

MARSUPIAL

What guides the conservation of threatened species? Andrew Burbidge and Keith Morris recently helped put together the latest conservation summary of marsupials, *The 1996 Action Plan for Australian Marsupials and Monotremes*. They discuss the report's implications for research and management of marsupials in Western Australia.

Andrew Burbidge
and Keith Morris



CONSERVATION

STATUS UPDATED





It is well known that many species of native animals are in need of conservation. What is not so well known is the process scientists use to decide species conservation priorities—the process known as an action plan.

Action plans are summaries of the conservation status of groups of species. As well as guiding conservation priorities, they allocate species and subspecies to the World Conservation Union (IUCN) Red List categories, using internationally accepted criteria, and provide brief statements of what is known about each species and subspecies, and what actions are necessary for their conservation.

An action plan for Australasian marsupials and monotremes was published by the IUCN in 1992, based largely on information dating from the late 1980s. Since that time, knowledge of Australia's marsupials has grown rapidly, and a new action plan was required as a matter of priority. Both the 1992 and

1996 action plans were prepared by the IUCN Species Survival Commission's Australasian Marsupial and Monotreme Specialist Group (AMMSG), a voluntary group of marsupial experts.

Funding to write the plan came from Environment Australia's Endangered Species Program. Since the authors are the current chair and secretary of AMMSG, the funds were provided under contract to the Department of Conservation and Land Management (CALM). The contract enabled us to employ Stephanie Maxwell (who took leave without pay from Environment Australia) on a part-time basis as action plan coordinator and to meet overheads. During the compilation of the action plan, we consulted more than 70 experts throughout Australia.

One of the first tasks in developing the new action plan was to make an authoritative list of Australian species and subspecies of marsupials and monotremes. This was not as easy as it may sound, as research into marsupial taxonomy, especially by geneticists using modern DNA analytical techniques, continues to reveal the existence of new species and subspecies. In some cases, DNA research has showed that the taxonomy of mammalogists working early this century was correct—and that later workers who synonymised one species

with another were wrong!

These modern techniques can help the prioritisation of conservation work. For example, research at The University of Western Australia's Zoology Department in the 1980s suggested that the grey-bellied dunnart (*Sminthopsis griseoventer*) population on Boullanger Island, in Jurien Bay, was a separate species or subspecies. When compiling the action plan, this population was treated as a subspecies and, because of its extreme rarity and recent decline in abundance, allocated to the Red List category 'critically endangered'. Then, just as the action plan was going to the printers, results were received of DNA analyses carried out at the South Australian Museum. This research, funded by a grant from the BankWest LANDSCOPE Conservation Visa Card, showed the island population did not differ from animals on the mainland and was not a subspecies at all. This has greatly affected conservation priorities and the allocation of funds.

CHANGES IN STATUS

In all, 28 species and subspecies of WA's monotremes and marsupials were allocated to 'threatened' categories—one to 'critically endangered', seven to 'endangered' and 20 to 'vulnerable'. This is a startling 35 per cent of extant WA marsupials. A further 11 species and subspecies were allocated to the 'lower risk (near threatened)' category and one, the woylie, to the 'lower risk (conservation dependent)' category. The only monotreme occurring in WA, the echidna (*Tachyglossus aculeatus*), is not threatened.

Improvements in the conservation status of some WA species have been confirmed by the Red List category allocated in the action plan. Significant changes from the 1992 action plan include the woylie (*Bettongia penicillata ogilbyi*) from 'endangered' to 'lower risk (conservation dependent)' (see LANDSCOPE, Autumn 1996) and the chuditch (*Dasyurus geoffroyi*) and numbat (*Myrmecobius fasciatus*) from 'endangered' to 'vulnerable'. All three species have been managed through recovery plans (see LANDSCOPE, Winter 1995), the main actions of which are fox control and translocations.

On the other hand, the more quantitative methods of allocating

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The little long-tailed dunnart is not threatened with extinction. It lives in semi-arid and arid parts of south-western Australia.

Below: The only monotreme (an egg-laying mammal that lacks teats) occurring in WA is the echidna.



conservation status, as well as improvements in knowledge, have resulted in some WA species being recognised as more threatened than when the 1992 action plan was compiled. These changes include the sandhill dunnart (*Sminthopsis psammophila*) from 'vulnerable' to 'endangered', Butler's dunnart from 'potentially vulnerable' to 'vulnerable', the two species of marsupial moles—karrarratul (*Notoryctes caurinus*) and itjaritjari (*N. typhlops*)—from 'potentially vulnerable' to 'endangered', and the quokka (*Setonix brachyurus*) from 'potentially vulnerable' to 'vulnerable'.

