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Eastern Fox Squirrel (*Sciurus niger*) Ecology and Management

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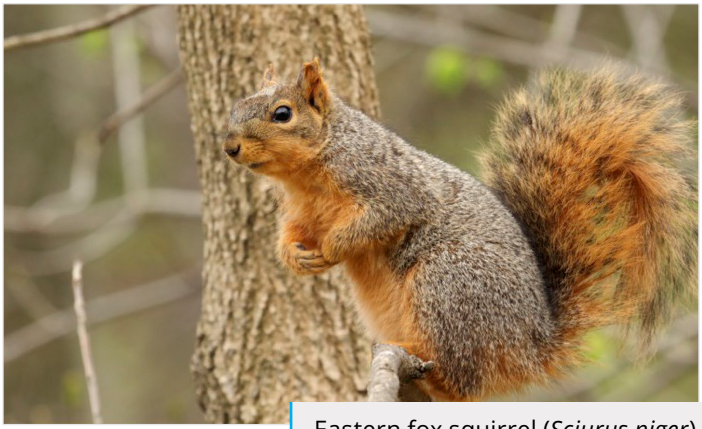
General Characteristics

Averaging 21 inches in length and weighing up to 2 pounds, eastern fox squirrels (*Sciurus niger*) are the largest tree squirrels in North America. They have a two-toned coloration, with brown-gray fur across their backs and red-orange fur on their stomachs. They have cinnamon-colored feet with four toes on the front and five on the back, each with long, sharp claws. Their ankles are double-jointed, allowing them to turn 180 degrees. They are extremely athletic, running up to 20 miles per hour and jumping up to 8 feet. Eastern fox squirrels have two upper and two lower incisors that grow continuously, a prominent characteristic of the order Rodentia. These teeth can grow up to 6 inches per year and must be filed regularly by gnawing on wood.

The word "squirrel" comes from the Greek word *skiouros*, meaning "shadow tail." Eastern fox squirrel tails are cinnamon-colored, approximately half the length of their bodies, and have multiple uses. For instance, the tail can be used as an umbrella to protect the squirrel against both extreme sunshine and rain. It keeps the squirrel warm in the winter by functioning as a blanket. Their tail acts as a stabilizer when jumping between branches, a parachute should they fall, and a rudder when they swim. A squirrel's tail also communicates emotions such as fear or annoyance.

Distribution

The range of the eastern fox squirrel extends through the Eastern and Central United States, spreading into Northern Mexico and Southern Canada. Due to their ability to adapt to a wide range of habitats, they are the most common squirrel in Texas. They are found in every ecoregion except for the Trans-Pecos region and parts of the High Plains. However, their range is expanding with the westward expansion of pecan orchards, which provide a convenient source of forage. There are three subspecies within Texas, the Texas fox squirrel (*Sciurus niger limitis*) to the West, the pineywoods fox squirrel (*S. n. ludovicianus*) to the East, and the reddish fox squirrel (*S. n. rufiventer*) to the North.



Eastern fox squirrel (*Sciurus niger*).

