



Black-tailed Prairie Dog Monitoring at Scotts Bluff National Monument, Nebraska: Annual Status Report 2008

Heartland Network Monitoring Report Update—August, 2008



ON THE COVER

Black-tailed prairie dog (*Cynomys ludovicianus*)

Photo from The Heartland Inventory and Monitoring Network and Prairie Cluster Prototype Monitoring Program files.

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Heartland Network Monitoring Report Update—August, 2008

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Executive Summary

In 2008, for the 14th consecutive year, black-tailed prairie dog populations on Scotts Bluff National Monument, Nebraska were monitored using methods outlined by Plumb et al. (2001). The 2008 density estimate (44.7 individuals/ha) for the main colony, was approximately 79 % higher than its fourteen year average. The population estimate of 412 individuals was 113 individuals above average for this colony. The density estimate (83.6 individuals/ha) for the north colony, was approximately 21 % higher than its five year average. The population estimate of 160 individuals was 31 individuals above average for this colony. Sometime between the 2007 and 2008 surveys, the colony in the Saddle Rock Unit went extinct. While the general location of the main and north colonies remained the same as in previous years, the overall size of the main colony was reduced from 18.1 ha in 2007 to 9.3 ha in 2008. In 2008, black-tailed prairie dog occupied 1.6 % of the monument's 698-ha of grassland habitat. Though tested for, Sylvatic plague was not found to be a causative agent in the die-off of the Saddle Rock colony, and the presence of plague was not observed in the other colonies. The observation of a single burrowing owl occurred during black-tailed prairie dog counts on the main colony.

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Introduction

- The objectives of black-tailed prairie dog monitoring at Scotts Bluff National Monument, Nebraska are to: 1) estimate black-tailed prairie dog population abundance; 2) map the size and location of black-tailed prairie dog colonies; and 3) determine through observation if sylvatic plague is present in any of the black-tailed prairie dog colonies. The objective of this report is to document our findings for 2008.
- Since monitoring began, black-tailed prairie dogs have inhabited between 1.4 and 39.9 ha of the monument's 698 ha of grassland habitat.

Methods

Black-tailed Prairie Dog Density and Abundance

- Plumb et al. (2001) detail the current monitoring methods used to estimate black-tailed prairie dog densities, abundance and colony sizes.
- To facilitate a more accurate observation of prairie dogs on the main colony, three observers conducted surveys. Each observer counted prairie dogs on independent sections of the colony. The small size of the north colony allowed one observer to count prairie dogs on this colony concurrent with their main colony count.
- To establish a maximum count of black-tailed prairie dog numbers, eight replicate counts, with 15-minute intervals between the start of each replicate occurred between 6:45am and 8:45am on June 24, 25, and 26.
- Using the maximum count of prairie dogs for the survey period, obtained by combining visual counts from observers within replicates, an estimate of annual black-tailed prairie dog density and abundance within the main colony were calculated. Similarly, density and abundance estimates were calculated for the north colony.
- Using mark-recapture data, maximum counts have been shown to significantly correlate with prairie dog abundance (Severson and Plumb 1998).
- To help explain annual variations in the black-tailed prairie dog populations, precipitation data was obtained from the National Weather Service, station 257665 at Scotts Bluff, Nebraska regional airport.

Black-tailed Prairie Dog Colony Mapping

- Boundaries of the black-tailed prairie dog colonies were mapped using a Global Positioning System (GPS) in conjunction with a PC-based Geographic Information System, ArcGISv.9TM. Boundaries were delineated by following active clip lines when discernable or mapping the area within five meters of active burrows when it was not.

Sylvatic Plague Surveillance

- Park personnel monitored sylvatic plague presence within the black-tailed prairie dog colonies throughout the year.

- Because of the colony die-off in the Saddle Rock Unit, the collection and testing of fleas for the presence of plague on all three colonies occurred.

