



Creating a Haven for Fox Squirrels

A mixed tree stand dominated by native species, with an open understory and full palms, is a rich habitat for feeding and nesting. Photo by Rebecca Ditgen

Only a Few Courses Offer Habitat Suited for Large Populations

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From August 1995 to December 1997 I was fortunate to spend my days on 60 golf courses in south west Florida. I was there not to play golf but to search for and study one of my favorite animals, the Big Cypress fox squirrel (*Sciurus niger avicennia*).

The Bureau of Nongame Wildlife, Florida Game and Fresh Water Fish Commission, funded the study to see if golf courses can offer long-term refuge to these native squirrels which do not survive the pressures of dense development.

Squirrels and golfers know that all golf courses are not alike. The 30 months of field work clearly showed that some courses provide much finer habitat for fox squirrels than others.

On the larger scale, it became clear that planning and design strategies are critical to fox squirrels. Squirrel population levels are affected by isolation and clustering of courses, by traffic flow within and around a course, and by the density of development in and around a course.

On a smaller scale, at the level of course management, it is clear that tree species, ground cover, and human interactions can strongly influence squirrel numbers. Only a small number of courses offer habitat suitable for relatively high numbers of squirrels, and even these may not be secure for the long term. Given the variation in

landscape quality, I was able to identify management practices which can enhance habitat for fox squirrels if the species is present on a course.

Managing portions of a golf course for fox squirrels requires that you attempt to mimic elements of their native habitat. In southwest Florida fox squirrels live in open pine forests and make use of cypress stands, hammocks and occasionally the mangrove edges along the Gulf. They frequently move

Editor's Note: *The Florida Green has followed and reported on this study in two previous articles since its inception in 1995. We are pleased to present Ms. Ditgen's results and suggestions for ways golf courses can enhance the fox squirrel habitat.*

and feed on the ground and so benefit from an open understory. Managing the roughs and forested stands within a course with these habits in mind enhances opportunities for fox squirrels to feed and nest.

A consideration of tree species, understory management, palm trimming, and human activities will serve as a short introduction to landscape practices that can benefit these colorful squirrels.

Vegetation types

Pines appear to be a key element in fox squirrel habitat. Squirrels harvest the annual crop of cones, feeding on the seeds and depositing the stripped cores at the base of trees. The trees are also used for nesting, escape routes and resting.

Important though pines are, fox squirrels need a variety of tree species to flourish. Native cypress trees can furnish a high quality food source as

soon as the trees are old enough to produce their small round cones. The grand old cypress trees gracing the fairways of fortunate clubs provide excellent nesting sites in the large airplants clinging to their main branches and in cavities found high in their broad trunks.

Native oaks produce excellent food, as do figs, maples and a range of native trees and shrubs. Cabbage palms can offer safe nest sites and food. Whether nesting in palms, cavities, stick nests or airplants, fox squirrels use Spanish moss to line their nests whenever it is available. The maintenance or development of mixed wooded areas of native species, complete with airplants and Spanish moss, creates critical habitat for fox squirrels.

A wide variety of non-native species supplement wildlife feeding on some of the older courses in southwest Florida. Few of these tree species are being planted today and so I will not

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Another study subject enjoys a large fungus dug from the rich litter layer beneath an open pine stand. Photo by Rebecca Ditgen

elaborate on them. I would instead encourage concentration on planting native species, both trees and shrubs, as they often require less care and water and they can provide food and shelter for native wildlife.

Understory

An open understory in tree stands is critical for the success of fox squirrels. Creating and maintaining an open understory is controversial and not part of the landscape plan of every course, but it is an essential landscape element in fox squirrel habitat. It benefits the squirrels even if all the trees are not native species. Native saw palmetto can be present but fox squirrels are not favored in a landscape with a heavy palmetto understory.

The open understory is most helpful to fox squirrels if it is covered with a layer of pine needles. The needle layer provides excellent areas for burying pine cones and acorns for later consumption. The acidic pine litter layer also appears to enhance the growth of mycorrhizal fungi which facilitate nutrient uptake by tree roots. The fungi are vital to pine survival and they provide a much-used food source for fox squirrels. Recent studies have shown that

squirrels spread the fungal spores as they defecate, providing further inoculation of pine roots. This is a good story for trees, fungi and squirrels.

Palm trimming

One of the easiest management techniques for fox squirrels, and a host of other native wildlife, is moderation in palm trimming, especially the native palms. Cabbage palms — by no accident the Florida state tree — have the look and grace of wild Florida. The layered leaves and long leaf bases of a cabbage palm provide a wonderfully protective shelter from tropical rains and winds, creating homes for native wildlife.

I was fortunate to witness more than one litter of fox squirrels starting life in the shelter of some rather full cabbage palms. The fullness of the palms was accomplished without distracting from the beauty of well-maintained courses.

