

Australian Capital Territory

Nature Conservation (Eastern Bettong) Conservation Advice 2018

Notifiable instrument NI2018–491

made under the

Nature Conservation Act 2014, s 90C (Conservation advice)

1 Name of instrument

This instrument is the *Nature Conservation (Eastern Bettong) Conservation Advice 2018*.

2 Commencement

This instrument commences on the day after its notification day.

3 Conservation advice for the Eastern Bettong

Schedule 1 sets out the conservation advice for the Eastern Bettong (*Bettongia gaimardi*).

Note 1 Under section 90C of the *Nature Conservation Act 2014* (the *Act*), the Minister must ensure that there is an advice about each item included in a list.

Note 2 Under section 90D of the *Act*, the Scientific Committee must prepare a conservation advice for an item.

Mick Gentleman MLA
Minister for the Environment and Heritage
22 August 2018

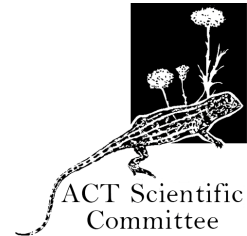
Schedule 1

(see s 3)



ACT
Government

Environment, Planning and
Sustainable Development



ACT Scientific
Committee

CONSERVATION ADVICE

EASTERN BETTONG – *Bettongia gaimardi*

CONSERVATION STATUS

The Eastern Bettong *Bettongia gaimardi* is recognised as threatened in the following sources:

International	Near Threatened , International Union of Conservation of Nature (IUCN) Red List
National	Extinct (mainland sub-species), <i>Environment Protection and Biodiversity Conservation Act 1999</i> Vulnerable (species); Extinct (mainland sub-species), The Action Plan for Australian Mammals 2012
ACT	Regionally Conservation Dependent in the Regional category, <i>Nature Conservation Act 2014</i>
NSW	Extinct (species), <i>Biodiversity Conservation Act 1995</i>
VIC	Threatened (species), <i>Flora and Fauna Guarantee Act 1988</i> Extinct (mainland sub-species), Advisory List of Threatened Vertebrate Fauna 2013
QLD	Extinct in the Wild (mainland sub-species), <i>Nature Conservation Act 1992</i>
TAS	Protected , Schedule 2, <i>Wildlife (General) Regulations 2010</i> , Section 26, <i>Nature Conservation Act 2002</i>

ELIGIBILITY CRITERIA

- a – IUCN category – Near Threatened (Burbidge et al. 2016)
- c – Reintroduced to historic ranges and managed under relevant guidelines
- d – Reintroduced/translocated to ACT as part of conservation initiative

CAM COMPLIANCE

Regional assessment of a species “not likely to be nationally threatened”.

TAXONOMY

Wakefield (1967) consolidated two species (*Bettongia cuniculus* and *B. gaimardi*) into a single species with two subspecies: the extant Tasmanian Bettong (*Bettongia gaimardi cuniculus*) and the extinct Eastern Bettong (mainland) (*Bettongia gaimardi gaimardi*).

However, a genetic study (Haouchar et al. 2016) of fossilised bones and museum skins combined with an existing DNA dataset shows the Tasmanian Bettong, *Bettongia gaimardi cuniculus*, lies within the range of variation of the mainland Eastern Bettong, *Bettongia gaimardi gaimardi*. The analysis does not strongly support the separation of the two subspecies, which suggests a more thorough assessment of their taxonomy is needed. However, current listings are based on the currently accepted taxonomy.

DESCRIPTION AND ECOLOGY

Description

The Eastern Bettong *Bettongia gaimardi* (Desmarest, 1822) is a strictly nocturnal, small macropod, typically grey-brown above with a paler underside and cream coloured legs. Pinkish flesh is noticeable around its mouth and naked brown nose, its forepaws and hind feet and the inside of the ears. In keeping with other bettongs, the hind feet are relatively long, while the forepaws have long, curved central claws.

Average adult measurements (Claridge et al. 2007)

- Head and body length: 323 (315-332) mm
- Tail length: 326 (288-345) mm
- Body mass: 1660 (1200-2240) g

Reproductive biology of the species (Rose 1987):

- Gestation: ~21 days
- Pouch life: up to 106 days
- Lactation after pouch vacation: 56-63 days
- Mass of young at pouch vacation: 279-370 g
- Mass of young at weaning: 1046-1350 g



Eastern Bettong (Woodlands and Wetlands Trust)

The Eastern Bettong's prehensile tail is roughly the length of its body and often has a white tip. The tail is noticeably fleshy and an important storage organ for reserves, especially fat. Like most members of the family *Potoroidae*, little distinguishes male and female individuals although males may be slightly longer and slimmer. Eastern Bettongs may live for 3-6 years in the wild (Rose 1986).

Eastern Bettongs¹ were once thought to be solitary animals, coming together only to breed. However, observations from Mulligans Flat Woodland Sanctuary suggest communal habitation (pers. comm. Prof Adrian Manning, ANU). Breeding occurs continuously with females producing two or three young per year for which they do all of the caring (Rose and Johnson 2008).

