

# Fawn leaf-nosed bat

## *Hipposideros cervinus*

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

### Identification

*Hipposideros cervinus* has a small nose-leaf with two well-developed secondary leaflets projecting from the side. The lower portion of nose-leaf is wider than upper (see Churchill 2008 for diagrams). Ears are broad and triangular and fur colour varies from grey to grey-brown to orange. Weight 6-9g; forearm length 45-47 mm (Churchill 2008).

### Echolocation call

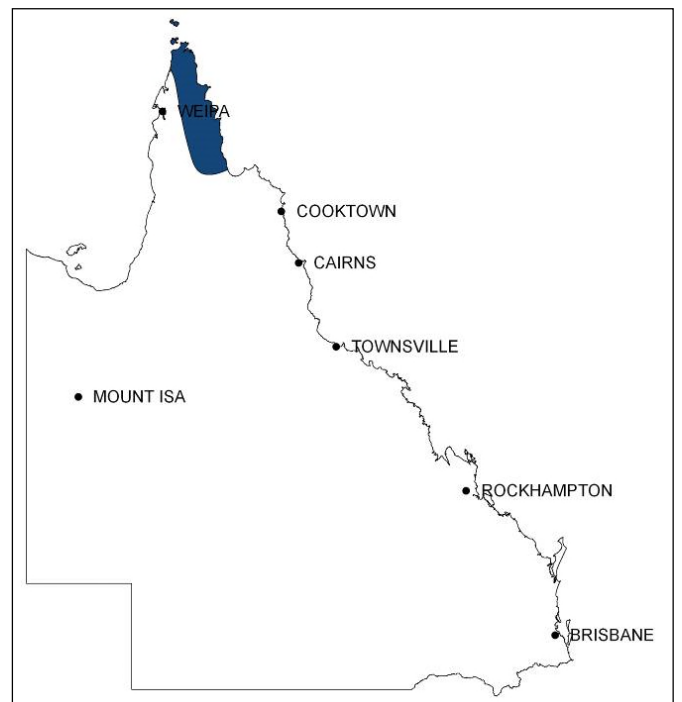
Echolocation calls are of constant frequency between 144-145 kHz, terminating in a downward FM sweep of 20 kHz (Pavey and Burwell 2008). Although the echolocation call of *H. cervinus* is distinct for this species, high frequencies attenuate more rapidly in the atmosphere making them difficult to detect unless the bat is very close to the microphone.

### Distribution

In Australia, *H. cervinus* is found on Cape York Peninsula, north of Coen, and in the islands of the Torres Strait. Although recorded from only a small number of locations in Australia, it is locally common at those localities with colonies of up to 900 bats (Pavey and Burwell 2008). The extralimital distribution ranges through Peninsular Malaysia, Indonesia, Philippines, Papua New Guinea, the Solomon Islands, and Vanuatu (Csorba et al. 2008).

### Habitat: roosting and foraging

There is little published information regarding the foraging and roosting ecology of this species within Australia. However, *H. cervinus* has been reported roosting in the small passages or avons of caves and disused mines with a warm (~ 26°C) humid (~ 94%) microclimate (Churchill 2008), often in association with



Eastern horseshoe-bat *Rhinolophus megaphyllus* and less frequently with diadem leaf-nosed bat *Hipposideros diadema* (Churchill 2008; Pavey and Burwell 2008). Individuals are also occasionally found roosting in buildings (Churchill 2008). Although Australia's entire population of *H. cervinus* is centred upon the rainforest regions of Northern Cape York Peninsula, it is also known to forage along creeks and into woodland near rainforest (Reardon et al. 2010). When foraging, flight is slow and fluttery, close to vegetation (<0.5 m), below the canopy to within one meter above ground. Flight is fast and direct when commuting (Churchill 2008; Pavey and Burwell 2008).

## Seasonal and timing considerations

There is no published information which suggests a suitable time of year to conduct surveys of this species. However, sampling is best conducted on warm, calm, dry nights within the survey period whenever possible (Fischer et al. 2009).

