

# Northern leaf-nosed bat

## *Hipposideros stenotis*

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

### Identification

*Hipposideros stenotis* has a complex nose-leaf covering much of the face. This consists of two supplementary leaflets with a wart-like protuberance near the centre of the nose-leaf, a smaller wart occurs on the top edge of the upper leaflet. Box-like cavities occur in the upper posterior nose-leaf with another small secondary wart in the centre (Milne and Hall 2008; see Churchill 2008 for diagrams).

*Hipposideros stenotis* also has long sharply pointed ears which are haired for one-third of the length. Fur on the back is brown and slightly lighter on the belly (Milne and Hall 2008). Weight 5-7 g; forearm length 42-46 mm (Churchill 2008).

Similar in appearance to *Hipposideros semoni*, however distributions do not overlap. *Hipposideros semoni* is also larger (forearm length 42-50 mm) and has a larger wart-like projections on the nose-leaf (Churchill 2008).

### Echolocation call

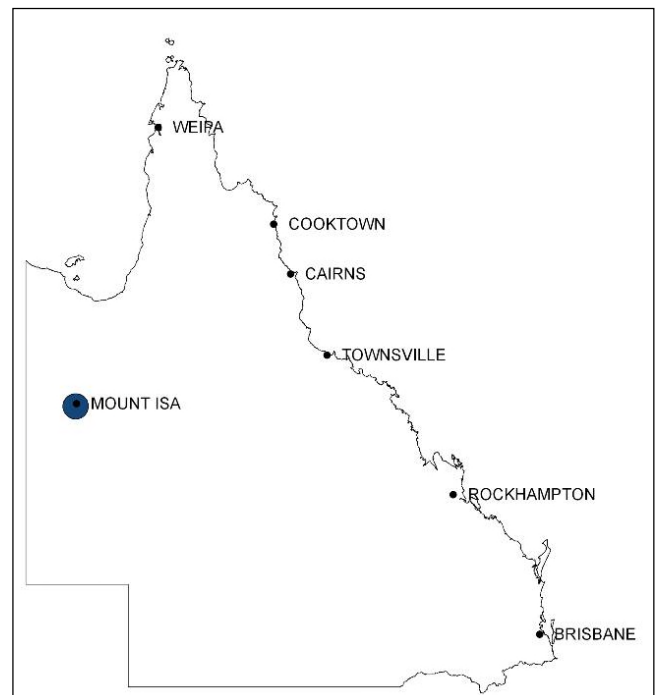
This species emits high (102-106 kHz) CF pulses of long duration (10-20 ms) and low intensity, terminating in a brief downward FM sweep (McKenzie et al. 1995; Milne 2002). The calls of *H. stenotis* are easily distinguished from all other microbats occurring within its range.

### Distribution

In Queensland, the only records of *Hipposideros stenotis* occur in the Mt Isa region (DSITIA 2012), and may be an outlying population as the next closest records for this species are in the Northern Territory (D. Milne pers. comm. 2011). The distribution of *H. stenotis* then continues across the Top End of the Northern Territory into the Kimberley of Western Australia (Duncan et al. 1999; Churchill 2008). Modelling suggests *H. stenotis* may be naturally rare, with small restricted and isolated populations across its range (Milne et al. 2006). It is endemic to Australia.



Photo by Bruce Thomson



## Habitat: roosting and foraging

There are few records of this species and it is thought to be genuinely rare. *Hipposideros stenotis* roosts in sandstone and limestone caves, boulder piles, and disused mines. Many roosts are small, shallow overhangs or splits in sandstone cliffs and can be easily overlooked. Roost microclimates are characterised by low humidity and bats roost close to the entrance (<50 m; Schulz and Menkhorst 1984; 1986). Individuals roost alone, in well separated pairs or in small (maternity) colonies of 6–12 bats (Schulz and Menkhorst 1984; 1986; Churchill 2008).

