

## NT Action Plan

# GOLDEN BANDICOOT

## *Isoodon auratus*

### Conservation Status

Australia: Vulnerable

Northern Territory: Endangered

### Priority for Management in the NT

Rank: 5



Photo: K. Brennan

### Priority actions for 2015-2025

- Establish threat surveillance on Wessel Islands to ensure the security and longevity of extant subpopulations. Implement an action plan to eradicate feral animals if they are detected.
- Determine any impact of removing animals (for translocations) on the founder population by re-surveying sites on Marchinbar Island where founder animals were removed and compare with sites where animals have not been removed.
- Confirm the on-going survival of translocated populations by re-surveying within 5 years of last survey (2011).
- Interpret population data in the context of fire history on the Wessel Islands and adapt management actions if population changes (declines or increases) necessitate them.
- If feasible, establish a population on the NT mainland.

### Targets for 2020:

1. Prepare and implement biosecurity plans for the islands, including feral animal surveillance
2. Complete surveys of Marchinbar, Guluwuru, and Raragala island populations
3. Develop and test appropriate burning recommendations

4. Identify options, risks and cost benefits for further translocations/reintroductions

### Recommended monitoring for targets:

#### *Indirect monitoring parameter(s)*

1. Marchinbar, Raragala and Guluwuru Islands are free of cats, black rats and other threats
2. Suitable fire regime implemented to maintain and enhance Golden Bandicoot habitat

#### *Direct monitoring parameter(s)*

1. Population estimates are stable for Marchinbar, Raragala and Guluwuru Island populations

### Further research required to enhance species recovery:

1. Effective methods of cat control on the mainland
2. Identification of optimal fire regime: can be undertaken as part of adaptive management program

## Conservation objectives and management

A national recovery plan for this species has expired (Palmer et al. 2003). Many actions for the Northern Territory in the recovery plan have been jointly implemented by Gumurr Marthakal Rangers of north-eastern Arnhem Land and scientists from the Northern Territory Government. The key conservation objectives listed here are taken from the Action Plan for Australian Mammals (Woinarski et al 2012) and the Commonwealth Government's conservation advice (<http://www.environment.gov.au/biodiversity/threatened/species/pubs/66665-conservation-advice-01102015.pdf>).

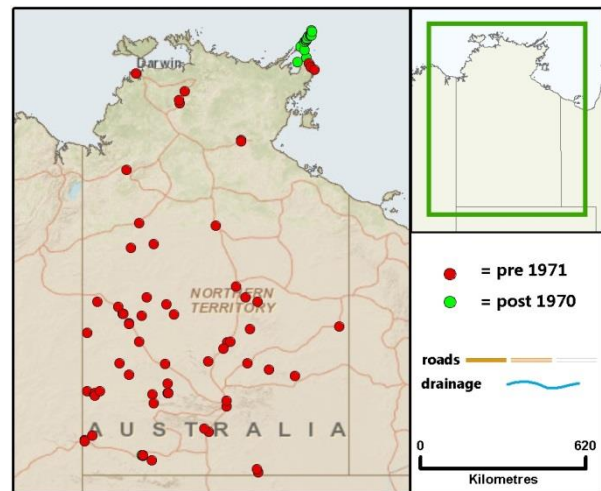
Management priorities are:

- Apply appropriate fire regimes for all subpopulations
- Develop and implement biosecurity for islands with Golden Bandicoot subpopulations
- Monitor island subpopulations and at selected mainland sites in Kimberley
- If developed, implement effective feral cat control mechanisms
- Reintroduce to additional parts of former range

### **Key management objectives for the NT:**

- Implement burning appropriate for Golden Bandicoots on the Wessel Islands
- Safeguard the existing population through biosecurity measures to keep the Wessel Islands cat-free
- Continue monitoring on the Wessel Islands and adapt management actions if population changes (declines or increases) necessitate them
- Investigate the potential reintroduction of Golden Bandicoots to parts of its former range

## Distribution in the NT



Known locations of Golden bandicoot in the Northern Territory (NT) pre- and post- 1970. [source: NT Fauna Atlas]

## Threatening processes

No single factor has been demonstrated to have caused the decline of Golden Bandicoots. Declines on the mainland have been attributed to predation by feral predators. In the arid zone the combination of land use changes, rabbits and drought in the early 1900s are likely to have been responsible for local extinctions (Morton 1990). Predation by black rats potentially contributed to the extinction of Golden Bandicoots on Hermit Island.