## Recommended survey approach

A combination of the following survey techniques is recommended for this species:

### Acoustic detection: passive monitoring

Although the echolocation calls of free flying *H. cervinus* are difficult to record (Reardon et al. 2010), calls are readily identifiable, enabling even short call sequences with few pulses to be successfully identified. If using an Anabat, the sensitivity must be set as high as possible (> 9). Spurious noise from insects and so on can be removed from calls in AnalookW later using a filter. Other types of bat detector with a higher frequency response may be more successful in detecting this species. Bat detectors can be placed in potential flyways, particularly along watercourses. Detectors should be set up to record for the whole night at multiple locations for multiple nights.

### Acoustic detection: active monitoring

Walking transects with a bat detector and spotlight in the evening can be used increase coverage of the area and may be more successful than passive monitoring for the survey of this species. Many Hipposiderids have a curiosity for small light sources (e.g. headlamps) and may come within range of hand held detectors (DEWHA 2010). *Hipposideros cervinus* can be distinguished from other bat species in flight by their echolocation calls (if recorded) and appearance. Recorded calls will confirm observations of the species and allow independent verifications to be made. Walking transects can include potential flyways, gullies, gorges, scarps containing caves, creeks, mine entrances and pools of water. Transects should begin at dusk and continue for at least two hours duration, and GPS tracks of transects should be kept to quantify effort and highlight areas surveyed.

## Capture techniques

This species can be caught in mist-nets and harp traps, although Reardon et al. (2010) suggests that standard two bank harp traps are less efficient than multibank harp traps (3-5 banks with the bag carrier bar touching the outer string bank) as individuals are agile enough to escape standard trap bags. Harp traps and mist nets can be set adjacent to or over water, along creeks lined with riparian vegetation, gullies, and flyways through very closed vegetation. It is worthwhile taking the time to cover any vegetation gaps surrounding harp traps.

## Roost searches

Prior to the survey it is important to establish whether there are any caves and mines in the area of interest, and any known roosts. In addition, further searches of gorges, gullies, fissures, rocky outcrops, and cliff lines should also be conducted at the site for additional caves or mine audits and shafts, which may be potential roosts for this species. Several hours per day may be required to conduct ground-based surveys for caves and mines. The most prospective caves can then be monitored for the emergence of bats at dusk.

## Survey effort guide

There is currently no information on the capture rate or detection probability of this species. However, the recommended level of effort below may provide a reasonable opportunity to detect or capture *H. cervinus* (in habitat appropriate to the species) if it is present in the survey area.

Per 100 ha of project area		
Survey technique	Minimum Effort	Minimum number of nights
Passive monitoring	16 detector nights	4 nights
Active monitoring	8 detector hours	4 nights
Harp traps	8 trap nights	4 nights
Mist netting	8 mist net hours	4 nights
Roost searches	2 hours per survey day	

## Ethical and handling considerations

- Avoid entering roosts during the day.
- When entering or working at the entrance of roosts be as quiet as possible.
- The number of people entering a cave at any time should be kept to a minimum.
- Any damage to the bat roost, such as removing rubble blocking corridors or bark sheets from trees, is unacceptable, even if these activities would increase the effectiveness of the search.
- Care should be taken when surveying bats during the breeding season (possibly November to January for *H. cervinus*; Churchill 2008), and survey methods should not include those which would cause distress resulting in the abandonment or dislodgement of young during this time.
- Mist nets must only be used by trained and competent personnel.
- Nets must be monitored constantly and should be closed when not attended.
- To reduce the chance of catching birds, mist nets should be furled until dark, not left open.
- All bats should be removed as quickly and gently as possible from mist nets to reduce injury and stress.
- If more bats are being caught than can be safely dealt with, the net should be furled as soon as all bats are removed.

- Place bats into a dry calico bag, one bat to a bag, keep bags off the ground.
- 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

Churchill, S. K. (2008). Australian Bats. (Allen and Unwin: Sydney).

Csorba, G., Bumrungsri, S., Francis, C., Bates, P., Gumal, M., Hall, L. and Bonaccorso, F. (2008) *Hipposideros cervinus*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.4. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Accessed 11 May 2011.

DEWHA (2010). Survey Guidelines for Australia's Threatened Bats. (Department of the Environment, Water Heritage and the Arts, Commonwealth Government: Canberra).

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.

Pavey, C. R. and Burwell, C. J. (2008). Fawn leaf-nosed bat, *Hipposideros cervinus*. In: 'The mammals of Australia. Third Edition' (Eds. S. Van Dyck and R. Strahan) pp. 459-460. (Reed New Holland: Sydney).

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).