

Ecological Restoration Brief

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Black-Tailed Prairie Dog: A Keystone Species in Prairie Restoration

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Keystone species are defined as one whose presence or absence dramatically alters the structure and dynamics of ecological systems.ⁱ Prairie dogs have been identified as a keystone species due to their affect on other pioneer prairie species. From the smallest trophic level to the large ungulates of the historic prairie, the prairie dog plays a pivotal role in this diminishing ecosystem.ⁱⁱ

Short grass and mid grass prairies are critical habitat to a variety of endangered and threatened species. One of these species is the black tailed prairie dog (*Cynomys ludovicianus*). By foraging and habitat preference, their native range in Texas is any prairie area west of the hundredth meridian. In other words, nearly everywhere in Texas west of towns like Childress, Abilene, Junction and Uvalde.

The prairie ecosystem is dependent on the prairie dog to be sustainable. Prairie dogs break up the soil when digging their tunnels. Not only does this allow the subsoil to be brought to the surface, increasing nutrient cycling and nitrogen content, but it also allows the soil to be aerated. Additionally, this allows an influx of water to get below ground level during rain events. This increased porosity leads to higher water penetration and groundwater recharge.ⁱⁱⁱ As a result of the soil disturbance, a greater diversity of forbs is found near prairie dog towns.

Several species have symbiotic relationships with prairie dogs and require them for their survival. For example, Killdeer will only nest on the bare ground created by the heavy herbivory of prairie dogs close to their burrows. Prairie chickens use these bare areas for their ritual mating dances and burrowing owls utilize the same tunnels for living and



Black Tailed Prairie Dog Family (*Cynomys ludovicianus*) on Maddin Prairie.
Credit: Jesse Wood

evading predators. Prairie dog colonies support a diverse array of wildlife, including black-footed ferrets, North America's most endangered mammal.



Prairie dog on its way to a new home.
Credit: Jesse Wood

Even though healthy prairie dog towns support great diversity and are critically important to ecosystem health, government policies and private efforts have wiped out the prairie dog population in the last 100 years. Since the late 1800's, prairie dogs have been considered a nuisance by ranchers because of their alleged competition for forage with cattle.^{iv} As a result, these animals have been poisoned, trapped, hunted and shot on site. However, recent research analyzing 40+ years indicates that prairie dog competition with cattle is less than 10%. Despite this new evidence, prairie dogs

continue to be killed at an alarming rate and current estimates indicate that less than 1/3 of 1% of the native prairie dog population remain.

Efforts are currently underway to restore this valuable prairie species. A soil scientist by training, restorationist Jesse Wood has over 15 years experience working with prairie dogs in prairie habitats. In the High Plains and in west Texas, Wood works with landowners to reestablish this threatened species. One example of a successful restoration effort is Maddin Prairie, located just outside Colorado City, TX. Maddin Prairie, owned by the Native Prairie Association of Texas (NPAT), recognized the necessity of prairie dogs for a healthy prairie habitat.

In 2006, Wood established an initial prairie dog family of 89 members on 10 acres of the Maddin Prairie. Today it is 100+ strong. The initial introduction involved building underground lairs and connecting them to the surface with black plastic piping. Pipe tops were covered with a metal mesh that was wide enough for the prairie dogs to get through, but small enough to discourage coyotes and badgers. As the town expanded, the prairie dogs have left the artificial environs to build their own burrows. As a result, NPAT has increased the prairie dog habitat to approximately 25 acres. According to Wood, prairie dog restoration can be implemented on as little as one acre. All that is needed is a landowner that recognizes the value of this diminishing prairie species.



Black Tailed Prairie Dog on the lookout in its new home. Cage is temporary.
Credit: Jesse Wood

For more information about NPAT's Maddin Prairie, prairie dog restoration effort, contact Jesse Wood at: ojwood@msn.com

ⁱ Paine, R.T. 1969. *A Note on Trophic Complexity and Community Stability*. American Naturalist 103:91-93.

ⁱⁱ Davidson, Ana. 1996. *The Prairie Dog as a Keystone Species*.

<http://sev.Iternet.edu/~bmilne/bio310/96/termpaps/david.html>. Accessed May 19, 2013.

ⁱⁱⁱ Stobodchikoff, Con, Perlbianca, S., Verdolin, Jennifer L. 2009. *Prairie Dogs: Communication and Community in an Animal Society*. Harvard University Press. 280 pages.

^{iv} Merriam, C. H. 1902. The Prairie Dog of the Great Plains. Pg. 237-270 in: *Yearbook of the United States Department of Agriculture*, Washington, D.C., U.S. Government Print Office.

The Texas Society for Ecological Restoration promotes ecological restoration as a means of sustaining the diversity of life on Earth and re-establishing an ecologically healthy relationship between nature and culture.

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