

**Upper Lockyer Valley  
Nocturnal Mammal Survey  
November 2014 – April 2015**



**Rod Hobson  
April 2015**

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Cover: White-striped Free-tailed Bat  
*Austronomus australis*. This is a common  
bat of south-east Queensland, being found  
throughout most of Australia except for  
Tasmania and the far north of the  
mainland. Unlike other microchiropteran  
bats the call of this species is distinctly  
audible. (Photo: Bruce Thomson)

## **Acknowledgements**

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# UPPER LOCKYER VALLEY NOCTURNAL MAMMAL SURVEY

November 2014 – April 2015

## 1: Introduction

The Citizens of the Lockyer Association (COL) commenced a programme in October 2011 to document the fauna of the Upper Lockyer Valley centred on the catchments of Stockyard and Flagstone Creeks (see map Appendix 1). Initially the target species were vertebrate fauna but since then it has been decided to include invertebrate fauna as well. The total number of both vertebrate and invertebrate species tallied to date (April 2015) now stands at 901 species (304 x vertebrates; 597 x invertebrates). Whereas the invertebrate fauna of the survey area is still relatively unknown except for a few of the more popular orders and families (Hobson 2015) it can be said with a certain degree of confidence that the vertebrate fauna of this area is now quite well understood.

On a recent review of the vertebrate checklist for the area, however one anomaly did become apparent. The list contained few of the nocturnal mammal fauna known or suspected to exist within the survey boundaries. This was not unexpected, as these animals are usually poorly represented on fauna data bases in general. These creatures, being nocturnal and in many cases shy and retiring species are hard to survey. Some species, particularly the microchiropteran (insectivorous) bats are extremely difficult to survey and need the services of professional researchers using specialised scientific equipment if such is to be attempted.

This report covers a recent nocturnal mammal survey conducted from November 2014 until April 2015 instigated by the COL under a grant from the Lockyer Valley Regional Council (LVRC) during which microchiropteran bats were the primary target. As it was decided to concentrate on these animals in this survey, a specialist in the field Dr. Bruce Thomson was enlisted to conduct this facet of the survey. Dr. Thomson is a highly respected researcher and published author on Australia's microchiropteran bats. During the survey seven species of bat were recorded to species level at six different sites, which brought the total number of bat species recorded in the survey area to 13 species i.e. 3 x megachiroptera (flying-foxes) and 10 x microchiroptera (insectivorous bats). This is a very respectable tally for the area but more species can be expected to be recorded when further survey work occurs and some confusing species already recorded are eventually separated out to specific level.

## 2: Methodology

Incidental fauna survey work was carried out by the author at selected sites and dates over the period as opportunity and weather conditions presented. Sites were selected based on the author's previous field experience of many years in the survey area. A hand held spotlight and Leica Ultravid 10 x 42 HD binoculars were used for this work. Ten nights of between two to four hours each were devoted to this work of which eight of the nights produced a result i.e. an average of 30 man-hour's structured spotlight survey for the period. This does not include other records gathered such as inspection of road-kills, incidental encounters

whilst driving etc. Nor does it include time devoted to a literature search of the author's databases for nocturnal mammals recorded from outside of the period of the survey.

The incidental fauna records were also greatly enhanced by local landowners and members of the public who forwarded observations, photographs and specimens for the survey. These persons are acknowledged at the beginning of this document.

The microchiropteran bat survey was carried out by Dr. Bruce Thomson using an acoustic sound recording device and associated software manufactured by Binary Acoustic Technology centred in Tucson, Arizona. Microchiropteran bats use pulses of sound (echolocation) in conjunction with eyesight to navigate and forage. Evolutionary history and differing ecological requirements means that echolocation calls between species tend to vary. These differences can, therefore be used to separate and identify bat species. Unlike the calls of other wildlife in general microchiropteran calls are discrete pulses of sound containing very pure tones that have time-frequency and time-amplitude components. The Binary Acoustic Technology system provides full spectrum calls as full sound files (.wav) with all acoustic information normally recorded in standard sound analysis. It is considered that in some instances, calls can be more reliably identified using full spectrum recordings than the sub-crossing readouts provided by other systems that only deliver a readout of frequency against time (no amplitude or harmonics).

In almost all microchiropteran species calls are in excess of 20 kHz, well above the hearing range of humans. Several brands of acoustic recording devices have been invented in recent years that have the capacity to record microbat calls and software developed to assist in the interpretation of these data. Whilst these systems do not always allow a positive identification of every species recorded in a given area at any one time they do go a considerable way towards identifying individual species of a hitherto very difficult group of mammals to survey. Positive results often depend on the quality and comprehensiveness of the library of reference calls held in the software and applicable to the bats of the region for comparative interpretations and analyses by the researcher.

### **3: Results**

Hereunder are the entirety of records of the nocturnal fauna for the survey area for the period April 2008 until the time of writing (April 2015).

#### **3.1: Microchiropteran Survey Records**

Acoustic surveys were carried out on the 6 and 7 March and 11 April by Dr. Bruce Thomson. Over the sampling period 6-7 March 459 calls were recorded and identified. The second period (11 April) was considerably cooler with only 12 calls recorded. This represented a positive identification to species level of three bat species. A fourth call series identified one known but as yet undescribed broad-nosed bat *Scotorepens* sp. A fifth series of calls from a long-eared bat *Nyctophilus* sp., that might well represent either one or two individual species was also recorded. In addition a call series was collected that represented either one or more bats of the genus *Vespadelus* but, unfortunately, the call reference library for this genus is not

yet adequate for this area and differentiation between species here is not possible at present. The following species groups were identified:

- **Little Bent-winged Bat *Miniopterus australis*** — calls with characteristic frequency in the range of 59-60 kHz. (Plate 2)
- **Ride's Free-tailed Bat *Ozimops ridei*** — calls with highly variable slope with characteristic frequency in the region of 30 kHz. (Plate 3). Please note that the taxonomy for this genus and species follows Reardon et al (2014).
- **Lesser Long-eared Bat/Gould's Long-eared Bat *Nyctophilus geoffroyi/gouldii*** — steeply sloping calls that sweep across a broad range of frequencies. These calls were a little lower than might have been expected for *Nyctophilus*, however there are no other species with similar calls in the region apart from *Myotis macropus* that is normally recorded over water. (Plate 4)
- **Central-eastern Broad-nosed Bat *Scotorepens* sp.** — with calls that have a characteristic frequency of approximately 50 kHz and often steeply sloping. This was one of the most common calls recorded during the survey. (Plate 5)
- **White-striped Free-tailed Bat *Austronomus australis*** — low frequency calls in the region of 10 to 14 kHz. Audible to human ear. (Plates 6, 7)
- **Eastern Cave Bat/Little Forest Bat *Vespadelus troughtoni/vulturinus*** — short calls with characteristic frequency around 50 kHz. Other *Vespadelus* spp. are normally lower in frequency than these, however more reference calls are required for the area in order to be certain of this species identification. (Plate 8)

Location details and dates, as well as species recorded for the microchiropteran survey are:

**06.03.15:**

**Site 1: Darvall property, Priors Road, Rockmount** at GDA94 — S27.694629 x E152.026218: +/- 3metres:

Little Bent-winged Bat *Miniopterus australis*

Eastern Cave Bat/Little Forest Bat *Vespadelus troughtoni/vulturinus*

\*Central-eastern Broad-nosed Bat *Scotorepens* sp.

