

An opportunistic observation of Ghost Bat (*Macroderma gigas*) predation on six bird species within Karijini National Park

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ABSTRACT

This note describes an opportunistic observation of Ghost Bat (*Macroderma gigas*) predation of six native bird species inferred from prey remains discovered in a cave in Karijini National Park, Western Australia. A Ghost Bat was photographed grasping a Little Button-quail (*Turnix velox*) and the presence of accumulated prey remains on the cave floor revealed wings of six bird species that are assumed to have been preyed upon by this animal. A number of Sheath-tailed Bats (*Taphozous* spp.) were also roosting in the cave.

KEYWORDS: Ghost Bat (*Macroderma gigas*), Karijini National Park, Sheath-tailed bat (*Taphozous* spp.), prey, diet

INTRODUCTION

The Ghost Bat is the largest microchiropteran found in Australia. It has a patchy but widespread distribution north of the Tropic of Capricorn with a population recorded in the Pilbara, Western Australia (Richards *et al.* 2008). The species is an active predator of vertebrates and invertebrates that uses visual or audible searches to detect potential prey from a vantage point before pursuing and swooping. Prey items are caught while flying or are alternatively gleaned from vegetation and the ground. Prey is carried in flight to regularly-used roost sites inside caves, mines or under rock overhangs, where it is consumed. Uneaten remains accumulate underneath the roost site (Douglas 1967; Tidemann *et al.* 1985).

METHODS

During the course of an unrelated study (Johnston *et al.* 2013) within Karijini National Park, a cave was located in an area of low rocky hills to the south-east of Dinner Plate Hill. The entrance to the cave had an easterly aspect and was set back into the cliff line. We entered the cave at 1600 hrs on 31 July 2012 and found that it contained two chambers. The first measured approximately 4 m wide, 2 m high and 20 m long and constricted to a ~ 1m diameter section before reopening into the second chamber of approximately 1 m wide, 1.5 m high and 5 m long and then terminated.

An accumulation of birds' wings, tails and plucked feathers was located in the first chamber. All wings were identified to species level based on plumage colour and pattern, and primary length. A count of left wings was made to determine the number of individual birds per species that those wings represented (right wings were not counted to avoid counting both wings of the same individual as two separate individuals).

RESULTS

We observed <20 Sheath-tailed Bats (*Taphozous* spp.) roosting in the first chamber and an individual Ghost Bat in the second chamber. As we entered this chamber, the Ghost Bat was observed grasping a bird carcass (Figure 1), which was then dropped as it exited the cave. The unconsumed bird was identified to be a Little Button Quail (*Turnix velox*) from which the head was missing, presumably removed by the bat (Figure 2). The head was located on the cave floor underneath where we had initially observed the ghost bat roosting.

The accumulation of bird wings, plucked feathers and bat scats, which formed two piles in close proximity suggested regular usage by bats (Figure 3). In total, 14 individual birds of six species were identified in the pile of prey remains (Table 1, Figure 4). The most common species was Budgerigar (*Melopsittacus undulatus*) (35% of wings) followed by White-winged Triller (*Lalage tricolor*) (21% of wings). Other species identified included Little Button Quail (*Turnix velox*), Australian Owlet-nightjar (*Aegotheles cristatus*), Masked Woodswallow (*Artamus personatus*) and a Honeyeater spp. (Meliphagidae) (Figure 4).

Both chambers in this cave were readily accessed by other wildlife species including predators such as feral cats (*Felis catus*) and dingo/wild dog (*Canis familiaris*). However given the arrangement and content of the two piles of bird remains, their proximity to large bat scats, and the presence of a Ghost Bat, there is little doubt that the remains are from the prey consumed by Ghost Bat.

DISCUSSION

Previous published reports describing the diet of Ghost Bats include invertebrate and vertebrate species (Douglas 1967; Tidemann *et al.* 1985). Schulz (1986) observed remains of bird species that can have a mass of up to 100–125g in the debris underneath Ghost Bat roost



Figure 1. Ghost Bat holding prey (Little Button-quail) at a cave in Karijini National Park. (Photo: Neville Little and Les Bould).



Figure 2. Unconsumed prey (Little Button-quail) dropped by Ghost Bat. (Photo: Michael Johnston).



Figure 3. Accumulation of uneaten prey remains found in the first chamber (Photo: Neville Little).



Figure 4. Bird wings collected from pile of accumulated prey remains and inferred to be prey of Ghost Bat. For identification see Table 1. (Photo: Ashley Herrod).

Table 1. Avian species, count of left wings and their proportion from total left wings, as identified from pile of prey remains. The letters refer to Fig. 4.

Species	Count of left wings	Percentage of total wings
b Budgerigar <i>Melopsittacus undulatus</i>	5	35
e White-winged Triller <i>Lalage tricolor</i>	3	21
a Little Button Quail <i>Turnix velox</i>	2	14
f Masked Woodswallow <i>Artamus personatus</i>	2	14
c Australian Owlet-nightjar <i>Aegotheles cristatus</i>	1	7
d Honeyeater spp. (Meliphagidae)	1	7

sites. The prey species observed in this circumstance indicates a largest adult mass of 46.4 g (Australian Owlet-nightjar; mean weight of 41 unsexed adults; Higgins 1999). Predation of other bat species has been observed (Pettigrew *et al* 1986; Schulz 1986) but we did not detect any evidence to suggest that this Ghost Bat had predated the Sheath-tailed Bats.

Our field observations were made six months after the passage of Cyclone Heidi during which 230 mm of rain fell over the site. The resultant response in vegetation growth and seeding supported abundant populations of granivorous birds such as Little Button Quail and Budgerigar (S. Berris, pers. comm.). The number of wings found on the cave floor in the main chamber indicate that multiple Budgerigars, White-winged Trillers and Little Button-quail had been consumed at that location. It is presumed that the first chamber was the preferred roosting location rather than the second chamber given that there was no accumulation of prey remains in the latter, other than the head of the quail. It is quite possible that we disturbed the Ghost Bat and it had retreated into the second chamber as we entered the cave.

The opportunistic detection of this Ghost Bat in Karijini National Park provides a snapshot of the species composition of its avian diet, and evidence of the continuing presence of this species within the Pilbara region.

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