



Wildlife Note — 1
LDR0603

Squirrels

by Chuck Fergus

Most Pennsylvanians are familiar with the gray squirrel, which lives both in towns and rural areas. The gray is our state's most common squirrel; the fox, red and flying squirrels are three other species native to our state.



Squirrels are fast and agile, scaling trees and jumping from treetop to treetop with great speed. When jumping, they use their large tails to help keep balanced.

Squirrels see only in shades of black and white, but their eyes are sharp and detect movement well. They have keen senses of hearing and smell. They are most active in early

mornings and late afternoons, except the nocturnal flying squirrel.

Squirrels are rodents, and the four species do not interbreed. Born blind and hairless, young are dependent upon their mother for up to two months.

Biology

Gray squirrel (*Sciurus carolinensis*) — Adult gray squirrels weigh 1 to 1½ pounds and are 18 to 20 inches in length; about half this length is a broad, bushy tail. Most grays are colored silvery-gray above and off-white below, often with rusty or brownish markings on the sides or tail. Albinism is rare, but melanism (black coloration) is fairly common. Once, black-phase gray squirrels were found throughout Pennsylvania; today they occur most often in the northcentral counties. "Black squirrels" may be any shade from dark gray to nearly jet black, often with a brownish tinge.

Gray squirrels eat mast — acorns, hickory nuts, walnuts and beechnuts. Other foods include berries, mushrooms, pine seeds and corn (only the germ at the base of the kernel is eaten), and dogwood, wild cherry and black gum fruits.

In early spring, squirrels eat buds, a high-energy food. They eat the buds and flowers of red and sugar maples in April, and later may feed on the winged fruits of red maple. These foods have a high moisture content that supplies squirrels' water needs, although grays will drink from available ground water sources. Grays smell out nuts they have previously buried for winter food. Unrecovered nuts may sprout and grow into trees. In this way, squirrels help ensure continual forest growth.

Grays are probably the wariest of Pennsylvania's squirrels. They're quicker than fox squirrels and less vocal than reds, although they sound warning barks and assorted "chucks." Hawks, owls, foxes and tree-climbing snakes occasionally kill young squirrels, but adults are not easily taken. Predators do not appreciably affect squirrel populations on good ranges — availability of food is the key to population size.

A maximum life span for a wild gray squirrel could be 10 years or even longer, but few live more than two or three years. Grays live in nests and dens. They build leaf nests in trees near good food supplies in both summer and fall. The leaf nests are cooler than tree dens, they're about 12 by 16 inches and are built of twigs, leaves, grass, bark and other plant materials. Tree dens are often in cavities where limbs have broken off or in deserted woodpecker holes, usually 40 to 60 feet off the ground. Resident squirrels gnaw back the outer tree bark that, in time, would otherwise seal off den holes.

Gray squirrels breed in late winter or early spring. Following a 44-day gestation period, females bear litters of 4 to 5 young in late February, March or early April. The young are usually raised in tree dens and nursed by their mother for 5 to 7 weeks. Gray squirrels often bear a second litter in July or August, and small grays seen in autumn are from summer litters. Grays are gregarious and do not seem to demonstrate territoriality. Three or four individuals may feed side by side where food is plentiful.

Fox squirrel (*Sciurus niger*) — Fox squirrels are found mainly in the western and southern counties. Unlike grays, fox squirrels prefer open, park-like woods with sparse ground cover, usually avoiding mountains and extensive forests. Their nesting, denning and feeding habits are much like those of gray squirrels.

Fox squirrels have gray to reddish-gray upper parts and buff to pale orange-brown undersides. Larger than grays, weighing nearly two pounds, they are slower, more sluggish and less vocal. They are about 21 inches in length, including a 10-inch tail.

Like the other Pennsylvania tree squirrels, fox squirrels never actually hibernate in winter but will hole up and sleep soundly through several days of snowstorms or extreme cold.

Mating season is in January, and young are born in late February or early March. Average litter size is 2 to 4 young; only one litter is raised per year.

