

Excitable Neighbors: Squirrels of the Watershed

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You have surely seen these furry-tailed neighbors as they scamper through the tree limbs and over the phone lines, extract nuts from mature pine cones, or heard them chattering. Our local tree squirrels are active during the day, and become habituated to our activity, and are therefore much more readily viewed than most other local wildlife. At a first glance, it may seem like there is just one type of squirrel running along your tree limbs, but there are actually four species of squirrel that live in our watershed.

There are three species of tree squirrels known from Marin County, and one species of ground squirrel. Of the tree squirrels, two species are native to California and one is introduced from the eastern part of the United States. Native western gray squirrels (*Sciurus griseus*) are found throughout much of California, primarily in oak woodlands of the foothills and valleys and in pine/oak forests. These are common in Marin County, where they feed on a variety of seeds, fungi, and other plant materials. Native Douglas squirrels (*Tamiasciurus douglasii*), sometimes called chickarees, are found in mostly conifer-forested regions of the north coastal area, including portions of Marin County. Eastern fox squirrels (*S. niger*) were introduced from the eastern United States and are well established in most major Californian cities, and the surrounding developed areas. The eastern gray squirrel (*S. carolinensis*) is another invasive squirrel found in the Bay Area, originally introduced from the eastern United States into Golden Gate Park in San Francisco. It is possible that this species is established here as well.

The two species that you are most likely to see along the creek are the western gray squirrel and the eastern fox squirrel; therefore these two species are both discussed in more detail below.

The western gray squirrel is about 22 inches in length, with a large bushy tail edged in white. The coat can run from a salt-and-pepper to a silvery gray above, with white below. Eastern fox squirrels are somewhat longer, and can grow to 29 inches in total length, also with a bushy tail. They commonly have a light brown coat above and a reddish or orange underside. However, they can vary greatly in color, and sometimes even appear black. This variable color is demonstrated well in the photo of an eastern fox squirrel family from our watershed.

In California, western gray squirrels breed from December to July, usually producing one litter of three to four young. Although the eastern fox squirrel may breed in any month in California, mating generally begins in December and continues to February, followed by a second mating period in June. Births begin in January, with most births in mid-March and July.

During the breeding season, the squirrels often engage in loud and very conspicuous boisterous chasing behavior. Chasing occurs as the males pursue the females, and when the males trying to chase each



It was first day out of the nest for two young eastern fox squirrels, protected by their nursing mother. The color of this non -native squirrel is variable even within a brood: the third in this brood was sandy-colored.

Photo by Charles Kennard

other away! This all results in quite a bit of chattering and scampering up and around tree trunks, telephone poles, across branches, and just about everywhere. Once the young are born, females can be quite territorial, and will chase other adults away from the nest.

Tree squirrels make brood nests in tree cavities, often enlarging an abandoned woodpecker nest, or build a spherical nest on the branches—known as a drey—of twigs, leaves, and shredded bark, high in a tree. Dreys consist of three or four concentric layers with the largest and heaviest sticks forming the outside and base, and the inner chamber insulated and lined with progressively finer materials, such as shredded bark, grass, moss, and lichen. These dreys are often mistaken for larger and messier bird nests, and are quite common in our watershed in the upper branches of trees such as bays or oaks. After a wind storm, baby squirrels can sometimes be found fallen from their dreys. Wildcare, in San Rafael, raises many of these babies every year.

Tree squirrels do not hibernate and are active year-round. They are most active in early morning and late afternoon. While resting out of nests, they commonly sprawl on a limb with chin on the bark and legs and tail hanging alongside the limb. On some stormy days, they may remain in their cozy nests.



The only native tree squirrel in this part of Marin is the western grey squirrel, but in some areas it is being replaced by more aggressive eastern species. Photo by Gary Leo

When disturbed by noise or movement, western gray squirrels may "freeze" (often in awkward positions) or, if danger does not seem imminent, they may produce a series of barks combined with foot-stamping and tail flicking. The most common vocalization by fox squirrels is a series of barks. A chatter bark is given after being startled. Tooth chatters and breathy barks are indicative of restlessness and mild stress. Grunts and longer lasting squeals are given during male-male chases. A high pitched whine occurs during mating chases.

The western gray squirrels are opportunistic feeders, and their diet varies with the availability of seasonal and local foods. They eat fungi, pine nuts, acorns, fruits of California bay, other fruits and nuts, forbs, and tender shoots and leaves. Fungi are important spring and summer foods, and acorns, when

available, are very important summer, fall, and winter foods. Gray squirrels bury nuts one at each location, about 3–4 inches deep (this is called "scatterhoarding"). In the winter, they locate these buried nuts with their sense of smell, and then they dig them up to eat.

Even though squirrels are native to our watershed, some people regard them as pests for raiding bird feeders. Tree squirrels are amazingly clever and agile so just about any feeder is susceptible, although numerous devices are available to physically exclude them.

Squirrels can sometimes cause damage around homes and gardens, where they feed on garden crops such as walnuts, oranges, apples, strawberries, tomatoes, corn, and a variety of other plants. They sometimes gnaw on telephone cables and may chew their way into wooden buildings or invade attics through gaps or broken vent screens. Of the tree squirrels in our watershed, the non-native eastern fox squirrel is by far the most serious pest to homes and gardens in urban and suburban situations. Tree squirrels also carry certain diseases such as tularemia and ringworm that are transmissible to people. They are also frequently infested with fleas and mites. These are all good reasons to make sure that you aren't attracting them with unprotected bird feeders.

Although the native western gray squirrel seems plentiful around here right now, it was listed as a threatened species in Washington State in 1993. Some of the reasons that it was threatened in Washington State are also pertinent here. Many populations of this native species have not recovered from past reductions. And now non-native wildlife species, such as the eastern gray squirrels, eastern fox squirrels, and wild turkeys are expanding and compete with the western gray squirrel for food and other resources. The eastern gray squirrel, although cute, has been nominated as among 100 of the "World's Worst" invaders by the Global Invasive Species Database for some of its behaviors, which are detrimental to native species seeking food and other resources. The western gray squirrels are further threatened with factors such as habitat loss (e.g., forest areas degraded by fire suppression and the spread of invasive plant species), road-kill mortality and disease.

This sweet featured species, that is a visible and audible part of our daily lives, is just one more reason that it is so critical to maintain a healthy, native, ecosystem within our watershed. Thank you for all you do to make that happen.

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