**Site 2: Darvall property, Priors Road, Rockmount** at GDA94 — S27.694629 x E152.026218: +/- 200 metres:

Lesser Long-eared Bat/Gould's Long-eared Bat *Nyctophilus geoffroyi/gouldii*

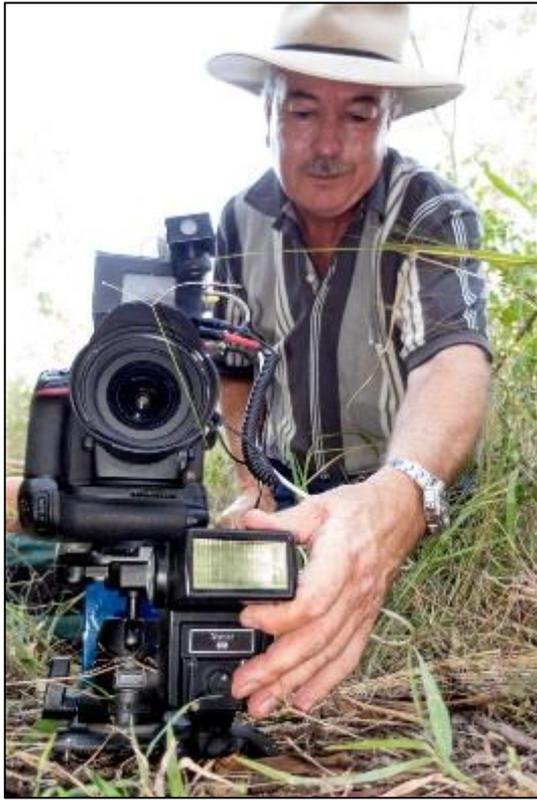
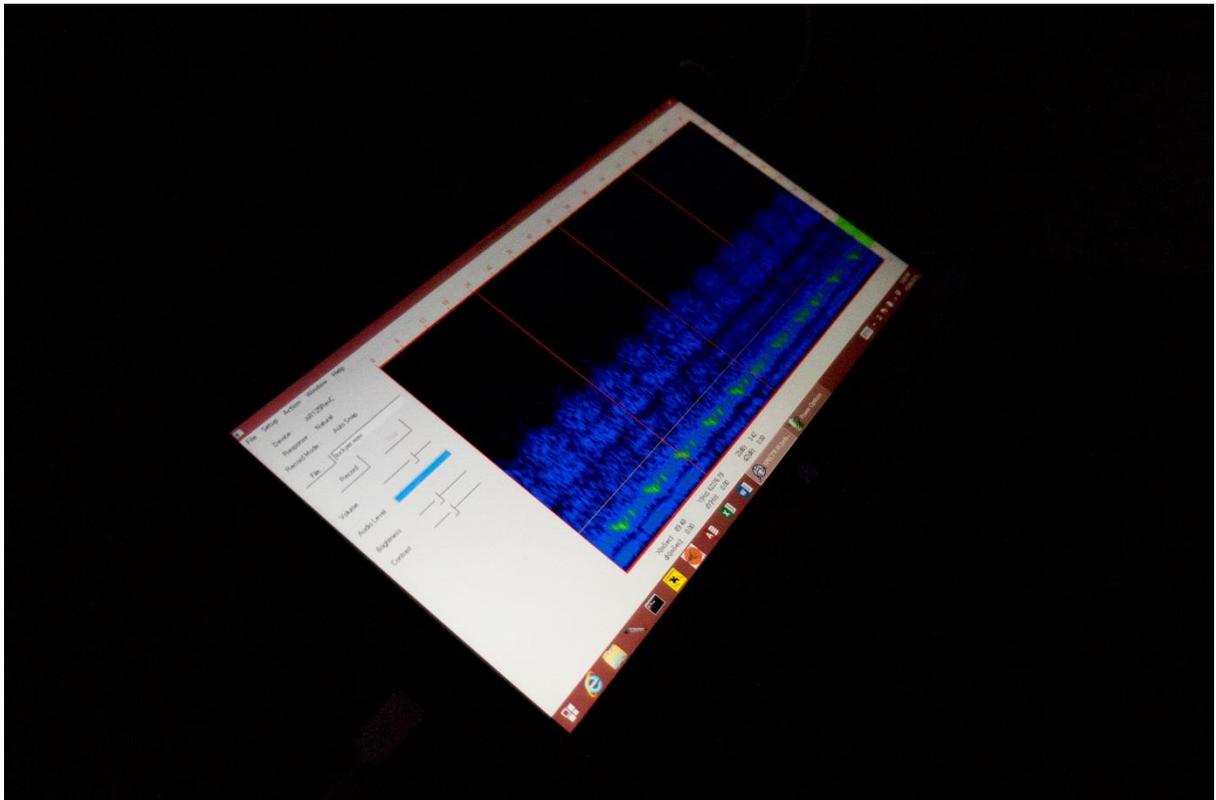


Plate 1. Bruce Thomson (above, left) setting up camera trap, Gorman's Gap, 11 April 2015. Bruce with bat detector (above, right), Sawpit Gully, 11 April 2015. Call sequence display generated by Binary Acoustic Technology's bat detector (below). Photos Robert Ashdown.



