# THE FOSSIL DISTRIBUTION OF THE EASTERN PYGMY-POSSUM *CERCARTETUS NANUS*

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This note is a contribution towards documenting the fossil distribution of the eastern pygmy-possum *Cercartetus nanus* (Marsupialia: Burramyidae) across its full range in south-eastern Australia. Distribution maps of its fossil occurrence have already been published for Victoria (Harris and Goldingay 2005), South Australia (Harris 2006) and Tasmania (Harris and Garvey 2006), and locality data from a fossil site for *C. nanus* in Queensland have been referred to by Harris *et al.* (2007). This note provides the first published list of fossil localities known for *C. nanus* in New South Wales (NSW) (Table 1), and presents a composite distribution map (Figure 1).

*Cercartetus nanus* has been reported from 57 fossil sites across its range. This includes 12 found during a review of literature on fossil sites in NSW (Table 1):

- The Bird Tracks Site, Delight Shelter, and Deep Creek Shelter are all from the Upper Mangrove Creek catchment.
- Marble Arch and Nargun Cave are south of Braidwood.
- London Bridge is south of Queanbeyan.
- Nettle Cave and Jenolan Caves are part of the Jenolan Caves system.
- Broom Cave and Wombeyan Quarry form part of the Wombeyan Caves system.
- Douglas Cave is near Stuart Town.
- Yarrangobilly is in Kosciuszko National Park.

The accumulating agents involved at the NSW sites (Table 1) accord with those for sites in Victoria (Harris and Goldingay 2005), Tasmania (Harris and Garvey 2006) and South Australia (Harris 2006). That is, regurgitated owl pellets and scats of mammalian predators deposited in caves or rockshelters, and also pitfall-trapping are inferred. Unfortunately, there is no definitive evidence regarding the specific identity of the predators involved at any of the fossil localities identified in south-eastern Australia. However, owls of

| Site Name | Sources | Origin | MNI | Age (yBP) | Latitude | Longitude |
|---|---|---|---|---|---|---|
| Douglas Cave | Gorter 1977 | PF | 5 | <29,200 | 32º 46' S | 149º 04' E |
| Delight Shelter | Attenbrow 1987, 2003, 2004 | MS | 1 | 2000 to 3000 | 33º 12' S | 151º 07' E |
| Bird Tracks Site | Attenbrow 1987, 2003, 2004 | - | 1 | <1000 | 33º 12' S | 151º 07' E |
| Deep Creek Shelter | V. Attenbrow *pers. comm.* | - | 6 | <1,100 to 3540±60 | 33º 12' S | 151º 07' E |
| Nettle Cave | Morris 1991, Morris *et al.* 1997 | OP | 20 | 7140±280 to 8730±280 | 33º 47' S | 150º 02' E |
| Jenolan Caves | Hollands 1991 | OP | 1 | - | 33º 48' S | 150º 01' E |
| Broom Cave | Broome 1896; Ride 1960; Wakefield 1972; Turnball and Schram 1973 | OP | 66 | 10,000 | 34º 19' S | 149º 59' E |
| Wombeyan Quarry | Hope 1982 | PF | 2 | >13,000 | 34º 18' S | 149º 58' E |
| London Bridge | Hope 1976 | - | 1+ | - | 35º 30' S | 149º 15' E |
| Marble Arch | Hope 1976 | OP | 1+ | - | 35º 42' S | 149º 42' E |
| Nargun Cave | Hope 1976 | OP | 1+ | - | 35º 42' S | 149º 42' E |
| Yarrangobilly | Drummond 1963 | OP, MS | 20 | - | 35º 43' S | 148º 29' E |

*Table 1:* Location and frequency of fossil *Cercartetus nanus* remains from sites in New South Wales. **Origin:** OP = Owl Pellet, MS = Mammal Scat, PF= Pitfall; MNI = Minimum Number of Individuals. A dash (-) indicates that the data are unknown or not available. The age of the material is years before present (yr BP) provided by the source indicated.

Harris JM, 2008. The fossil distribution of the eastern pygmy-possum *Cercartetus nanus*. *Australian Mammalogy* **29**: 233-236.

