

# Bat Netting Strategies on Dominica

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## **Abstract**

Mist nets were used in several habitats around Springfield Research Centre, Dominica, to determine the optimal time for sampling bats. Nets were deployed for a three hour period beginning just prior to sunset. The vast majority of bats caught during this study were between the hours of seven o'clock and eight o'clock pm.

## **Introduction**

The island of Dominica is home to twelve different species of Microchiroptera, from six different families (Evans and James 1997). According to Franzen et al.'s (2003) study done on bat diversity, the most common bats caught near the Springfield Research Centre were *Molossus molossus* a small reddish brown insectivorous free tailed bat, *Tadarida brasiliensis* similar to *Molossus molossus* but distinguishable by its wrinkled upper lip, *Sturnira lilium* one of the smaller frugivorous species, and *Artibeus jamaicensis* a larger frugivorous bat common in all habitats (Evans and James 1997). Bats, being nocturnal animals, only emerge from their roosts at night to forage. The first three hours of nightfall are the most common and most convenient, times to catch bats using a mist net in the previous studies conducted at the Springfield Research Centre (Franzen et al., 2003). The goal of this study was to find the best time to catch bats during the early nighttime hours, the importance of this information lies in the fact the researcher must also eat around the same time the bats do. So, by knowing the ideal time to sample, a researcher can plan an early meal around the bats. After reviewing the results of previous projects on the bats of Dominica (Franzen et al. 2003), I hypothesize that most of the bats will be captured in the second time bracket, between seven o'clock to eight o'clock pm.

## **Methods and Materials**

For this project a twelve-meter mist net was set up at two different locations. The bats were entangled after flying into the net, then the time of capture, species, and sex of the bat was determined before release. The first location was Check Hall River, just south of the Springfield Plantation House. Nets were placed at the Check Hall River on May 27, June 3, and June 7. This site was chosen because of its large open area suitable for foraging by bats, and the water of the river attracts insects. Also along the banks was a large fig tree and other fruit bearing trees on which the larger frugivorous bats can feed. Location two was a *Syzygium jambos* (or Rose Apple) tree, located at the beginning of the Fifi trail, just north of the Springfield Plantation. Nets were set up at the second site on nights of May 29 and June 5. This location was chosen because of the fruit of the *Syzygium* tree, which when examined during the day appeared to have large bites taken out of them, presumably from bats.

To set up the bat net, two poles about seven to eight feet in height were cut from trees. Loops on each end of the mist net were then strung over the ends of the poles. The nets were then stretched and the poles were tied in place with rope. The bats captured would fly into the fine mesh of the net and were then extracted using leather gloves. Headlamps were essential to keep the hands free for removal of bats in the dark. Nets were put up at six pm and at nine o'clock each night were taken down. The bats caught were recorded for time of capture, species, and sex. The data were then grouped into hourly brackets between six and nine pm, according to time of capture.

## **Results**

The results supported the hypothesis that most of the bats will be captured during the second bracket of seven o'clock to eight o'clock. Fig.1 clearly shows the vast majority of bats were caught during the second hour, and very few in the first and last brackets. Table 1 shows that on the nights of May 27<sup>th</sup>, June 3<sup>rd</sup>, and June 5<sup>th</sup> (the most

prolific nights) there were also far more bats captured in the second bracket. Tables 2 and 3 shows that most of the bat species caught in the hypothesized time bracket were female and *Molossus molossus*. In fact most of the bats caught during this study were female *Molossus molossus*.

## **Discussion**

Most of the bats captured by mist nets were within the hypothesized time frame. This would make the second bracket the best time to catch the bats during the early evening hours. I don't believe this means that the most prolific feeding time is during this hour. The first bracket was not very effective, probably for the simple reason that the bats are roosting for the majority of it and just emerging towards the end of the hour. As for the later time bracket (8-9pm), bats were actually foraging in the vicinity of the net every night. I observed many bats of various species flying, and several going around and over the net.