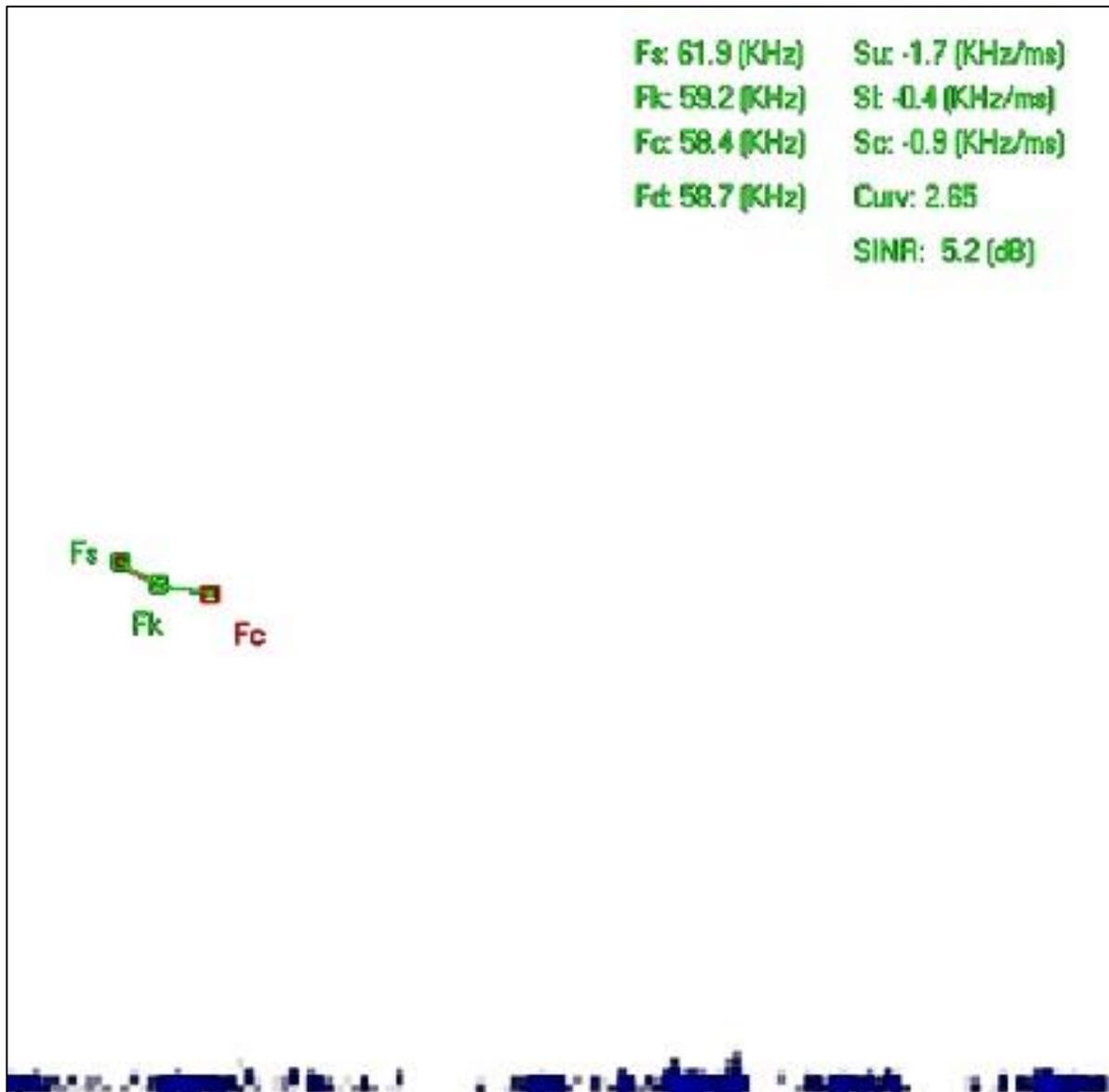


Plate 2. Call sequence of Little Bent-winged Bat *Miniopterus australis*, Site 1, Darvall property, Priors Road, Rockmount, 6 March 2015.

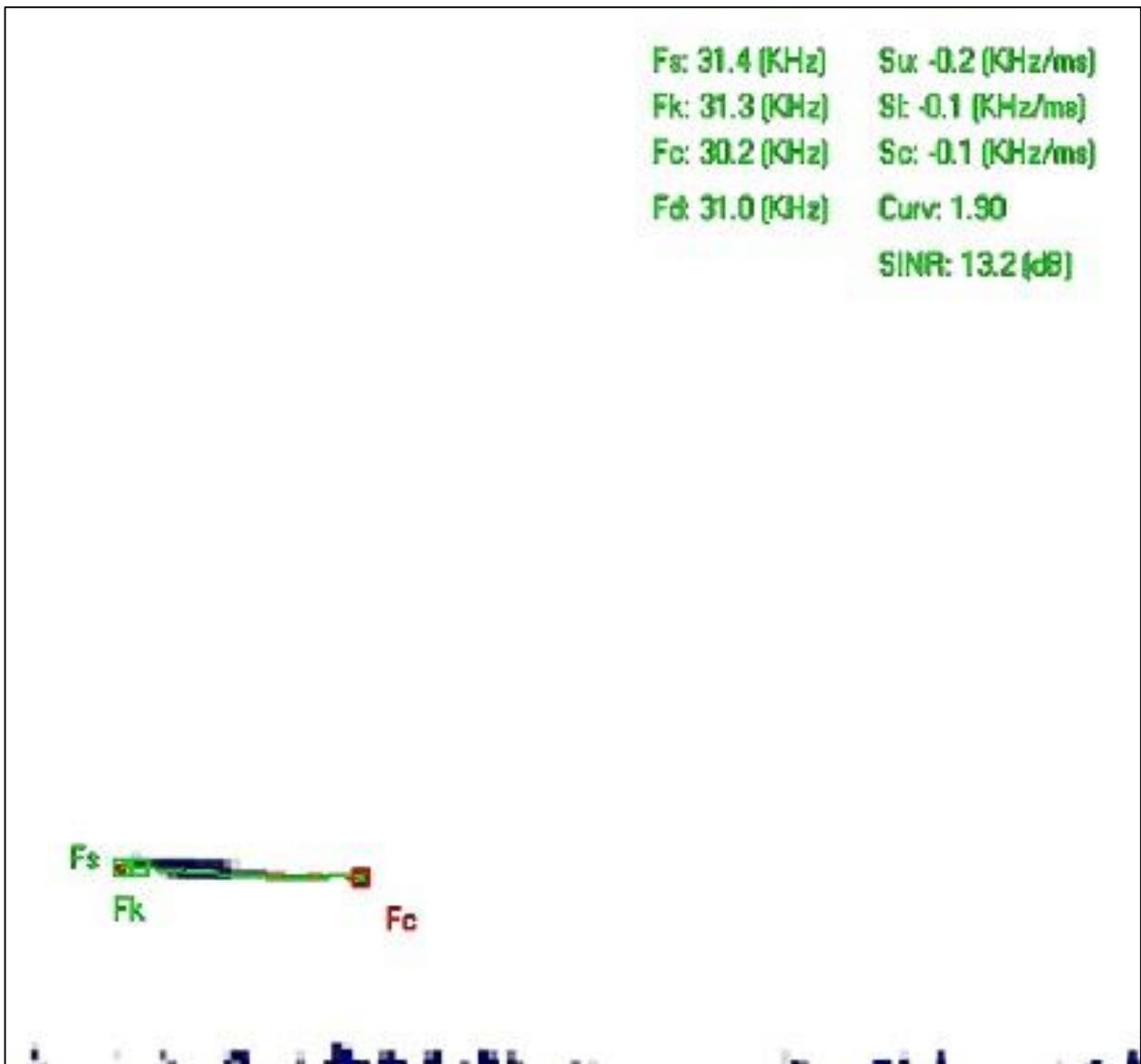


Plate 3. Call sequence of Ride's Free-tailed Bat *Ozimops ridei*, Site 3, Smith property, 1 Kennedys Road, Stockyard, 11 March 2015.

