

2006 PRAIRIE DOG MONITORING ON BUREAU OF LAND MANAGEMENT

LAND IN NORTHERN CATRON COUNTY, NEW MEXICO



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## EXECUTIVE SUMMARY

In 2004, the Bureau of Land Management (BLM) contracted Hawks Aloft, Inc., to conduct aerial surveys to identify Gunnison's prairie dog (*Cynomys gunnisoni*) colonies in northern Catron County, New Mexico, and to conduct ground surveys to determine the status and spatial coverage of colonies. In 2006, we conducted additional aerial and ground surveys in the region. We identified 12 potential prairie dog colonies during aerial surveys on 13 and 26 June 2006, but only four of them were previously undocumented colonies situated on BLM land. Including the four new colonies and the original 18 colonies monitored in 2004, we attempted to visit 22 colonies on the ground in August 2006. Thirteen colonies were active and 1 colony appeared inactive in 2006; we were unable to determine the status for the remaining eight colonies because some colonies were flooded by recent monsoonal rainfall or because road conditions or property boundaries limited access to sites. In 2006, we counted 75 prairie dogs at active colonies and estimated an average area of 5.0 acres ( $\pm 2.9$ ) per colony, both substantially less than 2004 estimates. Although our observations could indicate a negative change in prairie dog populations in northern Catron County, apparent differences in prairie dog numbers and spatial coverage could be explained, at least in part, by sampling differences between years. We suggest that switching the emphasis of future monitoring from aerial surveys to ground surveys would provide the most informative, and cost-effective, assessment of the health of this prairie dog population.

## INTRODUCTION

Prairie dogs (*Cynomys* spp.) are colonial ground-dwelling herbivores that are considered keystone species throughout shrub-steppe and grassland habitats (Kotliar et al. 1999, Bangert and Slobodchikoff 2000, Hoogland 2001). Prairie dogs are considered keystone species because they create habitat (e.g., burrows, low vegetation structure) or provide food resources for a variety of taxa, including birds. Burrowing Owl (*Athene cunicularia*), Ferruginous Hawk (*Buteo regalis*), and Mountain Plover (*Charadrius montanus*) are species that might be negatively affected by the loss of prairie dog colonies (Cully 1991, Dinsmore et al. 2003).

Although prairie dogs are key components of a healthy shrub-steppe ecosystem (Miller et al. 1994, Bangert and Slobodchikoff 2000), research indicates that they have declined greatly since the late 1800s and early 1900s (Marsh 1984, Miller and Cully 2001). Causes of decline have been attributed to poisoning, shooting, habitat loss, alteration of grazing regimes, and sylvatic plague (*Yersinia pestis*) (Cully and Williams 2001, Miller and Cully 2001). Some species (Utah prairie dog, *C. parvidens*, and Mexican prairie dog, *C. mexicanus*) have been listed as threatened or endangered (U.S. Department of Interior 2000, Scott-Morales et al. 2004). Black-tailed prairie dog (*C. ludovicianus*) is a widespread and once numerous species, but only a small portion of historic habitat is currently occupied (Sidle et al. 2001, Vermeire et al. 2004); this portion is less than 1% by some estimates (Miller and Cully 2001). Gunnison's prairie dog (*C. gunnisoni*) has a more limited range (Colorado, New Mexico, Utah, and Arizona), and has experienced local declines (e.g., Cully 1991, Cully et al. 1997). A petition to list this species was recently filed, although local monitoring is needed to clarify its status.

A considerable number of Gunnison's prairie dog colonies occurs in northern Catron County, New Mexico, on land managed by the Bureau of Land Management (BLM). In 2004, BLM contracted Hawks Aloft, Inc., to conduct aerial and ground surveys to identify potential Gunnison's prairie dog colonies. Eighteen active colonies were identified that year (Hawks Aloft 2004). In 2006, we conducted additional aerial surveys and revisited many of the 2004 colonies. Aerial surveys were the main desired objective prescribed by the BLM; therefore, we concentrated first on identifying new colonies from the air, and then added ground monitoring of existing colonies as resources allowed. In this report, we provide locations of colonies identified during 2006 aerial surveys and information on the status and sizes of prairie dog colonies visited in 2006. Information on prairie dog populations in northern Catron County will help BLM evaluate the health of this shrub-steppe, grassland ecosystem and contribute to larger scale status assessments this species.

