

Western gray squirrel (*Sciurus griseus*) background information

The western gray squirrel (*Sciurus griseus*) is a member of the squirrel family in the order Rodentia. They are the largest native tree squirrel within their range, which is the far western US to the east side of the coast ranges.

Western gray squirrels are an arboreal species that use the canopy for travel. Gray squirrels commonly forage on the ground. Exploratory behavior consists of moving in short hops with nose held close to the ground and occasional digging. They are diurnal with peak activity in the morning.

The diet of western gray squirrels includes hypogeous fungi (truffles), mushrooms, mast (nuts and hard-shelled seeds), fleshy fruits, green vegetation and insects. Fungi make up about half of the diet, with *Rhizopogon* spp. identified as a primary food during spring summer. Hypogeous fungi have a mutualistic relationship with ponderosa pine and rely on small mammals for their dispersal.

Mast is considered the critical food for western gray squirrels that helps them prepare for overwintering. Squirrels begin feeding on green cones in spring. In spring they also forage for old seeds and may use pine cambium. Cones are cut and generally collected on the ground one by one. Uneaten nuts and acorns are scatter-hoarded.

Gray squirrels use transitional habitats, i.e., stands of intermediate age containing both older and younger trees. In the North Cascades, they prefer to nest in ponderosa pine trees, but they will also use large Douglas fir. Only in the last couple decades have it been realized that they don't require oaks as a habitat.

Nests are generally located in the middle of large trees and may be made of twigs, leaves, shredded bark, mosses, lichens, grass. Nest trees are generally the largest diameter dominant trees in a stand, and tend to occur in clumps of trees. During winter, squirrels may share a nest. The ratio of natal nest trees to all nest trees is much higher in stands with a high amount of mistletoe.

In Klickitat county, Washington, adults have 50% annual mortality while juveniles have about 70% mortality. Cause of mortality is primarily due to predation, but episodic outbreaks of mange have been linked to significant declines. At Fort Lewis, vehicle mortality is also a significant limiting factor.

Females occupy an exclusive territory, while that of

males may overlap other males' territories. In the southeastern Cascades, home range of females covers about 80 acres while males cover about 300 acres. In the Methow these numbers are half again as high, while south of Oregon they are half again as low.

Females come into estrus for one day of the year. In low populations, this means that males must cover large distances in order to have a higher probability of finding a reproductive female.

Females rear one litter per year. Females establish natal dens between February and July, with the young emerging from April to August. Each female raises about 3 young to the age of nest emergence each year.

Subadults lack a home range. About 20% of juveniles disperse from their home range for a mean distance of 2900 meters (close to 2 miles).

More on diet

Western gray squirrels are scatter-hoarders; they bury seeds and acorns in shallow caches. They recover some, but not all, buried seeds, leaving many to germinate. Grey squirrels spread the spores of truffles in the caches; these fungi serve to facilitate nutrient and water uptake in germinating seedlings.

Squirrels can tolerate high levels of tannin, which in plants deters seed consumption and bacterial decomposition. Studies show that squirrels preferentially cache acorns with higher tannin content, even when these species have higher energy stores to begin with.

Conservation

Limiting factors for western gray squirrel viability are complex and variable. Limiting factors include 1) habitat loss and fragmentation; 2) availability of year-round food supply; 3) predation; 4) competition from introduced species; 5) vehicle mortality. Studies in the northernmost North Cascades population implicate additional factors may affect viability, including understory cover density and snow depth.

Conservation guidelines are designed to protect nest trees from disturbance, provide connectivity for arboreal travel, and enhance the abundance and diversity of food sources. Forestry recommendations include crown fire risk reduction, retention of larger trees (> 8 inches DBH) in patches that include a mix of conifers and deciduous trees with moderate to high basal area.