Fleas, chiggers and mosquitoes may bother squirrels, and tapeworms have been found in some specimens. Fox and gray squirrels seem to get along together wherever their ranges overlap.

Red Squirrel (*Tamiasciurus hudsonicus*) — The red squirrel is alert, raucous and energetic. About half the size of the gray, the red measures about a foot from nose to tail-tip and weighs about 5½ ounces. In summer its fur is a rich, rusty brown, turning grayer in winter, when this squirrel also develops prominent ear tufts. The undersides are off-white.

The red squirrel is sometimes called a chickaree or a pine squirrel, reflecting its preference for nesting in conifers. Behavior, feeding habits and denning practices are generally similar to those of gray and fox squirrels, although reds sometimes nest in holes at the base of trees. They enjoy eating the immature, green cones of white pine. Unlike fox and gray squirrels, reds do not bury nuts singly, preferring a large cache — often in a hollow log — for storing food.

The breeding season for red squirrels begins in late winter, with 3 to 6 young born in April, May or June after a 40-day gestation period. Reds have strong territorial instincts, often defending food sources and den trees against intrusion, and will even aggressively drive off trespassing grays.

Southern Flying Squirrel (*Glaucomys volans*) — The southern flying squirrel is found throughout Pennsylvania; it occurs from southern Maine to Florida and from Minnesota to Texas, with isolated populations in Mexico and Central America. The southern flying squirrel is slightly smaller than the closely related northern flying squirrel, and much more common in Pennsylvania.

Adults are 8 to 10 inches long, including a 3- to 5-inch tail. Weights range from 1.5 to 3 ounces. The soft, velvety fur is grayish brown on the back and pearly white on the belly. The large, dark brown eyes are adapted for night vision. The so-called flying membrane is a loose flap of skin between the fore and hind legs on either side of the body; when a flying squirrel extends its legs, they stretch the membrane taut, making an airfoil on which the animal can glide from one tree to another or from a tree to the ground. A flying squirrel can sail up to 40 yards in a downward direction. It uses its broad, flat tail as a rudder.

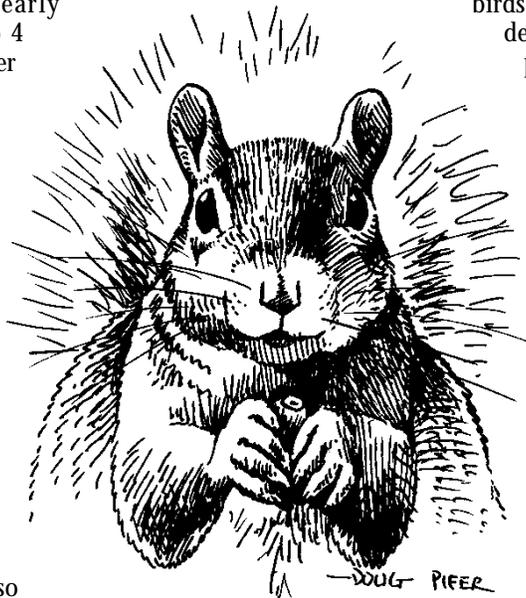
Flying squirrels are mainly arboreal, although they also forage on the ground. They are rarely seen, since they are nocturnal. They nest in hollow tree limbs and woodpecker cavities and sometimes in large birds' nests, which they cap with shredded bark and leaves. After a gestation period of about 40 days, 2 to 7 young (on average, 3 or 4) are born in April, May or June. The young are weaned after about two months. Adult males do not help the females rear the young. The southern flying squirrel may produce two litters per year, with the second litter arriving in September.