Key words: Burramyidae, *Cercartetus nanus*, fossil, palaeodistribution

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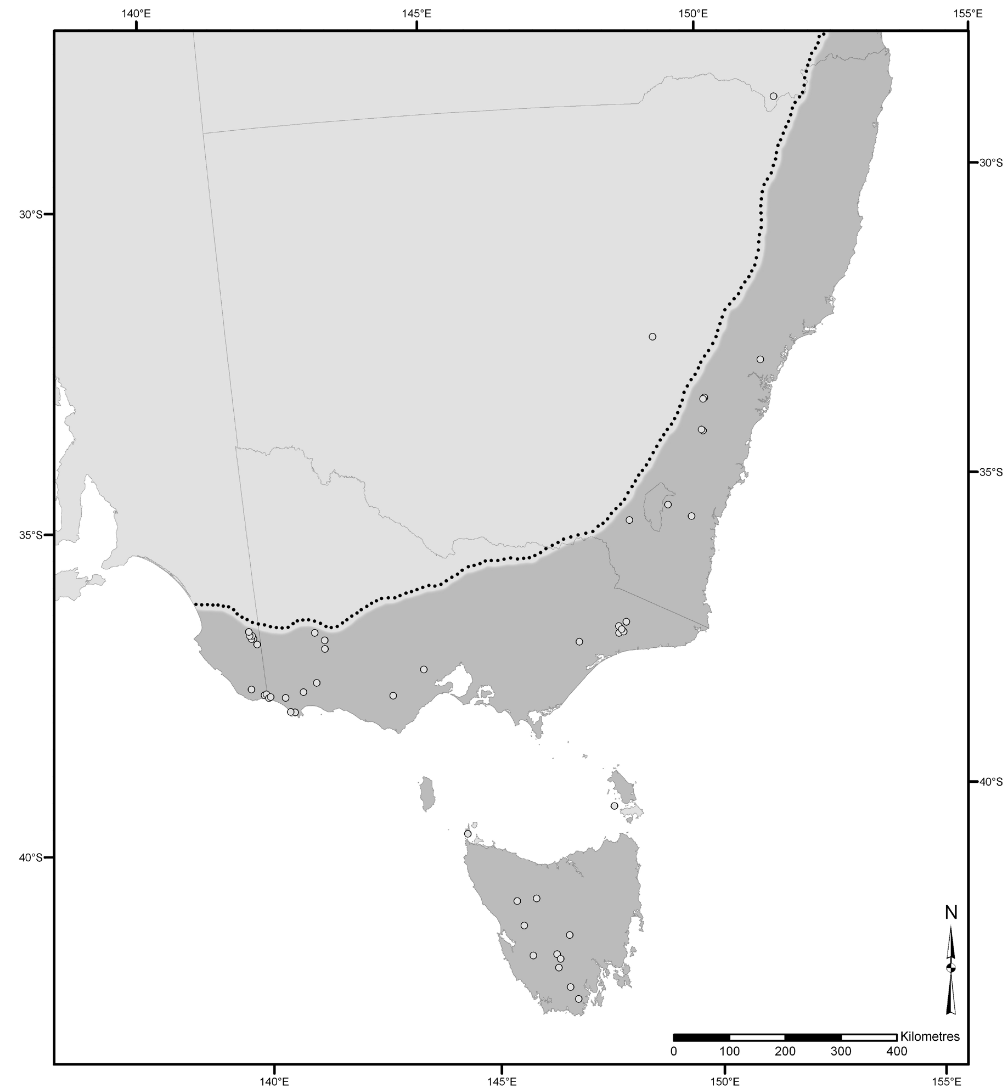


*Fig. 1:* Distribution of known fossil sites for *Cercartetus nanus*. Sources: NSW records (references cited in this study); Victorian records (Harris and Goldingay 2005; Marshall 1985; Ossa *et al.* 1995; Bilney *et al.* 2006); South Australian records (Harris 2006); Tasmanian records (Harris and Garvey 2006); Queensland record (Archer 1978). The dark shaded area is the estimated modern range and on the mainland is bordered by the dotted line (from Strahan 1995 for the mainland; Harris *et al.* 2008 for Tasmania).

the genus *Tyto* and quolls *Dasyurus* spp. are favoured candidates. Microscopic examination of the fossil *C. nanus* material may allow specific attribution to predatory species or verification of pitfall origin. This is important, because if the predator type is known, a consideration of the hunting and other behaviour of that predator can enable the identification of possible biases in the composition and species abundances of the bone assemblage (Andrews and Evans 1983).

Three of the NSW sites (Broom Cave, Wombeyan Quarry, and Douglas Cave) appear to be Late Pleistocene, the others (where dated) are Holocene (i.e. < 10,000 years). However, no dates are available for five of the NSW sites, and another 15 sites across its range (see Harris and Goldingay 2005; Harris 2006; Harris and Garvey 2006). The oldest fossil *C. nanus* bones known from anywhere at present are from Cathedral Cave in the Naracoorte Caves National Park World Heritage

Site in South Australia where dates as old as 528 ± 41 ka have been established (*C. nanus* in Unit 4 of Prideaux *et al.* 2007). An obvious avenue for subsequent work is ascertaining ages for the undated sites, and/or refining dates for those sites with only broad date ranges. Ultimately, such information will be needed to provide an accurate chronology of the occurrence of *C. nanus*, and to investigate past dispersal.

The most westerly fossil site for *C. nanus* in NSW is Douglas Cave, which lies south-east of Dubbo. This location is extralimital to the modern distribution as estimated by Strahan (1995) (see Figure 1), but recent *C. nanus* captures from near Dubbo (Shelly 1998), Pilliga, Coonabarabran, Parkes and Molong (Bowen and Goldingay 2000) demonstrates that its contemporary range extends further west than thought previously. The presence of *C. nanus* in the late Pleistocene deposits at Douglas Cave highlights that the species has long been resident in the central-west and that its dispersal to this region has not been in the recent past (i.e. within the last 10,000 years). There is evidence for a slight eastward contraction at the range periphery in Queensland (Harris *et al.* 2007). Another minor range decline had been suggested for South Australia by Harris (2006) although this has been shown to be incorrect by more recent modern records (see van Weenen and Harris 2006; Bachmann 2007). Present evidence suggests that there has not been a striking range decline like that reported for the mountain pygmy-possum *Burramys parvus* (Broome and Mansergh 1989; Brammall 1993). This is probably due to the wider ecological tolerances and wider geographic range of *C. nanus* compared with *B. parvus*.

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