Distribution and Habitat

The Eastern Bettong now occurs naturally only in Tasmania where it is common over much of the drier eastern half of the state from sea level to 1000 m. It occurs on Bruny Island and was reintroduced to Maria Island. The species disappeared from mainland Australia around the 1920s and earlier from the ACT (Short 1998; Menkhorst 2008). Its prior distribution occurred in an arc from the south-eastern corner of South Australia through the tablelands of eastern Australia to south-eastern Queensland (Seebeck and Rose 1989).

¹ The Eastern Bettong disappeared from the mainland long before much was known about its biology. Therefore a lot of knowledge of the species comes from studies in Tasmania and from information on closely related species. However, increasingly more knowledge of the species is coming from research at Mulligans Flat Woodland Sanctuary and Tidbinbilla Nature Reserve.

There are records of numerous 'Rat Kangaroos' in the ACT region and these were almost certainly Eastern Bettongs (Gillespie 1992; Smith 1992). The Eastern Bettong had probably disappeared from the ACT area by 1908². Additional observations of the Eastern Bettong on the lands that became the ACT and in surrounding regions, come from museum specimens, sub-fossil remains and bounty payments. Ford (in Ikin 2012) recently reviewed museum specimens of bettong species (including sub-fossil remains) and found that all specimens south of Sydney were of Eastern Bettongs, including records from eastern NSW that had been previously thought to be the Burrowing Bettong (*B. penicillata*). Sub-fossil remains of the Eastern Bettong in the ACT region, some of which date to less than 200 years old, come mostly from cave deposits such as at London Bridge in the Burra Valley, Wombeyan, Yarrangobilly, Wee Jasper, Cotter and Michelago (Ford 2008, pers. comm. Dr Fred Ford, Australian Government).

Anecdotally, rat kangaroos were reported as a severe pest by Samuel Schumack who lived on "Spring Vale" at Weetangera from 1866 to 1915 (Schumack 1967). It is likely that the species was *Bettongia gaimardi* (Gillespie 1992).

Eastern Bettongs were reintroduced to the ACT in 2011 and 2012, with 60 adult bettongs translocated from the wild in Tasmania to establish two populations, at Tidbinbilla Nature Reserve and Mulligans Flat Woodland Sanctuary.

The Eastern Bettong inhabits well drained, open eucalypt and woodlands with grassy or heathy ground cover. The species also occurs in *Casuarina* forests with a similar groundcover. These *Casuarina* habitats, however, are apparently of secondary importance because the two main *Casuarina* species in Tasmania tend to be restricted to specific places, notably coastal fringes and drier places in the case of *Allocasuarina verticillata*, and watercourses for *A. littoralis*. However, Eastern Bettongs can persist in highly modified landscapes, as was observed in Tasmania when trapping the animals for the Mulligans Flat Woodland Experiment (pers. comm. Prof Adrian Manning, ANU). The eucalypt and *Casuarina* habitats that occur in the eastern half of Tasmania probably resemble forests that the Eastern Bettong once occupied on the mainland. Likewise, the regions where it occurs in Tasmania and those it once occupied on the mainland encompass similar altitudes, with much suitable habitat between sea level and 1000 m above sea level in Tasmania and possibly slightly higher on the mainland.

Eastern Bettongs require habitat that provides suitable cover as they spend the day in nests constructed from plant material that they harvest and carry to the nesting site using their prehensile tail.

Environments with low shrubs, tussock grass and fallen timber provide ideal places for the animal to conceal the nest (Rose 1986), while the nest itself plays an important role in thermoregulation (Rose and Rose 1998). Most relatively undisturbed forest is likely to provide suitable areas for nesting for the Eastern Bettong.

Members of the *Potoroidae* are obligate mycophagists³. Similar to other potoroids, the Eastern Bettong relies heavily on the fruiting bodies of ectomycorrhizal hypogeous fungi⁴ - truffles - to meet its nutritional requirements. Eucalypt forests support a high diversity of hypogeous (underground) fungi⁵. In environments with sporadic rainfall, however, these fungi may not always be available and it is likely that the bettong also relies on foods such as roots, tubers, seeds, fruit and invertebrates (Maser et al. 2008; Munro et al. in prep). Bettongs are well equipped for this strategy, being mobile (as shown by large home

² The year the region was selected as the site of the nation's future capital city.

³ Obligate mycophagists obtain most of their nutritional requirements from fungi.

⁴ Those that form a symbiotic relationship with plant roots and that produce underground fruiting bodies – truffles.

⁵ Maser et al (2008) note that it is not unusual to identify 50 of fungi species during scat analysis.

ranges of 65–135 ha and traversing long distances to feeding areas); having powerful claws for digging; and having highly developed olfactory regions in the brain (Wallis 1990; Rose and Johnson 2008; Munro et al. in prep).

