



Corkscrew  
Swamp Sanctuary

## Along the Boardwalk

October, 2007

[www.corkscrew.audubon.org](http://www.corkscrew.audubon.org)

### Donations come in many forms, shapes

Works of art, spotting scopes, education programs, and reference books for volunteer use. All have been donated to Corkscrew recently and all are, or soon will be, in use.

Artist Nancy Gray-Giffin, *near right*, owner of Miss Nance's Custom Crafts in Naples, created and donated an exquisite life-size beaded replica of Corkscrew's Ghost Orchid, *far right*. It is on display in the Nature Store.

Jackie Accardi-Mena donated a Tom Ahern wood carving of a Saw Whet Owl in memory of her husband. The carved owl, *right*, is on display in the Blair Center lobby.

Donations in memory of volunteer Brad Lewis, at his wife's request, will provide a new Vortex spotting scope and tripod for boardwalk use.

Donations in memory of William Marks, volunteer Leslie Burgess'



brother, were designated for enhancement of programs and materials in the Education Department.

Volunteer Dick Brewer donated nine new insect, plant, and reptile field guides for the reference library in the Bunting House and five natural history books for the Parker library.

### Ghost Orchid blooms again

The Ghost Orchid continued to surprise by beginning its third set of blooms this summer on September 19.

### Looking for something to do?

Help is needed with trimming and sweeping along the boardwalk. Any help from volunteers who are already here or those planning to return in October would be greatly appreciated.

Three other areas needing assistance are digital slide presentation design, helping with the native plant garden, and spending a little time at the membership desk (in air-conditioning).

To help, contact Sally Stein at [Sstein@audubon.org](mailto:Sstein@audubon.org) or (239) 348-9151, ext. 112.

### Christmas Bird Count team organization beginning now

Although the Corkscrew Christmas Bird Count isn't until Saturday, December 15, Sally will begin organizing the different teams this coming month.

If interested, contact Sally at the phone or email listed above.

### Holiday shopping season near

Beginning to think of holiday presents? The Nature Store now has an assortment of 2008 Audubon calendars.

### Quick ID Guide:

#### Blue-headed Vireo, White-eyed Vireo, and the Ruby-crowned Kinglet

Three small birds share certain identifiable traits, but they can be separated by looking at combinations of field marks.

All are about the same size, have two light wing bars, and forage in about the same habitats.

The White-eyed Vireo has white eyes; the other two don't. The White-eyed Vireo has a yellow ring around its eye that extends to the bill to form yellow "goggles," while the other two have white rings. The White-eyed Vireo is much more yellowish overall although immature birds show less yellow.

The Blue-headed Vireo has a noticeable gray head, and the white eye ring extends toward the bill to form its goggles. Its throat shows more white than does the kinglet's throat.

The Ruby-crowned Kinglet has a

longer and thinner bill than do the vireos, and its eye ring doesn't extend to the bill. Its head is a pale brownish-gray, and it has a small black bar on the wing just below the longer white wing bar, which neither vireo has.

Blue-headed Vireo



White-eyed Vireo



Ruby-crowned Kinglet



### Bird Trivia

What large shorebird found at Sand Dollar Island and Caxambass Pass has a long, straight bill that appears to curve up? Discover the answer at [www.collieraudubon.org/birding.html](http://www.collieraudubon.org/birding.html)

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## In Case a Visitor Asks

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### What are those ugly growths on bay leaves, and do they hurt the tree?

They are galls. A gall is a plant structure formed by abnormal growth within plant tissues and is caused by a reaction to a parasitic attack in the plant's cells.

The conspicuous leaf galls that we see on Red Bay (*Persea borbonia*) leaves are caused by the psyllid *Trioza magnoliae*, or jumping plant louse. The adults are small insects which greatly resemble leafhoppers except that the wings are clear and colorless.

In order to form galls, the insects must seize the time when plant cell division occurs at a high speed: the



growing season. The immature psyllids hatch and inject their saliva into the leaves as they feed. The saliva acts as a potent plant growth regulator and causes the edges of the leaves to curl around the insects.

The gall provides a microclimate for the young psyllids. The microclimate is protection from wind, storms, and temperature extremes. A protein-rich inner wall lines the parasite's "home" with plenty of food. With these conditions, the parasites breed very successfully, which is the name of the game.

When mature, the adult psyllids emerge from the galls, mate, and lay eggs for another generation.

What does the bay get out of it? Usually nothing, but it is not harmed either.

Most of the leaves remain unaffected. There must be this balanced relationship between the parasite and the plant in order for them to both continue their existence. Too many gall-causers and the plant would not be able to protect itself properly, which would eventually result in the end of the parasite.

The only harm to the plant is that it is forced to use energy and materials for gall formation instead of for improving other structures.

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## September Sightings

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A Cassius Blue butterfly pauses on a stalk near the wildlife crossing (September 4).



A Black-and-yellow Argiope pulls silk from its spinaret to construct its web (September 11).



A Limpkin returns to the rising water between the lakes to hunt Apple Snails. (September 14).

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## Friends in the Night

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by Allyson Webb

It's the beginning of a new day, and light slowly begins to brighten the world. Some animals are just getting up, and some are going to bed. Bats in particular are heading to roosts to sleep in safety after a long night of foraging.

