

Western Bat Working Group

Species Accounts Developed For the 1998 Reno
Biennial Meeting Updated at the 2005 Portland
Biennial Meeting

***ANTROZOUS PALLIDUS PALLID* BAT**

Prepared by: Rick Sherwin Updated by: Daniela A. Rambaldini

Western Bat Working Group

Species Accounts

Developed For the 1998 Reno Biennial Meeting

Updated at the 2005 Portland Biennial Meeting

ANTROZOUS PALLIDUS PALLID BAT

Prepared by: Rick Sherwin

Updated by: Daniela A. Rambaldini

I. DISTRIBUTION:

Antrozous pallidus (Vespertilionidae) ranges throughout western North America, from British Columbia's southern interior, south to Queretaro and Jalisco, and east to Texas (Figure 1). An isolated population, *A. p. koopmani*, is endemic to Cuba. *A. pallidus* inhabits low elevation (< 1,830 m / 6,000 feet) rocky arid deserts and canyonlands, shrub-steppe grasslands, karst formations, and higher elevation coniferous forests (> 2,100 m / 7,000 feet). It is most abundant in xeric ecosystems, including the Great Basin, Mojave, and Sonoran Deserts.

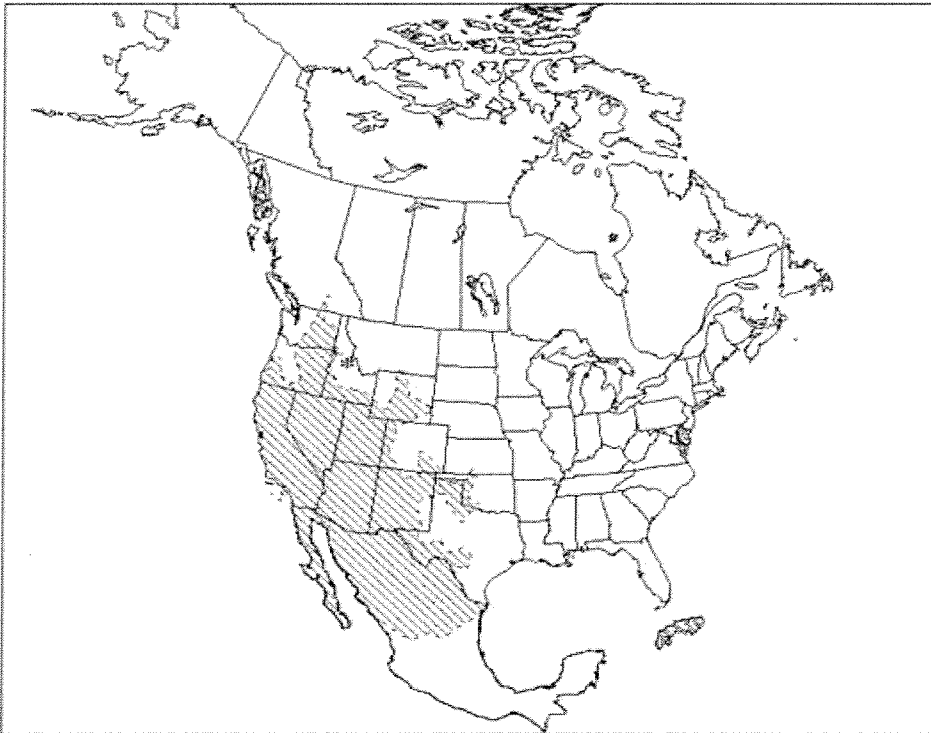


Figure 1. Distribution of *Antrozous pallidus* in North America. Map modified from Bat Conservation International, 2001. Reprinted with permission.

II. STATUS:

Global Rank – G5. State Ranks: AZ – S4/S5; CA – S3; CO – S4; ID – S1; KS – S1; MT – S1; NM – S5; NN – S5; NV – S3B; OK – S3; OR – S3; TX – S5; UT – S4; WA – S3; WY – S1; BC – S1. USFS – None; BLM – Special Status/Sensitive; USFWS – Sensitive. California Species of Special Concern. Mexico – Not a species of concern. IUCN Red List Category – LR.

III. IDENTIFYING CHARACTERISTICS AND LIFE HISTORY:

A. pallidus is a large (forearm length 45-60 mm) light-colored bat with long prominent ears, a blunt snout, and pinkish-brown or gray wing and tail membranes. Glands near the scroll-shaped nostrils secrete a distinct skunk-like scent. Pallid bats can be distinguished from other long eared bats (*i.e.*, *Corynorhinus townsendii* and *Idionycteris phyllotis*) by their lighter fur, longer forearm, and lack of lappets (fleshy flaps) projecting from the base of the ears (*I. phyllotis*) or large rhinal lumps (*C. townsendii*).

