

Bats of Hickatee Cottages

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Bats are critical contributors to mammalian biodiversity, particularly in the neotropics. The sheer number of individuals and the myriad of food habits represented further support the significant contribution by this group to neotropical ecosystems. Bats comprise more than 50% of the terrestrial mammal fauna in the neotropics. The ecological services provided by bats are critical. These services range from being primary pollinators and seed dispersers to key insect predators. If we lose the bats we may lose much of the intact tropical vegetation and the “lungs” of the planet.

In addition to many bat species being threatened or endangered throughout the region and within Belize, they have enormous potential as bioindicators. Insectivorous bats occupy high trophic levels, and are sensitive to accumulations of pesticides and other toxins. Bat populations are affected by a wide range of stressors that affect many other taxa. In particular, changes in bat numbers or activity can be related to climate change, deterioration of water quality, agricultural intensification, loss of and fragmentation of forests.

Essentially bats are the “night shift” in the Neotropics. For example, they have the same trophic levels as birds: Top predators – Raptors = Carnivorous bats; Nectar feeders – Hummingbirds = Nectar feeding bats; Frugivores – Fruit eating birds = Fruit bats; Piscivores – Kingfishers & herons = Fishing bat; Aerial insectivores – Flycatchers, Swallows, Swifts etc. = Aerial insectivorous bats.

Bat surveys within the southern coastal areas of Belize have been limited. When the possibility arose to survey the habitats on the Hickatee Cottages property and surrounding area, this was a great opportunity to begin filling in some of the distribution knowledge gaps and habitat associations for bats. In 2006 we completed the first surveys on and around the Hickatee Cottages property, using both acoustic survey methods and harp traps to capture bats. We returned in 2011 for a brief 3 night follow up survey. To date, 27 species representing six families have been documented here (Table 1).

Table 1. Bats documents on the Hickatee Cottage property, Methods are A= acoustic and HT= harp trapping.

Family	Species	Common Name	Method
Emballonuridae	<i>Diclidurus albus</i>	Northern Ghost Bat	A
	<i>Peropteryx kappleri</i>	Greater Dog-like Bat	A
	<i>Peropteryx macrotis</i>	Lesser Dog-like Bat	A
	<i>Rhynchonycteris naso</i>	Proboscis Bat	A
	<i>Saccopteryx bilineata</i>	Greater White-lined Bat	A
	<i>Saccopteryx leptura</i>	Lesser White-lined bat	A
Mormoopidae	<i>Pteronotus davyi</i>	Davy's Naked-backed Bat	HT- A
	<i>Pteronotus gymnonotus</i>	Big Naked-backed Bat	A
	<i>Pteronotus parnellii</i>	Common Mustached Bat	HT-A
	<i>Pteronotus personatus</i>	Wagner's mustached bat	A
Natalidae	<i>Natalus mexicanus</i>	Mexican Greater Funnel-eared Bat	HT
Phyllostomidae	<i>Artibeus jamaicensis</i>	Jamaican Fruit-eating Bat	HT
	<i>Artibeus toltecus</i>	Toltec Fruit-eating Bat	HT
	<i>Artibeus watsoni</i>	Thomas's Fruit-eating Bat	HT
	<i>Carollia perspicillata</i>	Seba's Short-tailed Bat	HT
	<i>Vampyressa thylene</i>	Northern Little Yellow-eared Bat	HT
Vespertilionidae	<i>Eptesicus furinalis</i>	Argentine brown bat	A
	<i>Lasiurus ega</i>	Southern Yellow Bat	A
	<i>Lasiurus intermedius</i>	Northern yellow bat	A
	<i>Myotis elegans</i>	Elegant myotis	HT- A
	<i>Myotis keaysi</i>	Hairy-legged myotis	HT -A
	<i>Rhogeessa aeneus</i>	Yucatan Yellow Bat	A
	Unconfirmed spp with 40 kHz call	?	A
	Unconfirmed spp with 45 kHz call	?	A
Molossidae	<i>Cynomops mexicanus</i>	Mexican Dog-faced Bat	A
	Molossid species	Molossid species	A
	<i>Molossus rufus</i>	Black mastiff bat	A

Acoustic survey methods provide a non-invasive means of identifying bat species by their unique echolocation calls or “vocal signatures.” Just as birders can recognize bird songs and calls to identify species, the same can be done for bats (Figure 1). As the calls emitted by bats are generally above the range of human hearing, we rely on ultrasonic detectors and electronic recording equipment.