Results

Black-tailed Prairie Dog Density and Abundance

- The density of black-tailed prairie dog on the main colony in 2008 was 44.7 individuals/ha, an increase of 36.6 individuals/ha from 2007, and higher than its fourteen year average (1995-2008) of 24.9 individuals/ha (Figure 1).
- Density estimates for the colony north of the canal was 83.6 individuals/ha, an increase of 13.0 individuals/ha from 2007, and higher than its five year average (2004-2008) of 69.2 individuals/ha (Figure 2.).

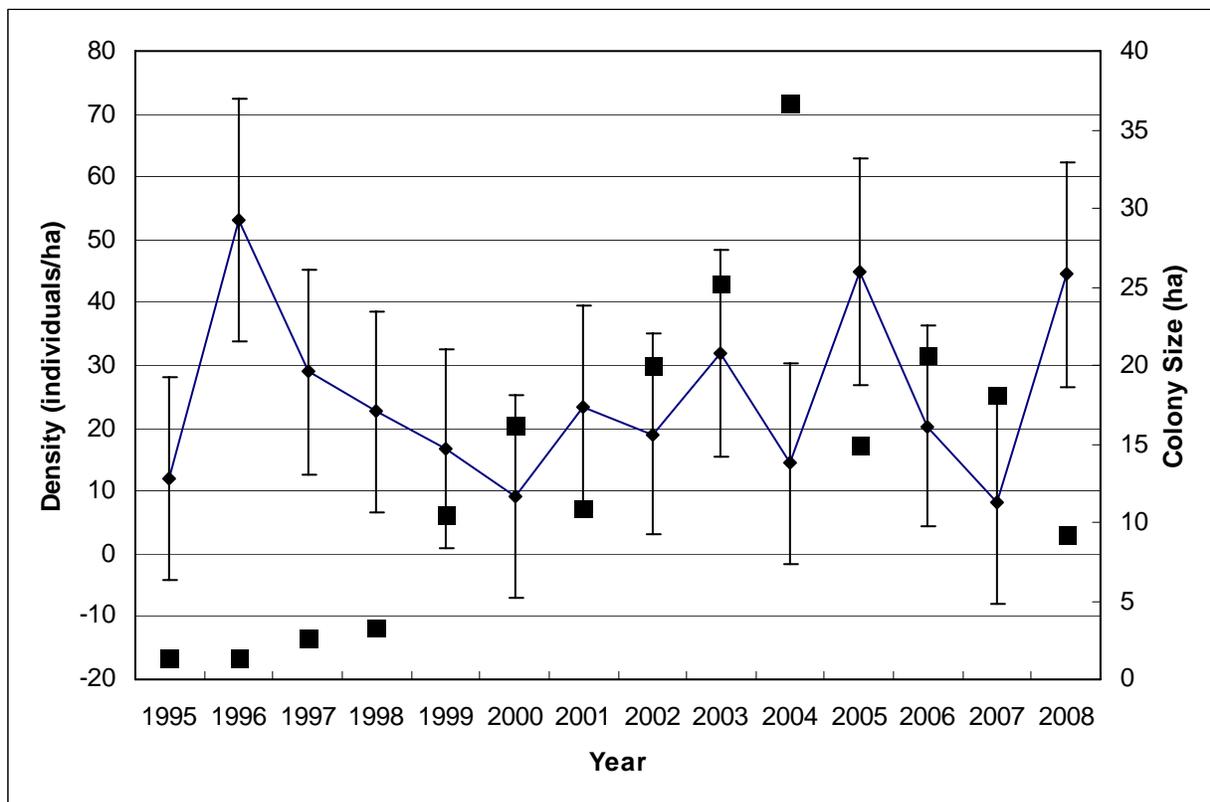


Figure 1. Annual estimates of black-tailed prairie dog (*Cynomys ludovicianus*) densities at Scotts Bluff National Monument, Nebraska – main colony, years 1995 to 2008. Error bars at each annual density estimate represent a calculated confidence limit for that year. Years with widely overlapping confidence limits about their density estimate are not significantly different. Squares represent the main colony size for each year.

