

**Approved Conservation Advice for
Isoodon auratus barrowensis (golden bandicoot (Barrow Island))**

(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 and draft plans, records or management prescriptions for this species.

Description

Isoodon auratus barrowensis (golden bandicoot (Barrow Island)), family Peramelidae, is a compact marsupial which grows to an average length of 24.5 cm with an average tail length of 10.5 cm. The golden bandicoot (Barrow Island) is slightly smaller and has slightly darker fur than the golden bandicoot (mainland), and weighs between 250 and 600 g when mature (Palmer et al., 2003; Strahan, 1998). The species is mainly solitary, though home ranges overlap and may alter by seasons, usually increasing in size in drier seasons (Palmer et al., 2003).

Isoodon is currently divided into many species and subspecies though the validity of this taxonomic approach is debated (Pope et al., 2001; Van Dyck & Strahan, 2008). Argument regarding the definition of subspecies focuses on whether isolated populations are genetically different subspecies or whether populations have developed morphological traits in response to environmental constraints at respective locations (Pope et al. 2001).

Conservation Status

The species is listed as vulnerable under the name *Isoodon auratus barrowensis* (Golden Bandicoot (Barrow Island)). This species is eligible for listing as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) as, prior to the commencement of the EPBC Act, it was listed as vulnerable under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

The golden bandicoot (Barrow Island) is also listed as vulnerable in Western Australia (*Wildlife Conservation Act 1950*).

The golden bandicoot (*I. auratus*) is listed as vulnerable under the IUCN Red List of Threatened Species (Burbidge et al., 2008) and though the Barrow Island subspecies is not distinguished in the listing, the distribution for the species in the Red List includes Barrow and Middle Island where only *I. auratus barrowensis* is found.

Cultural Significance

Archaeological records show that traditional Aboriginal use of Barrow Island Nature Reserve has occurred in the past. Though there is no Native Title claim for the area, three Aboriginal groups (Yabburara/Mardudhunera, Kurama/Marthudunera and Thalanyji) have expressed their interests in the area (DEC, 2011).

Distribution and Habitat

Barrow Island is a limestone island dominated by *Triodia* grasslands. Bandicoots occur in all vegetation types found on the island including disturbed areas (Short & Turner, 1994), utilising grasslands and limestone caves for sheltering (Palmer et al., 2003). The golden bandicoot on Barrow Island shows a strong seasonality in breeding with a summer peak in births (Palmer et al., 2003). This species is omnivorous, with foods taken including ants, termites, moths, reptiles, rodents, shorebird and turtle eggs and hatchlings, and a variety of roots and tubers (McKenzie et al., 1995; Southgate et al., 1996).

The population of the golden bandicoot (Barrow Island) was restricted to Barrow and Middle Islands (McKenzie et al., 1995) after it became extinct on Hermite Island around 1912 (Burbidge, 1971). The species has recently been reintroduced to the Montebello Islands (including Hermite Island); Doole Island in Exmouth Gulf and is present at the ex-pastoral station, Lorna Glen, managed by DPaW (DPaW WA, 2013, *pers comm.*). There is no evidence of decline on Barrow Island (Maxwell et al., 1996) and the population there is estimated to be stable at 45 000±3000 (R Teale, 2014, *pers comm.*). As the subspecies occurs in small isolated areas in the Pilbara region of Western Australia, all populations are considered important for survival (Palmer et al., 2003).

This species occurs within the Carnarvon and Murchison (Lorna Glen) IBRA Bioregions and the Rangelands Natural Resource Management Region.

The distribution of this species is not known to overlap with any EPBC Act-listed threatened ecological community.

The Department of the Environment has prepared survey guidelines for Australia's threatened mammals. The survey guidelines are intended to provide guidance for stakeholders on the effort and methods considered appropriate when conducting a presence/absence survey for mammals listed as threatened under the EPBC Act. <http://www.environment.gov.au/epbc/publications/threatened-mammals.html>

Threats

The high population density and large population size, together with the relatively safe status of Barrow Island, does not imply high security as a single isolated population is highly vulnerable to novel influences or catastrophic events such as an island-wide bushfire.

