

## Use of a Black-Tailed Prairie Dog Burrow by Honey Bees in the Texas Panhandle

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**Abstract** - *Cynomys ludovicianus* Baird (Black-Tailed Prairie Dog) is considered to be a keystone species in the prairie, providing food and habitat for a diversity of wildlife. In October of 2020, we observed an active *Apis mellifera* Linnaeus (European Honey Bee) hive visible within the entrance of a burrow made by Black-Tailed Prairie Dogs in the treeless plains of the Texas Panhandle. This observation suggests that prairie dogs could provide habitat for this economically important pollinator and in landscapes otherwise devoid of cavities such as are commonly found in trees, buildings, and other structures.

*Cynomys ludovicianus* Baird (Black-Tailed Prairie Dog) is considered to be a keystone species in the prairie (Kotliar et al. 1999), providing food and habitat for bats, birds, small mammals, reptiles, amphibians, and invertebrates (Adams 2021, Duchhardt et al. 2021, McCaffrey 2001, McCaffrey et al. 2009, Pruett et al. 2010, Ray et al. 2015). While mapping the boundary of a colony of Black-Tailed Prairie Dogs at the US Department of Energy-National Nuclear Security Administration's (DOE-NNSA) Pantex Plant in Carson County, Texas, on 20 October 2020 (09:30), we encountered a hive of *Apis mellifera* Linnaeus (European Honey Bee) within a prairie dog burrow. The prairie dog colony was located on a satellite property of the Pantex Plant, separated from the main property by ~8.8 km NE, or 18.1 km NE of the intersection of Interstate Highway 40 and Farm to Market Road 2373. The bee hive was in a burrow on the south boundary of the colony (35°22'47.11"N, 101°29'30.02"W).

The burrow entrance was oriented to the south and we observed at least two fresh white combs visible in the entrance. The bees were active, flying in and out of the burrow and working on the comb's surface. Although the outside layers of comb blocked our view of how deep the hive extended, it is probable that the entirety of the hive was in the long, narrow entrance tunnel, rather than any large internal chamber. We did not have the bees tested for Africanized traits, because testing is no longer conducted in Texas, given the Africanized genes are considered to occur statewide (M. Reed, Texas Apiary Inspection Service, College Station, TX; 2020 pers. comm.).

We revisited the burrow on 8 February 2021 (13:30), and it was apparent that an animal, most likely a *Mephitis mephitis* Gray (Striped Skunk) or *Taxidea taxus* Schreber (American Badger), had dug out and depredated much of the comb (Fig. 1). It appeared that there were no active bees remaining at that time and activity was not observed on several follow-up visits in the spring.

Our observations of this hive are important for two reasons: 1) these observations provide what is believed to be the first evidence that Black-Tailed Prairie Dog burrows can possibly support hives of this economically-important pollinator, and 2) the observation further illustrates the importance of Black-Tailed Prairie Dogs to biodiversity in the prairie.

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The European Honey Bee is important economically in the US (Patel et al. 2021), providing \$1.6–\$5.7 billion in social gains each year through pollination services (Southwick and Southwick 1992). Wherever honey bees are kept, feral colonies can become established through swarming (Villa 2004), and established feral colonies can be sources for further increases in local populations. Wild colonies of honey bees are documented to prefer large enclosed cavities with, generally, small or narrow entrances that are at least 3–5 m above ground surface (Avitabile et al. 1978; Seeley and Morse 1976, 1978). Honey bees with Africanized genes tend to nest underground at a higher rate than those lacking Africanized genes (Sanford 2006). Still, a review conducted by Saunders et al. (2021) of iNaturalist data found that only 2.8% of 326 honey bee hives documented were in underground cavities. Hives can occur in abandoned animal burrows (Saunders et al. 2021), but most underground hives are located in fissures in rock, under rock overhangs, and cavities in cliff faces and clay banks (Saunders et al. 2021, Wenner et al. 1992). Predation rates on hives in prairie dog burrows and other animal burrows warrants further investigation to understand the contribution of these cavities to local populations of honey bees.

Trees on the western Great Plains can be scarce and concentrated near water sources and human settlements, potentially limiting opportunities for colonization of tree cavities by honey bees. Thus, colonies of Black-Tailed Prairie Dogs may provide honey bees additional habitat in areas that are otherwise void of suitable cavities.

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Figure 1. Honey comb in an enlarged entrance to a prairie dog burrow on the Pantex Plant, after predation by a mammalian predator (8 February, 2020; James D. Ray).

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