#### Objectives In Brief:

- Conduct aerial surveys to identify Gunnison's prairie dog colonies
- Determine status and estimate size of prairie dog colonies identified during 2004 and 2006 aerial surveys

#### STUDY AREA

We conducted fieldwork on BLM land west of Quemado, in Catron County, New Mexico. Aerial surveys in 2004 were conducted mostly south of Highway 60 in a 116,510-acre block (Fig. 1). We attempted to expand on this coverage by flying over

BLM land to the north of the area previously covered. We surveyed two blocks of approximately 25,000 acres, the first along Highway 60, about 6 km west of Quemado, and the other between Zuni Salt Lake and Highway 60 (Fig. 1).

## METHODS

Hawks Aloft conducted monitoring in two parts in 2006: we first conducted aerial surveys to identify prairie dog colonies previously undiscovered, and then visited colonies on the ground to determine status (active or inactive) and size (numbers and spatial coverage). We attempted to relocate as many of the 2004 colonies as possible, in addition to visiting all colonies identified from the air in 2006.

We conducted aerial surveys on 13 and 26 June 2006. One observer accompanied the pilot in a Cessna 205 fixed wing aircraft. Air speed during surveys averaged 110 mph and altitude ranged from 500-800 feet above ground surface. We flew east-west transects spaced one-quarter mile apart. From these distances, we were easily able to detect Gunnison's prairie dog colonies, because burrow entry mounds commonly measure 1m in width and are fairly conspicuous. The pilot assisted the observer with locating burrows. Upon locating a group of burrows, an immediate attempt was made to mark the geographic coordinates in Universal Transverse Mercators (UTM, NAD 27 CONUS) using a Garmin 92 Global Positioning System (GPS) designed for use in aircraft. Using this protocol, we were able to record a waypoint for 100% of sighted prairie dog towns. Because the landscape consisted of BLM land interspersed with privately-owned sections, we could not always immediately determine if colonies were on public land. After both aerial surveys were completed, we plotted colony location coordinates on a

USGS quadrangle map, and then consulted BLM 1:100,000 surface management maps to verify that colonies were located on BLM land. If colonies were determined to be on private land, we did not attempt to visit the colony. We combined the 18 known colonies identified in 2004 with potentially new (and accessible) colonies identified by air in 2006 to form a list of colonies to monitor on the ground.

We conducted a ground check of known colonies, or potential colonies, to verify the presence of prairie dogs and estimate spatial size. We conducted ground monitoring during August. We considered a colony to be active if at least one prairie dog was observed. We observed each colony at a distance from a vehicle, if possible, for at least 15 minutes. During this time, we attempted to count the minimum number of individuals present, as well as identify the spatial extent of the colony. At the end of this observation period, we circled the colony on foot and collected UTM coordinates for what we perceived were the outermost burrows. We then plotted the coordinates on ArcGIS and calculated the area within each colony's polygon of points. We made an effort to collect as many coordinates as possible along the perimeter, but the number of coordinates depended somewhat on the number of burrows present. For each colony, we report the number of prairie dogs observed and estimate the area of each colony in acres. We also present an average area for active colonies (with 95% confidence intervals) and the total observed occupied area for prairie dogs in this area in 2006.

## RESULTS

We identified 12 potential prairie dog colonies during the two aerial surveys in June 2006. Based on UTM coordinates, we found that eight of the colonies were in

previously undocumented locations and four were in locations documented in 2004. Of the eight potentially new prairie dog colonies, four were located on private land and excluded from subsequent ground monitoring. We considered that the remaining four colonies were new, and we added these four locations to the original list of 18 from 2004 to be monitored on the ground.

We observed prairie dog activity at 13 colonies, and we found that one colony appeared inactive (Table 1, next page); for the remaining eight colonies, we were unable to determine the status. At three colonies, access was limited. Although these colonies appeared to be on BLM land, roads leading to the site ran through private property and access was restricted. Two other colonies were flooded by recent monsoonal rainfall. No prairie dogs were observed in the area, and the status for these colonies is unclear. We were unable to visit three other colonies because of various logistic constraints, including poor road conditions associated with inclement weather and budgetary limitations.

Based on the area within colony perimeter points, we estimated that the 13 active colonies in 2006 covered a total of 65.3 acres (26.4 ha) in the Quemado area (Table 1). Our 2006 estimate was considerably smaller than 2004 (622.5 acres). Colonies averaged 5.0 acres  $\pm$  2.9 each (2.0 ha  $\pm$  1.2) with a range of 0.7 to 20.6 acres. We observed 75 prairie dogs at active colonies in 2006, down from the 1,146 observed in 2004 (Table 1). Because many prairie dogs were probably hidden in burrows when we visited, our totals in both years underestimate the number of individuals actually present. We did not observe Burrowing Owls at any of the prairie dog colonies.