A draft management plan for the Barrow Island Nature Reserve was released in 2011 (DEC). This plan identified the major threats facing the subspecies as land clearing (direct and indirect loss of habitat); introduction of non-indigenous species; large intense bushfires; physical barriers to fauna from infrastructure; direct harm to fauna from operating machinery/vehicles.

Currently, Barrow Island Nature Reserve is significantly the biggest land mass (~23 500 ha) in Australia with no introduced vertebrate pests (DEC, 2011). The reintroduction of any predators to Barrow, Middle and Hermite Islands, such as cats, foxes, dogs and rats, poses a serious threat. Historically black rats, house mice, honey bees, wasps, frogs and rock rats have all been introduced to the island, but have since been successfully eradicated (Chevron Australia, 2005, cited in DEC, 2011).

The nature of the dominant *Spinifex* vegetation creates heavy fuel loads that lead to a high potential for a significant part of the island to be affected by wildfire. The last major wildfire on Barrow Island was in 1960 where a significant (>90%) area of the island was burnt. A smaller (~1000 ha) wildfire occurred in October 2013 (DPaW WA, 2013, *pers comm.*). All Barrow Island fauna is at serious risk from an uncontrolled wildfire event, firstly due to the lack of escape chances and secondly from the loss of habitat and food sources (DEC, 2011).

Barrow Island is also an oilfield and site of a gas processing plant (Australia's largest resource project). Butler (1987) identified disturbance by oilfield activities, especially gravel extraction and road construction as potential threats from these operations. The oilfield and gas processing projects are required to minimise environmental impacts associated with their operations. In particular, the gas processing project must comply with the *Barrow Island Act 2003* (including vegetation clearing restrictions) and project approval conditions (including quarantine restrictions) imposed by both the WA and Commonwealth governments. Chevron Australia Pty Ltd (as the project operator) has prepared environmental management plans and procedures to address these requirements (Strahan, 1998; Chevron Australia, n.d).

Research Priorities

Research priorities that would inform future priority actions include:

- Review taxonomy of the species/subspecies as part of a wider consideration of the genus as a whole
- Research the impact of fire on the subspecies.

Priority Actions

The following priority recovery and threat abatement actions can be done to support the recovery of the golden bandicoot (Barrow Island):

Habitat Loss, Disturbance and Modification

- Continue monitoring the species (along with other Barrow Island fauna), and adapt management actions if population changes (declines or increases) necessitate them.

Animal predation

- Continue quarantine management practices for all Barrow Island Group partners to reduce the risk of any feral animals re-establishing on the island.

Fire

- Continue to work with WA Department of Parks and Wildlife, Chevron Australia and other Barrow Island Group partners to ensure Barrow Island has a suitable fire management strategy and that actions related to an appropriate fire regime are implemented.

Conservation Information

- Continue cooperative work with all Barrow Island Group partners that have key management responsibilities for the environment on Barrow Island Nature Reserve.

This list does not necessarily encompass all actions that may be of benefit to the golden bandicoot (Barrow Island), but highlights those that are considered to be of highest priority at the time of preparing the Approved Conservation Advice.

Existing Plans/Management Prescriptions that are Relevant to the Species

- National recovery plan for the Golden Bandicoot *Isodon auratus* and Golden-backed Tree-rat *Mesembriomys macrurus* 2004 – 2009 (Palmer, C., R. Taylor & A. Burbidge, 2003).
- Chevron Australia Environment Management Plans – Barrow Island <http://www.chevronaustralia.com/ourbusinesses/barrowandthevenardislands.aspx> and <http://www.chevronaustralia.com/our-businesses/gorgon/environmental-responsibility/environmental-approvals>
- Barrow Group Nature Reserves Draft Management Plan (DEC, 2011).

