

Diversity of Bat Species in Selected Habitats of Dominica

Petra Franzen

Jennifer Olexy

Jessica Miedema

Texas A&M University

Study Abroad Program

Dr. Robert Wharton

Devra Hunter

Dominica 2003

ABSTRACT:

The purpose of this project was to determine the diversity of bats in different habitats of Dominica. Seven species were caught throughout five different locations. Our data supported the idea that diversity between the different habitats is greatly influenced by roosting and feeding habits, as well as resources available.

INTRODUCTION:

The island of Dominica lies in the center of the Lesser Antilles, between Guadeloupe and Martinique. For its size of 800 square kilometers, Dominica encompasses a great variety of habitats and could possibly have the greatest diversity of flora and fauna among any of the islands in the Lesser Antilles (Evans and James 1997: 3). The island also has a large area of unspoiled habitat, much of this being rainforest (Evans and James 1997: 3). There are twelve species of bat located on the island of Dominica and eleven of these may be found associated with this vegetation. These twelve include the Fisherman bat, *Noctilio leporinus*, Davy's naked-baked bat, *Pteronotus davyi*, the Lesser Antillean long-tongued bat, *Monophyllus plethodon*, the Jamaican fruit-eating bat, *Artibeus jamaicensis*, the Antillean cave bat, *Brachyphylla cavernarum*, the Lesser Antillean tree bat, *Ardops nichollsi*, the Yellow-shouldered bat, *Sturnira lilium*, the Mexican free-tailed bat, *Tadarida brasiliensis*, the Velvety free-tailed bat, *Molossus molossus*, the Mexican funnel-eared bat, *Natalus stramineus*, the Big-brown bat, *Eptesicus fuscus* and finally the Mouse-eared bat, *Myotis dominicensis*. All of these species of bat are native to Dominica, but none are endemic to the island (Evans and James 1997: 3).

Our group set out to determine how the various habitats on the island affect the diversity of these bats.

MATERIALS AND METHODS:

Bats were netted at five different locations: Check Hall River, the pond at the Bee House, Stinking Hole, Champagne Beach, and two dry stream beds along the path to Stinking Hole. These locations were chosen because they were readily accessible and

included a water source, a corridor, or a roosting site. Cabrits National Park and the two story building in the maintenance complex at Springfield were also areas of observation.

In order to catch the bats, mist nets and butterfly nets were used depending upon the habitat. Bamboo poles were cut to support the mist nets, and were anchored with stakes and string. Six meter or twelve meter nets were used depending upon how heavily vegetated the area was or how narrow the corridor. Butterfly nets were used while netting around roosting sites such as Champagne Beach and Stinking Hole to avoid catching too many at a time. Dr. Wharton was a major asset in hand netting.

Mist netting was conducted for a total of nine nights. Check Hall River was netted on May 22, May 25 and June 3. Nets were set up at the Bee House pond on May 23, May 27, and June 1. On May 24 and June 4, nets were set up along the dining area porch. Nets were also put up at Mt. Joy on May 27 and at the fig tree on June 4. All nets were set up by dusk and kept up until bat activity slowed, usually around 9:00PM. Butterfly nets were used to catch emerging bats at Stinking Hole on May 28 and roosting bats in a cave along Champagne Beach on June 2. Observation of roosting bats was done on May 26 at Cabrits National Park and on June 6 at the two-story building in the maintenance complex.

Shannon-Weaver indices were used to determine habitat diversity at the Bee House and Check Hall River.

RESULTS:

Monophyllus plethodon was the only species caught using hand nets at Stinking Hole (Table 1). *Sternira lilium* and *Artibeus jamaicensis* were netted at the two dry creek beds along the trail to Stinking Hole (Table 2). At the Bee House, *Tadarida brasiliensis*, *Sternira lilium*, and *Artibeus jamaicensis* were caught using mist nets (Table 3). At a cave along Champagne Beach *Pteronotus davyi* was captured using hand nets (Table 4). The species captured at Check Hall River with mist nets were *Myotis dominicensis*, *Molossus molossus*, and *Artibeus jamaicensis* (Table 5).

The coordinating H values for Shannon-Weaver indices are shown in Table 6 and Table 7.

DISCUSSION:

Each habitat where netting was attempted was analyzed to determine why certain species would prefer that particular area.

Stinking Hole is a large roosting cave and is located in the rainforest along the trail to Middleham Falls. The emergence from the cave included many species of bats, obvious by the size differences between them. However, *Monophyllus plethodon* was the only species caught at Stinking Hole (Table 1). This species is a nectivorous bat, and this is the only habitat in which it was caught.

Nets were also set up across two dry creeks along the path to Stinking Hole. The creeks create an ideal corridor for bats to fly through. *Sturnira lilium* and *Artibeus jamaicensis*, both fruit bats, were netted here (Table 2).

Two nets were placed along the pond at the Beehouse, one on each side of the pond. The pond is a water source for the bats, as well as a place to find insects. There are also mango trees there, possibly attracting fructivorous bats such as *Artibeus jamaicensis* and *Sturnira lilium*. *Tadarida brasiliensis* may have been drawn by insects as well as water at the pond. Table 3 shows these species and how many of each was caught.