There are several possibilities for the observed pattern. First most of the bats recorded were females (Table 3) and many of these appeared to be gravid. The gravid females might leave their roosts before the others in order to have more time to forage and gain enough nutrients for her and the developing young she carries. In 2003 a study was done on the gravid, or lactating females caught and their flying height at time of capture. They determined that "pregnant bats may fly lower during their gestation period," so more than likely most of the females captured in this study were gravid and unable to maneuver quickly enough to avoid the net (Adams et al. 2003). Secondly most of the total bats caught were *Molossus molossus* (Table 2). It is possible that their roost is located some distance from Springfield and their arrival at Springfield Plantation coincides with the second time bracket.

If I were to repeat this project I would advise setting up nets in more than two different locations. There are reports of bats frequently being caught in the banana fields,

and this area was not touched during this study (Genoways et al. 2001). Also clear identification, and acknowledgment of which specimens captured were gravid and which ones were not would be helpful. Studies in the past have been done tagging bats and then releasing to see if the same ones were caught again, but without any success. I would like to be able to take this a step further and satellite tag the bats to see if in fact they are coming back to the same areas to feed night after night and in fact are learning, or if they are just never coming back to that location again. Projects could be done, by shrinking the time brackets. For example in the second time bracket (7-8pm) twenty six of the thirty two bats caught during this bracket were between the times of 7:00 and 7:30. Also I would recommend for later projects to schedule an early dinner, since only four bats were caught in the early time bracket (Table 3), and there were no bats caught during the entire study before 6:45. The nets could possibly not go up until 6:30pm, giving plenty of time for an early dinner. Due to the resources available and time allotted I was unable to determine exactly why more bats were caught during the seven to eight o'clock time bracket, perhaps a project in the future will be able to determine the reason.

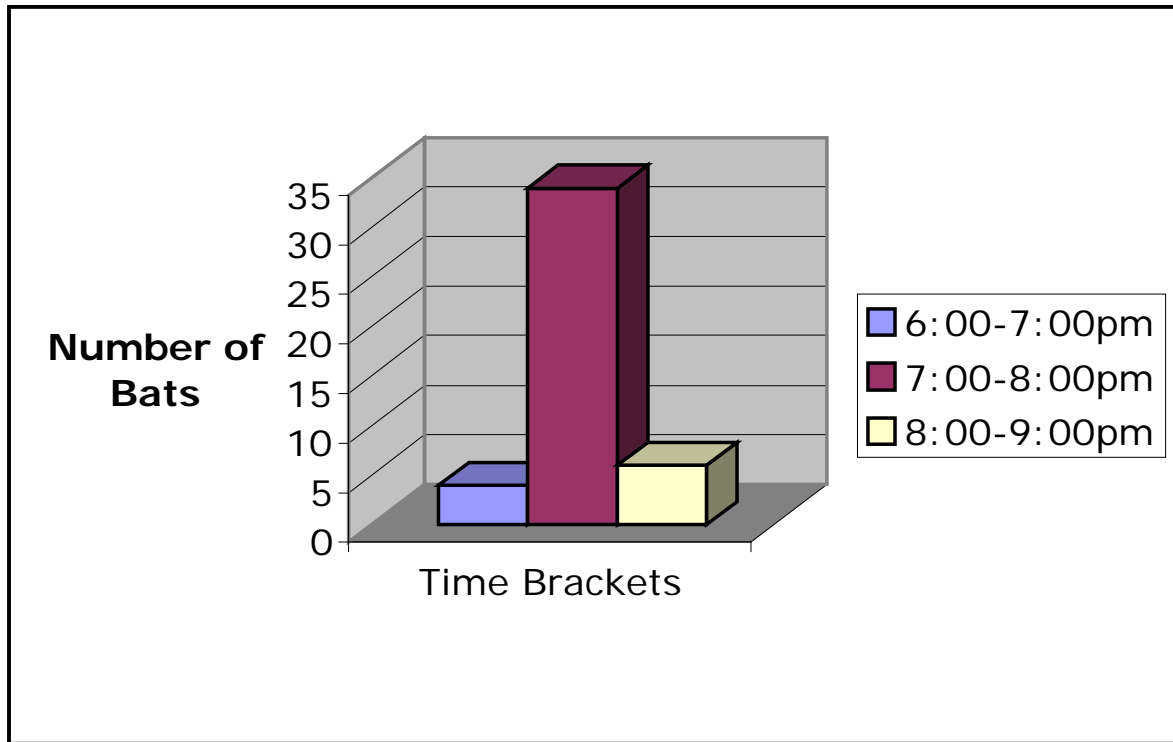
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## **Tables and Figures**

Time Bracket	27-May-05	29-May-05	3-Jun-05	5-Jun-05	7-Jun-05
6 oclock to 7 oclock	0	1	1	1	1
7 oclock to 8 oclock	5	1	9	1	18
8 oclock to 9 oclock	0	1	0	0	5

**Fig. 1**



Number of bats caught and their corresponding time bracket.