Including subspecies in the 1996 plan also led to changes in the categories, as the 1992 plan considered only full species. Subspecies were examined to be consistent with modern definitions of biodiversity conservation, which include the conservation of the genetic diversity within species.

One result of examining subspecies was an increase in the number of marsupials listed as extinct in WA, since, as well as six extinct species of marsupials, there are a further four extinct subspecies. Another result was to increase the number of marsupial 'conservation units' that require management. This will not significantly increase the conservation work load, as CALM has already taken into account genetic variation within species.

FUTURE CHALLENGES

The removal of the woylie from the WA and Australian threatened species lists in 1995 was a milestone in mammal conservation in Australia. The same techniques that were used to conserve the woylie are being used to conserve other threatened mammals in the south-west of WA as part of CALM's 'Western Shield' program. We anticipate that other marsupial species will be removed from threatened species lists in the near future.

One major challenge reinforced by the action plan is the conservation of threatened mammals in arid parts of the State. This is particularly important for species that occur only in the deserts. Several such arid zone endemics are extinct, but others remain in small pockets of country and continue to decline slowly in range and abundance. They include the sandhill dunnart, the mulgara



(*Dasycercus cristicauda*), the amputa (*D. hillieri*), the marsupial moles (see *LANDSCOPE*, Winter 1996) and the bilby (*Macrotis lagotis*).

CALM has already begun research and management to combat the processes threatening such species, processes such as predation by feral cats and foxes, and inappropriate fire regimes. Some species-specific research will also be needed, otherwise we will not know whether cat control and fire management are effective. In the case of the marsupial-moles, so little is known that there are no techniques available even to trap animals or keep them alive in captivity, let alone study them in the wild.

Another challenge is to clarify the status of Butler's dunnart. This small carnivorous marsupial, named after well-known naturalist Harry Butler, has been located in WA only once, when Harry

Top: The 'critically endangered' Gilbert's potoroo is known only from one small population.

Photo - Jiri Lochman

Above: Fat-tailed dunnarts are survivors—they even occur in degraded parts of the Nullarbor Plain and on farms.

collected three specimens at Kalumburu in 1965–66. They proved to be the same species as an individual captured at Melville Island (Northern Territory) in 1913. The only other animals located since were on Bathurst Island in 1991 and also off the Northern Territory coast.

If these challenges are successfully met over the next few years, the next marsupial and monotreme action plan will show an even better conservation status for Australia's marsupials.

**COMPLETE TAXONOMIC LIST AND CONSERVATION STATUS OF
WESTERN AUSTRALIAN MONOTREMES AND MARSUPIALS,
WITH IUCN RED LIST CATEGORY ALLOCATED BY THE 1996 ACTION PLAN.**



Last seen by Aborigines in the early 1950s in the southern Great Sandy Desert, the beautiful pig-footed bandicoot is extinct.



The mainland subspecies of the boodie (or burrowing bettong) was common, but has not been seen since the 1950s.



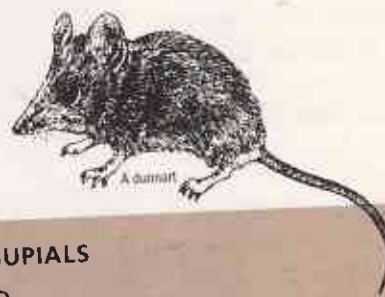
The Dorre Island subspecies of the rufous hare-wallaby is restricted to a single island in Shark Bay and is 'vulnerable'.
Photo - Marie Lochman



Restricted to south-west and eastern Australia, the southern subspecies of the brush-tailed phascogale is one of the most arboreal of carnivorous marsupials.