Table 1. Summary of prairie dog colonies monitored in 2004 and 2006 in northern Catron County, New Mexico.

Site	Year Found	2004 Name	Easting	Northing	Zone	2004			2006		
						Active?	Prairie Dogs	Acres	Active?	Prairie Dogs	Acres
1	2006	None	714245	3797776	12	-	-	-	Yes	8	4.7
2	2006	None	719635	3798155	12	-	-	-	Yes	6	4.3
3	2004	RH-01-PD	700861	3789237	12	Yes	23	1.8	Yes	5	5.4
4	2004	BL-03-PD	702678	3792698	12	Yes	50	24.9	?	-	-
5	2004	LA-02-PD	713892	3812119	12	Yes	75	21.6	Yes	2	20.6
6	2006	None	703467	3807965	12	-	-	-	Yes	1	0.7
7	2006	None	703370	3804541	12	-	-	-	?	-	-
8	2004	TJ-01-PD	709354	3804763	12	Yes	230	94.7	?	-	-
9	2004	AC-01-PD	720184	3797954	12	Yes	135	39.3	Yes	1	2.3
10	2004	NN-01-PD	682371	3785342	12	Yes	150	85.2	Yes	30	9.0
11	2004	CW-01-PD	695018	3787757	12	Yes	30	11.7	Yes	4	2.1
12	2004	HE-01-PD	766826	3758008	12	Yes	210	194.7	Yes	6	2.3
13	2004	RH-06-PD	704095	3791323	12	Yes	10	6.6	Yes	3	2.1
14	2004	RH-05-PD	702896	3791280	12	Yes	5	6.2	Yes	2	2.1
15	2004	BK-02-PD	696402	3775641	12	Yes	10	9.0	Yes	1	2.3
16	2004	RH-02-PD	704329	3782175	12	Yes	3	0.7	Yes	6	7.4
17	2004	RH-03-PD	702991	3778803	12	Yes	25	7.4	?	-	-
18	2004	QM-02-PD	737282	3797991	12	Yes	75	25.6	No	-	-
19	2004	RH-04-PD	702023	3788445	12	Yes	30	14.1	?	-	-
20	2004	JC-01-PD	688176	3773200	12	?	-	-	?	-	-
21	2004	BL-02-PD	696295	3801288	12	Yes	85	78.7	?	-	-
22	2004	CM-01-PD	313462	3819742	13	?	-	-	?	-	-

## DISCUSSION

The substantial decrease in number of prairie dogs observed and estimated spatial coverage from 2004 to 2006 could be the result of sampling differences or an indication of a real population change in northern Catron County. Drastic changes in prairie dog populations are possible in a short time. In 2004, we reported that an active colony from 2000 with at least 60 burrows had been eliminated shortly thereafter (Hawks Aloft 2004). Sylvatic plague can decimate a large population in a matter of months (Rayor 1985). Cully and Williams (2001) describe the consequences of plague as “local extirpation of colonies, reduced colony size, increased variance in local population sizes, and increased distances between colonies.” Persecution is another factor potentially affecting prairie dog populations, particularly on or in close proximity to private land.

Despite the numerous pressures that prairie dogs face, there is reason to consider that the apparent population changes in Catron County from 2004 to 2006 are the result of sampling differences. We conducted ground monitoring during the month of August, likely after the seasonal peak in prairie dog activity. We lack information on the exact seasonal timing of monitoring in 2004, but monitoring likely was conducted earlier in the season that year to coincide with concurrent monitoring of Ferruginous Hawk (*Buteo regalis*) nests. In August 2006, many prairie dog colonies experienced flooding from monsoonal rainfalls. Flooding prevented us from determining the status for a few colonies and prevented a thorough mapping of perimeter burrows for a few other colonies. At colonies 1, 5, and 12, the observer commented that many of the burrows were flooded. At colonies 6 and 13, the observer commented that part of the colony was underwater. Flooding at these colonies undoubtedly resulted in an underestimation of

prairie dog numbers and spatial coverage. The effects of ephemeral flooding on prairie dog colonies are unclear, but it is possible that temporary flooding might affect the consistency of the sampling effort more than actual population sizes or spatial coverage.