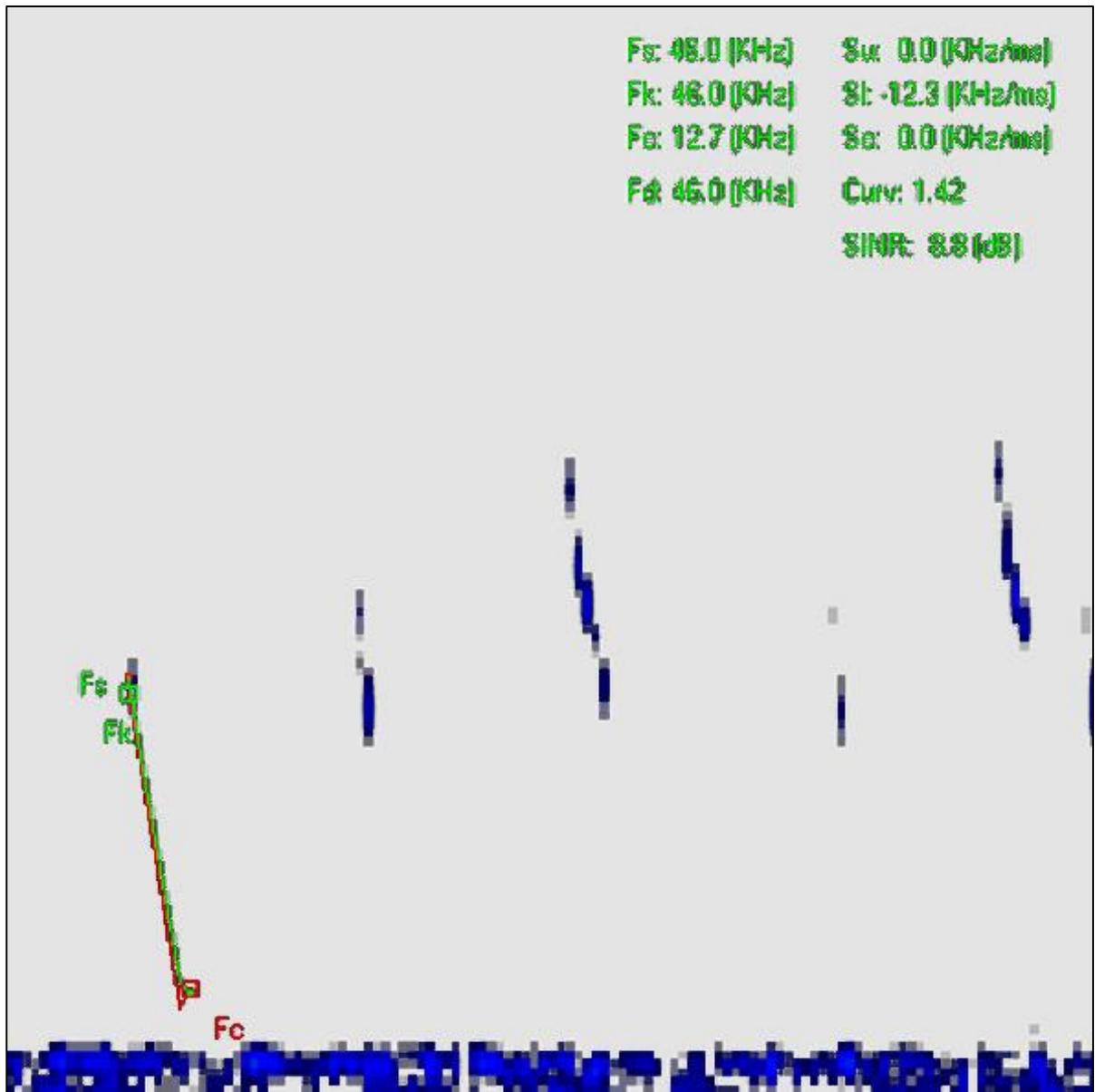


Plate 4. Call sequence of Lesser Long-eared Bat/Gould's Long-eared Bat *Nyctophilus geoffroyi/gouldii*, Site 2, Darvall property, Priors Road, Rockmount, 6 March 2015.