EXTINCT MARSUPIALS

- Chaeropus ecaudatus* (Ogilby, 1838), pig-footed bandicoot
- Macrotis leucura* (Thomas, 1887), lesser bilby
- Perameles bougainville fasciata* Gray, 1841, western barred bandicoot (mainland subspecies)
- Perameles eremiana* Spencer, 1897, desert bandicoot
- Bettongia lesueur graii* (Gould, 1841), boodie, burrowing bettong (mainland)
- Potorous platyops* (Gould, 1844), broad-faced potoroo
- Lagorchestes asomatus* Finlayson, 1943, kuluwarri, central hare-wallaby
- Lagorchestes hirsutus hirsutus* Gould, 1844, rufous hare-wallaby (south-west mainland)
- Lagostrophus fasciatus albigilis* (Gould, 1842), banded hare-wallaby (mainland)
- Orychogalea lunata* (Gould, 1841), crescent nailtail wallaby



THREATENED MARSUPIALS

CRITICALLY ENDANGERED

- Potorous gilbertii* (Gould, 1841), Gilbert's potoroo
- Lagorchestes hirsutus* unnamed subsp., Mala, rufous hare-wallaby (central mainland)

ENDANGERED

- Dasyercus hillieri* (Thomas, 1905), amputa
- Parantechinus apicalis* (Gray, 1842), dibbler
- Phascogale calura* Gould, 1884, red-tailed phascogale
- Sminthopsis psammophila* Spencer, 1895, sandhill dunnart
- Perameles bougainville bougainville* Quoy and Gaimard, 1824, western barred bandicoot (Shark Bay)
- Notoryctes caurinus* Thomas, 1920, kakarratul, northern marsupial mole
- Notoryctes typhlops* (Stirling, 1889), itjaritjari, southern marsupial mole

VULNERABLE

- Dasyercus cristicauda* (Krefft, 1867), mulgara
- Dasyurus geoffroyi* Gould, 1841, chuditch
- Sminthopsis-butleri* Archer, 1979, Butler's dunnart
- Isoodon auratus auratus* (Ramsay, 1887), golden bandicoot (mainland)
- Isoodon auratus barrowensis* (Thomas, 1901), golden bandicoot (Barrow Island)
- Lagorchestes conspicillatus conspicillatus* Gould, 1842, spectacled hare-wallaby (Barrow Is)
- Lagorchestes hirsutus bernieri* Thomas, 1907, rufous hare-wallaby (Bernier Is)
- Lagorchestes hirsutus dorrae* Thomas, 1907, rufous hare-wallaby (Dorre Is)
- Macropus robustus isabellinus* (Gould, 1842), Barrow Island euro
- Petrogale lateralis* MacDonnell Ranges race, black-footed rock-wallaby (MacDonnell Ranges race)
- Petrogale lateralis* western Kimberley race, black-footed rock-wallaby (West Kimberley race)
- Petrogale lateralis hacketti* Thomas, 1905, black-footed rock-wallaby (Recherche)
- Petrogale lateralis lateralis* Gould, 1842, black-flanked rock-wallaby (south and central WA)
- Setonix brachyurus* (Quoy and Gaimard, 1830), quokka
- Pseudocheirus occidentalis* Thomas, 1888, western ringtail

LOWER RISK (CONSERVATION DEPENDENT) MARSUPIALS-

Bettongia penicillata ogilbyi (Waterhouse, 1841), woylie, brush-tailed bettong (SW WA)

LOWER RISK (NEAR THREATENED) MARSUPIALS

Dasyurus hallucatus Gould, 1842, northern quoll

Phascogale tapoatafa pirata Thomas, 1904, brush-tailed phascogale (northern mainland)

Phascogale tapoatafa tapoatafa (Meyer, 1793), brush-tailed phascogale (southern mainland)

Isodon obesulus fusciventer (Gray, 1841), quenda, southern brown bandicoot (WA)

Lagorchestes conspicillatus leichardti Gould, 1853, spectacled hare-wallaby (mainland)

Macropus eugenii derbianus (Gray, 1837), tammar wallaby (WA)

Macropus irma (Jourdan, 1837), western brush wallaby, kwoora

Petrogale burbidgei Kitchener and Sanson, 1978, monjon

Petrogale concinna monastria (Thomas, 1926), nabarlek (north-west Kimberley)

Trichosurus vulpecula hypoleucis (Wagner, 1855), common brushtail possum (south-west mainland)

LOWER RISK (LEAST CONCERN) MARSUPIALS AND MONOTREMES

Tachyglossus aculeatus aculeatus (Shaw, 1792), short-beaked echidna (mainland)

Antechinus flavipes leucogaster (Gray, 1841), mardo, yellow-footed antechinus (WA)

