

# Flute-nosed bat

## *Murina florium*

Vulnerable (*Nature Conservation Act 1992*) | Ecological Sciences, Queensland Herbarium

### Identification

*Murina florium* is readily identifiable by distinctive tubular nostrils which diverge sideways from the point of the muzzle. The fur is long and woolly, rufous brown or dark grey-brown, and extends over the tail membrane, feet and forearms. The wing membranes are attached to the outer toes and the thumbs are unusually long for a micro-bat (Churchill 2008; Schulz et al. 2008). Weight 5-11 g; forearm length 32-36 mm (Churchill 2008).

### Echolocation call

*Kerivoula papuensis* emits a low intensity, short duration (< 3 milliseconds), steep linear echolocation call, from *Murina florium* emits a low intensity, steep linear call of short duration (< 4 ms) dropping from 120 kHz to < 60 kHz (Schulz et al. 2008; Churchill 2008).

### Distribution

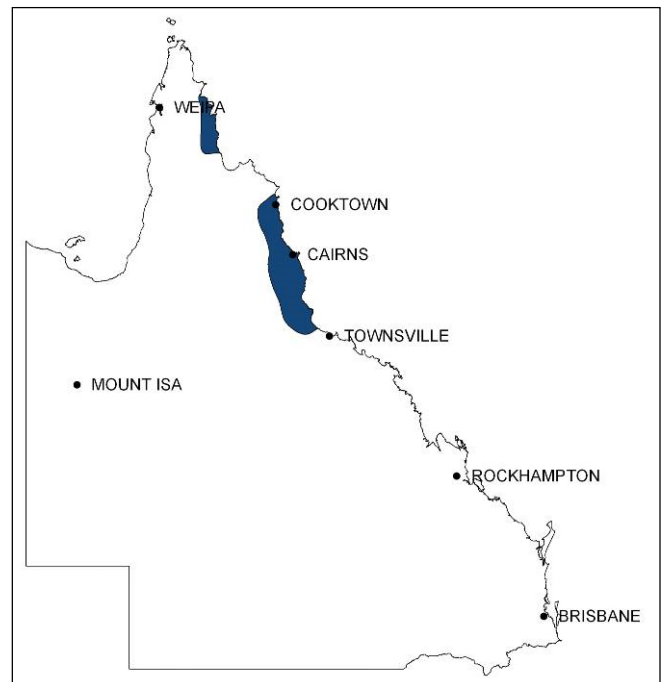
This species occurs in Wet Tropics region of north-east Queensland from the Paluma Range to Shiptons Flat at elevations from near sea level to 1200 m. It is also known from an isolated record at Iron Range on Cape York Peninsula (Clague et al. 1999; Kutt and Schulz 2000). The southern and northern distribution limits of *M. florium* are not well known, and its range may continue to expand with increased survey work in the Wet Tropics region (Duncan et al. 1999).

### Habitat: roosting and foraging

This species uses a variety of short-lived roosts including the hanging nests of yellow-throated scrub wren *Sericornis citreogularis* and fern wren *Oreoscopus gutturalis*, vertically suspended clusters of dead leaves, and epiphytic fern fronds (Schulz and Hannah 1998).



Photo by Michael Matheson



*Murina florum* roost predominantly as single individuals and appear to exhibit low roost fidelity (Schulz and Hannah 1998), perhaps due to the temporary nature of the roosts. Roosts occur 1.5-8 m above the ground in the rainforest understorey (Schulz and Hannah 1998).

*Murina florum* is found in upland and lowland tropical rainforest, including microphyll fern-vine, notophyll vine, and mesophyll forests. The species also occurs in gallery forest and wet sclerophyll forests dominated by flooded gum *Eucalyptus grandis* with or without rainforest understorey (Clague et al. 1999; Kutt and Schulz 2000). *Murina florum* forages in the canopy and sub-canopy of the rainforest and in the ecotone between rainforest and wet sclerophyll forest (Duncan et al. 1999). *Murina florum* has a slow, fluttery flight and is capable of hovering. It has also been observed emitting a loud, long, audible high-pitched whistle similar to the call made by eastern tube-nosed bat *Nyctimene robinsoni* (Schulz and Hannah 1996).