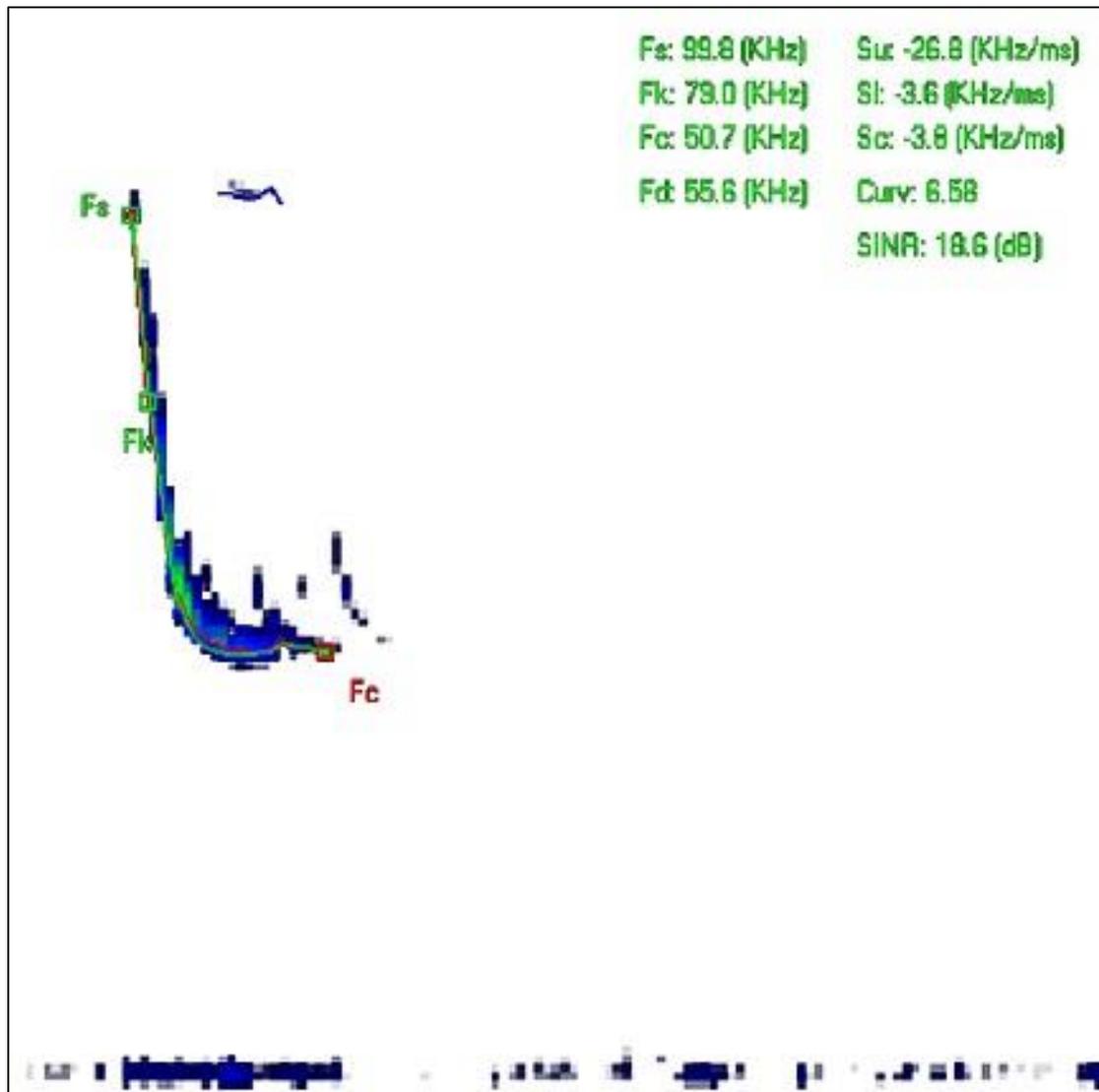
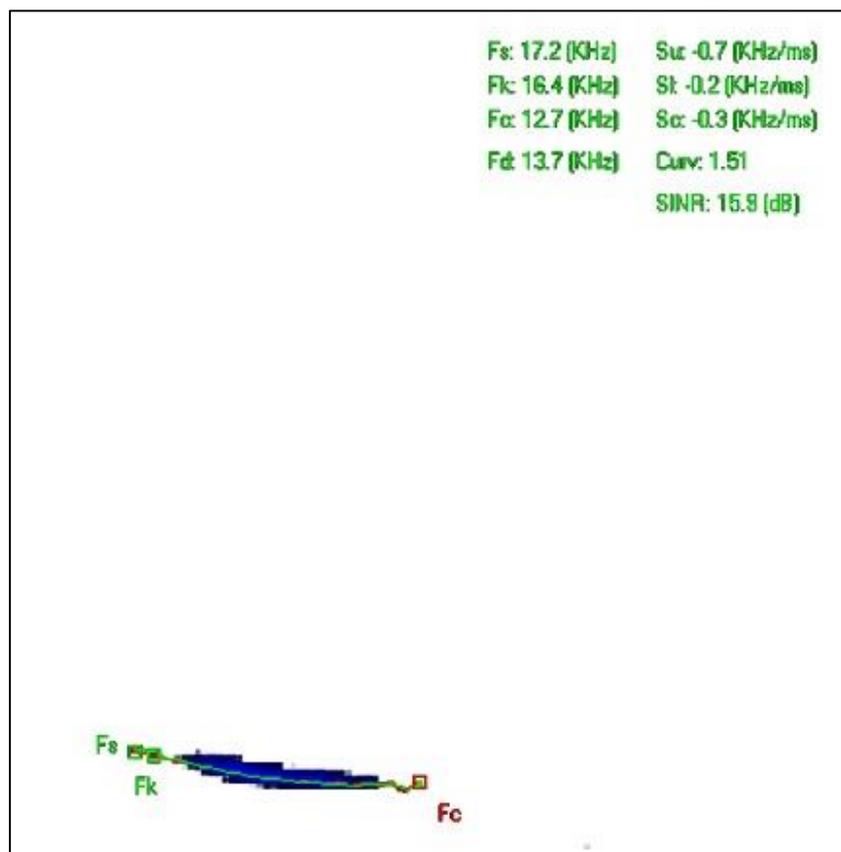
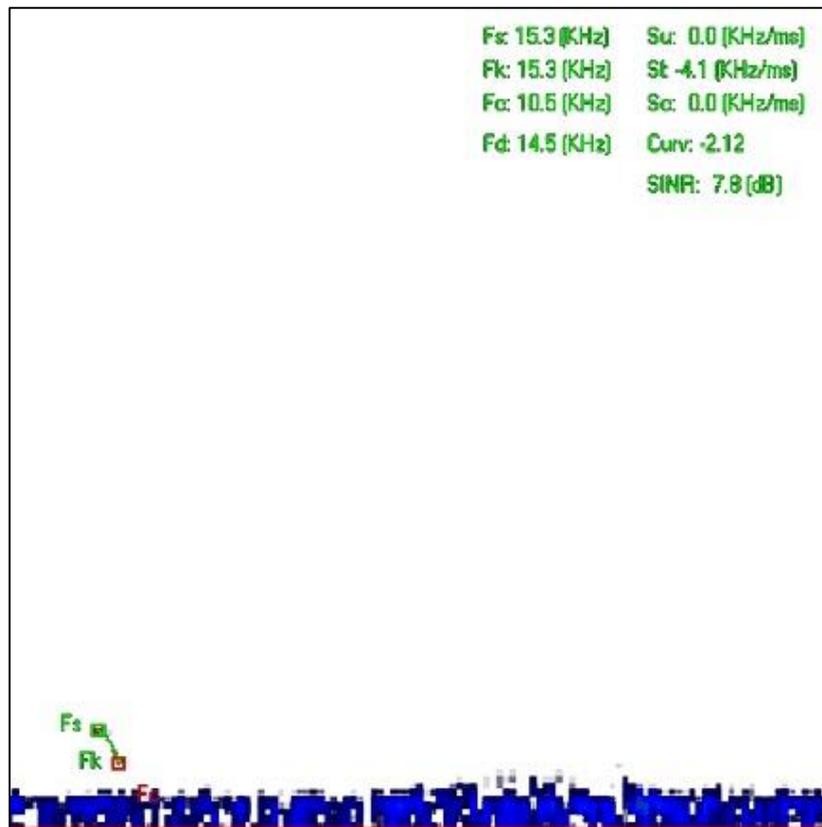


Plate 5. Call sequence of Central-eastern Broad-nosed Bat *Scotorepens* sp., Site 1, Darvall property, Priors Road, Rockmount, 6 March 2015.



Plates 6 and 7. Call sequences of White-striped Free-tailed Bat *Austronomus australis*, Site 4, Walton property, Sawpit Gully Road, Rockmount, 11 April 2015.