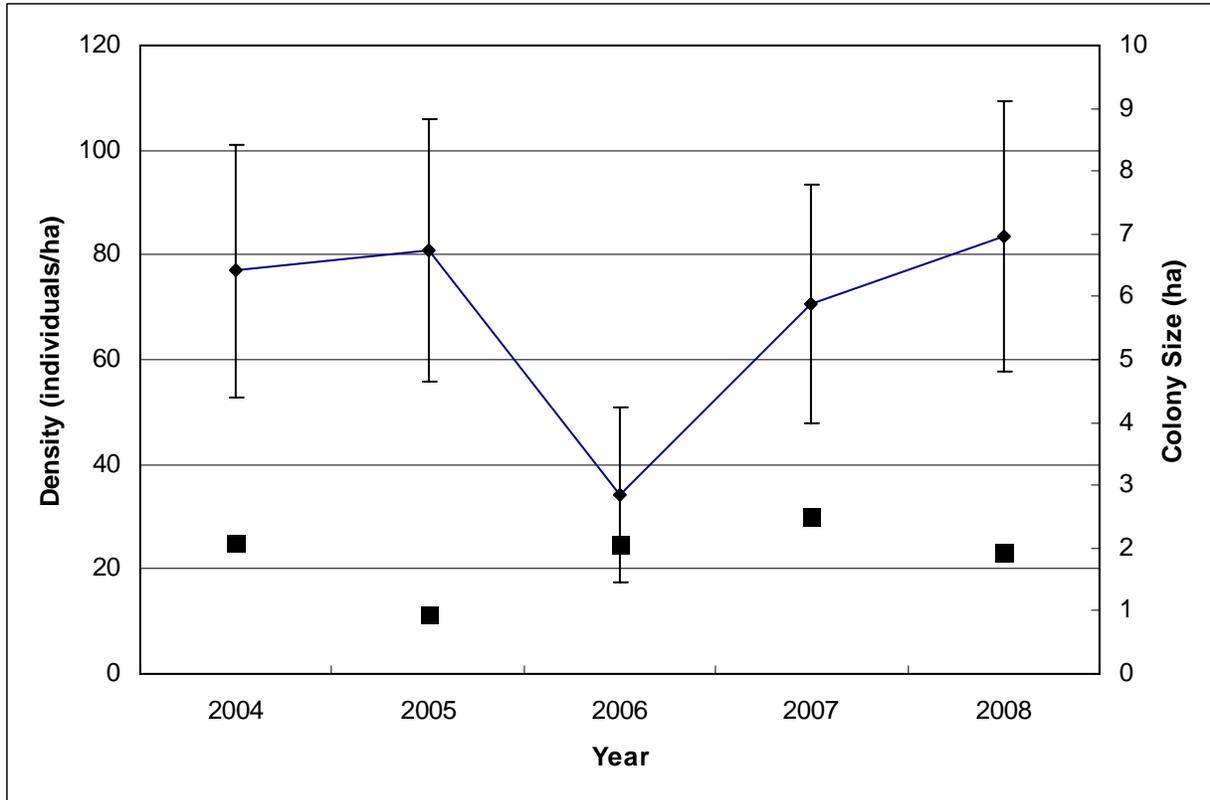


Figure 2. Annual estimates of black-tailed prairie dog (*Cynomys ludovicianus*) densities at Scotts Bluff National Monument, Nebraska – north colony, years 2004 to 2008. Error bars at each annual density estimate represent a calculated confidence limit for that year. Years with widely overlapping confidence limits about their density estimate are not significantly different. Squares represent the north colony size for each year.

- Population size for the main colony was estimated at 412 individuals, an increase of 264 individuals from 2007 (Figure 3). The estimated black-tailed prairie dog population size was 113 individuals above the fourteen-year average (1995-2008) of 299 individuals.
- The estimated population size for the north colony was 160 individuals, a decline of 14 individuals from 2007 (Figure 4). However, the estimated population size was 31 individuals above the five-year average (2004-2008) of 129 individuals.

