Townsend's Big-eared Bat (*Corynorhinus townsendii*)

Species Status Statement.

Distribution

The western range of Townsend's big-eared bat extends from the Pacific Ocean eastward to the western-most Great Plains states, and from central Mexico northward to southern British Columbia (Kunz and Martin 1982). This bat occurs across Utah in a wide variety of habitats (Oliver et al. 2000, UDWR data). Its close affinity for caves and mines, however, likely influences that distribution locally – causing the species to concentrate on areas with the greatest availability of these resources (Sherwin et al. 2003).

Table 1. Utah counties currently occupied by this species.

Townsend's Big-eared Bat	
BEAVER	MILLARD
BOX ELDER	PIUTE
CACHE	SALT LAKE
CARBON	SAN JUAN
DAGGETT	SANPETE
DAVIS	SEVIER
DUCHESNE	TOOELE
EMERY	UINTAH
GARFIELD	UTAH
GRAND	WASATCH
IRON	WASHINGTON
JUAB	WAYNE
KANE	WEBER

Abundance and Trends

This species is generally accepted as uncommon in much of its western range, with a downward population trend over the past 50 or more years (Pierson et al. 1999, Gruver & Keinath 2006). Early records for Utah suggested Townsend's big-eared bat made up 7-20% of the state's bats. In surveys during the 1990s, however, captures of Townsend's big-eared bats accounted for as little as 1% of overall bat captures (Oliver et al. 2000). A Utah Division of Wildlife Resources (UDWR) systematic statewide survey and monitoring program indicated an increase in detections of this bat during summer months between 2009 and 2015 (UDWR files). Recent analysis of Townsends' big-eared bat hibernacula counts show stable to slightly increasing winter populations west wide (Weller et al. 2018). Counts of bats at protected hibernacula in Utah have been stable to increasing for the past decade (UDWR files).

Statement of Habitat Needs and Threats to the Species.

Habitat Needs

Townsend's big-eared bat is a cave and mine dependent species (Sherwin et al 2003, Hayes et al. 2011). The availability of caves and mines determines distribution and local population status (Kunz and Martin 1982, Pierson 1999). The species favors larger, more complex caves and mines (number of openings, internal structure, size of tunnels and rooms, etc.). This is likely because of the variable conditions (e.g. temperature, airflow) they provide (Gruver and Keinath 2006). Caves and mines are the principal roosting habitats for this species in Utah, though natural caves are preferred over mines (Oliver et al. 2000, Sherwin et al. 2000). Pre-closure surveys of abandoned mines in Utah indicate that approximately 20% of abandoned mines show evidence of use by Townsend's big-eared bats.

This bat uses a variety of habitats for foraging, but appears to prefer forests, forest edges and riparian zones, especially in association with cave and mine resources (Kunz and Martin 1982, Pierson et al. 1999, Gruver and Keinath 2006). This sedentary species does not move great distance between roosts (Kunz and Martin 1982), and forages in close proximity to roost complexes (Gruver and Keinath 2006). Townsend's big-eared bat is a slow flying and highly maneuverable bat, which probably feeds by gleaning vegetation as well as capturing prey on the wing (Gruver and Keinath 2006).

Threats to the Species

The primary threats to this species are loss of cave and mine roosting sites, and human disturbance at roosts (Pierson et al. 1999, Sherwin et al. 2003, Gruver and Keinath 2006). Mine closure programs across the west, for human safety, have resulted in the closure of thousands of mines (Sherwin et al. 2003). Additionally, increased demand for valuable minerals has resulted in reactivation of thousands more mines throughout the range (Hayes et al. 2011). Both mine closure and reactivation can destroy important roosting sites and result in the direct destruction of bats.

Caves present the most stable roost habitats for Townsend's big-eared bats, and they support larger roosting concentrations than mines (Sherwin et al. 2000, Sherwin et al 2003). Caves are especially important for maternity colonies and as hibernacula (Pierson et al. 1999, Sherwin et al. 2000, Hayes et al. 2011). Interest in recreational caving is on the increase and many authors consider this species susceptible to disturbance (Sherwin et al. 2000). Townsend's big-eared bats using caves often roost in exposed situations readily accessed by people (Hayes et al. 2011) and instances of people killing roosting bats have been documented (Oliver et al. 2000). Pierson et al. (2000) reported the abandonment of 13 known Townsend's big-eared bat roosts in Utah from closures and human disturbance. However, Sherwin et al (2003) suggest roosting ecology of this bat is complex, movement between roosts is a common behavior, and absence may not indicate abandonment.

Townsend's big-eared bat preys primarily on moths (Kunz and Martin 1982), many of which are important crop and forest pests in their larval stages. Use of pesticides to control agricultural and forest pests decreases forage availability and may increases bat exposure to toxins (Pierson et al. 1999).

An emerging potential threat is the rapid advance of white-nosed syndrome (WNS) across the continent. WNS is found in 36 states and 7 provinces, and as of 2019, is as close as eastern Wyoming. The fungus that causes WNS has been found on Townsend's big-eared bats elsewhere with no apparent detrimental effects. It is not expected to cause mortality in western populations, but the disease warrants consideration.

