

Noctilio leporinus (Greater Bulldog Bat)

Family: Noctilionidae (Bulldog Bats)

Order: Chiroptera (Bats)

Class: Mammalia (Mammals)



Fig. 1. Greater bulldog bat, *Noctilio leporinus*.

[<http://fw.dpnr.gov.vi/education/AndyWebPage/AnimalLifePages/Mammals/Bats/BulldogBat.htm>,
downloaded 3 November 2011]

TRAITS. The greater bulldog bat is one of the largest New World bats that can be found living in Puerto Rico (Gonnan et. al 2005) and in Trinidad. The bat has characteristic features such as a split upper lip, also known as a hare lip, which is formed by the folding of skin directly under its nostrils. It also has a large nose pad, large canines and a rigid chin and long ears which are narrow and pointed (Fig.). It has long elongated hind limbs consisting of very long toes and claws (Fig. 2) which it uses for fish hunting. The tail of this bat is short in comparison with the interfemoral membrane with most of the tail being wrapped within this membrane with the last few millimeters of the tail's length protruding from the membrane's end (Fig 1B). The short dorsal fur ranges from a pale yellowish orange to dark orange in males or from orange-brown to grayish brown colour in females (Gannon et. al 2005). It has a white middorsal stripe which is observed to span the length of the bat's body from its head to its rump (Gannon et. al 2005). The belly also varies in colour and can range from a dirty white to an orange hue. This species thus exhibits dimorphism with respect to colour and size with males being larger and more brightly colored than the smaller, duller colored females. The skull of this bat is quite large and lacks

incisive foramina (openings in the bone of the oral hard palate behind the incisors where blood vessels and nerves may pass). The bat has a total length of 112-130mm in length, with the longest body part being the forearm, 85-90mm, followed by the hind foot, 26-34mm, which is then followed by the tail, 23-33mm and finally the height of the ear being 22-30mm.

ECOLOGY. This particular species of bat is found in tropical habitats including South American regions as well as in some Caribbean islands such as Trinidad. Generally they are found close to large inland water sources including streams and ponds (Gannon et al. 2005). They may also be found around coastlines, bays and even some of the larger rivers (Wikipedia 2011). During the day they are found in caves and are known to roost in hollow trees, such as the silk –cotton and red mangrove. They are also found in manmade structures and also caves. During the night however, the greater bulldog bat is most active. It feeds on fish found at or close to the surface of the water found within its habitat. It mainly feeds on fish and insects around its surroundings especially moths and beetles (Wikipedia 2011).

SOCIAL ORGANIZATION. These nocturnal, polygynous, bats may be found in large clusters of several hundred or in smaller clusters comprising thirty. The males and females live together in social groups called harems (Gannon et al. 2005) which consist of a large male which protects a group of females. This male usually has exclusive mating rites to the females of the harem and usually larger, older and thus more experienced than the surrounding males. The other male bats, which aren't included in harems, known as bachelor bats, have been found to roost alone or with a small number of other male greater bulldog bats (Gannon 2005). The males within the harem were also found to have larger testes than bachelors. Female greater bulldog bats within a small group associate with each other for long periods of time, but males which may enter the females' social group may only form a component of the harem for two or more consecutive breeding seasons (Wikipedia 2011). Also, each cluster of bats has a specific scent to other clusters and thus each bat is aware of any foreign members of their harem. Young bats do not leave the roosting area. However, when they have matured to adults, they join the adults to forage. This species is generally solitary but has been known to associate with other species of bats in countries such as Cuba and in Puerto Rico and they have also been known to share caves with these bats of different species (Gannon et al. 2005).

ACTIVITY. Greater bulldog bats are active mostly during the night. They may forage several times during the night with each foraging trip lasting anywhere between 45 and 90 minutes. Total foraging time may sum up to be approximately 2 .5 hours long per night. Between foraging on consecutive nights, the bats rest and digest their food at the dayroost. Roosting may occur at the regular roosting location or at a distant location to the regular dayroost. Generally the bats return to the roosting area just before dawn and spend the day there until dusk.

FORAGING BEHAVIOUR. Females leave the day roost individually, but eventually end up hunting within a group of comprising other females. Resident males do not accompany the females during hunting (Gannon et al. 2005). Sometimes the greater bulldog bat eats fish it catches using a special feature called echolocation. When the bat detects the fish, it rapidly strikes by snapping its hind feet down and forward into the water. Also during foraging, another behavior is observed; this behavior is characterized by the dragging of the bat's feet through the water for up to 10 meters in areas where the stocking density of the fish is high. During this type

of foraging behavior the feet face forward and instantaneously grabs at any fish it has come into contact with. They generally forage in features such as ponds, along with around streetlights, along roads and over fields where flying insects are scooped out of mid air by the bat using its tail or wing membrane. Terrestrial prey however is grabbed with the hind feet similarly to the behavior described for the fish foraging behavior. These bats demonstrate behavioral flexibility to capture prey in the different media. Fish and insects are foraged throughout the year, but insects are most important during the wet season and fish more important to the bat during the dry season. The greater bulldog bats primarily eat fish and are less likely to eat insects on a normal basis as insects require that the bat spends energy to chase it. Feeding on insects is an opportunistic behaviour.

COMMUNICATION. The greater bulldog bat may use chemicals in the form of an oily yellow fluid to communicate (Gannon et al.2005). This accumulates on the fur under the wings of both the males and females. For example, as females roost they coat themselves in the chemical secretion which is characteristic of their individual colony. The composition of these natural chemical fragrance secretions differs between individuals and sexes. The differences in the chemical scents are used to communicate information about individuality, sexual identity, even the state of a particular bat's reproductive condition and for the identification of outside members of a colony. The bats also communicate via echolocation. This may be used between two bats in order to prevent collisions while flying.

SEXUAL BEHAVIOUR. Records of reproductive behavior are limited for this species. Gestation occurs between the months of December to April. The females in April are found to be almost full term in their pregnancy. The female may breed once a year with a very small portion of the female population breeding biannually. Reproduction however may correspond with the seasons of high food availability. There is a nine month interval separating mating and birth indicating the presence of a reproductive delay mechanism such as delayed implantation and delayed fertilization. Litter size is usually only one. Within a cluster of bulldog bats, there are nine females and one male. This male is responsible for copulation with the females and has testes that are larger than the other male bats in close proximity. Although not much information was found regarding sexual behavior such as courting, it is inferred that when the mating season has arrived bats use the yellow oily chemical secretion to communicate their reproductive condition and sexual identity to each other. They do this by rubbing their heads under other bats' wings (Animal Diversity Web 2008), directly in the area where the yellow oily chemical is secreted.

JUVENILE BEHAVIOUR. Juveniles are never left alone during the day but this however is different at night when all the adult bats are out foraging. The juveniles only take their first flight when they have matured. It is at this point they leave the day roost and go out to forage just as the rest of the adult greater bulldog bat population.

ANTIPREDATOR BEHAVIOUR. The greater bulldog bat remains within the day roost when there is high light intensity at night. Studies show that the bats prefer to leave the day roost to forage when light intensity is low. This is so as with higher light intensity, the bats are more likely to be detected by their predators and thus predated. To the bat, leaving the day roost under higher light intensities to forage may lead to its death and thus, the bat opts that that fate is too

costly and remains within the day roost (Bork 2006). This is predation avoidance and is employed when the cost of the bats predation is higher than its need to forage (Bork 2006).

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Fig. 2. Roosting greater bulldog bat.

[<http://fw.dpnr.gov.vi/education/AndyWebPage/AnimalLifePages/Mammals/Bats/BulldogBat.htm>,
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