

## Further notes on the welfare of small mammals captured during pitfall trapping

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### Abstract

Researchers conducting trapping surveys of vertebrate fauna are required to use a range of measures to ensure the wellbeing of captured animals. These include procedures to protect small mammals captured during pitfall trapping. Various materials can be placed in pitfall traps to provide shelter for small mammals, especially those captured overnight. During long-term studies at three sites in southern and western Victoria, two species of small marsupials used polystyrene cups that were placed in pitfall traps for shelter. (*The Victorian Naturalist* 132 (2) 2015, 51–53)

**Keywords:** pitfall traps, polystyrene cups, Eastern Pygmy Possum, Swamp Antechinus

### Introduction

National guidelines set broad parameters for the ethical use of wildlife during field studies (Australian Government 2013). Animal ethics committees require researchers conducting field studies of vertebrate fauna to produce and use more detailed procedures to protect the welfare of captured animals (Petit and Waudby 2012). Pitfall trapping, a survey method commonly used to detect the presence of reptiles and amphibians (Cogger 2014), also produces captures of small mammals (Menkhorst and Knight 2011). Small refuges may be placed in pitfall traps to provide shelter for those captured overnight.

The Eumeralla section of the Great Otway National Park (Eumeralla) (38°23'S, 144°12'E) is situated near Anglesea approximately 90 km south-west of the Melbourne CBD. Surveys of vertebrate fauna have been conducted at this site by RMIT University since 2004 (RMIT University unpubl.) and by Holmesglen Institute since 2006 (Homan unpubl.). The Wonthaggi Heathlands Nature Conservation Reserve (WHNCR) (38°38'S, 145°35'E) is situated approximately 104 km south-east of the Melbourne CBD. RMIT University has conducted surveys of vertebrate fauna at this location since 2007 (RMIT University unpubl.). Wuurak Land for Wildlife property, Moyston West (37°18'S, 142°41'E) is situated approximately 210 km west of the Melbourne CBD. Surveys of vertebrate fauna have been conducted at this property since

2004 (Homan 2012, 2014). Pitfall trapping was a survey method used during these studies and a 245 ml polystyrene take-away coffee cup was placed in each pitfall bucket as shelter for captured mammals.

Field studies at WHNCR during 2001 and 2002 produced numerous records of White-footed Dunnart *Sminthopsis leucopus*, Swamp Antechinus *Antechinus minimus* and House Mouse *Mus musculus* using polystyrene cups as shelter in pitfall traps (Homan 2004). This paper provides additional records of small marsupials using polystyrene cups during pitfall trapping at the above three sites over the last ten years. These records provide further evidence that artificial refuges can play an important part in ensuring the well-being of small mammals captured during pitfall trapping.

### Further records of small mammals using polystyrene cups as shelter in pitfall traps Eumeralla section, Great Otway National Park

23 February 2006: One adult female Swamp Antechinus (34 g) captured overnight.

4 October 2006: One adult female Swamp Antechinus (32 g) captured overnight.

16 October 2007: One adult male Eastern Pygmy Possum *Cercartetus nanus* (20 g) captured overnight.

2 September 2008: One sub-adult male Eastern Pygmy Possum (14 g) (Fig. 1) captured overnight.



**4 March 2014:** One adult male Swamp Antechinus (39 g) and one adult female Eastern Pygmy Possum (20 g) captured overnight in the same pitfall trap and sharing the same polystyrene cup when traps were checked at dawn. This Swamp Antechinus, which had a distinctive broken tail, was recaptured two days later when it also used the polystyrene cup in a different pitfall bucket.