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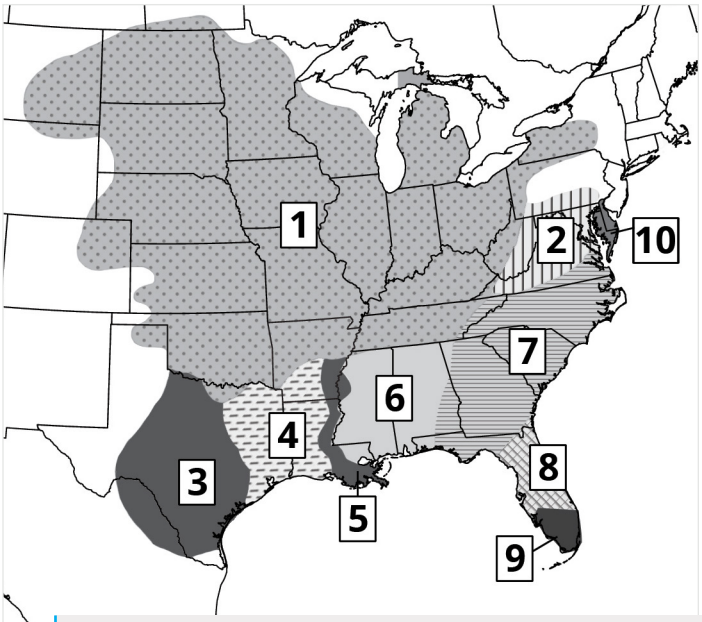
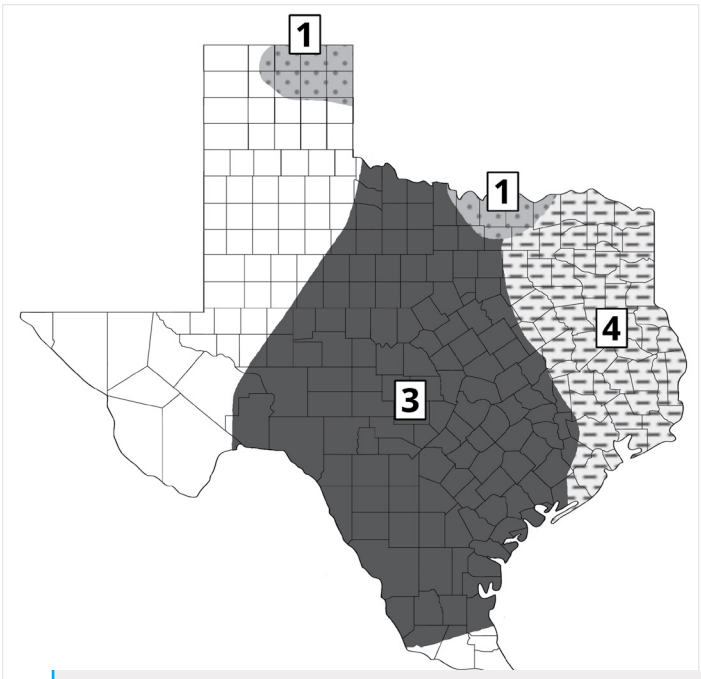


The native range of eastern fox squirrels (*Sciurus niger*) in North America. Ranges of the subspecies are also indicated: (1) *S. n. rufiventer*, (2) *S. n. vulpinus*, (3) *S. n. limitis*, (4) *S. n. ludovicianus*, (5) *S. n. subauratus*, (6) *S. n. bachmani*, (7) *S. n. niger*, (8) *S. n. shermani*, (9) *S. n. avicennia*, and (10) *S. n. cinerus*. *Map derived from Moncrief et al., 2010.*



This enlarged view of Texas from the U.S. map on the left shows a closer look at the native range of eastern fox squirrels (*Sciurus niger*). Ranges of the subspecies are also indicated: (1) *S. n. rufiventer,* (3) *S. n. limitis*, and (4) *S. n. ludovicianus*. *Map derived from Moncrief et al., 2010.*

Habitat and Diet

The ideal habitat for eastern fox squirrels is mature, upland hardwood forests connected by strips of open corridors with little understory vegetation. The size and spacing of trees are important characteristics of eastern fox squirrel habitat, with den trees averaging 12 inches or more in diameter at breast height coupled with 20 to 60 percent canopy cover and 30 percent or less understory density. The age of trees is a key indicator of habitat suitability. Preferred cavities are often found in 40- to 50-year-old stands of trees (Tesky, 1993; Nicholson, 2017). Squirrels depend heavily on forested habitats, but they commonly occupy forest edge habitat and will readily go into agriculture fields, orchards, and residential areas to take advantage of available food and cover. An intermixture of mast-producing trees, or the nuts and fruit produced by species such as oak, pine, elm, beech, and pecan, and proximity to riparian areas, or areas along a water body, are attractive habitat characteristics. However, the presence of a consistent source of food across all four seasons is crucial in determining habitat suitability. Due to the periodic nature of mast crops, an assortment of different species is essential in providing alternate food sources.

Eastern fox squirrels have a diverse diet that changes seasonally. In the fall and winter, hard mast such as acorns, pecans, and hickory nuts are critical, providing squirrels with much-needed energy. In the spring and summer, eastern fox squirrels have a broad diet, consuming insects, buds, green shoots, fruits, and seeds, providing individuals with protein. Eastern fox squirrels typically feed in the early mornings and late afternoons. They consume an average of 1.5 pounds of mast per week, although it takes 30 to 40 pounds to sustain a squirrel through the breeding season.

Eastern fox squirrels will drink free-standing water, but their water needs can easily be met through the consumption of succulent vegetation.

Table 1. Dietary habits of eastern fox squirrels through the seasons

Season	Food Sources
Spring	Flowers (oak, black walnut, elm, hickory, maple, willow, pecan), seeds (osage orange, corn), fungi, bulbs, insects, bird eggs
Summer	Nuts (hickory, walnuts, acorns), fruit (mulberries, black cherries, grapes, blackberries), seeds (maple, hackberry, pine), fungi, bulbs, insects
Fall	Nuts (acorns, hickory nuts, walnuts, pecans), seeds (osage orange, maple, dogwood, pine, corn), fruit (blackberries, grapes), fungi, bark
Winter	Nuts (acorns, hickory nuts, black walnuts, pecans, hazelnut), seeds (osage orange, dogwood, pine), plants (elm, sweetgum, hornbeam), soybeans, bark

Eastern fox squirrel (*Sciurus niger*) foraging a pinecone.