Extensive, hot, late dry season fires have been implicated in the decline of mammal species within the same weight range elsewhere in northern Australia, and believed to impact Golden Bandicoots in two main ways. Firstly, feral cat hunting patterns are known to focus and be more effective in recently burnt areas (McGregor et al 2014), thereby posing a greater threat to Golden Bandicoots than under patchy and low-intensity fire regimes. Secondly, Golden Bandicoots require a mix of vegetation types with open foraging areas and thick cover for nest sites. This mix can be produced by a fine-scale mosaic of burning (Southgate et al 1996). An inappropriate fire regime, either too much or too little burning is likely to reduce the

habitat quality and impact the Golden Bandicoot.

The greatest threat to the Wessel Islands population in the NT is the deliberate or inadvertent introduction of cats to the islands, either by visiting Aboriginal landowners, by visiting fishermen or yachties.

### Particular habitat requirements

The Golden Bandicoot is omnivorous and previously occupied a broad range of habitat types (McKenzie et al. 1975, 1978, 1995) including:

- hummock and tussock grasslands on sand-dunes and sand-plains in the arid zone
- acacia and eucalyptus woodlands in the tropical semi-arid zone
- vine thickets
- heath and woodlands in rugged sandstone
- volcanic country in the subhumid tropics

The Golden Bandicoot is found in several habitat types in its current distribution. On the Kimberley mainland the Golden Bandicoot is now only recorded in rocky sandstone habitats and vine thickets within the medium to high rainfall area (700 to 1200 mm average annual rainfall): In the Pilbara, Golden Bandicoots survive on two islands with an arid climate, while on three of the Wessel Islands in the Northern Territory with high rainfall, they occupy heathland on sandstone. Given their capacity to historically occupy a broad range of habitat types they appear to have few specific habitat requirements, and the area they occupy may more closely reflect a lack of threats and potentially appropriate fire regimes.

### Past and present activities in the NT

Golden Bandicoots were discovered on Marchinbar Island during a biodiversity survey in 1993 of the Wessel Island group. In 1994, scientists worked with the island's traditional owners to find the best way to trap Golden Bandicoots and found that adding a sweetener to bait used in traps was required to attract them. In 1994-95, the total population at its single known NT site was estimated at around 1 400 individuals, occurring across most of the

210 km<sup>2</sup> extent of Marchinbar Island (Southgate et al. 1996). Additional population monitoring and habitat assessments were undertaken with traditional owners in 2004 and 2006, to determine the size and distribution of the Marchinbar population. The estimate was considered similar to that from the 1994-95 surveys.

Marchinbar Island has no feral cats, although feral dogs have been present for around 30-50 years, and these are known to take some bandicoots. These feral dogs were exterminated in 2004-05 largely because of their impacts on Golden Bandicoots (and nesting marine turtles).

Guluwuru and Raragala Islands in the Wessels and Napier Peninsula on the mainland were surveyed for Golden Bandicoots during 2006 and 2007 and none were found.

In 2007, 12 animals were translocated to Guluwuru Island and then a further 18 in 2008. In 2009, 15 individuals were moved from Marchinbar to Raragala Island. Monitoring of the Guluwuru translocated population in 2009 reported that it had established and increased (Palmer 2009). The translocated sub-populations were doing well on both islands when surveyed again in 2011. However, the site on Marchinbar where some of the founder animals were taken had lower than expected capture rates when resurveyed in 2011 (K. Brennan pers comm). There was also a fire in the region of the island where founder animals were taken in 2012. Re-surveying founder sites on Marchinbar Island is currently a high priority.

### Status and activities outside the NT

Beyond the NT, the same subspecies of Golden Bandicoot (*I.a. auratus*) also occurs on a small portion of the mainland of the north-western Kimberley between Mitchell Plateau in the north and Yampi Peninsula in the south, Western Australia. The range includes nearby offshore islands, Lachlan, Augustus, Storr and Uwins.

The species distribution in the north-western Kimberley includes an Australian Wildlife Conservancy sanctuary in the Artesian Range.

As part of a pilot study for a research program on medium-sized mammals at this sanctuary, two Golden Bandicoots were radio tracked and found to move regularly between shelter sites over a 600m long riparian strip grading to grassy foothills. Shelter sites were located between grass tussocks, and bandicoots created a network of runways between shelter sites. At some sites in Artesian Range the Golden Bandicoot is sympatric with the Northern Brown Bandicoot (James A. pers comm). Golden bandicoots are monitored as part of a biannual monitoring program targeted at medium-sized mammals across the full range of habitats in the Artesian Range. Management activities on the sanctuary that may assist the Golden Bandicoot include fire management using prescribed early dry season burning, and destocking 116 000 ha of the valley adjacent to the Artesian Range (the range itself is inaccessible to feral herbivores).