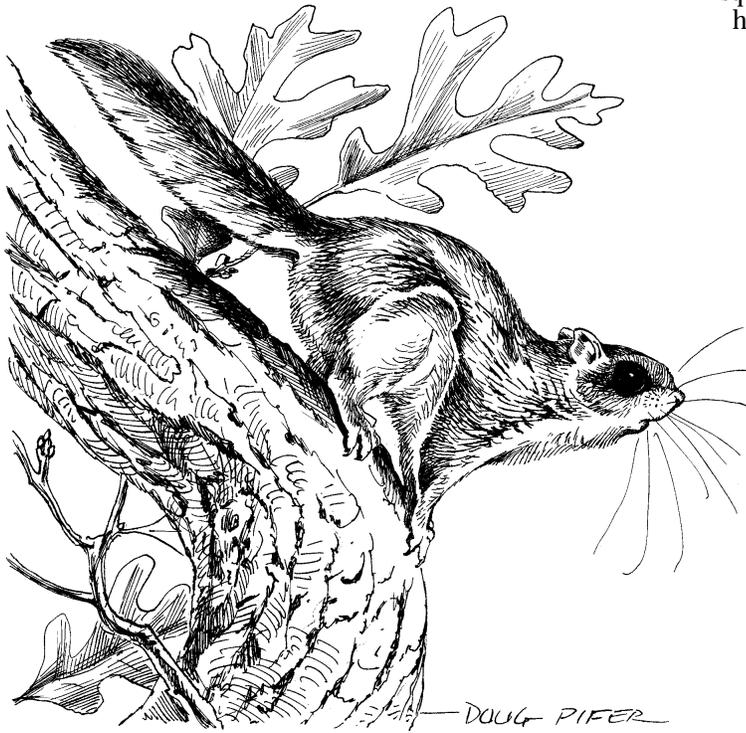
Flying squirrels may be more common than many people think. A good way to look for them is to rap a stick against trees or branches that have cavities; the squirrels may stick their heads out or emerge to see what's going on.

Flying squirrels eat nuts; seeds; winter buds of hemlock, maple and beech; tree blossoms and sap; fruits; berries; ferns; and fungi, both above-ground and subterranean types. They store surplus nuts in their dens and also bury them in the ground. Although small and apparently docile, flying squirrels are the most predaceous of the tree squirrels eating moths, beetles, insect larvae, spiders, birds and their eggs, small mice and shrews and carrion. Owls and house cats are major predators of flying squirrels; foxes, coyotes, weasels, skunks, raccoons and black rat snakes also take them. The average life span is estimated at five years.

Active year-round, flying squirrels are quite sociable, and in cold weather several individuals may share a tree cavity, sleeping snuggled together for warmth; up to 50 southern flying squirrels have been found in one nest. The southern flying squirrel may become torpid during the coldest part of the winter. One to three individuals typically live on an acre of suitable wooded habitat.

Northern Flying Squirrel (*Glaucomys sabrinus*) — The northern flying squirrel is slightly darker and browner than its southern counterpart. The two species' ecology and habits are similar, although the northern flying squirrel shows a greater affinity for conifers, and the southern flying squirrel favors nut-producing hardwoods. The





northern flying squirrel inhabits New England as far south as the mountains of northern Pennsylvania; there are also disjunct populations in parts of the Appalachians to the south. *Glaucomys sabrinus* ranges from the Great Lakes states west to Alaska.

Northern flying squirrels inhabit old-growth and mature forests, particularly northern hardwoods (beech, birch, maple) interspersed with hemlock, spruce and fir. Home ranges are estimated at 5 to 19 acres and perhaps larger. Adults do most of their foraging between dusk and midnight, and for one to three hours before dawn. They feed heavily on lichens and fungi, including many underground ones, truffles and their relatives, which the squirrels sniff out. They also eat seeds, buds, fruits and insects. They den in tree cavities or woodpecker holes during the winter, and in the summer, they may build nests out of leaves and shredded bark, in crotches of conifers high above the ground. Females produce one litter per year, usually with 2 to 4 young.

The loss and fragmentation of old-growth forest may be causing a decline in the northern flying squirrel population in Pennsylvania, and it is considered a threatened species here.