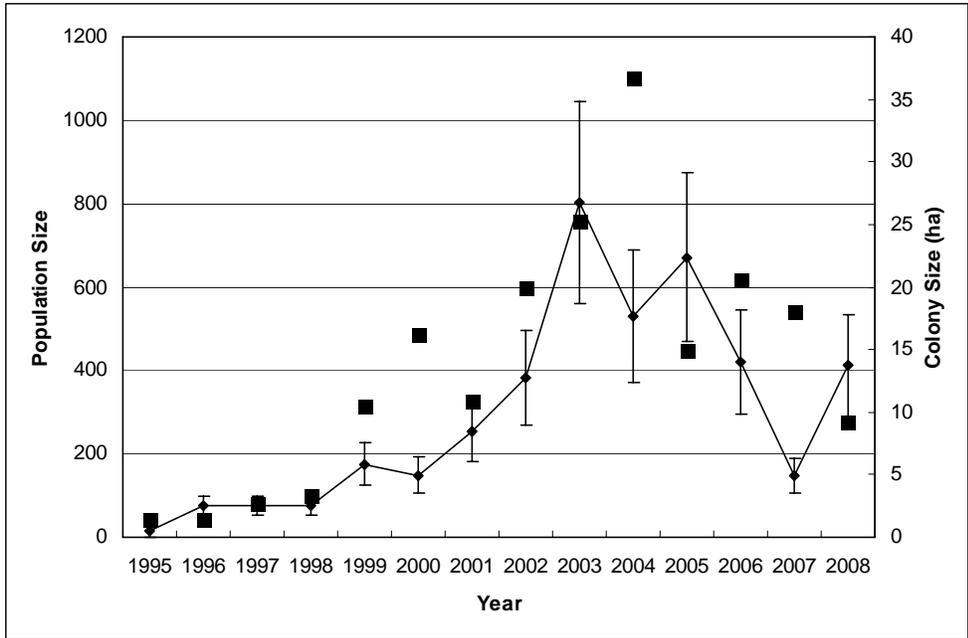


Figure 3. Annual estimates of black-tailed prairie dog (*Cynomys ludovicianus*) population sizes at Scotts Bluff National Monument, Nebraska – main colony, years 1995 to 2008. Bars at each annual population estimate represent a calculated confidence limit for that year. Years with widely overlapping confidence limits about their population estimate are not significantly different. Squares represent the main colony size for each year.