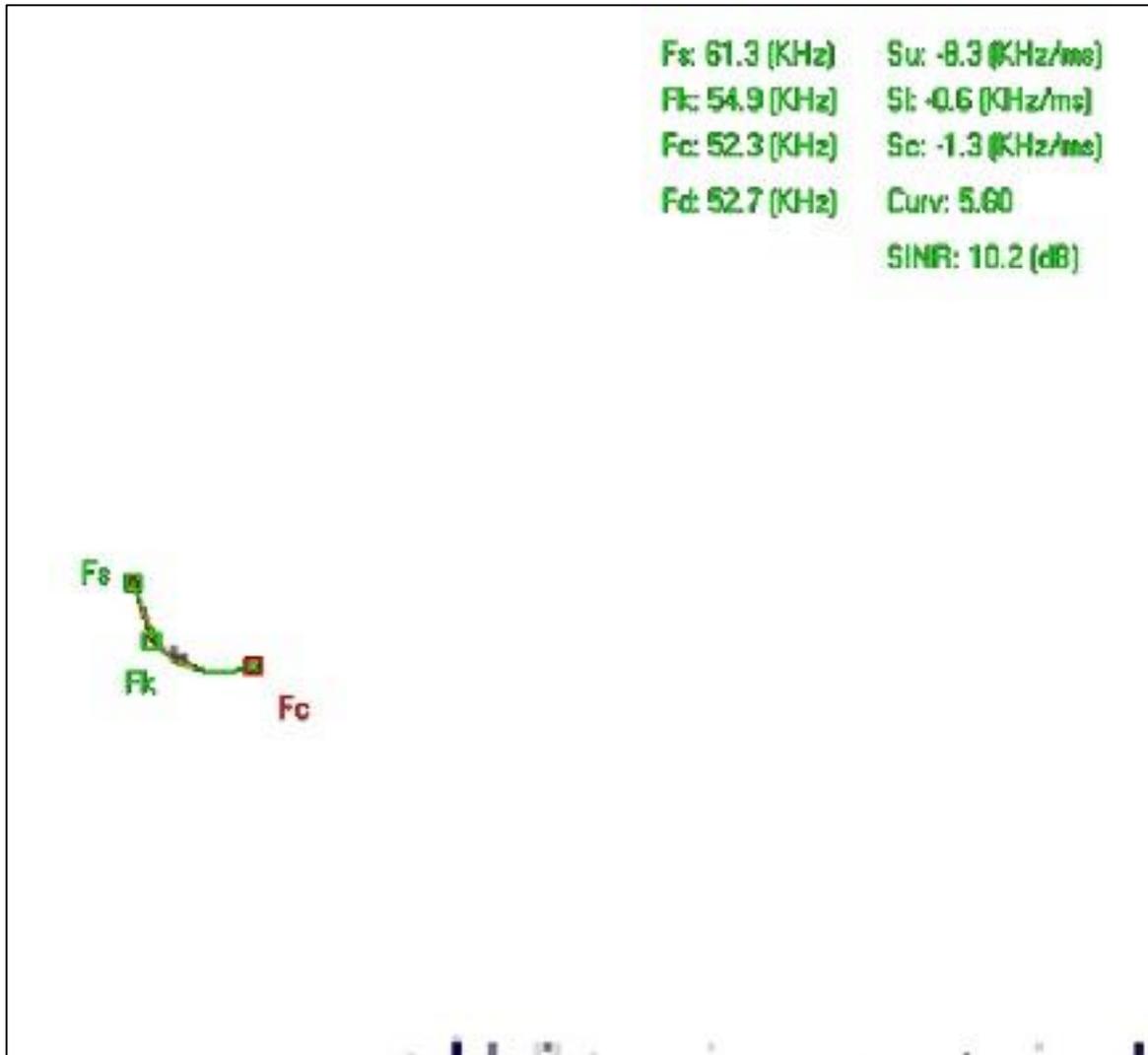


Plate 8. Call sequence of Eastern Cave Bat/Little Forest Bat *Vespadelus troughtoni/vulturnus*. Site 1, Darvall property, Priors Road, Rockmount, 6 March 2015.

**07.03.15:**

**Site 3: Smith property, 1 Kennedys Road, Stockyard** at GDA94 — S27.63010 x E152.065730: +/- 100 metres:

\*\*Ride's Free-tailed Bat *Ozimops ridei*

**11.04.15:**

**Site 4: Walton property, Sawpit Gully Road, Rockmount** at GDA94 — S27.692150 x E152.057061: +/- 200 metres:

White-striped Free-tailed Bat *Austronomus australis*

\*a recognised but undescribed species

\*\* colony of Ride's Free-tailed Bat in ceiling of private residence

**3.2: Incidental Records**

Location details and dates, as well as species recorded for the incidental component of the nocturnal mammal survey are:

**23.12.15:**

**102 Preston Boundary Rd., Preston** at GDA94 — S27.63711 x E151.94920; +/- 100 metres:

1 x Koala *Phascolarctos cinereus*

**21.01.15:**

**Kennedys Road, Rockmount** at GDA94 — S27.66905 x E152.07344; +/- 5 metres:

1 x Sugar Glider *Petaurus breviceps* (remains)

**“The Barn”, 1709 Flagstone Creek Rd., Upper Flagstone** at GDA94 — S27.62276 x E152.03346; +/- 25 metres:

1 x Grey-headed Flying-fox *Pteropus poliocephalus* (dead)

