

2014 Black-tailed Prairie Dog (*Cynomys ludovicianus*) Population Survey Report

U.S. Fish and Wildlife Service

Fort Niobrara National Wildlife Refuge

Valentine, NE

Surveys Conducted by Anna Keenan and Spencer Witt

Abstract

The black-tailed prairie dog (*Cynomys ludovicianus*) town native to Fort Niobrara National Wildlife Refuge in Valentine, NE was surveyed for management purposes the weeks of July 18th through August 1st, 2014. Active prairie dog town acreage was mapped by gathering perimeter information via GPSmap Garmin 60CSx. Multiple waypoints were collected along town boundaries to create polygon shape files in ArcMap 10. In addition, visual counts of black-tailed prairie dogs were conducted using there flagged grids placed in areas of varying prairie dog densities. Active prairie dog acreage total3ed 72.2 acres in 2014 and the population estimate after visual count corrections totaled 1,800 individuals.

Introduction:

As part of an ongoing study of black-tailed prairie dog abundance and distribution on Fort Niobrara National Wildlife Refuge in Valentine, NE, annual visual surveys are conducted in conjunction with GPS mapping of active prairie dog town acreage. Surveys are conducted from mid-June to late August. This allows for the emergence of new pups as well as the dispersal of yearling males. Black-tailed prairie dogs are a keystone species of prairie ecosystems and provide aesthetic enjoyment for refuge visitors. In order to maintain a healthy population, prairie dog numbers are monitored annually. These surveys provide important information for the continued management of this species on the refuge.

Methods:

Active prairie dog town acreage was mapped by gathering perimeter data via a GPSmap Garmin 60CSx unit. Multiple waypoints were collected along town boundaries. Active prairie dog town boundaries were defined by heavily browsed vegetation and active holes. An active hole was defined as one that was currently being utilized by one or more individuals with the appearance of scat around the burrow as well as the absence of overgrown vegetation and spider webs across the hole entrance.

Once the waypoints were collected, they were offloaded onto DNR Garmin and saved to a Geographic Information Systems (GIS) file. The waypoints were then edited in ArcMap 10 to create new shapefiles of the active prairie dog town. Total town acreage was then calculated by editing the attributes table of the ArcMap file.

After shapefiles were created, three sampling grids were placed within the town boundaries in low to medium and medium to high density areas. Each grid consisted of a rectangle with dimensions of 30 meters by 150 meters, resulting in an area of 0.45 hectares. Three equally

spaced lines of flags were placed the length of the grid at 30 meter intervals with the middle line of flags placed 15 meters from the two outside lines. This established two lanes of equal area for conducting visual counts. Obstructions such as tall vegetation, trees, and uneven terrain were avoided in order to obtain a clear line of sight the entire length of each grid. Waypoints of grid corners were then collected with a GPSmap Garmin 60CSx unit and offloaded onto DNR Garmin. They were then saved to the same GIS file that contained the active prairie dog town acreage. New shapefiles were created on top of the town acreage shapefile to display grid size and location.

Visual counts of black-tailed prairie dogs were conducted on four consecutive mornings from July 29th to August 1st 2014. Protocol called for three consecutive morning counts instead of four; however, this was not achieved due to schedule conflicts. Counts were conducted between approximately 08:30 and 11:45 in order to obtain higher activity levels during the cooler morning temperatures. Observers used binoculars from the bed or cab of a truck in order to obtain a high degree of visibility. The observer's truck was parked approximately 60 meters away from the grid's middle line of flags so as not to disrupt natural behaviors. A fifteen minute waiting period was enacted to allow prairie dogs to become accustomed to the observer's presence. At the end of the fifteen minute waiting period, counts were taken every five minutes for a total of forty-five minutes, resulting in ten counts per grid per day. Both left and right lanes were counted and recorded during each five-minute counting period. In order for the highest number of prairie dogs to be recorded during each five-minute viewing periods, counts were adjusted as the number of individuals detected increased. In addition, individuals who crossed from one viewing lane into another were not counted twice. Prairie dogs observed outside of grid lines were not counted. However, individuals observed along grid line perimeters were recorded. The order in which grid counts took place was rotated each day to avoid counting the same grid first, middle, or last on consecutive days.

