Corkscrew's Bats
Friends in the Night

by Allyson Webb,
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Big Brown Bat *Eptesicus fuscus*	Eastern Pipistrelles *Pipistrelles sublavus*	Northern Yellow Bat *Lasiurus intermedius*	Brazilian Free-tailed Bat *Tadarida brasiliensis*
Rafinesque's Big-eared Bat *Corynorhinus rafinesquii*	Evening Bat *Nycticeius humeralis*	Seminole Bat *Lasiurus seminolus*	Florida Bonneted Bat *Eumops floridanus*

As night descends, many animals settle in for the night. Others are just beginning to stir.

A variety of nocturnal animals call Corkscrew home, including misunderstood and often feared bats. These fascinating animals, the only mammals with true flight, are our friends in the night skies, hunting for insects such as mosquitoes and numerous agricultural pests. Yet little is known about them.

These brief profiles will introduce you to the mysterious and intriguing world of bats with an emphasis on the species found in the Corkscrew area.

All bats belong to the order *Chiroptera*, which means "wing-hand." In North America and South America, all species are members of the suborder *microchiroptera*.

Bats are some of the most successful mammals in the world with regard to diversity and range. Over 1,000 species of bats exist worldwide and account for approximately 20% of the world's mammalian species. They are located on all major continents except

Antarctica, and these dynamos can be found in all but the most extreme polar areas and severe deserts.

Food habits range widely; bats can be insectivores, frugivores, nectarivores, carnivores, and sanguinivores.

These flying mammals are the best natural insect-control around.

People are slowly beginning to understand and appreciate these wonderful creatures, but no bats in Florida are completely safe or protected.

Bats that use trees and foliage are losing ground to development, and bats that move into buildings are susceptible

to improper exclusions and illegal extermination.

Doing research on bats is difficult, but new technologies are helping us better understand them. However, there still isn't much information about Florida populations. Education, habitat preservation, and more research are all keys to ensuring the continuation of these beneficial animals.

At Corkscrew, two bat houses are in place: one by the guest cabin and another in the back of the main parking lot. The parking lot bat house is home to a colony of Brazilian Free-tailed Bats. However, repeated disturbance of this roost could lead to its abandonment, so please respect their home.

For more information about bats, visit

Bat Conservation International ..... www.batcon.org
GORP Bat Watch ..... gorp.away.com/gorp/activity/wildlife/batwatch.htm
Florida Bat Conservancy ..... www.floridabats.org
Lubee Bat Conservancy ..... www.lubee.org
Organization for Bat Conservation ..... www.batconservation.org

Big Brown Bat

Eptesicus fuscus

Big Brown Bats are found throughout North America from Canada to southern Mexico.

Normally forest dwellers, they do not hesitate to utilize attics and crevices in buildings, caves, and rocks for daytime retreats. Favorite roosts are under the loose bark of dead trees and in cavities of trees.

Big Brown Bats are just that … big (13-16 inch wingspan) with brown, long fur ranging in color from dark to golden brown. Their undersides are a lighter shade. They have dark brown, almost black ears. Their teeth are impressive because these beneficial bats eat a variety of hard-bodied insects.

The Big Brown Bat is largely crepuscular, becoming active at just after sunset. Like most other bats, *E. fuscus* does not feed in heavy rain. It forages

by flying slow, straight courses over water, forest canopies, wooded clearings, and even around city lights. They prey primarily on beetles using their robust skull and powerful jaws to chew through the beetles' hard chitinous exoskeleton. They also eat other flying insects including moths, flies, wasps, flying ants, lacewing flies, and dragonflies. They eat until full, and then often make use of a "night roost" (hanging under a porch or in a barn to rest while digesting the meal). Then, they feed some more before returning to their daytime roost before dawn.

During autumn and winter, Big Brown Bats are busy mating. In the eastern United States, females will typically have twins. The actual timing of birth varies with latitude, and in Florida, the pups are probably born from May to mid-June.

The Big Brown Bat has a recorded life-span of 19 years. Known enemies include barn owls, horned owls, and rat snakes.

In Florida, the Big Brown Bat doesn't have a large population, so entire colonies could be wiped out with a single improper eradication. Education is one key to maintaining this valuable and beautiful bat.

Rafinesque's Big-eared Bat

Corynorhinus rafinesquii

Rafinesque's Big-eared Bat distribution covers the southeastern United States. Collier County is at the southernmost extent of its range. In Florida, this species uses tree cavities and loose bark as well as abandoned or little used buildings for nesting and roosting. Despite being considered colonial (roosting in groups), these bats are often found alone or in pairs.