## Seasonal and timing considerations

In the wet tropics, the majority of bat surveys are conducted in the dry season, usually during the winter months. However, capture rates of *M. florum* may decrease substantially in the winter (Schulz and Hannah 1998). Clague (2012) reports that this species is most often caught during adverse (wet) weather when it forages in the sub-canopy and understorey. Bat activity has also been shown to decrease with decreasing temperature elsewhere (for example Richards 1989). Thus, surveys carried out during the winter months would have a lower probability of capturing *M. florum* and require a greater trapping effort (Schulz and Hannah 1998).

Capture rates are also lower in harp traps which were rain affected (when water droplets cling to the strings as a result of rainfall or canopy throughfall) as well as those with an accumulation of spider web filaments (M. Schulz pers. comm. 2012), as the traps become more obvious. Particularly to species which are able to resolve fine details against background clutter (Berry et al. 2004; Francis 1989), such as to *M. florum*. This stresses the importance of sampling during fair weather when possible, and survey periods should be extended if sampling is affected by wet weather conditions.

## Recommended survey approach

*Murina florum* is best surveyed using capture techniques. The echolocation calls of this species are rarely recorded acoustically, as they are of high frequency, low intensity calls and short duration. Although *M. florum* produces a distinctive audible call, a long drawn-out high-pitched whistle, which can be used to survey the species (Schulz and Hannah 1998; Kutt and Schulz 2000), it is known by only a few people. To date, no recordings have been made of this call and until recordings become available capture techniques will remain the best approach for targeting this species.

Both harp traps and monofilament mist nets have been useful in catching this species in the past (Schulz and Hannah 1996), but harp traps are far more successful. *Murina florum* was not discovered until the advent and increasing use of the harp trap in Australia in the early 1980s (Richards et al. 1982; Churchill 1998). Multibank harp traps (3-5 banks) may also be better than standard two bank harp traps, as highly manoeuvrable species accustomed to flight through dense vegetation can escape easily from the standard traps (Reardon et al. 2010).

## Capture techniques

Harp traps should be placed in rainforest, vine, mesophyll, gallery, and wet sclerophyll forests, and in the ecotone between rainforest and wet sclerophyll where available in the project area. *Murina florum* has been successfully captured in harp traps set over water, along forestry and walking tracks, and in the midst of vine tangles with mini harp traps (Schulz and Hannah 1996; Schulz and Hannah 1998). Over 80% of all captures

occur when a trap was left in situ for two or more consecutive nights (Schulz and Hannah 1998), and captures are predominantly single individuals (Schulz and Hannah 1996; Schulz and Hannah 1998).

## Survey effort guide

Trapping success is variable, depending on site selection and season. Schulz and Hannah (1998) reported a capture rate of 0.13 individuals per trap night (13 individuals/100 harp trap-nights) at Mt Baldy State Forest. However, a previous study at the same location reported a capture rate of only 3.5 individuals/100 harp trap-nights (Schulz and Hannah 1996). The recommended level of effort below may provide a reasonable opportunity to capture *M. florium* in habitat appropriate for the species in the survey area.

Per 100 ha of project area		
Survey technique	Minimum Effort	Minimum number of nights
Harp traps	10 trap nights	2 consecutive nights per trap
e.g. 5 traps set for 2 nights each or 2 traps set for 5 nights each, and so on.		

