

Blacktailed Prairie Dog Town Grassland Complex

COMMON NAME Blacktailed Prairie Dog Town Grassland Complex
SYNONYM Blacktailed Prairie Dog Town Grassland Complex
PHYSIOGNOMIC CLASS ()
PHYSIOGNOMIC SUBCLASS ()
PHYSIOGNOMIC GROUP ()
PHYSIOGNOMIC SUBGROUP ()
FORMATION ()
ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM

RANGE

Theodore Roosevelt National Park

Black-tailed prairie dog (*Cynomys ludovicianus*) towns occur throughout Theodore Roosevelt National Park. They are especially prominent along roadsides in the South Unit. Towns may range in size from about a hectare to several hundred hectares.

Globally

This complex occurs widely throughout the Great Plains of the central United States. The blacktailed prairie dogs (*Cynomys ludovicianus ludovicianus*) occur on the Great Plains and the whitetailed prairie dogs (*Cynomys leucurus*) occur in the Great Basin (Knight 1994). Prairie dog towns historically covered millions of hectares in the Great Plains; currently their towns range in size from tens to hundreds of hectares, with an average density of 10 to 55 animals/ha (Whicker and Detling 1988).

ENVIRONMENTAL DESCRIPTION

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Prairie dog towns are located on clay, clay loam, silty loam, and sandy loam soils deposited following erosion from adjacent uplands, including badlands formation. The soils are deep and not easily eroded. Towns are found on level sites in the sage brush flats areas, along drainages, in broad valleys, on gentle to moderately sloping hillslopes, and on tables and buttes.

Globally

Prairie dog towns are located on a wide variety of soils, including clay, clay loam, silty loam and some sandy loam soils deposited following erosion from adjacent uplands, including badlands formations. Soils are deep, structured and not easily eroded. This type is found on level sites along drainages, in broad valleys, on gentle to moderately sloping hillslopes, and flats on tables and buttes (Von Loh et al. 1999). Prairie dogs create extensive burrows in their towns. Large volumes of soil are moved, improving filtration, hastening the incorporation of organic matter, facilitating nutrient cycling, and increasing the spatial heterogeneity of vegetation, soils, and other ecosystem components (Knight 1994).

MOST ABUNDANT SPECIES

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<u>Stratum</u>	<u>Species</u>
Herbaceous	<i>Verbena bracteata</i> , <i>Hedeoma hispida</i> , <i>Dyssodia papposa</i> , <i>Aristida purpurea</i> , <i>Buchloe dactyloides</i> , <i>Pascopyron smithii</i>

Globally

<u>Stratum</u>	<u>Species</u>
Short Shrub	<i>Artemisia frigida</i>
Forb	<i>Dyssodia papposa</i>
Graminoid	<i>Aristida purpurea</i> , <i>Bouteloua gracilis</i> , <i>Buchloe dactyloides</i> , <i>Pascopyrum smithii</i>

CHARACTERISTIC SPECIES

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Verbena bracteata, *Hedeoma hispida*, *Dyssodia papposa*, *Aristida purpurea*, *Buchloe dactyloides*, *Pascopyron smithii*

Globally

Aristida purpurea, *Artemisia frigida*, *Bouteloua gracilis*, *Conyza ramosissima*, *Dyssodia papposa*, *Hedeoma hispida*, *Pascopyron smithii*, *Verbena bracteata*

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OTHER SPECIES (GLOBAL)

Stratum

Species

VEGETATION DESCRIPTION

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Although several plant species are consistently found in the prairie dog towns, overall vegetation characteristics are highly variable depending upon size and age of the town and its position on the landscape. The more common patches of vegetation within towns include purple three-awn (*Aristida purpurea*), fetid dogweed (*Dyssodia papposa*), field bindweed (*Convolvulus arvensis*), and large-bract verbena (*Verbena bracteata*). The vegetation in all towns usually tends toward a prostrate growth form because of intensive grazing by prairie dogs and bison. The overall pattern of vegetation appears in relatively concentric zones relating to the outward expansion of town boundaries over time. Foliar cover varies from <25% to almost 100%. Towns located adjacent to roadsides and on the sage brush flats associated with the Little Missouri River often contain more exotic plant species, especially smooth brome (*Bromis inermis*), compared to the more isolated towns. Bison often heavily use towns located near the Little Missouri River.

