ARIZONA GAME AND FISH DEPARTMENT
HERITAGE DATA MANAGEMENT SYSTEM

Animal Abstract **Element Code:** AMAFC01020
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CLASSIFICATION, NOMENCLATURE, DESCRIPTION, RANGE

NAME: *Thomomys bottae* *
COMMON NAME: Botta's Pocket Gopher; Valley Pocket Gopher
SYNONYMS: *Oryctomys (Saccophorus) bottae*
FAMILY: Geomyidae

AUTHOR, PLACE OF PUBLICATION: Eydoux and Gervais. 1836. Mag. De Zool., Paris, 6:23.

TYPE LOCALITY: Coast of California.

TYPE SPECIMEN:

TAXONOMIC UNIQUENESS: The taxonomy of both the species and the subspecies is somewhat controversial. There are 77 subspecies of the species *T. bottae*, of which 20 are found in Arizona (Goldman, 1935). Since then additional subspecies have been described for a total of 41 in Arizona. *T. bottae* is recognized as a separate species by Cockrum (1960), Hoffmeister (1969;1986), and Patton (1973), whereas *T. bottae* is considered synonymous with *T. umbrinus* by Hall and Kelson (1959) and Hall (1981). The controversy over the existence of the species *T. bottae* revolves around the interpretation of hybridization, identified by morphologic and genetic analysis, between a population of *T. umbrinus* and a population previously assigned to *T. bottae* in the Patagonia Mountains. Those that believe the two populations belong to one species interpret the hybridization as intergradation between the two populations, and, accordingly, reduce *T. bottae* to synonymy with *T. umbrinus* and assign the latter name as the species name because it has historical precedence. Those who would retain the two as separate species consider the hybridization to exist in a narrow zone and that intergradation of species characters does not extend outside this zone, and in fact is confined to a small percentage (16% - 39% using 4 morphologic and 1 genetic measure) of individuals. The subspecific designation was not questioned, however, until recently when Hoffmeister (1986) extensively revised *T. bottae* in Arizona and reduced the number of subspecies in the state to 14. He discarded color, formerly an important character, in differentiating subspecies because of its variability within populations and the similarity of color in populations at equivalent elevations in equivalent soils. Morphological characters were similar enough in six adjacent subspecies in southeastern Arizona (including *T. b. grahamensis*) and southwestern New Mexico to be combined into one subspecies. This he called *T. b. mearnsi*, the oldest name of six.

DESCRIPTION: Pocket gophers are named for their large fur-lined cheek pouches that open to the outside. They have small black eyes; short rounded ears that are not quite covered by short, fine fur that lies close to the body; and a nearly hairless and highly sensitive tail. It has a broad head; a short, thick, highly muscled neck, shoulders and forearms; and long claws. Females have four pairs of mammae, two pectoral and two inguinal. The incisors are enlarged, rootless and evergrowing. The size of these mammals varies among populations, and within populations. Males are generally larger than the females. The head and body is 4 4/5 - 7 in. (12.2 - 17.8 cm); tail 2 - 3 3/4 in. (5.1 - 9.5 cm); wt. 2 ½ - 8 4/5 oz. (71 - 250 g). Color is also variable among populations. Higher elevation populations are darker than lower elevation populations due to the many black hairs intermixed with the bright, cinnamon-buff colored hairs that are typical of the lower elevation animals. Furthermore, colors of the dorsum for populations vary with soil colors.

AIDS TO IDENTIFICATION: Both *T. baileyi* and *T. umbrinus* are smaller than *T. bottae*. The dark band of color on the dorsum is from the tip of the nose to the tip of the tail for *T. umbrinus*, where as it is not usually present for *T. bottae*. The color of the sides below the dark band is iridescent or purplish in *T. umbrinus*. The number of pectoral mammae is one pair for *T. umbrinus* and 2 pair for *T. bottae*. The number of acrocentric chromosomes is 54 or 56 for *T. umbrinus*, and 0-18 for *T. bottae*. The dark areas around the ears are not extensive or prominent for *T. bottae*, but is prominent around and behind the ears for *T. talpoides*. Diploid number of chromosomes is more than 70 for *T. bottae* and 60 or less for *T. talpoides*. The sphenoidal fissure is open and large in *T. bottae*, but usually closed and small in *T. talpoides*.

Nothing else makes fan-shaped mounds of earth surrounding its burrows where they come to the surface or blocks its burrow entrances with distinctive plugs of dirt.

ILLUSTRATIONS: Color drawing (Burt and Grossenheider 1976: plate 13)
Slides (R. Glinski and T. Waddell; slide collection of the Nongame Branch of the Arizona Game and Fish Department, Phoenix).

TOTAL RANGE: Southwestern United States from California to Texas.

RANGE WITHIN ARIZONA: Throughout most of Arizona.

SPECIES BIOLOGY AND POPULATION TRENDS

BIOLOGY: A solitary animal that lives in underground burrows in nearly every habitat, so long as sufficient tuberous roots and plant material are available and soil is suitable for digging. Tunnels are detected by looking for fan-shaped mounds of earth, which they push out as they excavate their subterranean tunnels. Gophers are the only rodent that blocks its tunnel entrance with a plug of dirt. Depth of the burrow varies with soil conditions. Length of burrows coincide with the amount of plant cover; if plant cover is high, the burrow lengths are shorter (Hoffmeister 1986). This pocket gopher burrows in soft soils where its activities

may result in both positive and negative effects. While increasing vertical cycling, porosity, aeration, and fertility of the soil, their digging may also increase the rate of erosion and gully formation and may help maintain early successional stages on overgrazed ranges. It uses its sensitive tail to guide itself backward through tunnels. It is highly adapted for digging with its strong but compact body form.

