7.4 Townsend's Big-eared Bat (*Plecotus townsendii pallescens*) – Category SO

Management Units with Known Occurrences

Townsend's big-eared bat is widely distributed in North America and was formally common throughout California, except in subalpine and alpine habitats (Harris 2000). This bat roosts in caves, mines, tunnels, bridges, abandoned buildings, and other human made structures (Harris 2000; Stokes et al. 2005). They are most commonly found in abandoned mines in San Diego County and appear to be located wherever there are historic mining districts, including within the MSCP area (Sherwin 2005). In western San Diego County, Townsend's big-eared bat forages in oak woodland and riparian habitats, where it specializes on moths close to the vegetation and may even glean insects off the plant leaves. Historically, this species was widespread from the coast to the desert in San Diego County, but is now rare and only occurs in the foothills and mountains (Miner and Stokes 2005; Stokes et al. 2005). In the 1970s, a survey of 12 maternity colonies active in San Diego County during the 1930s and 1940s found only 1 which was still active.

Within the MSPA, Townsend's big-eared bat has been detected at 15 preserves in MUs 3, 4, 5, 6, 9, 10, and 11 (see Table of Occurrences or online map: http://arcg.is/2jZ8ZiW), 6 of which are in MU3. There was a single individual observed roosting at the Dulzura Creek Bridge during a 2015–early 2016 survey (Stokes 2016). A large diurnal roost of 100 bats was discovered at Cottonwood Tunnel. During the 2015–early 2016 survey, Townsend's big-eared bats were detected at Sloan Canyon, Proctor Valley, Marron Valley, Long Potrero, Honey Springs Ranch, Hollenbeck Canyon, Hwy 94 Bridge in Jamul, Otay Mountain Mines, Cleveland National Forest Mines, and Barret Flume.

In MU4, Townsend's big-eared bats were detected roosting in an old abandoned mine at El Capitan Preserve and a female with evidence of having raised young was mist netted at the Oakoasis Preserve. This species was also detected foraging at Hellhole Canyon Preserve in MU5, where there is suitable roosting habitat and the most species-rich bat community documented in the MSPA since 2000. In MU6, Townsend's big-eared bat was detected foraging at Del Dios Highland Preserve, making this the most recent westerly observation for this species in the MSPA.

There are 11 recent (>2000) detections of Townsend's big-eared bat east of the MSPA boundaries in the Cleveland National Forest extending from the U.S.-Mexican Border north to the San Diego-Riverside County line.

Management Categorization Rationale

Townsend's big-eared bat should be managed as a Species Management Focus Category SO Species due to high risk of loss from Conserved Lands in the MSPA and because managing vegetation alone will not ensure its persistence (see Vol. 1, Table 2-4). Townsend's big-eared bat is at a moderate risk of loss from the MSPA as the species has declined since the 1940s, is highly sensitive to disturbance at roosts, and occurs in relatively small numbers (see Vol. 3, App. 1, Species Profiles).

Townsend's big-eared bat has declined in the MSPA because of habitat loss and fragmentation, especially oak woodland and riparian vegetation communities, and because of extermination or disturbance of bat colonies (Miner and Stokes 2005; Stokes et al. 2005). Bats require multiple roosts with different temperature ranges to accommodate changing seasonal climate conditions, and these roosts need to be within nightly commute distances to foraging habitat. Bats are vulnerable to destruction of roosts (e.g., construction of water projects and transportation facilities, etc.) or catastrophic events at roosts (e.g., fire, human disturbance) that adversely affect a large number of individuals at once. Recreational activities like cave or mine exploration and rock climbing near roosts can adversely affect reproductive success and survival, and can cause bat colonies to abandon roosts (Miner and Stokes 2005). Townsend's big-eared bat is especially sensitive to human disturbance at roosts.

Population recovery is also slow as bats are relatively long-lived with low productivity (Miner and Stokes 2005). Townsend's bats forage in riparian areas, specializing on moths near vegetation, so they may be susceptible to pesticides applied for mosquito abatement. Pesticides can cause harm to bats from ingestion of poisoned prey or by being sprayed inadvertently at day roosts.

A warming and drying climate predicted for the arid southwest could also adversely affect reproduction by reducing surface water available for drinking by lactating bats (Adams and Hayes 2008). A recent study in an arid region of the west showed that lactating female bats visited water to drink 13 times more often than nonreproductive females. Modeling predicts that bat occurrences could decline with increasing aridity and warming forecast for the future.

Management and Monitoring Approach

The overarching goal for Townsend's big-eared bat is to protect diurnal, nocturnal, and maternity roosts from destruction and human disturbance and enhance foraging habitat within commuting distance of nocturnal and maternity roosts to increase resilience to environmental and demographic stochasticity, maintain genetic diversity, and improve chances of persistence over the long term (>100 years).

For the 2017–2021 planning cycle, the management and monitoring approach is to:

(1) Finalize the results of research begun in 2015 on Townsend's big-eared bat to identify nocturnal, diurnal, and maternity roosts, foraging areas, and water sources associated with roosts in order to identify seasonal and annual changes in use and important foraging areas, monitor reproductive status, collect habitat covariates associated with roosting and foraging habitat, and assess threats to bats at all preserves where they occur, and to develop management recommendations.

(2) Inspect the vicinity of Townsend's big-eared bat roosts on an annual basis (see Table of Occurrences), taking care not to disturb bats, and use a regional monitoring protocol to collect covariate data on human activities and other threats to determine management needs.

(3) Perform routine management activities such as protecting occurrences from disturbance through fencing, signage, and enforcement.

For details and the most up-to-date goals, objectives, and actions, go to the MSP Portal Townsend's Big-eared Bat summary page: https://portal.sdmmp.com/view_species.php?taxaid=203457

Townsend's Big-eared Bat References

Adams, Rick A., and Mark A. Hayes. 2008. Water Availability and Successful Lactation by Bats as Related to Climate Change in Arid Regions of Western North America. *Journal of Animal Ecology* 77(6):1115–121. DOI:10.1111/j.1365-2656.2008.01447.x.

Harris, J. 2000. *California Wildlife Habitat Relationships System Species Account for Townsend's Big-Eared Bat.* Prepared for California Department of Fish and Game California Interagency Wildlife Task Group.

Miner, K. L., and D. C. Stokes. 2005. *Bats in the South Coast Ecoregion: Status, Conservation Issues, and Research Needs.* USDA Forest Service Gen. Tech. Rep. PSW-GTR-195.

Sherwin, R. 2005. Townsend's Big-Eared Bat. Western Bat Working Group. http://wbwg.org/western-bat-species/.

Stokes, D. C. 2016. *Progress Report for Focused Pallid Bat (Antrozous Pallidus) and Townsend's Big-Eared Bat (Corynorhinus Townsendii) Surveys in San Diego County, California*. Prepared for the San Diego Management and Monitoring Program and the United States Geological Survey.

Stokes, D. C., C. S. Brehme, S. A. Hathaway, and R. N. Fisher. 2005. *Bat Inventory of the Multiple Species Conservation Program Area in San DiegoCounty, California, 2002–2004*. U.S. Geological Survey, Western Ecological Research Center final report prepared for the County of San Diego and California Department of Fish and Game.