Pallid bats roost alone, in small groups (2 to 20 bats), or gregariously (100s of individuals). Day and night roosts include crevices in rocky outcrops and cliffs, caves, mines, trees (*e.g.*, basal hollows of coast redwoods and giant sequoias, bole cavities of oaks, exfoliating Ponderosa pine and valley oak bark, deciduous trees in riparian areas, and fruit trees in orchards), and various human structures such as bridges (especially wooden and concrete girder designs), barns, porches, bat boxes, and human-occupied as well as vacant buildings. Roosts generally have unobstructed entrances/exits, and are high above the ground, warm, and inaccessible to terrestrial predators. However, this species has also been found roosting on or near the ground under burlap sacks, stone piles, rags, and baseboards. Although year-to-year and night-to-night roost reuse is common, they may switch day roosts on a daily (1-13 d) and seasonal basis. "Rallying" behavior, accompanied by distinct vocalizations, may help alert colony members and juveniles to new roost sites. *A. pallidus* has an extensive repertoire of social communication calls, some of which are audible to humans.

Pallid bats are opportunistic generalists that glean a variety of arthropod prey from surfaces, but also capture insects on the wing. They eat antlions, beetles, centipedes, cicadas, crickets, grasshoppers, Jerusalem crickets, katydids, moths, praying mantids, scorpions, solpugids, termites, and rarely take geckos, lizards, skinks, small rodents, and plant material, which is likely ingested when arthropod prey are gleaned from plant surfaces. Large (3-7 cm / 1-3 in) flying prey are sometimes captured by 'wing-cupping', whereby prey are forced down to the substrate. They forage over open shrub-steppe grasslands, oak savannah grasslands, open Ponderosa pine forests, talus slopes, gravel roads, lava flows, fruit orchards, and vineyards. They may echolocate (short FM 60-25 kHz) while flying, but generally use passive acoustic cues to locate prey. 'Perch feeding' has also been observed in some individuals from different populations. Diet composition and foraging style vary within and between populations.

Females have 1 to 2 pups per year, although 3 embryos have been reported. Adult and yearling males may roost in maternity colony structures, albeit usually separate from the females and young. Mating occurs from October to February, parturition from late April to July, and weaning in August; exact dates vary across latitudes and between years, with populations at higher latitudes and in cooler climates giving birth later in the season. Yearling females are reproductively mature and males may be capable of mating in their first year. Maternity colonies disperse between August and October.

Winter habits are poorly known, but this species apparently does not migrate long distances between summer and winter sites. In coastal California, males and females overwinter in a primary roost but occasionally use alternate roosts throughout the winter. Overwintering roosts have relatively cool, stable temperatures and are located in protected structures beneath the forest canopy or on the ground, out of direct sunlight. In other parts of the species' range, males and females have been found hibernating alone or in small groups, wedged deeply into narrow fissures in mines, caves, and buildings. At low latitudes, outdoor winter activity has been reported at temperatures between -5 and 10 °C.

Recommended survey methods include active acoustic monitoring of echolocation and audible social "directive" calls, visual observation, and mist netting in foraging habitats and at roost entrances/exits. Day roosts in natural structures are often difficult to identify, but capture at open night roosts such as bridges may be easier and less invasive. Pallid bats are a high priority species at the northern and eastern limits of the species' range, and along the western coast in California .

IV. THREATS:

Pallid bats' tendency to roost gregariously and their relative sensitivity to disturbance makes them vulnerable to mass displacement. Roosts and hibernacula can be damaged or destroyed by vandalism, mine closures and reclamation, recreational activities such as rock climbing, forestry practices such as timber harvest, and, where man-made structures are occupied, demolition, modification, chemical treatments, or intentional eradication and exclusion. Maternity colonies and hibernating bats are especially susceptible to disturbance. Loss or modification of foraging habitat due to prescribed fire, urban development, agricultural expansion, and/or pesticide use pose potential threats. This is especially true in coastal California , where urbanization has reduced roosting and foraging habitat, and in British Columbia , Canada where agricultural expansion may compromise prey availability and quality.

V. GAPS IN KNOWLEDGE:

There are scant records of seasonal movements, locations of hibernacula and winter roosts, and mating behavior. There is a paucity of information quantifying tolerance to habitat modification (*i.e.*, conversion of native habitat for agriculture and forced roost relocation) and impacts of threats such as roost disturbance and pesticide or heavy metal contamination. Data are also lacking for population trends, roosting and habitat requirements, and limiting factors, especially for peripheral populations. There have been few studies of this species in Mexico and Cuba .