Table 2. Summary of a Utah threat assessment and prioritization completed in 2014. This assessment applies to the species' entire distribution within Utah. For species that also occur elsewhere, this assessment applies only to the portion of their distribution within Utah. The full threat assessment provides more information including lower-ranked threats, crucial data gaps, methods, and definitions (UDWR 2015; Salafsky et al. 2008).

Townsend's Big-eared Bat
High
Cave / Mine Exploration
Medium
Mine Shaft / Adit Closures

Rationale for Designation.

Two eastern subspecies of this bat are listed under the Endangered Species Act (ESA), and two western subspecies were once considered for ESA protection (USFWS 1994). All the western states have designated Townsend's big-eared bat a species of conservation concern at some level. The Western Bat Working Group lists it as a species at "high risk of imperilment". A multi-state species conservation strategy completed in 1999 (Pierson et al.) was formally adopted by the Western Association of Fish and Wildlife Agencies in 2001 and has resulted in active conservation programs in all 13 western states and one Canadian province. Each of these entities now has in place bat management/conservation plans that incorporate Townsend's big-eared bat conservation actions. These include increased survey and monitoring, roost location and identification, roost monitoring and protection, coordination with mine closure programs, and development of conservation partnerships (WAFWA 2009).

Townsend's big-eared bat populations in Utah have stabilized, or may be increasing, due primarily to management under the conservation strategy (Pierson et al. 1999) and implementation of a MOU with the Utah Division of Oil, Gas and Mining. Maintaining Sensitive Species status for Townsend's big-eared bat will assure continued protection for local populations and conservation of important roost habitats, and will safeguard the gains made in

species protection over the past two decades (WAFWA 2009). These benefits will also accrue to other cavern-dwelling bats.

Economic Impacts of Sensitive Species Designation.

Sensitive species designation is intended to facilitate management of this species, which is required to prevent Endangered Species Act listing and lessen related economic impacts. The listing of other bat species in eastern states has prompted requirements for extensive regulatory compliance for a wide variety of project categories including transportation, utility rights-of-way, habitat management, and forest management. As Townsend's big-eared bats are reliant on cave and mine habitats for roosting, restrictions on recreational caving and abandoned mine closures could result from an ESA listing.

Literature Cited.

Gruver, J.C. and D.A. Keinath (2006, October 25). Townsend's Big-eared Bat (*Corynorhinus townsendii*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region.

Hayes, M.A., R.A. Schorr and K.W. Navo. 2011. Hibernacula selection by Townsend's big-eared bat in southwestern Colorado. Journal of Wildlife Management 75(1):137-143.

Kunz, T.H. and R.A. Martin. 1982. *Plecotus townsendii*. Mammalian Species. 175:1-6.

Sherwin, R.E., D. Strickland and D.S. Rogers. 2000. Roosting affinities of Townsend's big-eared bat (*Corynorhinus townsendii*) in northern Utah. Journal of Mammalogy 81(4):939-97.

Sherwin, R.E., W.L. Gannon and J.S. Altenbach. 2003. Managing Complex Systems Simply: Understanding Inherent Variation in the Use of Roosts by Townsend's Big-Eared Bat. Wildlife Society Bulletin 31(1):62-72.

Oliver, G.V. 2000. The bats of Utah. Publication Number 00-14. Utah Division of Wildlife Resources. Salt Lake City, Utah, USA. 140pp.

Pierson, E.D., M.C. Wackenhut, J.S. Altenbach, P. Bradley, P. Call, D.L. Genter, C.E. Harris, B.L. Keller, B. Lengus, L. Lewis, B. Luce, K.W. Navo, J.M. Perkins, S. Smith, and L. Welch. 1999. Species conservation assessment and strategy for Townsend's big-eared bat (*Corynorhinus townsendii* and *Corynorhinus townsendii pallescens*). Idaho Conservation Effort, Idaho Department of Fish and Game. Boise, Idaho, USA.

Salafsky, N., D. Salzer, A.J. Stattersfield, C. Hilton-Taylor, R. Neugarten, S.H.M. Butchart, B. Collen, N. Cox, L.L. Master, S. O'Connor, and D. Wilkie. 2008. A standard lexicon for biodiversity conservation: unified classifications of threats and actions. Conservation Biology 22: 897–911.

Utah Division of Wildlife Resources [UDWR]. 2015. Utah Wildlife Action Plan: A plan for managing native wildlife species and their habitats to help prevent listings under the Endangered Species Act 2015-2025. Publication Number 15-14, 385 pp.

U.S. Fish and Wildlife Service [USFWS]. 1994. Endangered and threatened wildlife and plants; animal candidate review for listing as endangered or threatened species; proposed rule. Federal Register 59:58982-59028.

Weller, T.J., T.J. Rodhouse, D.J. Neubaum, P.C. Ormsbee, R.D. Dixon, D.L. Popp, J.A. Williams, S.D. Osborn, B.W. Rogers, L.O. Beard, A.M. McIntire, K.A. Hersey, A. Tobin, N.L. Bjornlie, J. Foote, D.A. Bachen, B.A. Maxwell, M.L. Morrison, S.C. Tomas, G.V. Oliver and K.W. Navo. 2018. A review of bat hibernacula across the western United States: Implications for white nose syndrome surveillance and management. PLoS ONE 13(10): e0205647. https://doi.org/10.1371/journal.pone.0205647