These prescriptions were current at the time of publishing; please refer to the relevant agency's website for any updated versions.

References

Burbidge A A (1971). *The fauna and flora of the Montebello Islands*. Western Australia Department of Fisheries and Fauna Report. 9:1-15. WA Department of Fisheries and Fauna.

- Burbidge A, Woinarski J. & Morris K. (2008). *Isoodon auratus*. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1.
Available on the internet at:
<http://www.iucnredlist.org/>
- Butler WH (1987). Management of disturbance in an arid remnant: the Barrow Island Experience. In: Saunder, D.A., G.W. Arnold, A.A. Burbidge & A.J.M. Hopkins, eds. *Nature Conservation: The Role of Remnants of Native Vegetation*. Page(s) 279-285. Chipping Norton: Surrey Beatty.
- Chevron Australia (undated). *Barrow Island, Environmental Management Plans*.
Available on the internet at:
<http://www.chevronaustralia.com/ourbusinesses/barrowandthevenardislands.aspx>
and <http://www.chevronaustralia.com/our-businesses/gorgon/environmental-responsibility/environmental-approvals>
- Department of Environment and Conservation (DEC) (2011). *Barrow Group Nature Reserves Draft Management Plan 2011*. Department of Environment and Conservation, Perth, Western Australia.
Available on the internet (cached) at:
www.dec.wa.gov.au/publications/doc_download/5527-barrow-group-nature-reserves-draft-management-plan-2011.html
- Department of Parks and Wildlife Western Australia (DPaW WA) (2013). Personal communications by email with staff associated with the Barrow Island Nature Reserve management, December 2013.
- McKenzie NL, Morris KD & Dickman CR (1995). Golden Bandicoot. In: Strahan, R, ed. *The Mammals of Australia*. Page(s) 172-173. Reed: Chatswood.
- Maxwell S, Burbidge AA & Morris K (1996). *The 1996 Action Plan for Australian Marsupials and Monotremes*. Wildlife Australia, Environment Australia.
Available on the internet at:
<http://www.environment.gov.au/biodiversity/threatened/publications/action/>.
- Palmer C, Taylor R & Burbidge A (2003). *Recovery plan for the Golden Bandicoot Isoodon auratus and Golden-backed Tree-rat Mesembriomys macrurus 2004 - 2009*. Northern Territory: Department of Infrastructure, Planning and Environment.
Available on the Internet at:
<http://www.environment.gov.au/biodiversity/threatened/publications/recovery/i-auratus-m-macrurus/index.html>
- Pope L, Storch D, Adams M, Moritz C & Gordon G (2001). A phylogeny for the genus *Isoodon* and a range extension for *I. obesulus penninsulae* based on mtDNA control region and morphology. *Australian Journal of Zoology*. 49:411-434.
- Short J & Turner B (1994). A test of the vegetation mosaic hypothesis: a hypothesis to explain the decline and extinction of Australian mammals. *Conservation Biology*. 8:439-449.
- Southgate R, Palmer C, Adams M, Masters P, Triggs B & Woinarski J (1996). Population and habitat characteristics of the golden bandicoot (*Isoodon auratus*) on Marchinbar Island, Northern Territory. *Wildlife Research*. 23:647-664.
- Strahan R. ed (1998). *The Mammals of Australia, Second Edition, rev.* Sydney, NSW: Australian Museum and Reed New Holland.
- Tate, GHH (1948). Results of the Archbold Expeditions. No. 60. Studies in the Peramelidae (Marsupialia). *Bulletin of the American Museum of Natural History*. 92:313-346.

Teale R (2014). Personal communication by phone, February, 2014. Biota Research and Consulting.

Van Dyck, S and Strahan R (2008). *The Mammals of Australia, Third Edition*. Sydney: Reed New Holland.