The big-eared bats are readily distinguished by their big ears, which measure about an inch long. When they rest or hibernate, they coil their ears back against their heads like rams' horns to reduce the ear surface area and conserve body moisture. When disturbed, they unfold their ears.

They have bicolored (individual hairs are dark at the base and light at the tip) grayish brown fur. Additionally, they have long toe hairs that extend beyond their claw tips.

Rafinesque's Big-eared Bats are

purely nocturnal, only foraging when it is completely dark. While their diet is mostly moths, they will eat other softer bodied insects such as mosquitoes. They are the only Florida bats to use gleaning (taking insects directly off of a surface) as a primary foraging technique. But they are capable of grabbing a meal "on the wing." They are extremely maneuverable flyers.

Not much is known about the reproduction of Rafinesque's big-eared bats. In Florida, the females typically give birth to one pup in May or early June. The pups are able to fly three weeks after birth and reach adult size in about three months. They can live up to 10 years in the wild.

Historically, their range followed the great cypress swamps. As these areas have been destroyed or modified, this species has adapted and begun to use old buildings or attics, bringing them into more contact with humans. Their populations have declined over the past century.

In Florida, habitat loss, pesticides, and ignorance are their biggest threats.

Biologists age bats by looking at the finger bones in the outstretched wings over a bright light. Juvenile bats' bones have clear spaces between the joints; adult bats have ossified joints.

Eastern Pipistrelles

Pipistrellus sublavus

Eastern Pipistrelles is Florida's smallest bat, weighing in at a mere 1/4 ounce. The body is less than two inches long, with an eight to ten inch wingspan. They are solitary except at mating and in small nursery groups.

Eastern Pipistrelles are some of the earliest bats to emerge in the evening and are often be seen in the ambient light as they move to foraging grounds. They are relatively slow and erratic in flight, often fluttering and flitting along watercourses or over pastures and woodlands much like large moths.

They can catch prey at a rate of one insect every two seconds, increasing body mass as much as 25 percent in just thirty minutes. Typically, the diet consists of flies, mosquitoes, flying ants, small beetles and small moths.

Eastern Pipistrelles inhabit marshes and open woods near the edges of water. They appear to favor watercourses as foraging grounds and are not usually found in open fields or deep forests. Although not considered abundant, they are present throughout Florida, except in the Keys.

In Florida, roost habitat includes tree foliage and cavities, rock crevices, Spanish moss, and occasionally buildings.

Fur color varies from silvery-gray to light brown. Individual hairs are tricolored; dark base, yellow-brown middle, and dark tips. The wings have black wing membranes contrasting with reddish-orange forearms.

Eastern Pipistrelles are obligate hibernators, meaning that they still hibernate even though food is available. Because they cannot remotely withstand freezing temperatures, they are among the first species to begin hibernating and some of the last to emerge in the spring. They generally hibernate individually.

Mating occurs in autumn before hibernation, and mating is the only time males and females are ever together. Females give birth to twins from late May to mid July. Having twins is rare among other bat species. At three weeks the young are able to fly, they are weaned and begin to forage with their mothers at four weeks, and at five weeks, they are independent. Sexual maturity is at 3 to 11 months.

hibernacula: the shelter of a hibernating animal; from the Latin *hibernaculum*, winter residence. Many bats in Southwest Florida remain active all year, roosting in a state of torpor during spells of cold temperatures.

Evening Bat

Nycticeius humeralis

The Evening Bat is one of the smaller bats, weighing less than half an ounce. Their tiny bodies fit easily in the palm of a hand, but with a wingspan of about eight to ten inches, they seem larger in flight.

Evening Bats are one of the more abundant species in Florida, although they are not in the Keys. Their range extends throughout the eastern United States. They are more prevalent in the southeastern states but are uncommon in most of the northern part of their range.

The fur is brown, sometimes with a bronze to reddish tint. A small, broad, dark, naked muzzle distinguishes them from other small brown bats.

These bats usually emerge early, 15-20 minutes after sunset, and fly a slow steady course when foraging. They prefer open areas and are often visible over open fields and ponds. Around human areas. They follow roadways and hunt at street lights. Females return to the roost to feed their young during the night.