**Table 1** Bat catches per hour at Springfield Research Centre, 27 May-7 June, 2005.

**Table 2** Species of bats caught at Springfield Research Centre 27 May- 7 June, 2005.

Bat Species	27-May-05	29-May-05	3-Jun-05	5-Jun-05	7-Jun-05
Ardops nichollsti	1	0	0	1	0
Artibeus jamaicensis	1	1	0	0	0
Molossus molossus	3	0	8	0	23
Monophyllus plethodon	0	0	0	0	1
Sturnira lilium	0	2	1	1	0
Tadarida brasiliensis	0	0	1	0	0

**Table 3** Time, species, sex, and time bracket for bats caught at Springfield Research Centre 27 May- 7 June, 2005.

May 27, 2005 River

Time (pm)	Species	Sex	Time Bracket
7:05	<i>Artibeus jamaicensis</i>	Female	2
7:07	<i>Molossus molossus</i>	Female	2
7:08	<i>Ardops nichollsti</i>	Male	2
7:09	<i>Molossus molossus</i>	Female	2
7:10	<i>Molossus molossus</i>	Female	2

May 29, 2005 Syzgium jambos

Time (pm)	Species	Sex	Time Bracket
6:52	<i>Sturnira lilium</i>	Female	1
7:03	<i>Artibeus jamaicensis</i>	Female	2
9:00	<i>Sturnira lilium</i>	Female	3

June 3, 2005 River

Time (pm)	Species	Sex	Time Bracket
6:46	<i>Sturnira lilium</i>	Female	1
7:05	<i>Tadarida brasiliensis</i>	Male	2
7:10	<i>Molossus molossus</i>	Female	2
7:10	<i>Molossus molossus</i>	Female	2
7:10	<i>Molossus molossus</i>	Female	2
7:18	<i>Molossus molossus</i>	Female	2
7:20	<i>Molossus molossus</i>	Female	2
7:20	<i>Molossus molossus</i>	Female	2
7:25	<i>Molossus molossus</i>	Female	2
7:27	<i>Molossus molossus</i>	Female	2

June 5, 2005 Syzgium jambos

Time (pm)	Species	Sex	Time Bracket
6:51	<i>Sturnira lilium</i>	Female	1
7:40	<i>Ardops nichollsti</i>	Male	2

June 7, 2005 River

Time (pm)	Species	Sex	Time Bracket
6:55	<i>Molossus molossus</i>	Male	1
7:00	<i>Molossus molossus</i>	Male	2
7:06	<i>Molossus molossus</i>	Male	2
7:10	<i>Molossus molossus</i>	Male	2
7:13	<i>Molossus molossus</i>	Female	2
7:16	<i>Molossus molossus</i>	Female	2
7:17	<i>Molossus molossus</i>	Male	2
7:20	<i>Molossus molossus</i>	Female	2
7:20	<i>Molossus molossus</i>	Female	2
7:26	<i>Molossus molossus</i>	Female	2
7:27	<i>Molossus molossus</i>	Male	2
7:30	<i>Molossus molossus</i>	Female	2
7:36	<i>Molossus molossus</i>	Female	2
7:39	<i>Molossus molossus</i>	Female	2

7:41	Molossus molossus	Female	2
7:50	Molossus molossus	Female	2
7:50	Molossus molossus	Female	2
7:56	Molossus molossus	Female	2
8:00	Molossus molossus	Female	3
8:05	Molossus molossus	Female	3
8:07	Molossus molossus	Female	3
8:14	Molossus molossus	Male	3
8:35	Monophyllus plethodon	Female	3