Population

Once there were so many gray squirrels in Pennsylvania that they were considered nuisances by pioneering farmers. In fact, bounties were paid on 640,000 squirrels in 1749, and many more were doubtless taken for the table.

Settlement and development of our state has changed the habitat, and squirrel numbers have decreased since the 18th century — but even so, there is no shortage of

squirrels in Pennsylvania today. They're our most heavily harvested small game species.

Biologists estimate that a healthy autumn squirrel population is composed of about 35 percent juveniles, 30 percent sub-adults and 35 percent adults; also, that one gray squirrel per acre of woodland is a good density and that three per acre is excellent and only occurs on prime habitat. Although a hundred or more squirrels may thrive in a park or campus, these situations do not occur in the wild. If food becomes scarce in the wild, large segments of the gray squirrel population may leave their home locales to travel in search of food and concentrate where they find it.

Squirrel populations fluctuate. Good reproduction — with most females bearing two litters — follows autumns in which large mast crops were produced. Severe winters, on the other hand, may reduce squirrel numbers, especially if they follow a mast failure.

Habitat

Woodland areas can be managed to favor squirrels. Of the two main forest types found in Pennsylvania — oak-hickory in the south and beech-birch-maple in the north — the oak-hickory forest is better squirrel habitat, mainly because it has a greater variety of vegetation types.

Gray squirrels prefer a deciduous forest with a variety of tree species that provide a diverse food supply. A forest of mixed maples, oaks, hickories and beech, for instance, would support more grays than would a ridge-top stand of chestnut oaks. The fox squirrel needs woodland edge — places where the trees border corn or other crop fields.

A good squirrel woods should contain many mature mast-producing trees, a mixture of other tree and shrub species to provide seasonal food variety, natural den trees and hollow tree cavities for escape purposes. Diverse tree and shrub species ensure adequate food supplies even though weather, tree characteristics or tree vigor may cause food crop failure of some types of vegetation.

Red, black and scarlet oaks regularly produce mast, while white and chestnut oaks are less reliable. Although white oak makes better sawtimber, landowners favor the red oak group if they wish to support a large, stable squirrel population. In selective logging operations, four to six hickories should be left per acre (if they are available), as they are heavy mast producers.

Old, hollow trees with many openings are rarely used for dens, although they provide temporary shelter from predators and hunters. A good den site is usually a tree nearing maturity with one or two openings into a cavity. Entrance holes are round and seldom over three inches in diameter. If you want to manage a timber tract for squirrels, keep at least four or five active den trees on each acre. In forests where trees have reached a mast-producing stage but are not mature enough to serve as good den sites, artificial nesting boxes may be used.

Wildlife Notes

Allegheny Woodrat
Bats
Beaver
Black Bear
Blackbirds, Orioles, Cowbird and Starling
Blue Jay
Bobcat
Bobwhite Quail
Canada Goose
Chickadees, Nuthatches, Titmouse and Brown Creeper
Chimney Swift, Purple Martin and Swallows
Chipmunk
Common Nighthawk and Whip-Poor-Will
Cottontail Rabbit
Coyote
Crows and Ravens
Diving Ducks
Doves
Eagles and Ospreys
Elk
Finches and House Sparrow
Fisher
Flycatchers
Foxes (Red & Gray)
Gray Catbird, Northern Mockingbird and Brown Thrasher
Hérons
Kingfisher
Mallard
Mice and Voles
Minks & Muskrats
Northern Cardinal, Grosbeaks, Indigo Bunting and Dickcissel

Opossum
Otter
Owls
Porcupine
Puddle Ducks
Raccoon
Rails, Moorhen and Coot
Raptors
Ring-necked Pheasant
Ruby-throated Hummingbird
Ruffed Grouse
Shrews
Snowshoe Hare
Sparrows and Towhee
Squirrels
Striped Skunk
Tanagers
Thrushes
Vireos
Vultures
Weasels
White-tailed Deer
Wild Turkey
Woodchuck
Woodcock
Wood Duck
Woodpecker
Wood Warblers
Wrens

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