

**ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM**

Animal Abstract

Element Code: AMAFB08011

Data Sensitivity: Yes

CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Tamiasciurus hudsonicus grahamensis*
COMMON NAME: Mount Graham Red Squirrel; Mount Graham Chickaree; Mount Graham Spruce Squirrel
SYNONYMS: *T. canadensis grahamensis*; *Sciurus hudsonicus grahamensis*; *Sciurus fremonti grahamensis*; *T. fremonti grahamensis*
FAMILY: Sciuridae

AUTHOR, PLACE OF PUBLICATION: *Sciurus hudsonicus grahamensis*, Allen, J.A. 1894. Descriptions of Five New North American Mammals. Bull. Amer. Mus. Nat. Hist. 6:347-350.
Tamiasciurus hudsonicus grahamensis Kelson, Univ. Utah Biol. Ser., 11 (3):17, 1951.

TYPE LOCALITY: Graham Mountain, Graham County, Arizona.

TYPE SPECIMEN: Am. Mus. Nat. Hist. #9013/7308. Adult female collected August 18, 1894 by W.W. Price and B.C. Condit.

TAXONOMIC UNIQUENESS: One of two species in genus found in North America. The only species found in Arizona. Species has 25 subspecies, two in Arizona; *T. h. grahamensis* is endemic, *T. h. mogollonensis* is not.

DESCRIPTION: A tree squirrel with large eyes and bushy tail, color of dorsum reddish to grayish brown often with yellowish or reddish-yellowish interspersed. In the summer it is separated from whitish venter by a black stripe. Tail shorter than body and dark colored above and below. White stripe above and below the eye; ears without a pronounced tuft of hair; skull rounded in dorsal profile. Average total length is 13.3 in (33.78 cm) and average weight is 8.3 oz (236.4 g). No sexual dimorphism between adults has been determined.

AIDS TO IDENTIFICATION: *T. h. grahamensis* is generally slightly smaller, and has a shorter body, hind foot, and skull than *T. h. mogollonensis*, the only other red squirrel in Arizona. The skull of *mogollonensis* is also narrower than that of *grahamensis*. Color is not a reliable distinguishing characteristic. Its explosive ratchet-like "chr-r-r-r" call is unique to the species, and serves to identify it even when it is not seen.

ILLUSTRATIONS: Color photo (O'Brien 1990)
Color photo (Young in <http://medusa.as.arizona.edu/graham/envir.html>)
Color photo (Cancalosi 1994)

TOTAL RANGE: Pinaleno Mountains above 8,700 feet elevation, Graham County, Southeastern Arizona.

RANGE WITHIN ARIZONA: See "Total Range."

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: *T. h. grahamensis* is more secretive and much quieter than other red squirrel in Arizona. They are most active about 2 hours after sunrise and before sunset. This species builds three types of nests: in a hole in a tree trunk, a tight nest of twigs, leaves, etc. in dense foliage which could be an alternative winter nest, and a nest of loosely held twigs and leaves in the branches of a tree which is used in good weather. It is still not known if this subspecies uses all three kinds of nests or not. Populations can be determined by examining active "middens" found under some trees. The squirrel creates these middens when they strip scales from spruce or fir cones to get at the seeds. The scales fall to the ground around the feeding site and accumulate in mounds averaging ten inches or more deep and five to ten feet across. Red squirrels bury cones and other foodstuffs in these piles where moisture and coolness are maintained by layers of insulation. An unopened cone buried in a midden will mature slowly allowing for the seeds to be consumed at a later date than if they were not buried. These middens are kept active for years and are aggressively defended. They are typically used by successive generations.

REPRODUCTION: When ready to breed, a female abandons her territorial behavior and allows males to enter her territory without opposition for a single day. After initiating a 'mating chase' and breeding with 1-2 males, females are no longer receptive and return to their territorial ways. One to two litters of 2 to 7 young per litter are produced every year. Gestation lasts from 35-40 days. Red squirrels are born helpless, and are nursed and cared for in the nest for 6-8 weeks. Only the mother, who provides nothing other than milk and protection from other squirrels, gives parental care. Young red squirrels are weaned at 7-11 weeks, and begin establishing their own territories at 9-12 weeks. Juvenile mortality (likely linked to over-wintering) is high at 67%, and most squirrels do not live past 2-3 years of age.

FOOD HABITS: Pine seeds are a big component of their diet, which they also store in caches of unhusked cones. They may eat a variety of other seeds, acorns, mushrooms, fungi, buds and fruit. Sometimes, the fungi is also stored in the middens.

HABITAT: Primarily occurs in higher conifer forests of high humidity, and a closed canopy. These factors produce a suitable microhabitat needed for middens. Their habitat covers about 6460 hectares at upper elevations of the Pinaleno Mountains. It is characterized by a series of rolling areas surrounded by steep edges and narrow canyons, especially along the northern and eastern edges. The Mt. Graham red squirrel is very selective when choosing an area, not only for midden placement, but also for general activities.

ELEVATION: 8,700 - 10,200 feet (2,654 - 3,111 m). They use to be found as low as 6,000 ft (1,830 m) on north facing slopes. According to AGFD, HDMS unpublished records (accessed 2003) they are found between 7,360-10,235 ft (2,243-3,120m).

PLANT COMMUNITY: Spruce-fir and mixed conifer.

POPULATION TRENDS: Perhaps they were more common in former times. They were thought to possibly be extinct until Dave Brown (AGFD) and others found them in 1980. Recent midden surveys suggest the population varies from approximately 100 to almost 400 animals. Dr. Donald Hoffmeister believes that the introduction of Abert Squirrels has played a significant role in their population decline (being out competed) (AGFD 1996). A 1998 survey by the US Forest Service estimated the population at 462 squirrels, an increase of 25% from the previous survey (USFS Biological Assessment, accessed 2003). The 1999 fall survey results were 528 squirrels and the fall 2000 survey showed the number of squirrels to be 474 (Arizona Game and Fish Department 2001).

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS: LE (USDI, FWS 1987)
Critical Habitat established (USDI, FWS 1990)

STATE STATUS: WSC (AGFD, WSCA in prep)
[State Endangered AGFD, TNW 1988]

OTHER STATUS: Forest Service Sensitive (USDA, FS Region 3, 1988).

MANAGEMENT FACTORS: Low numbers; limited distribution; and possible competition for habitat with the introduced Abert's squirrel. Development of astronomical observatory and related facilities and roads. Alterations of closed canopy forests, such as logging and insect infestations, could affect the microenvironment critical for maintenance of middens.

PROTECTIVE MEASURES TAKEN: Critical Habitat has been designated under the authority of the Endangered Species Act: Hawk Peak-Mount Graham Area; Heliograph Peak Area; Webb Peak Area. Major constituent element is dense stands of mature spruce-fir forest.

SUGGESTED PROJECTS: Intensive population studies, habitat requirements and life history studies. Determine characteristics most favorable for cache sites. Determination of level of competition/interactions with Abert's squirrel.

LAND MANAGEMENT/OWNERSHIP: USFS Coronado National Forest.

SOURCES OF FURTHER INFORMATION**REFERENCES:**

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ADDITIONAL INFORMATION:

Revised: 1992-02-25 (JSP)
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