Gophers are active both day and night and throughout the winter. They usually remain below ground, but occasionally travel on the ground. They are preyed upon by black bears, striped skunk, coyote, bobcat, and especially the long-tailed weasel. Avian predators include red-tailed hawk, spotted owl and the great horned owl. Despite the numerous predators, habitat factors and competition between individuals are probably a more important population limiting factor than predation.

REPRODUCTION: Young are assumed to be born every month of the year except September. The highest percentage of pregnancies are from mid-February through May. The gestation period is about 30 days, with 3-4 young born per litter. Burt and Grossenheider (1976), indicate young being born October-June; with 5-7 young born, and a 19 day gestation period. The males are probably polygamous, mating with females in adjacent burrow systems, although it is thought that at least some males practice serial monogamy, because Reichman et al (1982) in Hoffmeister (1986) found four cases where a male and female were sharing a 1.6-m-deep nest.

FOOD HABITS: Grasses, forbs, roots, and tubers, including those of shrubs.

HABITAT: They live in extremely xeric places such as the Yuma desert at Tule Wells, through all of the vegetative types, to near timberline in the White and San Francisco Mountains. The soils in which these gophers live are highly variable depending upon elevation and climatic differences. Ground cover ranges from bare to litter covered, to covered with mosses, forbs, grasses, and grass-like plants. They may also be found in open vegetated areas along road sides, valleys and mountain meadows.

ELEVATION: Found near sea level to 11,000 feet (3,355 m).

PLANT COMMUNITY:

POPULATION TRENDS:

SPECIES PROTECTION AND CONSERVATION

ENDANGERED SPECIES ACT STATUS:
STATE STATUS:
OTHER STATUS: T. umbrinus grahamensis: Forest Service Sensitive (USDA, FS Region 3 1999)

MANAGEMENT FACTORS:

PROTECTIVE MEASURES TAKEN: Pocket gophers seem to have benefitted from the elimination of livestock grazing at upper elevations, from the control of motorized travel and camping in meadows, from the closure to camping of high elevation cienegas, and from enlarged or new openings resulting from various logging, fires, construction, or other events.

SUGGESTED PROJECTS: Monitoring of changes in habitats of open areas with ground cover, and in extent and severity of erosion.

LAND MANAGEMENT/OWNERSHIP: USFS, BLM, State, and Private.

SOURCES OF FURTHER INFORMATION

LITERATURE CITATIONS:

Arizona Game and Fish Department, Heritage Data Management System. 1996 Mammal Diversity Review notes.

Burt, W.H. and R.P. Grossenheider. 1976. A field guide to the mammals of America north of Mexico. Houghton Mifflin Company, Boston. pp. 124-125.

Cockrum, E.L. 1960. The Recent mammals of Arizona. Their taxonomy and distribution. University of Arizona Press. Tucson. pp. 276.

Goldman, E.A. 1935. Pocket gophers of the *Thomomys bottae* group in the United States. Proc. Biol. Soc. Washington. 48:11153-158.

Goldman, E.A. 1947. The pocket gophers (genus *Thomomys*) of Arizona. United States Government Printing Office, Washington D.C. Pp. 23-24.

Hall, E.R. 1981. The mammals of North America. John Wiley & Sons, New York. Vol. I, pp.469-496.

Hoffmeister, D.F. 1969. The species problem in the *Thomomys bottae* - *Thomomys umbrinus* complex of pocket gophers in Arizona. University of Kansas. Mus. of Nat. Hist. Misc. Publ. 51:75-91.

Hoffmeister, D.F. 1986. Mammals of Arizona. University of Arizona Press pp.219-221.

Patton, J.L. 1973. An analysis of natural hybridization between pocket gophers, *Thomomys bottae* and *Thomomys umbrinus*, in Arizona. Jour. Mammal. 54(3):561-584.

Spicer, R.B. 1985. The status of the Pinaleno pocket gopher (*Thomomys bottae grahamensis* Goldman) of southeastern Arizona. Unpublished Ariz. Game and Fish Dept. report to U.S. Fish and Wildlife Service, Office of Endangered Species, Albuquerque.

USDA, Forest Service Region 3. 1999. Regional Forester's Sensitive Species List.

MAJOR KNOWLEDGEABLE INDIVIDUALS:

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ADDITIONAL INFORMATION:

*It was decided by the biologists at the 1996 Mammal Diversity Review, in which Dr. Hoffmeister was a participant, that the following changes where to be followed when considering subspecies of *T. bottae*:

T. umbrinus grahamensis is a synonym of *T. bottae mearnsi.*
T. umbrinus hualpaiensis is a synonym of *T. bottae desertorum*.
T. umbrinus muralis is a synonym of *T. bottae desertorum.*
T. umbrinus suboles is a synonym of *T. bottae desertorum*.
T. umbrinus subsimilis is a synonym of *T. bottae subsimilis*.

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