The tropical palm trim so common on a number of courses may provide a “clean” look, but it turns our state tree into a useless remnant of a palm as far as wildlife is concerned. There are compromises in palm trimming. The extreme trim may be used on a few palms placed at dramatic points around the course if members prefer that look and the palms

in more secluded areas or near pine stands may be left with fuller crowns.

You do not need to stop trimming palms altogether to create usable habitat, but save enough leaves so that a dense upper crown remains and also keep long leaf bases in the crown to create a protected shelter in the top of the tree.

A few non-native palms found on golf courses can provide some of the benefits of the cabbage palms. Though I would not encourage you to plant the non-native palms, if you already have queen palms you know the fruits are highly sought after by fox squirrels.

The queen palm fruits can help the squirrels in the low food season of late winter and early spring. If you want to cut off the fruits so they will not litter the ground around the trees you might try placing them in an out-of-the-way area where squirrels can get to them for feeding.

Human interactions

Because golf courses are essentially human places, people who play there and squirrels who live there will eventually meet. Everyone will benefit and be happier if some thought is given to what people can do for and to squirrels.

Feeding — I have been on several courses where fox squirrels were common yet they were still wary of humans. They did not approach carts and they ran for cover when people or carts approached. That is the healthiest situation for both squirrels and humans. Squirrels should never be fed from golf carts or otherwise handed by people. They must never associate food and people.

Once fed from carts or otherwise by hand, fox squirrels become pests. They hang around tees and greens waiting for distracted golfers and then make off with the food supply. Cart-fed squirrels have a greatly increased risk of dying in a one-sided cart-squirrel accident or being pounded over the head by a golf club. They become unpopular and members may even lobby for their removal.

It is of course best to have an ongoing understanding and notices for members

about not feeding squirrels or other animals. Even one member who habitually feeds the animals can train them to be problem animals. If you already have problem cart trespassers try squirt guns to discourage them. Squirrels just need to get the idea that a cart will offer an unpleasant experience.

Feeding fox squirrels is not necessarily a bad thing to do, but it needs to be done so it helps the squirrels and does not aggravate the members. If you want to feed fox squirrels, it is best done by scattering food on the ground in an isolated location away from heavy cart traffic.

Placing it about on the ground instead of in feeders in trees may reduce transmission of diseases such as skin fungus. In the wild, fox squirrels eat nuts, seeds and some fruit. You will need to follow that pattern. Commercial seed mixes can be appropriate squirrel food and you may also place the fruits of trimmed palms in the mix. Squirrels should not be fed bread or processed foods and peanuts are not nuts.

Nest boxes

If your course is one of the many

with few ideal nesting sites, you may want to provide additional nesting sites in the form of nest boxes. Wood duck nest boxes work well for fox squirrels. Ideally they should be placed fairly high in pine or cypress trees, at least 25 feet from the ground, and be in a mixed cluster of trees.

You will need holes in the bottom for drainage and some circulation under the roof section. These boxes are often well used, both by females with litters and by individuals during extremely heavy rains and wind.

Education

One of the best ways to benefit fox squirrels is by providing information to members and guests. This might include signs asking players to watch out for darting squirrels along cart paths or club roadways or writing columns about habitat enhancement, feeding restrictions, or natural history of wildlife species that are common on your course.

Many club members are not familiar with our native wildlife and plants and a little information may go a long way in helping them to understand and appreciate the unique and beautiful natural heritage of Florida.

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In review

Whether you are the manager of an existing course with fox squirrels or you are involved in the planning of a new course, knowing what fox squirrels need can allow you to manage for their survival. Just remember the main areas of attention:

- Plant and maintain pines, cypress, oaks, maples, figs and other native trees and shrubs
- Maintain an open understory and create areas with a pine litter layer
- Trim palms moderately or not at all
- Consider human interactions- feeding, nest boxes, education

With careful planning, well-directed efforts, and good fortune you can help increase the feeding and nesting opportunities of the unique Big Cypress fox squirrel of southwest Florida.

An acknowledgment: In the course of my study I met a host of helpful and hardworking superintendents and assistant superintendents, many of whom shared my affection for these delightful fox squirrels. Their generosity and patience gave me access to the fox squirrels and their urban homes and I am deeply grateful for their assistance.

About the Author

Rebecca Ditgen is a wildlife ecologist in the Department of Wildlife Ecology and Conservation at the University of Florida. She conducted research on urban populations of Big Cypress fox squirrels as a Ph.D. student in that department and plans to continue her study of the species with a project in Big Cypress National Preserve. RSDitgen@ufl.edu.



A moderately trimmed cabbage palm provides a mid-day resting site for a Big Cypress fox squirrel whose fondness for pecans allowed him to be part of a radio-tracking study. Photo by Rebecca Ditgen