Eastern fox squirrel (*Sciurus niger*) lying flat against branch of southern live oak (*Quercus virginiana*), relying on camouflage to hide it from predators.

Home Range and Behavior

An individual eastern fox squirrel may occupy an area of up to 10 acres of territory per season, utilizing 40 acres throughout an entire year. The average carrying capacity of quality eastern fox squirrel habitat is one squirrel per 2 to 3 acres. Home ranges of multiple squirrels overlap, and territories are typically not defended, with the exception of individual nesting sites. Squirrels are a communal species in that they will share winter food stores.

Eastern fox squirrels are diurnal, meaning they are active during the day and sleep at night. However, they are also crepuscular, meaning they are most active during the early mornings and late afternoon. Though eastern fox squirrels do not hibernate, they do sleep for several consecutive days during the winter.

When they feel threatened, eastern fox squirrels hide rather than run. They will lie motionless, relying on their coloring to camouflage them to their surroundings, while continuously peeking around a tree to observe the intruder's location. Their most prominent defense tactic is to keep an object between themselves and the threat, often shifting positions around a tree as a predator moves. The most prominent predators of eastern fox squirrels are birds, such as hawks and owls, as well as foxes, bobcats, coyotes, and domestic cats and dogs. Squirrels are vocal, using sounds, such as clucking, barking, and whistling, and actions, such as flicking their tail and chattering their teeth, to signal that predators are nearby, announce that danger has passed, and in courtship and territorial displays. When startled, they are known to make a loud shrieking sound, and, as infants, they will purr when being fed by their mothers.

Reproduction

Eastern fox squirrels breed twice a year, once in the winter (January/February) and again in the summer months (May/June). Squirrel gestation lasts approximately 45 days, and females give birth to three young per litter, on average. At birth, the young are blind, hairless, and develop slowly in comparison to other rodents. At 5 weeks, squirrels open their eyes and have a full coat of fur. At 7 to 8 weeks, they climb out of the nest, and they venture to the ground at 10 weeks. At 3 months, they are fully weaned and able to survive on their own, although they typically spend their first winter with their mother. They reach sexual maturity at 10 to 11 months, beginning the cycle anew.

Hollow trees are the preferred sites for dens and nurseries for raising young. Den openings are generally circular and 2.9 to 3.7 inches in diameter, while the den itself is typically 6 inches wide and 14 to 16 inches

Juvenile eastern fox squirrels (Sc*iurus niger*) peeking out of their den in a hollowed tree.

deep. Eastern fox squirrels can create their own dens by cutting through the interior of a tree with their teeth. However, they often utilize natural cavities or those created by woodpeckers or other tree-boring birds. Eastern fox squirrels will readily build a nest of twigs and leaves, known as a "drey," within the tree canopy. These nests are spherical and are typically 12 to 20 inches in diameter with an inner cavity that is 6 to 8 inches across (MacClintlock, 1970).

Nest Boxes

If mature trees with cavities are scarce, artificial dens may be constructed to provide suitable nesting habitat. Nesting structures can be created using a variety of recycled materials, from wood to rubber tires. However, inner dimensions should be at least 9.5 inches x 7 inches x 18 inches, while the entrance should be at least 3 inches in diameter. Placement of the shelter in the canopy is an important indicator of which sex and age class will most likely benefit from its implementation. For instance, if the target is sexually mature females, place the nesting box within the canopy close to a field edge. If the target is juveniles or adult males, placement below the canopy and away from the forest edge is ideal. Due to both the eastern fox squirrel's home range area and overlap, it is important to supply multiple shelters in one area. A good rule of thumb is to make 2 to 3 shelters available per squirrel per acre (Nicholson, 2017).

Squirrel Hunting in Texas

Eastern fox squirrels are important small-game animals throughout their range, playing a vital role in ecosystem dynamics. With more than one million individuals harvested annually, squirrel hunting serves not only as a cultural tradition, fostering environmental stewardship among sportsmen, but also as a practical tool for managing sustainable population levels across the state (Alexander, 1994). Additionally, the species' economic contribution, through licensing, equipment sales, and related expenditures, provides essential funding for habitat conservation and broader wildlife management initiatives.

