister considered the Threatened Species Scientific Committee's (TSSC) advice under section 189 of the EPBC Act and amended the list under section 184 to include *Bettongia penicillata ogilbyi* (Woylie). The TSSC determined that this subspecies met criteria 1, 2, and 3 of the EPBC Act (TSSC, 2006) because it has experienced a severe reduction in numbers that is likely to continue, it has limited geographic distribution which is precarious for its survival and the estimated total number of individuals is limited..

In Western Australia, the subspecies is listed on Schedule 1 (Fauna that is rare or is likely to become extinct) of the *Wildlife Conservation (Specially Protected Fauna) Notice 2008(2)*, pursuant to section 14(2)(ba) of the *Wildlife Conservation Act 1950*. In South Australia the subspecies is listed as rare under the *National Parks and Wildlife Act 1972*.

The other subspecies, *Bettongia penicillata penicillata* (Brush-tailed Bettong (eastern subspecies)) is listed under Schedule 7 of the South Australian *National Parks and Wildlife Act 1972* as 'endangered'. This subspecies is also listed under the EPBC Act as 'extinct'.

At the species level *Bettongia penicillata* is listed in Victoria as threatened under the *Flora and Fauna Guarantee Act 1988*, and is listed as Extinct in the Northern Territory under the *Territory Parks and Wildlife Act 2000* and in New South Wales under the *Threatened Species Conservation Act 1995*.

Distribution and habitat

The species once occupied most of the Australian mainland south of the tropics, including the arid and semi arid zones of Western Australia, the Northern Territory, South Australia, New South Wales and Victoria. Indigenous oral history has confirmed that Woylies were broadly

distributed in the central deserts — ranging over much of the Gibson Desert in central Western Australia and into the southern region of the Northern Territory (Burbidge and Fuller 1984, Burbidge et al., 1988). By the 1970s, the geographic distribution of the Woylie had been reduced to three locations in Western Australia.

Like many medium-sized terrestrial mammals in arid and semi-arid Australia, the subspecies had retreated to the most mesic (mild) parts of this former range since European settlement (Burbidge and Mckenzie, 1989). In Western Australia, widescale fox baiting and reintroduction projects implemented under the Western Shield program and similar programs in other states have led to an increase in the distribution and abundance of the Woylie. The subspecies has been translocated with mixed success to 46 sites in Western Australia, South Australia and New South Wales including a number of wildlife sanctuaries.

The subspecies now occurs at 21 locations, and while in some areas these are isolated and island sites (particularly in South Australia), overall the distribution is not considered to be severely fragmented.

The estimate for the historic extent of occurrence for the Woylie is 1 771 786 km^2 (Lomolino and Channell, 1995 using information contained in Strahan, 1983). The extent of occurrence of the Woylie in 2006 was estimated to be 18 300 km^2 (Freegard, 2007), about 1% of its former range. While these estimates are based on a variety of methods, they show that the extent of occurrence has reduced considerably.

This subspecies occurs within the following Natural Resource Management Regions: Northern Agricultural, South West, Swan, Avon, South Coast (WA); Eyre Peninsula, Northern and Yorke, SA Arid Lands, SA Murray Darling Basin (SA); and in the Lower Murray Darling, Central West and Western regions (NSW).

Threats

Predation

Introduced predators, in particular the European red fox (*Vulpes Vulpes*) and feral cat (*Felis catus*) are the main threats to the survival of the Woylie, despite targeted management and research programs. Feral cats, dogs (*Canis familiaris*) and pigs (*Sus scrofa*) have also been implicated as the cause of several failed reintroduction attempts.

Predation by *Morelia* sp. (carpet pythons) and *Haliaeetus leucogaster* (white-breasted sea-eagles) has been implicated in the failed Woylie translocation to St Francis Island in South Australia (Department for Environment and Heritage, 2006) and *Aquila audax* (wedgetail eagle) predation contributed to the failed reintroduction to the Flinders Ranges in South Australia (Bellchambers, 2001).

Habitat destruction

Inappropriate fire regimes, leading to the loss of protective understorey have negatively impacted the Woylie (DEC, 2007). A contributing factor to the recent decline in Woylies could be a result of land clearing and grazing on private land, pastoral leases and state forests leading to changes in the abundance, availability and/or suitability of water, food, shelter, reproductive mates and territorial space. Habitat destruction can also come about from feral pigs and the dieback caused by the exotic pathogen *Phytophthora cinnamomi* (dieback). Competition for increasingly limited resources from rabbit *(Oryctolagus cuniculus)* and domestic stock has been a factor in the decline of the Woylie, particularly in more arid areas.

Climate change may alter the availability of resources as rainfall and temperature patterns change, thereby acting as a threatening process.

Disease

Disease agents are possibly responsible (in part or wholly) for Woylie declines and can be categorised into the following groups: viral, bacterial, haemaparasites, endoparasites, ectoparasites, toxic and nutritional. Wayne (2008) has suggested that disease is likely to be a significant factor in the large recent declines in population size.

Existing Mangement Plans

- A recovery plan was first written for the Woylie by Hall et al. (1991) and was substantially revised by Start et al. 1995. A plan of management for Woylies in South Australia was developed by Nelson et al. (1992). A review of the conservation status of the Woylie that resulted in the delisting of the species in 1996 was conducted by Start et al. (1998).
- The Woylie is mentioned in management plans for various conservation reserves and sanctuaries in which it occurs (e.g. Dryandra Woodland Management Plan, Islands of the Western Eyre Peninsula Management Plan, Karakamia Sanctuary Management Plan).

Research priorities

Considerable conservation and monitoring work is underway in relation to the Woylie. The most important priority is research into the reasons for the sudden decline in Woylie numbers, particularly in the large indigenous populations. Current research includes;

- Woylie Conservation Research Project (WCRP - see Wayne, 2008). Phase 1 aimed to diagnose the cause of the Woylie declines. Phase 2 began in mid 2008 and aims to further investigate causes identified in Phase 1.
- Mesopredator release is being undertaken by the WA DEC's Science Division. The project aims to investigate the relationship between introduced predators (foxes and cats) and various native species in 1080 baited and unbaited sites.

Further areas of research recommended by the Committee include;

- The impacts of disease on important Woylie populationsand associated hygiene practices that could be established in those populations; and
- Altered baiting regimes to better target the direct predators of the Woylie.

Local and regional priority actions

Existing Management Actions

The following regional priority recovery and threat abatement actions are underway to support the recovery of *Bettongia penicillata ogilbyi* (Woylie).

- In South Australia, several ecosystem reconstruction/revegetation projects are being undertaken (e.g. Ark on Eyre, Bounceback) and the reintroduction of the Woylie has been considered as a desirable outcome following the restoration work and implementation of feral animal control programs at these sites.

- In Western Australia fox and cat baiting under the Western Shield program is aimed at improving the conservation status of many species. Reintroduction projects under the same program also benefit a range of species including the Woylie.

The Woylie was not mentioned in any national invasive species threat abatement plan because it was not considered a threatened species when these documents were written. Should these documents be revised, the Woylie could be listed as an affected species for plans covering the impacts of the European fox, feral cat and possibly *Phytophthora cinnamomi* and feral pigs.

Although much is being done for the conservation of the Woylie several further actions are suggested.

Future Priority Actions

Fire regimes

- The development and implementation of a suitable fire management strategy for Woylie locations may be a priority where fire regimes could cause loss of protective understory .

Conservation Information

- Raise awareness of the Woylie within the local community.

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