The Evening Bat's food preferences are similar to those of the Big Brown Bat (see July newsletter), primarily beetles and true bugs, but they eat more moths. In Florida, evening bats also have been seen foraging for mosquitoes, flying ants and termites, beetles, stinkbugs, June bugs, and flies.

In natural areas, Evening Bats roost behind loose bark, in the crevices and cavities of dead trees, and abandoned woodpecker cavities. They readily adapt to bat houses, often sharing the space with other bat species; they've even been found roosting in the folds of outdoor patio umbrellas.

Evening Bats prefer a woodland or mixed woodland/open area habitat for nesting colonies. Colony sizes range from just a few to around 70.

Evening bats are one of the few bats which almost never enter caves. In Florida, they leave bat houses in late summer and winter and return in the early spring of the following year to establish maternity colonies. No one knows where they go in the winter.

Evening bats have a relatively short life span of about 10 years. Mating typically occurs in the fall although fertilization is delayed until spring. One to three pups are usually born in May.

Immediately after the pups are born, they begin to squeak. For the first two weeks, the mother is at rest and the young stay nestled under her wing. During the third week they are able to fly and practice until they can negotiate turns, land, and hang from walls. Pups completely stop nursing at about 9 weeks and at this time are able to eat insects on their own.

Northern Yellow Bat

Lasiurus intermedius


Merlin D. Tuttle
Bat Conservation International

The Northern Yellow Bat is a solitary, non-migratory, tree-loving species that lives along the southeastern Atlantic and Gulf Coasts, Cuba, and coastal Mexico, usually found in areas where Spanish moss is prevalent.

In Florida, these bats inhabit hardwood and pine forests near permanent water but are also found in palm groves. They roost year-round in Spanish moss or beneath the dead, fan-shaped fronds of palms.

At four to five inches in length and with a wingspan of 14-16 inches, the Northern Yellow Bat is the second largest bat in Florida after the Mastiff Bat.

There are no reliable longevity records for this species, but the fact that they typically produce litters of three suggests relatively short life spans compared to most other bats.

Its long, thick, silky fur varies in color from yellowish-orange to yellowish-brown to almost gray, enabling it to be well camouflaged in its roost habitat of dead palm fronds. The fur extends down the body to cover about half of its tail membrane. Its ears are relatively large and pointed.

Although it is solitary, small groups may roost together in the skirts of old fronds of cabbage palms.

This species forages at night at heights of 15 - 20 feet over meadows, golf courses, marshes, and above the treetops along lake and forest edges. Its diet consists entirely of insects, mostly flies, dragonflies and damselflies, beetles, true bugs, and wasps.

Breeding occurs in autumn, but pups aren't born until May and June. The female leaves the pups in the roost while she goes out to forage, but if the roosting site is disturbed, she carries them with her. The young forage for themselves in two to five weeks.

Northern Yellow Bats do not migrate, but rather go into a state of torpor when the weather is harsh or food is not abundant. During torpor they rely on stored body fat to sustain them.

A dramatic decline in numbers has been reported in areas of Florida where pesticide use is especially heavy. That and loss of habitat are its main threats. The clearing of woodlands and the practice of removing old palm fronds and Spanish moss kills many individuals and destroys habitat.

Owls and rat snakes are known predators of Northern Yellow Bats.

Seminole Bat

Lasiurus seminolus

The Seminole Bat is common throughout Florida except in the Keys. It spends most of its life in forests of mixed oak and pine, or in lowland cypress stands and river swamps and is closely associated with lowland wooded areas with Spanish moss. It ranges throughout the Gulf Coast states but not much further north than the Carolinas.

The Seminole Bat is a medium-sized bat with deep mahogany fur with frosted tips, giving it a distinct reddish-maroon hue. The fur goes to the tip of its tail and extends along the underarms to the wrists, ending with distinctive white patches on the wrists and shoulders. It is about two to three inches in length with a wingspan of 11-13 inches, The white wrist and shoulder markings are distinctive.

Both males and females roost in Spanish moss during winter and spring. Many roosts are in shaded locations over ground that reflects minimal sunlight and where the bats can drop down and into flight. Females rear young in tree foliage. During extreme weather conditions, they may roost beneath loose bark.

The Seminole Bat is solitary and commonly roosts in pine trees and Spanish moss. Mating occurs in late fall or early winter, possibly in flight.


Jerry L. Gingerion, DVM

During winter and early spring, Seminole Bats don't hibernate or undergo extended migration but fall into torpor during cold spells, waking to feed in warmer times.