**01.02.15:**

**Hell Hole Gully Track, Glen Lomond Park, Hell Hole** at GDA94 — S27.62127 x E151.97775; +/- 500 metres:

1 x Squirrel Glider *Petaurus norfolkensis*

3 x Common Brushtail Possum *Trichosurus vulpecula*

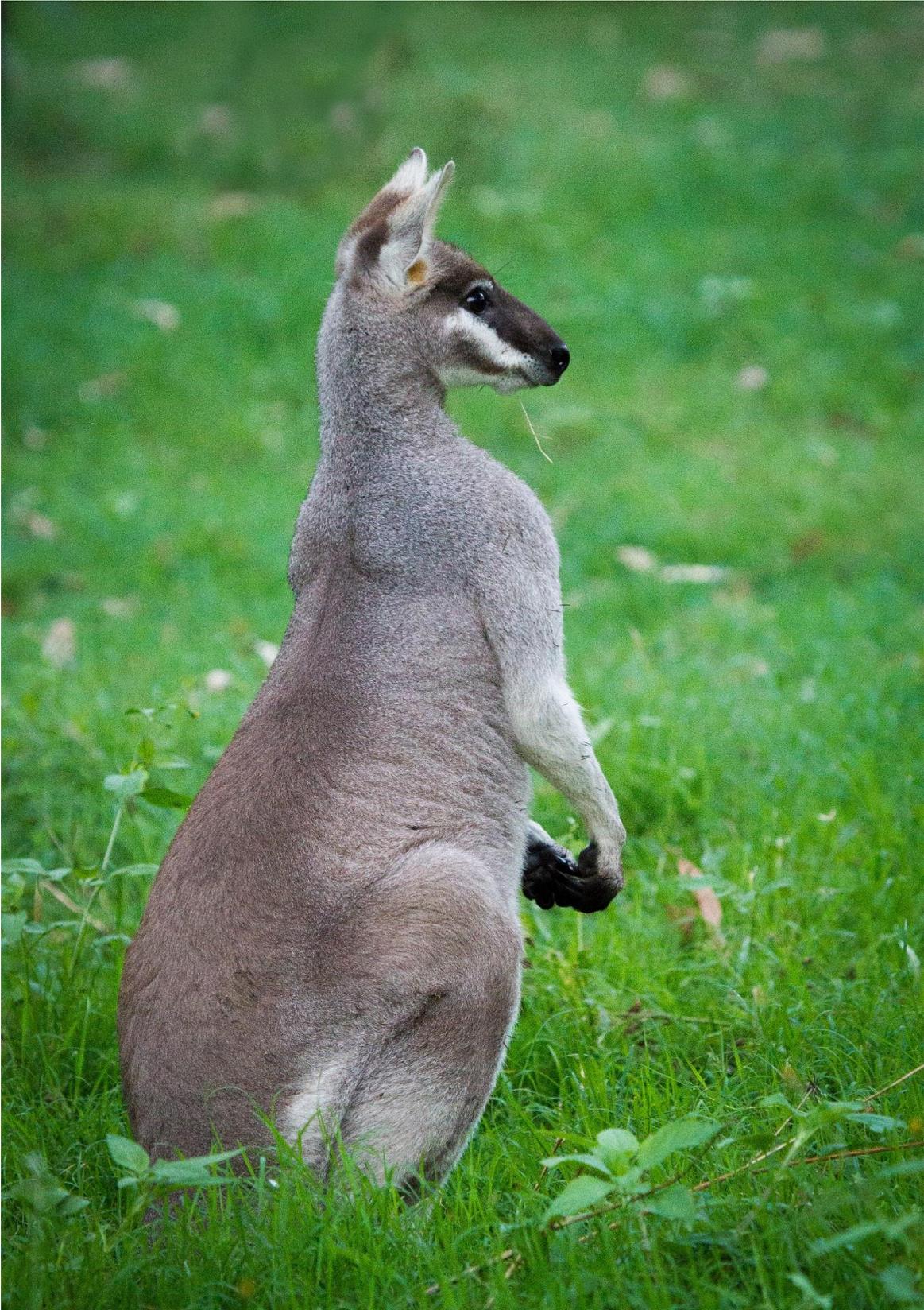


Plate 9. Whiptail Wallaby *Macropus parryi*. A small mob of these macropods were recorded on the Darvall Property, Priors Road, Rockmount during the survey. Photo Robert Ashdown.



Plates 10 and 11. Koala *Phascolarctos cinereus* (top) was recorded at Rockmount and Preston during the survey. Red-necked Wallaby *Macropus rufogriseus* (bottom) is a common macropod in the Lockyer Valley and was recorded at several sites during the survey. Photos by Bruce Thomson.



Plates 12 and 13. Grey-headed Flying-fox *Pteropus poliocephalus* (top) was recorded at Upper Flagstone and Sawpit Gully during the survey. Short-eared Brushtail Possum *Trichosurus caninus* (bottom) was recorded at Dwyers Scrub Regional Park on 8 March 2015. This was the first record of this species for the survey area. Photos Robert Ashdown.



Plate 14. Squirrel Glider *Petaurus norfolkensis*. This species was recorded at Hell Hole Gully Track, Glen Lomond Park, Hell Hole on 1 February 2015. Photo Bruce Thomson.

**03.02.15:**

**Sawpit Gully Road (Walton Property), Rockmount** at GDA94 — S27.69222 x E152.05731; +/- 200 metres:

1 x Fawn-footed Melomys *Melomys cervinipes*

**07.02.15:**

**entrance, Gormans Gap Historical Track, Gormans Gap** at GDA94 — S27.64064 x E151.98421; +/- 10 metres:

1 x European Brown Hare *Lepus europaeus*

**14.02.15:**

**P & E. Darvall property (Palm Creek), Mt. Whitestone** at GDA94 — S27.67788 x E152.08890; +/- 300 metres:

1 x Common Ringtail Possum *Pseudocheirus peregrinus*

1 x Yellow-bellied Sheath-tailed Bat *Saccolaimus flaviventris*

**21.02.15:**

**cnr. Walkers and Rockmount-Preston Roads, Rockmount** at GDA94 — S27.68167 x E152.02082 +/- 200 metres:

1 x Long-nosed Bandicoot *Perameles nasuta*

1 x Swamp Wallaby *Wallabia bicolor*

**923 Preston Boundary Rd., Preston** at GDA94 — S27.67381 x E151.99138; +/- 10 metres:

1 x Fox *Vulpes vulpes* (road kill)

**24.02.15:**

**102 Preston Boundary Rd., Preston** at GDA94 — S27.63711 x E151.94920; +/- 25 metres:

1 x Koala *Phascolarctos cinereus*

**25.02.15:**

**Hell Hole Creek Road, Hell Hole** at GDA94 — S27.65024deg. x E151.99561 deg.; +/- 100 metres:

2 x Red-necked Wallaby *Macropus rufogriseus*

1 x Swamp Wallaby *Wallabia bicolor*

**Stockyard-Rockmount Road, Stockyard** at GDA94 — S27.66465 x E152.02861: +/- 50 metres:

1 x Northern Brown Bandicoot *Isodon macrourus* (road-kill)

**03.03.15:**

**Darvall Property, Priors Road, Rockmount** at GDA94 — S27.69444 x E152.002963: +/- 50 metres:

3 x Whiptail Wallaby *Macropus parryi*

2 x Red-necked Wallaby *Macropus rufogriseus*

**06.03.15:**

**Darvall Property, Priors Road, Rockmount** at GDA94 — S27.69415 x E152.002963: +/- 250 metres:

Koala *Phascolarctos cinereus*

Common Brushtail Possum *Trichosurus vulpecula*

**07.03.15:**

**Darvall Property, Priors Road, Rockmount** at GDA94 — S27.69147 x E152.03000; +/-50 metres:

3 x Whiptail Wallaby *Macropus parryi*

**Gormans Gap Historical Track, Gormans Gap** at GDA94 — S27.63806 x E151.98611; +/- 100 metres:

1 x Long-nosed Potoroo *Potorous tridactylus*

**08.03.15:**

**Sawpit Gully Road (Walton Property), Rockmount** at GDA94 — S27.69222 x E152.05731; +/- 100 metres:

1 x Grey-headed Flying-fox *Pteropus poliocephalus*

**14.03.15:**

**Cran Bridge, junction Flagstone & Stockyard Creeks, Stockyard** at GDA94 — S27.63316 x E152.06465; +/- 20 metres:

1 x Black Rat *Rattus rattus* (road-kill)

**Dwyers Scrub Regional Park, Mt. Whitestone** at GDA94 — S27.70262 x E152.09500; +/- 25 metres.

1 x Short-eared Brushtail Possum *Trichosurus caninus*

**P & E. Darvall “Under Milkweed”, Mt. Whitestone** at GDA94 — S27.67861 x E152.08694; +/- 100 metres:

1 x Southern Forest Bat *Vespadelus regulus* (adult male, dead)

**15.03.15:**

**East Egypt Rd., Mt Whitestone** at GDA94 — S27.67713 x E152.07747; +/- 100 metres:

3 x Eastern Grey Kangaroo *Macropus giganteus*

Please note:

**12.01.15:** Spotlighting at Sawpit Gully and along Priors and Walkers Roads, Rockmount did not reveal any nocturnal mammal fauna.