Visual count data was then utilized to determine total population estimates of the entire prairie dog town. A variety of sources have suggested that the highest visual count represents approximately 85% of the total population and 15% below-ground. Therefore, the high count for each grid was corrected by multiplying by 1.15. Total population counts were then estimated by multiplying the average density estimate from corrected visual counts by the total number of active prairie dog town acreage.

Methods derived from: Severson, Kieth E. and Glenn E. Plumb. 1999. Comparison of methods to estimate population densities of black-tailed prairie dogs. Wildlife Society Bulletin. 26(4):859-866.

Results and Discussion:

Sampling grids were placed in areas that were believed to be representative of low, medium, and high densities of prairie dogs. However, upon further review, it was found that the data collected more closely represents one medium and two high density areas, thus excluding the intended representation of a low density area. Factors such as high sweet clover densities made

viewing low density areas difficult and impractical. Special care should be taken to include a known low density area in future counts.

The horse pasture east of the bunkhouse produced noticeably larger numbers of visible prairie dogs on the fourth day of counts, making the results questionable. This affected the results in such a way that the estimated prairie dog population was 2,592 individuals. This was almost twice the number of prairie dogs estimated in 2012 (1,848). Based on the lead researcher's experience, 2,592 was outside the realm of possibility for the occupied area of 72.2 acres.

As a result of these discrepancies, the decision was made to discard the 2014 data and use data from past years combined with the current acreage from this year. Subsequently, viable data from 2010-2012 was extrapolated, resulting in a range of 13-41 prairie dogs per acre corrected and a mean of 25 prairie dogs per acre corrected. This data was used in conjunction with calculated active town acreage (72.2) to estimate a population of 1,800 animals.

A historical moratorium via the U.S. Fish and Wildlife Service on black-tailed prairie dog control coupled with several summers of drought may have caused prairie dog numbers to increase steadily from 2002-2006. The population reached its highest in 2005, with a total of 5 towns spanning 175 acres. Although counts were not conducted during this year, it is estimated that prairie dog numbers probably exceeded 5,000 animals based on data collected during 2003.

Although total prairie dog town acreage increased slightly from 66 acres in 2012 to 72 acres in 2014, the overall population has remained fairly steady, ranging from 1,848 individuals in 2012 to an extrapolated population of 1,800 in 2014. These numbers reflect a healthy dog population similar to numbers recorded in the past several years. The slight reduction in prairie dog numbers from 2012 may be a result of increased badger predation as well as early summer precipitation.

Future management decisions will be based on the continued monitoring of black-tailed prairie dog abundance and distribution on the Refuge. Any signs of abnormality such as hair loss should be reported to the Wildlife Health Office in Bozeman, MT and investigated. As a keystone species, the population of black-tailed prairie dogs on the Refuge is an important management concern for both the stability of the sandhills prairie ecosystem as well as the future enjoyment of visitors to the Refuge.

Table 1: 2014 Black-tailed Prairie Dog Survey Results

Survey Grid	High Count of Prairie Dogs Observed	Prairie Dogs per Hectare	Prairie Dogs per Acre	Prairie Dogs per Acre Corrected for 85% Factor
Old Store Yard	20	44	18	21
Northeast Exhibition Pasture	40	89	36	41
Horse Pasture East of Bunkhouse	43	96	39	45

Table 2: 1999-2014 Black-tailed Prairie Dog Survey Results

Year	Total Prairie Dog Acreage	# of Prairie Dogs per Acre Corrected		Estimated Prairie Dog Population
		Range	Mean	
2014	72	13-41*	25*	1800
2012	66	13-47	28	1848
2011	65	14-29	21	1365
2010	90	13-47	31	2800
2009	82	24-39	32	2600
2008	103	9-16	13	1300
2007	160			
2006	167			
2005	~175			
2004	163			
2003	95	15-46	29	2800
2001	56			
1999	~23			

*Mean Prairie Dogs per Acre Corrected: 25