### ***Wonthaggi Heathlands Nature Conservation Reserve.***

**9 October 2013:** One adult female Swamp Antechinus (49 g) found in cup when traps checked at noon.

### ***Wuurak Land for Wildlife Property.***

**2 April 2014:** One sub-adult male Eastern Pygmy Possum (12 g) captured overnight.

## Discussion

Standard Operating Procedures used by educational institutions, field naturalist clubs, wildlife consultants and other investigators are designed to provide a clear set of measures to ensure the well-being of animals used during field studies (Petit and Waudby 2012). In particular, stud-

ies that involve live trapping are expected to be conducted using a comprehensive set of ethical procedures. Welfare measures used during pitfall trapping may include external rain and shade covers, checking traps carefully and in a timely fashion and providing vegetation and small refuges in each pitfall trap (Hobbs and James 1999; Thompson and Thompson 2009; Petit and Waudby 2012).

Various artificial materials have been suggested as suitable refuge shelters in pitfall buckets. These include cardboard tubing, sections of cardboard egg cartons, pieces of folded cardboard, PVC tubing, transparent plastic tubing, polystyrene discs and insulation foil (Hobbs and James 1999; Pestell and Petit 2007; P Robertson pers comm. 10 April 2014). In other instances natural materials consisting of strips of bark have been used (Pestell and Petit 2007). Polystyrene cups have also been used as shelters during pitfall trapping (Homan 2004; P Robertson pers. comm. 10 April 2014; Fauna Survey Group, FNCV unpubl.). Some refuges such as cardboard tubes and other cardboard materials have the disadvantage of absorbing moisture



**Fig. 1.** Eastern Pygmy Possum in polystyrene cup, Eumeralla, 2008. Photo Graeme Eames.



and promoting fungal growth in certain circumstances (Petit and Waudby 2012). Polystyrene cups, however, have the advantage of being waterproof and also provide good insulation.

During surveys at Eumeralla, 713 pitfall trap-nights were completed between 2004 and 2014 (RMIT University unpubl.; Homan unpubl.). Nine small mammals were captured in pitfall traps during these surveys, with six of these (66%) using polystyrene cups. Individuals found outside cups included a sub-adult Swamp Rat *Rattus lutreolus* and an adult Swamp Antechinus in separate buckets in October 2006 and a House Mouse in March 2012. The recording of an Eastern Pygmy Possum and a Swamp Antechinus in the same cup at Eumeralla in March 2014 was unexpected. Sharing of a cup by different species has been recorded by the author on only one other occasion. At WHNCR in 2002, a White-footed Dunnart and a House Mouse were found in the same polystyrene cup (Homan 2004). At WHNCR, 374 pitfall trap-nights were completed between 2007 and 2013, resulting in one mammal capture mentioned above. At Wuurak LFW property, 230 pitfall trap-nights were completed between 2004 and 2014. These produced two captures of Eastern Pygmy Possum, one found inside the cup (mentioned above) and one outside the cup (Homan 2012). Although no evidence such as scats or hairs were found, it is possible that all individuals found outside cups at dawn may have used the cups at some time during the night and vacated cups only when they heard investigators approaching pitfall buckets.

Other studies have involved the provision of various types of shelters including polystyrene cups in pitfall traps. During surveys in far East Gippsland an adult Eastern Pygmy Possum (September 2003) and an adult female Dusky Antechinus *Antechinus swainsonii* (September 2006) used polystyrene cups that had been provided in pitfall buckets (FNCV unpubl.). Pestell and Petit (2007) completed 2606 pitfall trap-nights at Innes National Park in South Australia, resulting in 78 captures of Western Pygmy Possum *Cercartetus concinnus*. Whilst polystyrene cups were not used during that study, 39 individuals (50%) used the shelters provided which included natural and artificial materials.

During the studies at Eumeralla, WHNCR and Wuurak external covers were placed over pitfall buckets each night and also when it rained during the day. A layer of vegetation was placed in the bottom of each pitfall trap and traps were checked at dawn, midday and late afternoon. No trap-deaths occurred during these surveys, possibly due to the welfare measures used. Whilst these studies produced relatively few records of mammals captured in pitfall traps, they nevertheless provide further evidence that polystyrene cups can provide ideal refuges for small mammals captured during pitfall trapping.

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