The cave at Champagne Beach is a roosting site for numerous species of bats, but *Pteronotus davyi* was the only bat hand netted here (Table 4). There could be many reasons that this species was found here because of its proximity to many different habitats. *P. davyi* is an insectivorous bat, but it was caught while roosting.

The Check Hall River is one of the most reliable netting sites at Springfield Plantation. Many of the bats netted during this visit to Dominica were caught here (Table 5). *Myotis dominicensis*, one of the rarer bats on the island, was netted here. This species is insectivorous and roosts in large open caves (Evans 46). It may have been netted while feeding on insects or drinking water. *Molossus molossus*, an insectivorous bat, was also netted at Check Hall River. *M. molossus* has many roosting areas, including deserted buildings and large open caves. *Artibeus jamaicensis* and *Sturnira lilium* were also netted here, probably drinking water because they are both fructivorous species. There was also a fig tree present in the area that the bats may have been feeding on.

The dining area porch, Mt. Joy, and the fig tree down the path from the Archbold House were also netting sites. However, netting here was unsuccessful. The cause for this at the porch may have been due to the activity level at dinner and excessive lighting. Netting was attempted at the fig tree because it could have possibly been a roosting site. The reason for the unsuccessful netting at the fig tree could perhaps be because there are no bats roosting in the fig tree. Another reason is that the area around the fig tree is not quite a corridor. A functional corridor would allow the bats to fly through the trees, low enough to net.

Two roosting sites were visited, Fort Shirley at Cabrits National Park and the two-story building in the maintenance complex at Springfield. *Tadarida brasiliensis* was found at Fort Shirley, and *Artibeus jamaicensis* was found at the maintenance building. Both of these structures are abandoned and undisturbed which make them suitable roosting sites for these bats.

There were five species that were not netted on this trip. One species, *Noctilio leporinus*, is found only along the coastline because it is piscivorous. Mist netting was never attempted along the coast. *Brachyphylla cavernarum* is known to roost in Stinking Hole (Evans and James 1997: 46), but unfortunately, it was not captured. *Ardops nichollsi*, a fructivorous bat that roosts in trees, may not have been netted due to its rarity (Evans 46). *Natalus stramineus* is widely distributed, but roosts in sea caves and lime kilns (Evans 46). Netting at a lime kiln was never attempted. Regrettably, *Eptesicus fuscus* was not captured, probably because it is relatively uncommon (Evans 46).

Shannon-Weaver indices were used to determine habitat diversity at the Bee House and Check Hall River. According to "Virtue Newsletter," as the value of H increases, it implies a higher level of diversity. Therefore, the Bee House, with an H value of 1.571, has greater diversity of bats than the Check Hall River, which has an H value of 0.818.

REFERENCES:

- Evans, Peter G.H. and James, Arlington. 1997. Dominica Nature Island: Wildlife Checklists. Ministry of Tourism, Roseau.
- University System of Maryland VIRTUE Newsletter "The Shannon Weaver Index".
April 2001. http://www.miljolare.no/virtue/newsletter/01_04/news/shannon.php.

ACKNOWLEDGEMENTS:

This group would like to acknowledge Dr. Robert Wharton for his driving skills and willingness to take on any challenge. His hand netting at Stinking Hole and Champagne Beach is greatly appreciated.

We would also like to acknowledge Devra Hunter for her knowledge and expertise of bats and methods of netting.

TABLES

Table 1. Total bats hand-netted at Stinking Hole.

Species	Number Netted
<i>Monophyllus plethodon</i>	11

Table 2. Total bats mist-netted at dry streams near Stinking Hole.

Species	Number Netted
<i>Artibeus jamaicensis</i>	3
<i>Sternira liliium</i>	1

Table 3. Total bats mist-netted at the Bee House.

Species	Number Netted
<i>Sturnira liliium</i>	4
<i>Artibeus jamaicensis</i>	3
<i>Tadarida brasiliensis</i>	3

Table 4. Total bats hand-netted at Champagne Beach.

Species	Number Netted
<i>Pteronotus davyi</i>	4

Table 5. Total bats mist-netted at Check Hall River.

Species	Number Netted
<i>Myotis dominicensis</i>	1
<i>Molossus molossus</i>	18
<i>Artibeus jamaicensis</i>	1
<i>Sturnira liliu</i>	1

Table 6. Shannon Weaver index for Check Hall.

Species	Proportion	H
<i>Myotis dominicensis</i>	0.04762	0.81810
<i>Sturnira liliu</i>	0.04762	
<i>Artibeus jamaicensis</i>	0.04762	
<i>Molossus molossus</i>	0.85714	

Table 7. Shannon Weaver for Bee House.

Species	Proportion	H
<i>Sturnira liliu</i>	0.40	1.57095
<i>Tadarida brasiliensis</i>	0.30	
<i>Artibeus jamaicensis</i>	0.30	