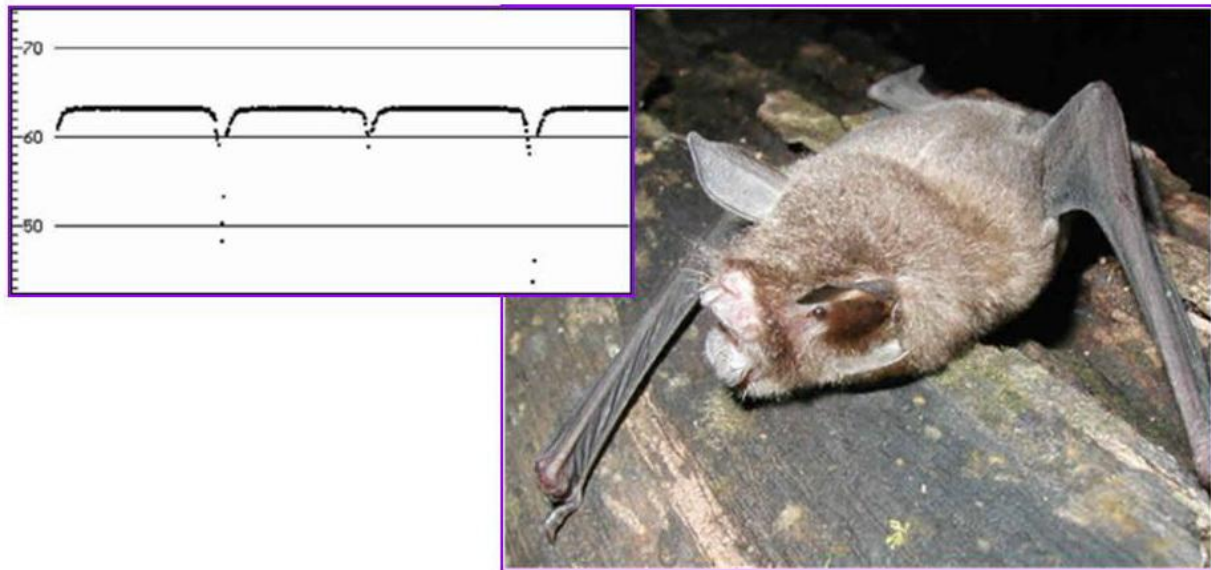


Figure 1. The common mustached bat, *Pteronotus parnellii* and its unique vocal signature on the left. The numbers show the frequency of the call pulses in kilohertz.

While we can identify most species by their vocal signatures, there are some that have remained elusive. These are species that have either not yet been captured or were captured and insufficient recording data exists to derive a positive identification. These are reflected in the table above as unconfirmed Vespertilionidae (evening bats) species with vocal signatures having characteristic frequencies of 40 kHz and 45 kHz. The molossid species calls are from the larger free tailed bats that fly high above the canopy and in open areas that make capture difficult and therefore we have not been able to capture them. So the task of matching faces to voices continues.

On our last visit to Hickatee Cottages (March 2011) keen interest in the bats of the area was expressed by Ian and Kate Morton, the proprietors. With the expansion of research-based projects at Hickatee Cottages, we selected the site as one of the national bat monitoring stations within Belize. We provided an acoustic monitoring station that can be moved to various locations on the property and operated for many nights at each location. This scientific collaboration is now providing new information both on species occurrence, seasonal variations

in relative abundance. This invaluable data is thereby contributing to the national risk assessment and monitoring program for bats within Belize.

Bats are often maligned by the public, primarily out of ignorance. Their nocturnal habitats lend an additional aura of mystery to these important creatures. While the common vampire bat and a few of the fruit bats can become pests in agricultural settings, the majority of the species known to occur in Belize are rarely encountered directly by people. Most people, who have a chance to learn of the role they play in the ecosystem, tend to be more understanding and less likely to harm them. We thank Ian and Kate Morton, Hickatee Cottages, for their contributions to bat monitoring and conservation in Belize.

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