Most young are born in late May or early June, though times of birthing may vary in years of differing climatic conditions.

Litters are typically one to four pups, which are fully furred and appear almost identical to their mothers by the time they are two weeks old. At three to four weeks, they can fly. No studies of Seminole bat longevity exist.

They are fast, direct flyers, feeding in flight above treetop level or as close as four feet above the ground in open areas. They also glean insects from foliage. They emerge early in the evening when temperatures are above 70° F and forage mostly over watercourses, pine barrens, and clearings, but also in edge habitats along rivers or roadways. They take advantage of prey attracted to street lamps.

Little is known about Seminole Bat food preferences, but the few available studies have shown that they consume mostly leafhoppers, flies, beetles, bees, and ants. Amounts vary with prey availability, season, and location.

Blue Jays are suspected of preying on these bats in the spring when young are unable to fly.

Brazilian Free-tailed Bat

Tadarida brasiliensis

This species uses a wide variety of habitats and can be found throughout the southern states and down into Central and South America.

The largest concentration of mammals in the world is a colony of Brazilian free-tailed bats at Bracken Cave near San Antonio, Texas. The Brazilian Free-tailed Bat is likely the most abundant bat in Florida.

In Florida, these bats do not roost in caves as they do in the Southwest. Instead, they tend to use man-made structures such as barrel tile roofs, bridges, eaves, and picnic shelters. They will use natural structures such as dead trees but do so rarely in Florida.

This affinity for stable, manmade structures makes them the most likely candidates for bat house use. Their colonies can swell to the thousands depending on the available roost space. Since they prefer very warm roost sites, they may shift sites seasonally but do not undergo long migrations in Florida.

Brazilian free-tailed bats are midsized bats with wingspans of about 12 inches. They have short grayish brown to dark brown fur. Their tails are free with a membrane that comes only to the middle of their tails. There are vertical wrinkles in their upper lips, and their ears are broad and rounded but do not join in the middle of their head like other similar Florida species.

These bats also have a scent gland at the base of the throat. They emit a strong, musky odor, somewhat similar to Baked Lays, and they can sometimes be smelled before seen.

Brazilian Free-tailed Bats are fast flyers and have been clocked at 60 miles per hour with tail winds. They have been seen flying at altitudes over 10,000 feet, higher than any other bat.

About 15-20 minutes after sunset, they begin to emerge. They prefer open habitats and will eat a variety of insects including beetles, moths, and flies. March is the breeding season. After breeding, females form large maternity colonies and after 11-12 weeks, females give birth to a single pup.

All of the bats found at Corkscrew eat insects, and just one bat can consume up to 3,000 insects in a single night. They are our greatest natural insect control.

Florida Bonnetted Bat

Eumops floridanus

Originally, Florida Bonneted Bats were a subspecies of Wagner's Mastiff Bat, but in 2004, taxonomic research concluded that the Florida population was in fact a separate species.

This rare creature is found only in the southern portion of Florida on both the east and west coasts. Currently, there is no evidence of their existence in the Keys.

These bats can be found in urban and forested areas where they may use buildings, barrel tile roofs, tree cavities, and rock crevices for roosting. One colony is currently living in a bat house in North Fort Myers. They seem to prefer smaller colonies of 8-12 bats. Little is known about the social behavior of these bats.

Florida Bonneted Bats are the largest bats in Florida with wingspans of 20 inches. They weigh between 34 and 47 grams. Their fur coloration varies. Dorsally, it can be dark gray, brownish gray, to cinnamon brown and lighter gray underneath. The fur is bicolored, being darker towards the tip. Its tail extends beyond the membrane. Their ears join together at the midline of their head and are broad and large with a slant forward over the eyes.

In part because of its rarity, this species has been difficult to study, and little is known about its foraging behavior. Guano under one roost contained the remains of true bugs, flies, and beetles.

Florida Bonneted Bats are later emergers, coming out approximately 40 minutes after sunset. They are high and fast flyers and have been seen at heights of 30 or more feet, above and along treetops and over open areas.

Again because of its rarity, very little is known about the reproductive ecology of this species. Females give birth to a single pup, but it is possible they have multiple birthing seasons in a year.

This is one of the few species that has acoustical calls audible to humans. The lower end of their call range is 10 kHz and goes up to around 18 kHz. People with good hearing may actually be able to eavesdrop on these guys as they hunt and navigate.