The northern leaf-nosed bat has been recorded in monsoon thickets, tall open forest, open eucalypt woodland (Darwin woollybutt *Eucalyptus miniata*, Darwin box *E. tectifica*, Darwin stringybark *E. tetradonta*, round-leaved bloodwood *E. latifolia* with grassland or shrubland understories), floodplains, open grassland, and spinifex hills (Duncan et al. 1999; Churchill 2008). In the Kimberley, it has been caught along creeks and pools fringed by stands of broad leaved paperbark *Melaleuca leucadendra*, silver tea-tree *M. argentea*, *Pandanus* spp. and rock fig *Ficus platypoda* (Duncan et al. 1999). *Hipposideros stenotis* is closely associated with steep hills, rocky outcrops and escarpments (Milne et al. 2006; Churchill 2008; Milne and Hall 2008). When foraging, flight is fluttery and characterised by frequent changes in direction, close to vegetation (Duncan et al. 1999; Churchill 2008).

## Seasonal and timing considerations

There is no published information which suggests the best 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:

### Acoustic detection: active monitoring

Walking transects with a bat detector and spotlight in the evening should also be used increase coverage of the area. Hipposiderids often have a curiosity for small light sources (e.g. headlamps) and may come within range of hand held detectors (DEWHA 2010). *Hipposideros stenotis* can be distinguished from other bat species based on its flight characteristics and echolocation call (when using bat detectors based on frequency division). Flight is also slow, fluttery and within one meter of the ground (McKenzie et al. 1996) or close to vegetation. Walking transects can be conducted along gullies, gorges, and scarps containing caves, along creeks, and around pools of water. 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. Recorded calls will confirm observations of the species and allow independent verification. 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

*Hipposideros stenotis* can also be surveyed using standard capture techniques. However, many *Hipposideros* species can easily escape from standard two bank harp traps, and the use of multibank harp traps (3-5 banks) with the bag carrier bar touching the outer string bank may be more successful (Reardon et al. 2010). Harp traps and mist nets can be set adjacent to or over water, along escarpments, creeks lined with riparian vegetation, flyways through very closed vegetation, and amongst boulder piles. It is worthwhile taking the time

to cover any vegetation gaps surrounding harp traps. This species has been successfully captured in harp traps set at waterholes and along creek lines (Lumsden et al. 2005).

## 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. These should be assessed for the presence of *H. stenotis*. Further searches for additional caves, rock fissures, gullies, boulder piles, and cliff lines should also be conducted at the site to find potential roosts of this species. Several hours per day may be required to conduct ground-based surveys for potential roosts.

## Survey effort guide

There is currently no information on capture rates or detection probabilities for this species. However, the recommended level of effort below may provide a reasonable opportunity to detect or capture *H. stenotis* (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
Active monitoring	16 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

Take care when surveying *H. stenotis* during the breeding season from October to February (Churchill 2008), as females are may be heavily pregnant, have young attached, and/or be nursing crèched young. Survey methods should not include those which would cause distress resulting in the abandonment or dislodgement of young during this time.

In warmer climates, small Hipposiderids are more prone to desiccation compared to other bat genera. Harps must be checked regularly (preferably 1-2 hours after dusk, around midnight and prior to dawn). Bats must not be kept any longer than one hour without specialist care (D. Milne pers. comm. 2011).

## Roost searches

- Avoid entering caves or mines known to be occupied by bats 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.

## Capture

- Allow sufficient time to check and close all traps occurs before early dawn and check traps regularly throughout the night (see Ethical and Handling Considerations).
- 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.
- Mist nets must only be used by trained and competent personnel.
- Do not use mist nets across the entrances of caves or mines unless there is prior knowledge of the number of bats within, and the number is not large.
- Nets must be monitored constantly. To reduce the chance of catching birds, mist nets should be furled until dark, not left open. Nets 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

These guidelines were prepared by Clare Hourigan in October 2011. Advice and comments on drafts for *Hipposideros stenotis* were provided by Sue Churchill and Damian Milne.

## Citation

Hourigan, C. 2011. Northern leaf-nosed bat, *Hipposideros stenotis*. Targeted species survey guidelines. Queensland Herbarium, Department of Environment and Science, Brisbane.

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