## Ethical and handling considerations

- Care should be taken when surveying bats during the breeding season (possibly October to November for *M. florium*; Churchill 2008), and survey methods should not include those which would cause distress resulting in the abandonment or dislodgement of young.
- Allow sufficient time to ensure the final check and closure of all traps occurs before early dawn.
- Harp traps must be checked at least twice during the night where lactating females are present, during adverse conditions (very cold or wet) or where predatory animals (e.g. *Antechinus* spp.) are common.
- Place bats into a dry calico bag, one bat to a bag, keep bags off the ground; otherwise quickly process in situ and let go straight away.
- Release bats close to their point of capture while it is dark. If a bat has entered torpor give it time to warm up before release.
- Care should be taken when working around or handling microbats due to zoonotic diseases, such as Australian bat lyssavirus (for further information see the [www.health.qld.gov.au](http://www.health.qld.gov.au)). Only fully vaccinated personnel are to handle bats.

## Acknowledgements

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## Citation

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## Key references

- Berry, N., O'Connor, W., Holderied, M. W., and Jones, G. (2004). Detection and avoidance of harp traps by echolocating bats. *Acta Chiropterologica* 6, 335-346.
- Churchill, S. K. (1998). 'Australian Bats'. New Holland Publishers: Sydney.
- Churchill, S. K. (2008). Australian Bats. Allen and Unwin: Sydney.
- Clague, C. (2012). Flute-nosed insectivorous bat, *Murina florium*. In 'Queensland's Threatened Animals' (Eds L. Curtis and A. J. Dennis) pp.384-385. CSIRO Publishing: Collingwood.
- Clague, C. I., Coles, R. B., Whybird, O. J., Spencer, H. J. and Flemons, P. (1999). The occurrence and distribution of the tube-nosed insectivorous bat (*Murina florium*) in Australia. *Proceedings of the Linnean Society of New South Wales* 121, 175-191.
- Duncan, A., Baker, G. B., and Montgomery, N. (1999). 'The Action Plan for Australian Bats'. Environment Australia: Canberra.
- Fischer, J., Scott, J., Law, B. S., Adams, M. A., Forrester, R. I. (2009). Designing effective habitat studies: quantifying multiple sources of variability in bat activity. *Acta Chiropterologica* 11(1), 127-137.
- Francis, C. M. (1989). A comparison of mist nets and two designs of harp traps for capturing bats. *Journal of Mammalogy* 70(4), 865-870.
- Kutt, A., and Schulz, M. (2000). Distribution and habitat of the flute-nosed bat *Murina florium* (Chiroptera: Vespertilionidae) in the wet tropics of north-eastern Queensland. *Australian Zoologist* 31(3), 458-468.
- Reardon, T. R., Robson, S. K. A., Parsons, J. G., Inkster, T. (2010). 'Review of the threatened status of microchiropteran species on Cape York Peninsula'. South Australian Museum: Adelaide. James Cook University: Townsville.
- Richards, G. C., Hall, L. S., Helman, P. M. and Churchill, S. (1982). First discovery of the rare tube-nosed insectivorous bat (*Murina*) in Australia. *Australian Mammalogy* 5, 149–151.
- Richards, G. C. (1989). Nocturnal activity of insectivorous bats relative to temperature and prey availability in tropical Queensland. *Australian Wildlife Research* 16, 151-158.
- Schulz, M. and Hannah, D. (1998). Relative abundance, diet and roost selection of the tube-nosed insect bat, *Murina florium*, on the Atherton Tablelands, Australia. *Wildlife Research* 25, 261-271.
- Schulz, M. and Hannah, D. (1996). Notes on the tube-nose insect bat, *Murina florium* (Chiroptera, Vespertilionidae) from the Atherton Tableland, north-eastern Queensland, Australia. *Mammalia* 60(2), 312-316.
- Schulz, M., Richards, G. C., Coles, R. B, Spencer, H. J., and Kutt, A. S. (2008). Flute-nosed bat *Murina florium*. In 'The Mammals of Australia' (Eds S. Van Dyck and R. Strahan) pp. 514-515. Reed New Holland: Sydney.