Another subspecies, *I. a. barrowensis* occurs on Barrow and nearby Middle Islands off the Pilbara coast (Woinarski et al. 2012). The Barrow Island population has an on-going monitoring program. This subspecies has also been successfully reintroduced to Hermite and Doole Islands in the Pilbara, and on the mainland at Lorna Glen Station inside a fenced predator-proof enclosure. A reintroduction trial outside of the enclosure where introduced predators are controlled is currently underway at Lorna Glen. There have also been two unsuccessful translocations of this subspecies, to the Gibson Desert and outside of the Lorna Glen enclosure in 2012. The failure of these translocations was attributed to predation by cats in the Gibson Desert and dogs at Lorna Glen (Page M. pers comm).

## Stakeholders

Government	<ul style="list-style-type: none"> <li>Department of Land Resource Management, Flora and Fauna Division</li> <li>WA Government</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of Wessel Islands populations</li> <li>Research into drivers of mammal decline and effect of feral cat predation</li> <li>Regulation of translocations in the NT</li> <li>Management and implementation of reintroduction programs in WA</li> </ul>
Conservation Agencies	<ul style="list-style-type: none"> <li>Australian Wildlife Conservancy</li> <li>Bush Heritage</li> </ul>	<ul style="list-style-type: none"> <li>Potential for reintroduction into fenced cat-exlosures or cat controlled areas on private reserves</li> <li>Research into drivers of mammal decline and effect of feral cat predation</li> <li>Manage land to improve Golden Bandicoot habitat</li> </ul>
Indigenous	<ul style="list-style-type: none"> <li>Gumurr Marthakal Rangers</li> <li>Traditional Owners Wessel Islands</li> </ul>	<ul style="list-style-type: none"> <li>Land Owners and Managers of Wessel Islands</li> <li>Monitoring of Wessel Island populations</li> <li>Monitoring and enforcing island biosecurity</li> </ul>

## Legal Status and Documents

**NT Conservation Status**

**Listed as Endangered**

[NT Factsheet](#)

**Priority for action in the NT**

Recovery Rank **Fauna No. 5**

<b>National listing and other jurisdictions</b>	National: Listed as Vulnerable under <i>EPBC Act</i> <a href="#">National SPRAT database</a>  WA: <b>Vulnerable</b>  SA: <b>Endangered</b>  NSW: <b>Extinct</b>  Vic: <b>Extinct</b>  IUCN: Vulnerable
<b>National Recovery Plan</b>	<a href="#">Recovery Plan for the Golden Bandicoot <i>Isoodon auratus</i> and Golden-backed Tree-rat <i>Mesembriomys macrurus</i> 2004 - 2009</a> (Palmer, C., R. Taylor & A. Burbidge, 2003).
<b>NT management or recovery plans</b>	
<b>Other relevant National Plans</b>	<a href="#">Threat Abatement Plan for Predation by Feral Cats</a> (Department of the Environment, 2015). <a href="#">Threat Abatement Plan for Competition and Land Degradation by Feral Rabbits</a> (Environment Australia (EA), 1999c) [Threat Abatement Plan].
<b>Policy Statements and Guidelines</b>	<a href="#">Survey guidelines for Australia's threatened mammals. EPBC Act survey guidelines 6.5</a> (Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2011).

## References

- McGregor HW, Legge S, Jones ME, Johnson CN (2014) Landscape Management of Fire and Grazing Regimes Alters the Fine-Scale Habitat Utilisation by Feral Cats. *PLoS ONE* 9(10): e109097. doi:10.1371/journal.pone.0109097
- Morton S. R. (1990). The impact of European settlement on the vertebrate animals of arid Australia: a conceptual model. *Proceedings of the Ecological Society of Australia* 16, 201-213.
- Palmer, C. (2009) All Good. Wankura have 2 new island homes. NT Department of Natural Resources, Environment, the Arts and Sport, Darwin.
- Southgate, R., Palmer, C., Adams, M., Masters, P., Triggs, B. and Woinarski, J. (1996). Population and habitat characteristics of the Golden Bandicoot (*Isoodon auratus*) on Marchinbar Island, Northern Territory. *Wildlife Research* 23, 647-664.
- Woinarski, J.C.Z., Burbidge, A.A. and Harrison, P.L. (2012). *The Action Plan for Australian Mammals 2012*. CSIRO Publishing, Collingwood.