**11.04.15:** Spotlighting at Gormans Gap Historical Track and Glen Lomond Park, Hell Hole did not reveal any nocturnal mammal fauna.

**3.3: Other Nocturnal Fauna of Survey Area**

This list is extracted from the author’s personal records: April 2008–November 2013.

Echidna *Tachyglossus aculeatus*

Yellow-footed Antechinus *Antechinus flavipes*

Common Planigale *Planigale maculate*

Common Dunnart *Sminthopsis murina*

Broad-toed Feathertail Glider *Acrobates frontalis*

Black-striped Wallaby *Macropus dorsalis*

Water Rat *Hydromys chrysogaster*

Eastern Chestnut Mouse *Pseudomys gracilicaudatus*

House Mouse *Mus musculus*

Pale Field Rat *Rattus tunneyi*

Black Flying-fox *Pteropus Alecto*

Little Red Flying-fox *Pteropus scapulatus*

Eastern Bent-winged Bat *Miniopterus orianae oceanensis*

Eastern Broad-nosed Bat *Scotorepens orion*

Lesser Long-eared Bat *Nyctophilus geoffroyi*

Beccari’s Freetail Bat *Ozimops lumsendae*

Dog *Canis familiaris*

Dingo *Canis lupus*

Cat *Felis catus*

Rabbit *Oryctolagus cuniculus*

Pig *Sus scrofa*

Red Deer *Cervus elaphus*

## 4: Discussion

Forty-seven species of mammal including 10 introduced animals are known to date (April 2015) from the survey area. This includes species recorded on the Citizens of the Lockyer Associations database maintained by the author since April 2008 until November 2014. Twenty-four mammals were recorded during the survey that can be considered as strictly nocturnal, crepuscular or both nocturnal and diurnal for the purposes of this report. It is beyond the scope of this document to discuss all the species recorded during this survey however some brief notes are given for the more relevant animals below.

Of the 24 species recorded during the survey seven were bats of which four were identified on the formal microbat survey and three were incidental records. Three of these animals had been recorded prior to this survey, as well. They are the Grey-headed Flying-fox, Ride's Free-tailed Bat and Southern Forest Bat. Yellow-bellied Sheath-tailed Bat, Little Bent-wing Bat, White-striped Free-tailed Bat and Central-eastern Broad-nosed Bat were new species for the survey area. In addition two call sequences were inconclusive and are only given to generic level positively with options for the likely species viz. *Vespadelus troughtoni/vulturinus* and *Nyctophilus geoffroyi/gouldii*. These four bats could well be present in the survey area. In fact one of them, the Lesser Long-eared Bat *Nyctophilus geoffroyi* has been confirmed for the survey area prior to the survey period under consideration. The total number of bat species recorded for the survey area from April 2008 up to and including those recorded on the survey in question is, therefore 13 species. This is approximately half of the known species of bats from south-east Queensland (Churchill 2008). Given the difficulty that these animals present the researcher this can be considered a quite good representation of the local chiropteran fauna. More work needs to be done on the group, however, if a comprehensive list is to be obtained.

The most significant find over the period of the survey was by Robert Ashdown and Wesley Jenkinson during invertebrate work on Gormans Gap Historical Track on 7 March 2015. Near the western end of the track they flushed a single Long-nosed Potoroo in the midmorning of the day. The vegetation type here is dry eucalypt woodland with a ground cover of native and exotic grasses heavily invaded by lantana. The potoroo was a new species for the survey area although old records exist from the Helidon Hills, Upper Flagstone Creek and Flagstone Creek but no dates survive. It has also been recorded recently near Ravensbourne National Park, also Perseverance Creek and in the Helidon Hills (P. Mc Connell pers. comm., pers. obs.). This macropod is a shy and retiring species that favours areas with thick ground cover so is rarely observed. It might well be more common than records suggest especially along the range escarpment and the headwaters of the Lockyer catchment where ample habitat remains extant. The Long-nosed Potoroo is designated as a vulnerable species under Queensland legislation, the Nature Conservation (Wildlife) Regulation 2006.

One other macropod of interest found during the survey was the Whiptail Wallaby. This animal was once widespread throughout the hilly country of the Lockyer Valley but its numbers have declined severely in recent years in this area. It is now rarely encountered but still seems to persist in the more isolated and less impacted areas of the Upper Lockyer Valley. A small community of these macropods is resident on a property on Priors Road at Rockmount at the time of writing (April 2015) (D. Darvall pers. comm., per obs.). This macropod was once heavily hunted for its hide including in the survey area and this would have contributed to its decline locally. It is still a common species in other parts of its range, however.

Koala was recorded on three separate occasions over the period of the survey. This species has been recorded sporadically over the period that the COL have maintained its database and a resident population of long standing is known from a private property at Rockmount (C. Stephens pers. comm.). Good stands of food trees for the species are still to be found within the survey area so it is likely that this marsupial might still be resident in fairly good numbers here. It is an iconic species that could well warrant a comprehensive local survey however, given its serious decline in other parts of south-east Queensland.

## **5: Conclusion**

Whilst several additional species of nocturnal mammal fauna were added to the list of species for the Upper Lockyer Valley much work still remains to be done before a comprehensive list of such fauna for this area can be produced. This is especially so with the difficult to survey species such as members of the native rodent and insectivorous bat communities. A start has already been made on this aspect of such research. Several species of bat and native rodent are known from areas abutting the survey area but have not yet been confirmed for Upper Lockyer but there is no doubt that they would be present in this area. Their presence here needs to be confirmed by future survey work.

Aside to the indisputable scientific and educational advantages of having a detailed knowledge of the flora and fauna of any district or region there are certainly also economic and public health issues that can benefit greatly from this sort of data. The economic advantages of a healthy microbat fauna especially in rural areas such as the Upper Lockyer Valley is well documented within the scientific literature. The U.S. Fish & Wildlife Service state that 70% of the world's bats are insectivores and that a single bat can eat between 600 and 1,000 mosquitoes and other insect pests in a single night. In a paper by Dillon *et al* (2004) the authors report on work done on insectivorous bats over cotton crops in Narrabri in northern New South Wales. Larva of *Helicoverpa* moths (Lepidoptera: Noctuidae) do severe damage to this crop however adult moths can detect insectivorous bats' sonar, which severely disrupts the pest's flight and egg-laying behaviour. Many other examples of the beneficial results of a healthy microchiropteran bat fauna in agricultural communities are available for the inquiring reader. For all of the above reasons it is recommended that work continue on the documenting of fauna of the Upper Lockyer Valley especially on the groups that still remain to be more adequately researched such as the microchiropteran bats and native rodents.

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