VI. RELEVANT LITERATURE:

Brown, P.E. and R.D. Berry. 1997. Surveys for bat species of special concern. Unpub. report prepared for California Department of Fish and Game, Wildlife Management Division. Sacramento , CA. Contract FG5124WM. 6 pp.

Chapman, K., K. McGuiness, and R.M. Brigham. 1994. Status of the Pallid bat in British Columbia . B.C. Environment. Victoria , B.C. Wildlife Working Report No. WR-61. 32 pp.

COSEWIC. 2002. Canadian Species at Risk, May 2002. Committee on the Status of Endangered Wildlife in Canada . 39 pp.

Ferguson , H. and J.M. Azerrad. 2004. Management recommendations for Washington 's priority species. Priority Habitat and Species. Volume 5. Mammals. Pallid bat, *Antrozous pallidus*. Washington Department of Fish and Wildlife. 10 pp. <http://wdfw.wa.gov/hab/phs/vol5/anpa.pdf>

Fuzessary, Z.M., P. Buitenhoff, B. Andrews and J.M. Kennedy. 1993. Passive sound localization of prey by the Pallid bat (*Antrozous pallidus*). *Journal of Comparative Physiology A*. 171: 767-777.

*Hermanson, J.W., and T.J. O'Shea. 1983. *Antrozous pallidus*. American Society of Mammalogists. Mammalian Species. No. 213: 1-8. *AND REFERENCES THEREIN.

Herrera, M.L.G., T.H. Fleming and J.S. Findley 1993. Geographic variation in carbon composition of the Pallid bat, *Antrozous pallidus*, and its dietary implications. *Journal of Mammalogy*. 74(3): 601-606.

- Johnston, D.S. 2002. [ABS]. Prey discrimination by olfactory cues in the Pallid bat (*Antrozous pallidus*). *Bat Research News*. 42(4):162.
- Johnston, D.S. 2004. [ABS]. Winter roosting ecology of Pallid bats (*Antrozous pallidus*) in a central California woodland forest. 2nd Bats and Forest Conference. Hot Springs, AR.
- Johnston, D.S. and M.B. Fenton. 2001. Individual and population-level variability in diets of Pallid bats (*Antrozous pallidus*). *Journal of Mammalogy*. 82(2): 362-373.
- Jones, C. 1965. Ecological distribution and activity periods of bats of the Mogollon Mountains area of New Mexico and adjacent Arizona. *Tulane Studies in Zoology*. 12: 93-100.
- Lewis, S.E. 1993. Effect of climatic variation on reproduction by Pallid bats (*Antrozous pallidus*). *Canadian Journal of Zoology*. 71: 1429-1433.
- Lewis, S.E. 1994. Night roosting ecology of Pallid bats (*Antrozous pallidus*) in Oregon. *American Midland Naturalist*. 132(2): 19-226.
- Lewis, S.E. 1996. Low roost-site fidelity in Pallid bats: associated factors and effect on group stability. *Behavioral Ecology and Sociobiology*. 39(5): 335-344.
- Pierson, E.D., W.E. Rainey, and R.M. Miller. 1996. Night roost sampling: a window on the forest bat community in northern California. Pp. 151-163. In *Bats and Forests Symposium*. October 19-21, 1995. Victoria, British Columbia, Canada. Research Branch, Ministry of Forests. Victoria, B.C. Working Paper 23/1996.
- Rambaldini, D.A. 2006. Behavioural ecology of Pallid bats (Chiroptera: *Antrozous pallidus*) in British Columbia. Unpublished report prepared for Environment Canada, Canadian Wildlife Service, BC Ministry of Environment, Osoyoos (Nk'Mip) Indian Band, and World Wildlife Fund of Canada. 82 pp.
- Rambaldini, D.A. and R.M. Brigham. 2004. Habitat use and roost selection by Pallid bats (*Antrozous pallidus*) in the Okanagan Valley, British Columbia. Unpublished report prepared for Canadian Wildlife Service, BC Ministry of Land, Water and Air Protection, Osoyoos (Nk'Mip) Indian Band, and World Wildlife Fund of Canada. 65 pp.
- Rodhouse, T.J. and R.G. Wright. 2004. Study of bat roosts in John Day Fossil Beds national monument. Unpublished report prepared for the University of Idaho and National Park Service, Upper Columbia Basin Network. Department of Fish and Wildlife Resources. Moscow, ID. 43 pp.
- Tatarian, G. 2001. Successful Pallid bat house design in California. *BATS Magazine*. Fall Issue. 9(2): 2-4.