Dasykaluta rosamondae (Ride, 1964), little red antechinus

Ningai ridei Archer, 1975, Wongai ningai

Ningai timealeyi Archer, 1975, Pilbara ningai

Ningai yvonneae Kitchener, Stoddart and Henry, 1983, southern ningai

Planigale ingrami (Thomas, 1906), long-tailed planigale

Planigale maculata (Gould, 1851), common planigale

Pseudantechinus macdonnellensis (Spencer, 1895), fat-tailed antechinus

Pseudantechinus ningbing Kitchener, 1988, Ningbing antechinus

Pseudantechinus woolleyae Kitchener and Caputi, 1988, Woolley's antechinus

Sminthopsis crassicaudata (Gould, 1844), fat-tailed dunnart

Sminthopsis dolichura Kitchener, Stoddart and Henry, 1984, little long-tailed dunnart

Sminthopsis gilberti Kitchener, Stoddart and Henry, 1984, Gilbert's dunnart

Sminthopsis granulipes Troughton, 1932, white-tailed dunnart

Sminthopsis griseoventer Kitchener, Stoddart and Henry, 1984, grey-bellied dunnart

Sminthopsis hirtipes Thomas, 1898, hairy-footed dunnart

Sminthopsis longicaudata Spencer, 1909, long-tailed dunnart

Sminthopsis macroura (Gould, 1845), stripe-faced dunnart

Sminthopsis ooldea Troughton, 1965, Ooldea dunnart

Sminthopsis youngsoni McKenzie and Archer, 1982, lesser hairy-footed dunnart

Isodon macrourus macrourus (Gould, 1842), northern brown bandicoot (WA)

Lasiorchinus latifrons (Owen, 1845), southern hairy-nosed wombat

Macropus agilis (Gould, 1842), agile wallaby

Macropus antilopinus (Gould, 1842), antilopine wallaroo

Macropus fuliginosus melanops Gould, 1842, western grey kangaroo (mainland)

Macropus robustus robustus Gould, 1841, common wallaroo, euro (mainland)

Macropus rufus (Desmarest, 1822), red kangaroo, marloo

Onychogalea unguifera (Gould, 1841), northern nailtail wallaby

Petrogale brachyotis (Gould, 1841), short-eared rock-wallaby

Petrogale rothschildi Thomas, 1904, Rothschild's rock-wallaby

Trichosurus vulpecula arnhemensis Collett, 1897, common brushtail possum (northern mainland)

Trichosurus vulpecula vulpecula (Kerr, 1792), common brushtail possum (eastern and central mainland)

Petropseudes dahli (Collett, 1895), rock ringtail possum

Petaurus breviceps Waterhouse, 1839, sugar glider

Cercartetus concinnus concinnus (Gould, 1845), western pygmy-possum (WA)

Tarsipes rostratus Gervais and Verreaux, 1842, honey-possum



The Barrow Island subspecies of the spectacled hare-wallaby occurs nowhere else and is classified as 'vulnerable'.



Western grey kangaroos remain abundant except where their habitat has been destroyed.

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The 1996 Action Plan for Australian Marsupials and Monotremes, edited by Stephanie Maxwell, Andrew A. Burbidge and Keith Morris for the Australasian Marsupial and Monotreme Specialist Group, IUCN Species Survival Commission (published by Environment Australia, Canberra), can be obtained from The Botanical Bookshop, PO Box 351, Jamison, ACT 2601. The Action Plan is also available on the internet at <http://www.anca.gov.au/plants/threaten/marsup1.htm>.

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LANDSCOPE

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Noisy scrub-birds are rare in museum collections. This one, from a Dutch Museum, was probably collected by John Gilbert. See page 36.



Mount Bakewell looms over the old town of York, but it is more than just a prominent landmark. Find out why on page 42.



This year, The Hills Forest celebrates its fifth birthday. Find out what's been happening there in our story on page 10.



The Kimberley region of Western Australia has some weird and wonderful landforms. Read all about them on page 16.



The northern quoll is just one of WA's marsupials that have been part of a recent conservation status review. See page 22.

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COVER

Get down on the ground, scramble through the leaf litter and compost in your garden, and discover the fascinating world of insects. 'Insects in the Garden', on page 28, shows how these seemingly insignificant creatures help keep the ecosystem running smoothly and how they are a vital part of nature's life-cycle.

Illustration by Philippa Nikulinsky



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