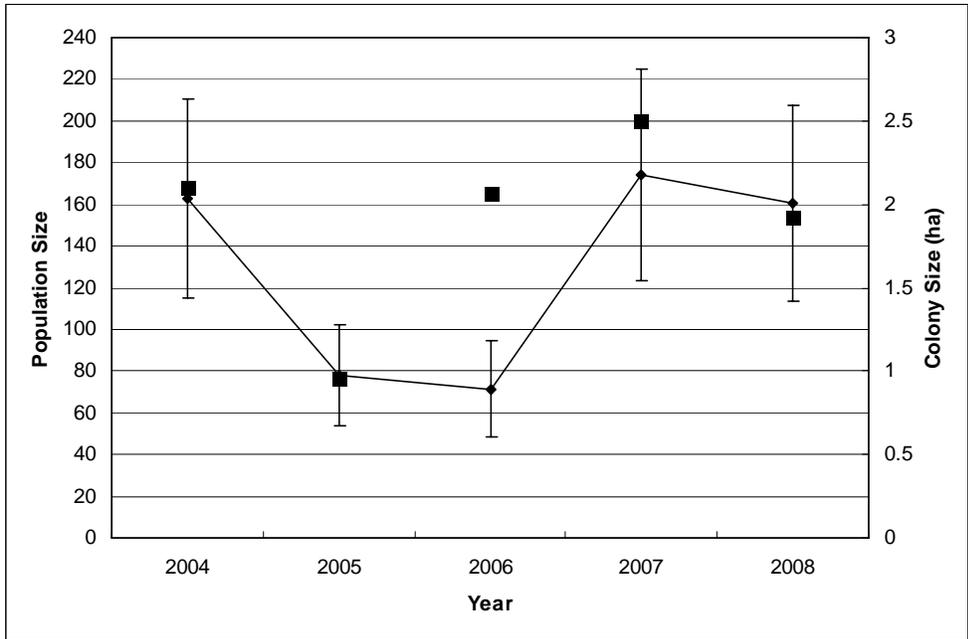


Figure 4. Annual estimates of black-tailed prairie dog (*Cynomys ludovicianus*) population sizes at Scotts Bluff National Monument, Nebraska – north colony, years 2004 to 2008. Bars at each annual population estimate represent a calculated confidence limit for that year. Years with widely overlapping confidence limits about their population estimate are not significantly different. Squares represent the north colony size for each year.

Black-tailed Prairie Dog Colony Mapping

- The main colony encompassed 9.27 ha in 2008, representing a decline in size of 8.83 ha from 2007. The colony size was 4.39 ha smaller than the fourteen year average of 13.66 ha.
- The north colony encompassed 1.91 ha in 2008, representing a decline in size of 0.58 ha from 2007. The colony size was the same as its five-year average.
- Locations of both the main colony and the one north of the irrigation canal are shown in Figure 5.