THREATS

The main current threat to the Eastern Bettong is predation by red foxes and to a lesser extent feral cats in Australia, as identified in the Mammal Action Plan (Woinarski et al. 2014). Other potential threats include:

- habitat clearing/fragmentation of its dry forest and woodland habitat
- habitat degradation and competition from livestock/introduced herbivores including overgrazing by livestock and rabbits
- inappropriate fire regimes (e.g., Vernes et al. 2001)
- previously – hunting/persecution/poisoning
- viral or other diseases
- climate change (e.g., Bateman et al. 2012)

MAJOR CONSERVATION OBJECTIVES

The priority management objectives are to:

- contribute to regional and national conservation of the species
- establish and maintain a viable, managed wild population(s) of the Eastern Bettong, in the long-term, as a component of the indigenous biological resources of the ACT.

These objectives are to be achieved through the following strategies:

Release/Re-establishment

- reintroduction and management of at least one captive population in the ACT
- release and reestablishment in suitable ACT locations under appropriate management regimes.

Protection

- where appropriate, implement management actions or methods required to protect the reintroduced species and its habitat in the ACT
- identify and protect habitat critical to the survival of the species in the ACT.

Survey, Monitoring and Research

- co-operate with and contribute to regional and national networks to ensure coordination of research, survey and monitoring programs.

CONSERVATION ISSUES AND PROPOSED MANAGEMENT ACTIONS

The Nature Conservation Act 2014 provides for protection of native animals. The Parks and Conservation Service of the Environment, Planning and Sustainable Development Directorate of the ACT Government has responsibility on ACT Government managed land for all the actions listed below and consistent with those in the *ACT Management Plan for the Eastern Bettong Bettongia gaimardi* (Ikin 2012). The future management of the species is the subject of an ACT Native Species Conservation Plan for the Eastern Bettong (in preparation) under Part 5.3 of the *Nature Conservation Act 2014*.

Release/Re-establishment/Protection

Captive populations of the Eastern Bettong, based on the reintroduction of 60 individuals from Tasmania in 2011 and 2012, have been established in the Tidbinbilla Nature Reserve (TNR) and Mulligans Flat Woodland Sanctuary in the ACT, where they are protected from the main threats.

At TNR the population is managed as a captive breeding 'insurance' population. The population at the Mulligans Flat Woodlands Sanctuary is considered a 'wild' population and open to the natural variations of population density. Based on recent population surveys, there are approximately 35 Eastern Bettongs at TNR (November 2017) and 140 Eastern Bettongs at Mulligans Flat (Summer 2018).

Reintroduction

A trial release of Eastern Bettongs into the wild in the ACT is being undertaken to evaluate the feasibility of its reintroduction 'beyond-the-fence'. This is into an area of the Lower Cotter Catchment which was assessed to be suitable habitat for this species and was subject to intensive predator control prior to, and following, the first release. The trial is using a staged approach, with small numbers of animals released at a time. 28 collared bettongs were released in the first stages of the trial in 2016. Monitoring of the released bettongs is continuing. Prior to the commencement of the trial release the following were undertaken:

- a full translocation proposal was approved by the Conservator of Flora and Fauna
- in mid-2015, an intense fox control program over 8,000 ha, commenced
- a risk assessment was undertaken as part of the planning process
- the project was approved by the ANU animal ethics committee
- predator control continues in the area of its release.

Intensive control measures, as required for the species, will be implemented for any future reintroduction programs.

Survey, Monitoring and Research

- continue to cooperate with and contribute to regional and national networks to ensure coordination of research, survey and monitoring programs
- identify, assess and manage threats to reintroduced populations
- establish long-term monitoring sites to assess the success of re-establishment.

OTHER RELEVANT ADVICES, PLANS OR PRESCRIPTIONS

Measures indicated in the Conservation Advice are in line with those in:

- ACT Native Species Conservation Plan for the Eastern Bettong (ACT Government - in preparation).
- Ikin K 2012. ACT Management Plan for the Eastern Bettong *Bettongia gaimardi*. Parks and Conservation Service, Territory and Municipal Services Directorate, Australian Capital Territory Government.
- Woinarski JCZ, Burbidge AA and Harrison PL 2014. *The Action Plan for Australian Mammals 2012*. CSIRO Publishing, Collingwood.

LISTING BACKGROUND

The Eastern Bettong *Bettongia gaimardi* has not been previously listed as threatened in the ACT as it was likely locally extinct since the early 1900s, until reintroductions to Tidbinbilla Nature Reserve and Mulligans Flat Woodland Sanctuary in 2012.

The mainland sub-species, *Bettongia gaimardi gaimardi*, was listed as presumed extinct under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth), 19 January 2000, and was transferred to the Extinct category under the EPBC Act, 16 July 2000.

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FURTHER INFORMATION

Further information on this species or other threatened species and ecological communities can be obtained from:

Conservation Research, Environment, Planning and Sustainable Development Directorate

Phone: (02) 132281

Environment, Planning and Sustainable Development Directorate

Website: <http://www.environment.act.gov.au/cpr>