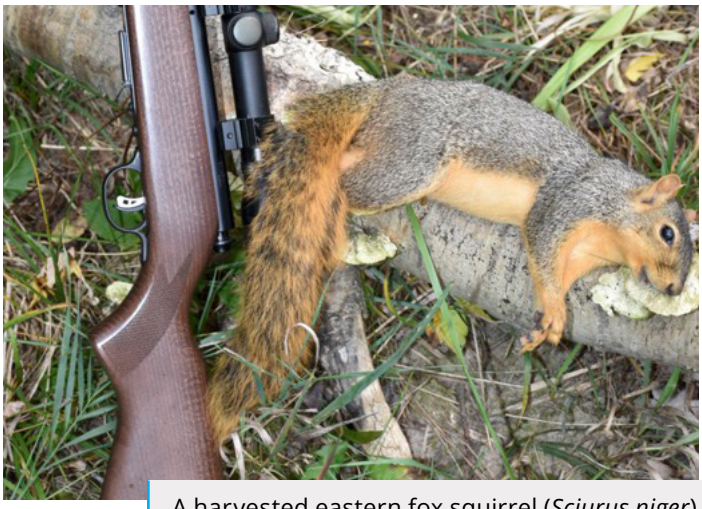
■ FUN FACT

Fox squirrels are so named because their gray and orange coat resembles a gray fox!

In Texas, regulated squirrel harvest is used to maintain healthy population densities and reduce localized overabundance that could lead to resource depletion or increased competition with other native species. The extensive public and private land access in the state, along with flexible hunting seasons, makes eastern fox squirrels an accessible management target, especially in areas where other forms of population control may not be feasible. Squirrel hunting also functions as a gateway for broader public participation in wildlife stewardship. Because it requires minimal equipment and skill to begin, it provides an approachable entry point for education in ecological literacy, responsible hunting ethics, and firearm safety. Processing small-game species like squirrels allows new participants to learn sustainable harvesting practices with lower barriers than large-game species might present. There are plenty of easy and delicious recipes that use squirrel meat, such as chicken-fried, the recipe for which can be on the next page.

Engaging the public in small-game hunting fosters a deeper understanding of habitat use, species behavior, and the importance of maintaining balanced ecosystems. Hunting eastern fox squirrels requires familiarity with local habitat conditions, tree species that support squirrel populations, and seasonal behavioral patterns. These observational skills are critical for informed wildlife management

Eastern fox squirrel (*Sciurus niger*) in a constructed nesting box



A harvested eastern fox squirrel (*Sciurus niger*).

and conservation action. Regulated squirrel hunting contributes to the long-term sustainability of both the species and the ecosystems they inhabit. Most importantly, however, new and experienced hunters alike must respect the animals and the roles that they play, not only ecologically, but in the long-standing tradition and culture of the activity.

Check hunting regulations to find exact hunting season dates and daily bag limits, which can be found online at Texas Parks and Wildlife Department (TPWD), at TPWD offices, or in most stores where hunting licenses are sold.

Eastern Fox Squirrel Issues and Prevention Techniques

Eastern fox squirrels are a resilient species, adjusting to urban environments through changes in population behavior, habitat selection, and demographics, a process referred to as synurbanization. This, however, results in significantly more frequent instances of human-wildlife interactions, an outcome that incurs both benefits and detriments. One benefit surrounding close squirrel proximity to humans is that squirrels are natural entertainers with their playful behavior. Observing squirrel behavior allows citizens of densely populated areas to interact with nature and creates a sense of community among local residents as they work to foster squirrel habitat through a sense of shared responsibility. Eastern fox squirrels are also important in maintaining ecological balance. They contribute to increasing biodiversity, control local insect populations, and promote plant propagation through seed dispersal, adding greenery to urban spaces, aesthetics, value, and healthier conditions.

FUN FACT

Fox squirrels can live up to 18 years in captivity!

Conversely, eastern fox squirrels are known to chew on items, causing damage to man-made structures, requiring costly repairs, and potentially increasing the risk for fires. Similarly, they find nesting habitat in attics, garages, and sheds, which can lead to home damage. By understanding the interplay between urbanization and its effects on synurbanized species like the eastern fox squirrel, which have adapted their ecology to survive in a human-dominated landscape, these species can be managed accordingly.