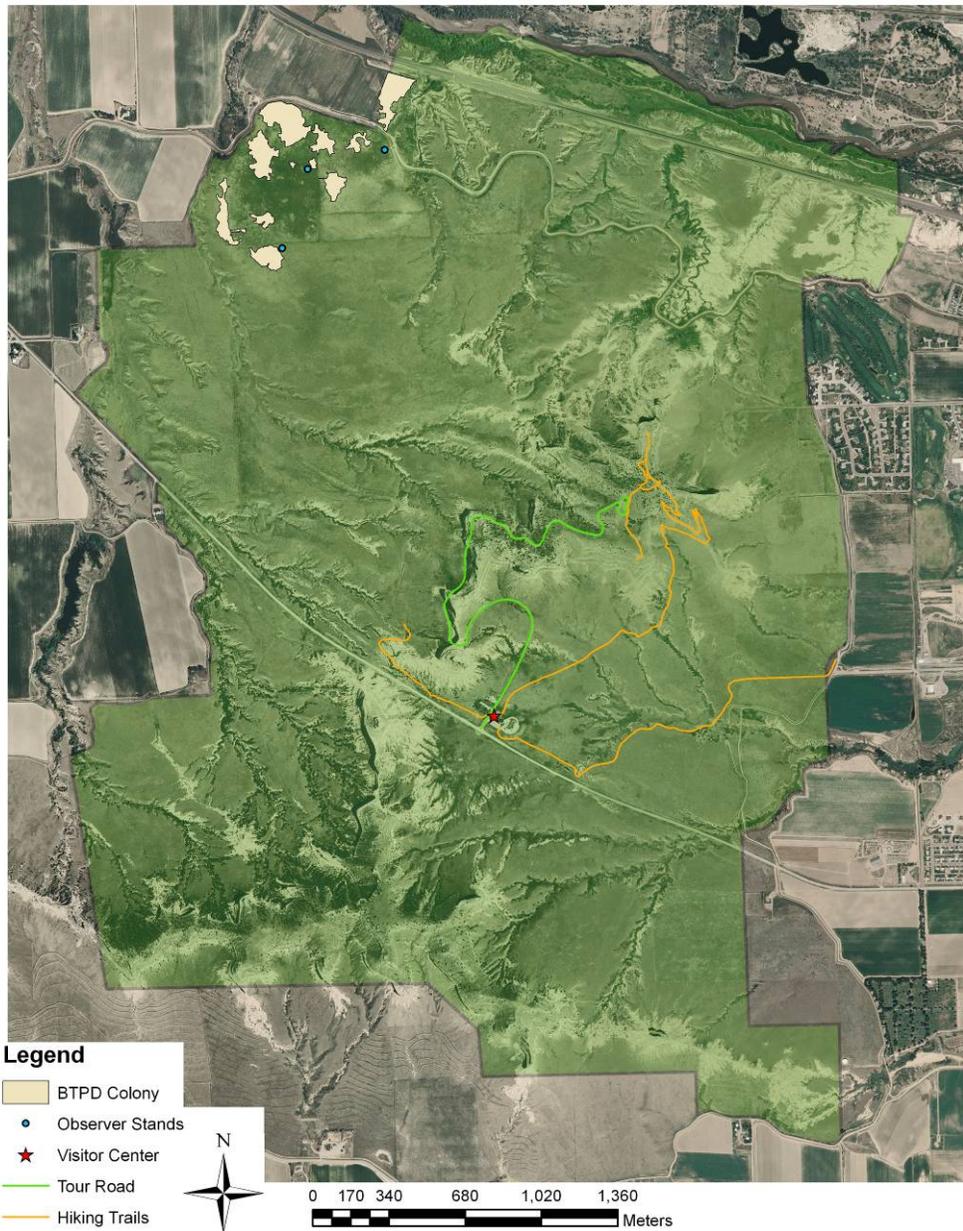


Figure 5. Black-tailed prairie dog (*Cynomys ludovicianus*) colony locations on Scotts Bluff National Monument, Nebraska during 2008.

Sylvatic Plague Surveillance

- Though tested for on the Saddle Rock Unit colony, Sylvatic plague was not found in, or the effects of, observed on, any colony in 2008.

Other Observations

- A badger (*Taxidea taxus*) observation occurred on the north colony in 2008. Although signs existed, observations of badger did not occur on the main colony or the extinct Saddle Rock Unit colony.
- A single burrowing owl occurred on the main colony during the 2008 surveys.

Discussion

- Density estimates for the 2008 black-tailed prairie dog population on the main colony at Scotts Bluff National Monument is the third highest on record since monitoring began fourteen years earlier. Overall population size is the fourth largest ever recorded.
- Density estimates for the prairie dog population on the north colony is the highest on record since monitoring began there five years earlier. However, overall population size is only the third largest ever recorded.
- Similar to previous years, the high population density seen on the main colony came on the heels of a very low density in 2007 (see Peitz and Cribbs 2007). The population density for the north colony was higher than the previous year, which was the second lowest density recorded there.
- The sizes of both black-tailed prairie dog populations on the monument were in the mid-range of their fourteen and five year estimates.
- By all observations, the colony in the Saddle Rock Unit of the monument has gone extinct. The few burrows observed were either old and unused, or dug out by presumably a badger.
- While the general location of the main and north colonies remained the same, both had declined in size.
- A factor affecting colony size may be weather. In the first years of the study, colony expansion was constant, but generally low, with annual precipitation above average. Since 1999, however, colony size generally increased from the previous year in years with below average precipitation, and shrank in size from the previous year when precipitation was above average. (Figure 6). Black-tailed prairie dogs need to forage over larger areas to meet their nutritional needs during dry weather conditions and smaller areas during wetter conditions (Hoogland 1995).