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 exterminations.

Researching bats is difficult work, but new technologies are helping us better understand them. However, there 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.

The final installment about Corkscrew's bats is on the next page. I hope you are beginning to understand and maybe even love my favorite mammals!

*For more information about bats, check out these web sites.*

- Florida Bat Conservancy  
..... [www.floridabats.org](http://www.floridabats.org)
- Bat Conservation International  
..... [www.batcon.org](http://www.batcon.org)
- Lubee Bat Conservancy  
..... [www.lubee.org](http://www.lubee.org)
- Organization for Bat Conservation  
..... [www.batconservation.org](http://www.batconservation.org)

# Friends in the Night

## Corkscrew's Bats: Fourth in a Species Profile Series

### 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



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 single pups.

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 mid-sized 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

Corkscrew's bats only eat insects and are our greatest natural insect control. One bat can eat up to 3,000 insects a night. To print a combined booklet of this series about Corkscrew's bats, go to [www.corkscrew.audubon.org](http://www.corkscrew.audubon.org) and click on "Wildlife."

### Florida Bonneted 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.



# Mosquitofish

*Gambusia holbrooki*

**H**ero or villain? Is it a legendary devourer of mosquito larvae that reduces mosquito populations, or is it a predator so aggressive that it is more detrimental than helpful in controlling mosquitoes?

Mosquitofish are actually a little bit of both.

Mosquitofish are members of the 'live-bearer' family along with guppies, mollies, swordtails and other popular aquarium fish. Of the 45 species of mosquitofish, all native to the Americas, two species are relatively widespread throughout the US.

Western Mosquitofish (*Gambusia affinis*) are native from the Mississippi River drainage west to California while Eastern Mosquitofish (*Gambusia holbrooki*) are native along the Atlantic coast from New Jersey to Florida.

Eastern Mosquitofish are the second most common fish in freshwater Everglades marshes (Least Killifish are smaller, but more abundant) and are a critical food source for larger fish and many wading birds.

While males and females can be difficult to tell apart, adult males are considerably smaller (~3/4" in length vs. females ~1") and have an extended anal fin called a gonopodium that is used for internal fertilization of females.

They are extremely hardy and adaptable fish that can survive a variety of pH's and temperatures (43-95° F, and for short periods of time as high as 107° F) and very low dissolved oxygen content.

Mosquitofish reproduce rapidly; gestation is about four weeks. A female can produce three to four broods a year in her three-year lifetime, each brood having up to several hundred young.

It is because of their adaptability to changing environments that Mosquitofish are so successful in the seasonally-flooded marshes at Corkscrew and throughout South Florida. They can sur-



vive a 90% dry season die-off and be at full population levels within months of the return of favorable conditions.

In addition to being prolific breeders, they are also excellent dispersers. With the onset of the wet season, they can move tens of miles from deep-water refuges to repopulate the system. Even with the extreme dry-down at Corkscrew this year, Mosquitofish were back in the lakes, only inches deep, within a week of the return of water.

## Mosquito-eating fish, really?

Because of their reputation as mosquito control agents, mosquitofish have been routinely and indiscriminately stocked in temperate and tropical waters around the world since the turn of the century. But are they really specialized mosquito eaters?

Mosquitofish are most often found near the water's surface and are voracious predators. They have upturned mouths designed for preying upon mosquito larvae, aquatic insects, smaller fish, and zooplankton that swim at the water's surface. Mosquitofish have been seen to consume 230 mosquito larvae in one hour, but they actually prefer other food sources when available.

Other native fish like Least Killifish, Bluefin Killifish, Swamp Darters, Golden Topminnows, and juvenile Sunfish appear to be just as effective eating mosquito larva and controlling mosquito populations as Mosquitofish.

In fact, in our ecosystem, Mosquitofish primarily eat grass shrimp, dragonfly and damselfly larvae, aquatic beetles, and eggs, larvae and juveniles of various fishes, including their own. In short, these fish will eat pretty much anything they can fit in their mouths. Mosquitofish have even been found to be aggressive toward larger fish, often attacking, shredding fins, and sometimes even killing them.

## Too much of a good thing?

The adaptability and aggressive nature of Mosquitofish make them very successful invasive species outside their native range. They have been introduced nearly worldwide by well-meaning mosquito control agencies and they have had extremely detrimental effects on native fishes, invertebrates, and amphibians.

Introduced Mosquitofish are thought to be responsible for the decline of several aquatic species in the West (topminnows, pupfish, Pacific treefrogs, California newt), Southeast (gopher frogs), and as far away as Australia (threatened frogs and other fish).

Introductions may actually increase mosquito populations when Mosquitofish consume native fish which are better adapted to control mosquito larvae in their native ecosystems. They may also precipitate algal blooms by eating the native zooplankton grazers.

Mosquitofish are a good reminder of the importance of keeping fish, and all species, restricted to their native range where they can be the heroes.

Any introduced species is a villain. In South Florida, native fish are threatened by introduced fishes such as Mayan cichlids, black acara, spotted tilapia, oscars, walking catfish, and brown hoplos which have the potential to out-compete or displace native communities.

Every organism has a specific niche in its native habitat. Introducing a species to a new area, even Mosquitofish, often upsets nature's delicate balance and in the long run creates bigger problems than ever existed in the first place.