Globally

Blacktailed prairie dog towns are located in open mixedgrass or shortgrass prairie habitat, and their activity has both direct and indirect effects on the vegetation. The blacktailed prairie dogs keep the surrounding vegetation clipped close to the ground, presumably to improve their ability to detect stalking predators. This clipping gives the impression of a mowed lawn, or overgrazed rangeland. Cover averages between 30 and 80%, but some patches may be 100%. Prairie dogs repeatedly clip and graze plants, rarely allowing shoots to reach full size. Thus, canopy height within the colony is about 5-10 cm, compared to 20-50 cm in nearby, uncolonized grassland (Whicker and Detling 1988). Changes in plant species composition may begin as early as 2 or more years after colonization. Shortgrass species, such as *Bouteloua gracilis* and *Buchloe dactyloides*, and annual forbs, such as become abundant and replace mid-height or tall grasses, such as *Pascopyrum smithii*. Continued heavy grazing may eventually result in complete dominance by a few species of forbs or dwarf shrubs, such as *Artemisia frigida*, *Dyssodia papposa*, and *Aristida purpurea* (Whicker and Detling 1988). Grazing may even cause genetic shifts within species. The shorter, more prostrate, growth forms of *Pascopyrum smithii* on prairie dog towns have been shown to be more abundant than those away from towns, suggesting that some genotypes within the species may tolerate grazing better than others (Jaramillo and Detling 1988, Whicker and Detling 1988). ^Bison may be attracted to the prairie dog towns, and a series of studies found that bison preferentially graze them (Coppock et al. 1983, Coppock and Detling 1986, Day and Detling 1990). The forage on the colonies is more nutritious than off, with higher nitrogen content and younger shoots, apparently because the animal waste products are deposited there. In turn, the presence of bison waste products further increases the soil fertility and forage quality (Knight 1994). Pronghorns may also prefer the prairie dog towns (Knight 1994). Plant species diversity is increased by the small-scale disturbances caused by the digging of prairie dogs, and animal species diversity may also increase because of the habitat provided for the badger, rattlesnake, burrowing owl, black-footed ferret, and cottontail, in addition to the bison and pronghorn (Knight 1994). ^Prairie dog towns also move over time, expanding and contracting, and, as larger towns can cover thousands of hectares at a time, the effect on the prairie landscape is substantial. ^The plant community types on a prairie dog colony are roughly indicative of the extent of herbivore disturbance and reflect the cumulative impact of grazing intensity, grazing duration, activities of other animals, soil characteristics, and weather (Whicker and Detling 1988). Early stages of the town may have a typical mixed grass or shortgrass prairie type. With continued grazing and age of the town, the composition may shift to a mix of annual species and dwarf-shrubs. These latter stages have not been classified, but are treated here as a complex. Species richness appears to be highest under moderate levels of disturbance, because grass species have not yet begun to disappear, but forb species have begun to increase.

ENVIRONMENTAL CONDITION

Prairie dog towns are located on a wide variety of soils, including clay, clay loam, silty loam and some sandy loam soils deposited following erosion from adjacent uplands, including badlands formations. Soils are deep, structured and not easily eroded. This type is found on level sites along drainages, in broad valleys, on gentle to moderately sloping hillslopes, and flats on tables and buttes (Von Loh et al. 1999). Prairie dogs create extensive burrows in their towns. Large volumes of soil are moved, improving filtration, hastening the incorporation of organic matter, facilitating nutrient cycling, and increasing the spatial heterogeneity of vegetation, soils, and other ecosystem components (Knight 1994).

CONSERVATION RANK G4. This rank has been assigned based on the G4 rank that is currently assigned to the Blacktailed prairie dog itself. However, more careful review of the rank from a community perspective is needed.

DATABASE CODE

CECX002003

USGS-NPS Vegetation Mapping Program
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SIMILAR ASSOCIATIONS

Pascopyrum smithii - *Bouteloua gracilis* - *Carex filifolia* Herbaceous Vegetation

Pascopyrum smithii - *Nassella viridula* Herbaceous Vegetation

COMMENTS

REFERENCES

- Coppock, D.L. and J.K. Detling. 1986. Alteration of bison and black-tailed prairie dog grazing interaction by prescribed burning. *J. Wildl. Mgmt.* 50(3):452-455.
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- Day, T. A., and J. K. Detling. Grassland patch dynamics and herbivore grazing preference following urine deposition. *Ecology.* 71(1):180-188.
- Jaramillo, V. J., and J. K. Detling. 1988. Grazing history, defoliation, and competition: Effects on shortgrass production and nitrogen accumulation. *Ecology.* 69(5):1599-1608.
- Von Loh, J., D. Cogan, D. Faber-Langendoen, D. Crawford, and M. Pucherelli. 1999. USGS-NPS Vegetation Mapping Program, Badlands National Park, South Dakota (Final Report). Technical Memorandum No. 8260-00-02, U.S. Bureau of Reclamation Technical Service Center. Denver Colorado.
- Whicker, A. D., and J. K. Detling. 1988. Ecological consequences of prairie dog disturbances. *BioScience.* 38(11):778-784.