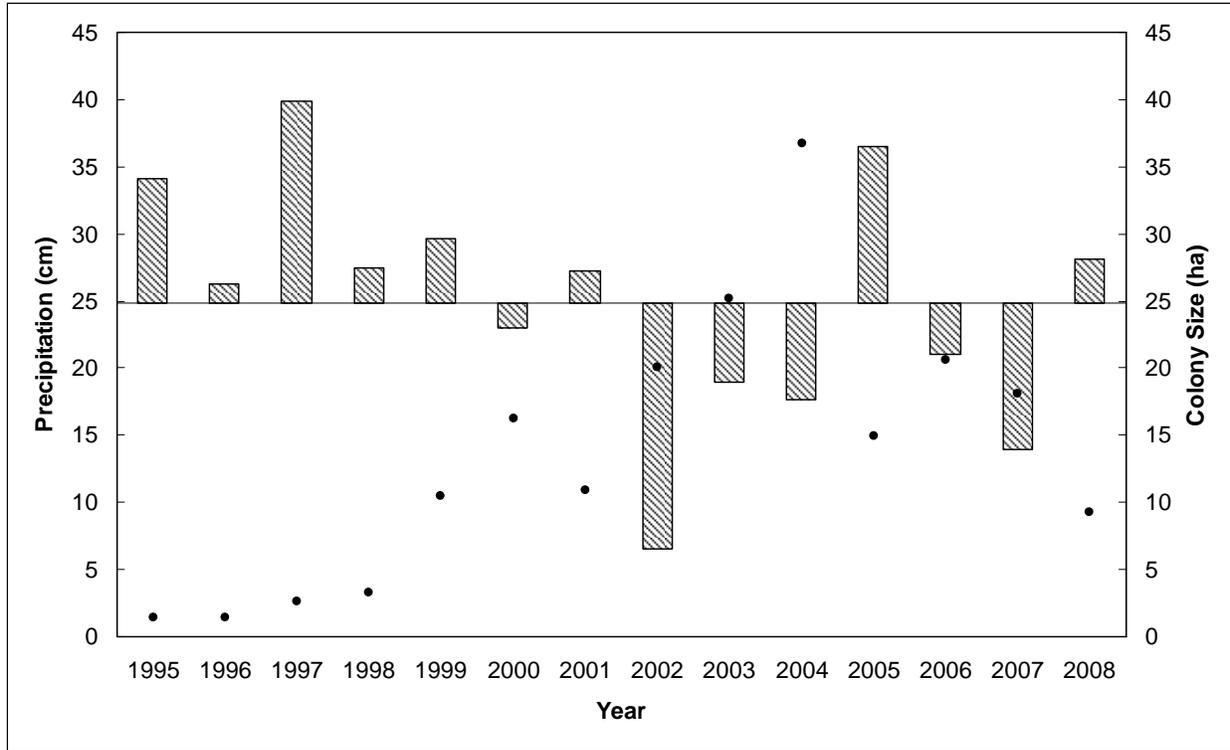


Figure 6. Cumulative precipitation for the first seven months of each year, shown annually as deviations from the fourteen year average (1995-2008) at Scotts Bluff National Monument, Nebraska. Annual precipitation averaged 25.03 cm for the first seven months of each year during the fourteen-year period. Asterisks represent the main colony size for each year.

- Presently, the combined colonies occupy only a small portion of the monument (i.e. 1.6% of the monument’s 698-ha of grassland). However, monument staff should continue to monitor for new occurrences of black-tailed prairie dog colonies in other areas of the monument.
- Sylvatic plague surveillance as well as surveillance for other mortality factors will continue to be a routine part of the monitoring.

Literature Cited

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The NPS has organized its parks with significant natural resources into 32 networks linked by geography and shared natural resource characteristics. HTLN is composed of 15 National Park Service (NPS) units in eight Midwestern states. These parks contain a wide variety of natural and cultural resources including sites focused on commemorating civil war battlefields, Native American heritage, westward expansion, and our U.S. Presidents. The Network is charged with creating inventories of its species and natural features as well as monitoring trends and issues in order to make sound management decisions. Critical inventories help park managers understand the natural resources in their care while monitoring programs help them understand meaningful change in natural systems and to respond accordingly. The Heartland Network helps to link natural and cultural resources by protecting the habitat of our history.

The I&M program bridges the gap between science and management with a third of its efforts aimed at making information accessible. Each network of parks, such as Heartland, has its own multi-disciplinary team of scientists, support personnel, and seasonal field technicians whose system of online databases and reports make information and research results available to all. Greater efficiency is achieved through shared staff and funding as these core groups of professionals augment work done by individual park staff. Through this type of integration and partnership, network parks are able to accomplish more than a single park could on its own.

The mission of the Heartland Network is to collaboratively develop and conduct scientifically credible inventories and long-term monitoring of park “vital signs” and to distribute this information for use by park staff, partners, and the public, thus enhancing understanding which leads to sound decision making in the preservation of natural resources and cultural history held in trust by the National Park Service.

www.nature.nps.gov/im/units/htln/