Chicken-fried Squirrel Recipe

Ingredients:

- 2 pounds squirrel meat
- 1½ cups flour
- 2 tsp baking powder
- 1 tsp baking soda
- 1 tsp garlic powder
- 1 TBSP Tony Chachere's seasoning
- Salt and pepper to taste
- 1½ cups buttermilk
- 1 egg
- 3 cups oil of choice

Gravy:

- 3 TBSP butter
- ⅓ cup flour
- 2 cups chicken broth
- ½ cup heavy whipping cream
- Salt, pepper, Tony Chachere's seasoning to taste

Instructions:

1. First, pound squirrel to ¼-inch thickness. Season with salt, pepper, and Tony Chachere's seasoning to taste.
2. Next, add 1½ cups of flour into a shallow dish. Add baking powder, baking soda, Tony Chachere's seasoning, garlic powder, and salt and pepper, to taste. Whisk until combined.
3. Add buttermilk and egg to a separate shallow dish. Whisk until combined.
4. Dredge each piece of squirrel in the flour mixture, then in the buttermilk mixture, and again in the flour mixture.
5. Preheat 3 cups of oil on medium/high heat. Once oil gets hot, add battered squirrel and fry until golden brown in color, 3 to 5 minutes per side. Transfer cooked meat onto a plate lined with paper towels and keep warm.
6. Make the gravy by melting butter in a saucepan. Once melted, add flour and stir continually for 1 minute. Slowly pour in 1 cup of chicken broth and stir until everything is combined. Add another cup of chicken broth and stir again. After, stir in heavy whipping cream and season with salt, pepper, and Tony Chachere's seasoning to taste.
7. Serve chicken-fried squirrel with gravy. Enjoy!

Eastern fox squirrels (*Sciurus niger*) may cause damage to homes and gardens.

Eastern fox squirrel (*Sciurus niger*) in a wire trap.

Exclusion

Eastern fox squirrels may occasionally cause damage to forests or ornamental trees by chewing bark from branches and trunks. To protect trees, place an expandable protective wrap around trunks. Commercial wraps are available, or they may be made from ¼-inch mesh hardware cloth. Wraps should extend 18 to 24 inches from the ground and should be placed on all trees that squirrels can access. This method works well on trees located close to bird feeders or structures, though not in areas with a continuous tree canopy that allows for easy movement between trees.

Similarly, excluding squirrels from buildings, gardens, and other crops is the most effective and proactive defense against potential damage. This can be done by implementing either a fence of 1-inch mesh wire or electric fencing. Mesh fencing should be at least 30 inches high and extend 6 inches below ground, with an additional 6 inches laid outward at a 90-degree angle to discourage burrowing. Three electric fencing strands should be placed 3 inches from an existing fence, one 6 inches above the ground and one at fence height. Ultimately, supplemental feeding is the most effective way to prevent eastern fox squirrels from stripping tree bark. Utilizing a bird feeder or scattering food sources such as corn, sunflower seeds, or nuts provides an easy source of supplemental feed (Pierce, 2022).

■ FUN FACT

Squirrels can only find a portion of the nuts that they bury. A single squirrel can bury several thousand nuts over the course of just a few months. That is a lot of plant propagation!

Trapping

In more urbanized areas where hunting may not be allowed, live trapping may offer a more effective solution to control squirrel populations. Wire or cage traps that are at least 24 inches long and have a 9-inch x 9-inch opening are commonly used to catch squirrels. To trap an eastern fox squirrel, tie open the door of the trap for several days to allow individuals to become accustomed to it. After a few days, set the trap and check it multiple times per day. Baited traps are often more successful, especially when items such as walnuts, pecans, or sunflower seeds are used to draw in animals. Translocating captured squirrels can cause significant stress to the individual and may contribute to the transmission of diseases. Before relocating a captured squirrel, always consult a local wildlife professional.

Resources

Conservation Programs for Private Landowners

Conservation programs can help landowners with some of the startup costs associated with implementing wildlife management practices. Many conservation programs exist for a specified management practice, each with its own requirements and incentives. While a landowner can only apply one conservation program to a parcel of land, there are ways to use combinations of conservation programs on different plots of the same property, thus utilizing many programs to meet a landowner's management goals in a fiscally responsible way. Wildlife biologists from the Texas Parks and Wildlife Department or the USDA's Natural Resource Conservation Service (NRCS) can help plan wildlife management objectives and choose conservation programs.

Technical Assistance for Private Landowners

The following agencies can give wildlife and/or forest management planning or technical assistance to private landowners:

- Texas Parks and Wildlife Department
- Texas A&M AgriLife Extension
- Texas A&M Forest Service
- Texas A&M Natural Resource Institute
- Texas A&M University Department of Rangeland, Wildlife, and Fisheries Management
- USDA Farm Service Agency
- USDA Natural Resource Conservation Service

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