FINAL: 31 JANUARY 2016

STATEMENT ON THE OCCURRENCE OF SIGNIFICANT BREEDING SITES FOR THE ENDANGERED BAT SPECIES *RHINOLOPHUS PHILIPPINENSIS* AND *HIPPOSIDEROS SEMONI* IN CAVES AT THE MELODY ROCKS KARST AREA OF ALKOOMIE STATION NEAR COOKTOWN, QUEENSLAND

In a previous statement (October 2015) regarding the populations of the nationally and Queensland listed endangered bat species *Rhinolophus philippinensis* and *Hipposideros semoni* found at the Melody Rocks karst area, it was very strongly suggested that both of these species were breeding within the karst area.

This current statement confirms that during additional fieldwork in the breeding season (November 2015; see also Churchill 2008), females of *R. philippinensis,* with some individuals in an advanced stage of pregnancy, have been trapped internally at the entrance to the previously identified deep cleft located well within the large open "Wallaby" entrance to the Ripple Cave system (Pearson & Bannink 2012). This cleft was monitored using ultrasonic detectors and found to contain a sizeable population of other bat species (*R. megaphyllus*, *H. diadema, Miniopterus australis* & *Vespadelus troughtoni*). Several individuals of each species were caught during the survey, most of the female *R. megaphyllus* were pregnant and about half of the female *M. australis* were pregnant. For the remaining captures, the reproductive condition for a single female *V. troughtoni* was unknown and only a single male *H. diadema* was caught. Based on these records, it can be safely concluded that this cave system is highly significant as a major breeding and maternity site for the endangered *R. philippinensis,* and as well for a number of other species. The cleft is yet to be fully explored but it is extensive and opens up via a series of deep underground fissures. The exact physical location of the maternity roosting areas (typically avens) are yet to be determined.

Regarding the presence of the endangered bat species *H. semoni* at Melody Rocks, results of this current survey period (November 2015) can be used to conclude that this species also uses the same cleft within Ripple Cave as a breeding site. In addition, it is also highly likely that at least a second cave system (known as Figtree-Doline) located some 600m to the north of Ripple Cave, is used by breeding females as well as a maternity site. Although no individuals of *H. semoni* were trapped during the current survey period, fortunately individual bats in flight (or cave roosting) can be readily identified as male or female because there is a significant difference in their echolocation call frequencies (Whybird et al. 1998; male 94kHz, female 78 kHz). This difference was used as a method to determine the presence of male and female *H. semoni* during the current survey period which is in their breeding season. Subsequently, the analysis of bat detector recordings revealed only female *H. semoni* were using the cleft area inside the Wallaby entrance to Ripple Cave and interestingly, the same situation was found for the Figtree-Doline Cave entrance.

These observations are quite important since they contrast to the survey results in the same locations made earlier in the same year (July 2015) when both males and females had been detected. Furthermore, during this latest survey period, male *H. semoni* were detected but they were feeding at night in areas much further away from this particular karst region e.g. at Kings Plains Lake. For cave dwelling bats such as this species, it is well known that the sexes segregate at the time of parturition, with females forming a maternity site to the exclusion of males that roost elsewhere. Given the direct evidence from capturing female *R. philippinensis* (and several other species) in an advanced stage of pregnancy, it is clear that Ripple Cave is a major bat breeding site at this time of year and it is reasonable to conclude that this is also happening with *H. semoni* at the same location. The additional observation that only females were occupying the Figtree-Doline Cave suggests that it is a breeding site as well and therefore more than one maternity site is very likely to exist for this species, at least in this region of karst.

In summary, the colonies of both *R. philippinensis* and *H. semoni* at Melody Rocks are resident populations. Both of these endangered species rely on the network of limestone caves so far discovered in an isolated and very confined area of exposed karst on Alkoomie Station. Currently this location is the only known breeding site for *R. philippinensis* in Australia. Based on current observations, this karst is the crucial focus for every aspect of the ecology of the local population of these two species (feeding, roosting and probably breeding). In other words, any disturbance or destruction of habitable caves (as day roosts and breeding areas) in the limestone and the immediate surrounding woodlands which are used as feeding areas, risks destroying the integrity of the population of the endangered bat species *R. philippinensis* and *H. semoni.* As such, any effect could easily lead to the local extinction of these bat species in a short time. In the harsh environment of Alkoomie Station, both of these species are totally dependent on cave or cave-like structures for day roosting. Being troglodytic they are also highly vulnerable to disturbance during reproduction, as they will have stringent requirements for successful breeding (maternity sites) in the general landform of Alkoomie Station. It is therefore paramount to preserve the whole of this area of karst to ensure the conservation of both of these endangered bat species at Melody Rocks.

Dr Roger B. Coles School of Earth, Environmental & Biological Sciences, Queensland University of Technology

KEY PUBLICATIONS SUPPORTING THIS STATEMENT

Churchill S (2008) Australian Bats. Allen & Unwin 2nd edition

Pearson L & P Bannink (2012) The significance of the Wallace Creek limestone region. Unpublished report to the South Endeavour Trust.

Whybird OJ, Coles RB & Clague CI (1998) Sexual dimorphism and the echolocation calls of *Hipposideros semoni*. *8th Australasian Bat Conference Abstracts* p8