Because different sampling efforts or conditions might explain the apparent population differences that we observed, we recommend that these colonies be monitored again, preferably early in the season, before concluding that any actual declines are occurring. Although BLM and Hawks Aloft have successfully used aerial surveys to identify prairie dog colonies over a large portion of northern Catron County, prairie dog monitoring should now focus on monitoring existing colonies on the ground rather than identifying new colonies from the air. Additional aerial surveys would be less desirable than ground surveys in the immediate future because:

- 1) much of the BLM land in the region has now been covered by aerial surveys,
- 2) few new colonies were added during aerial surveys in 2006, and
- 3) aerial surveys are expensive and quickly deplete monitoring budgets.

We suggest that switching the emphasis of future monitoring from aerial surveys to ground surveys would provide the most informative, and cost-effective, assessment of the health of this prairie dog population.

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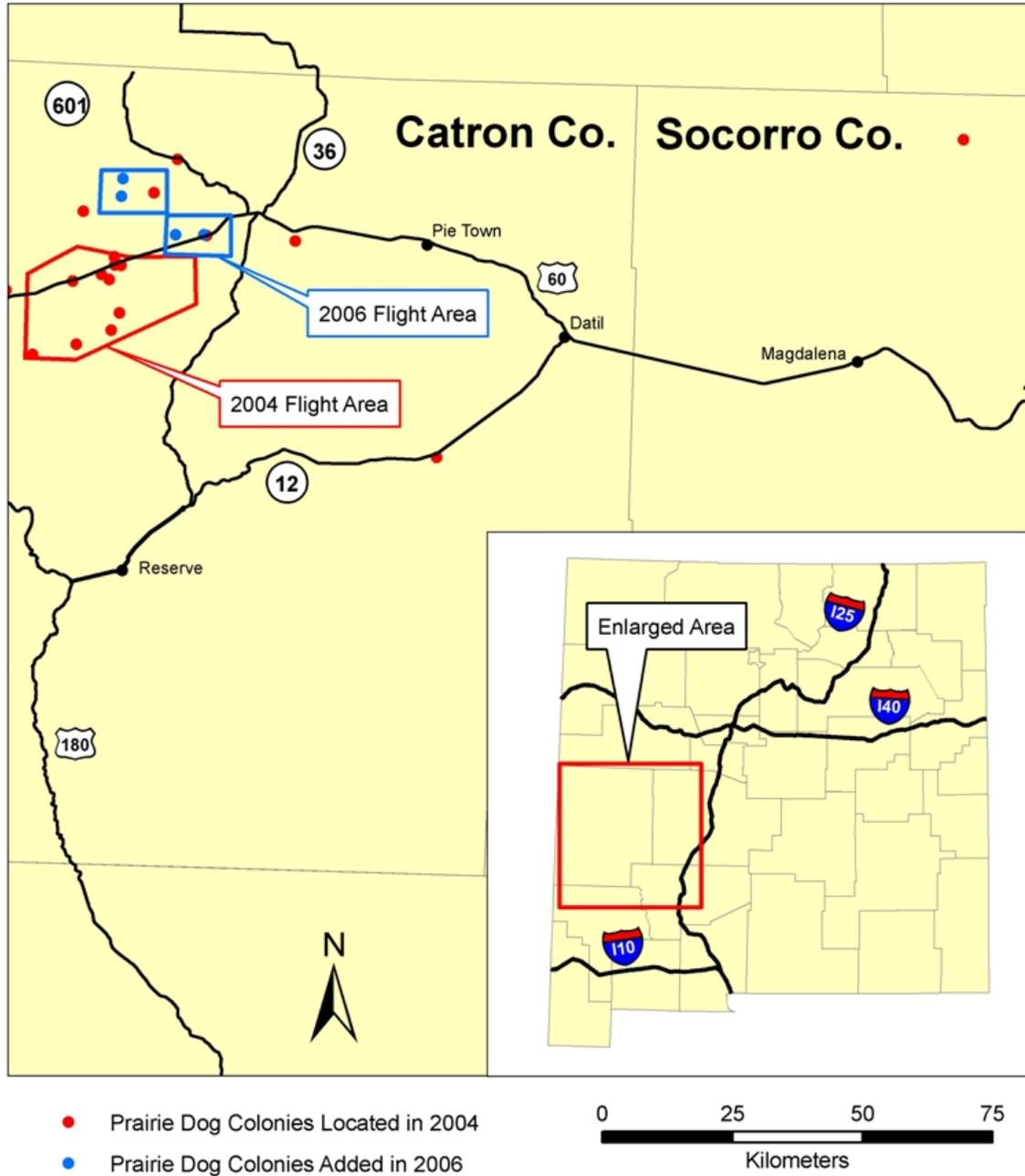


Figure 1. Survey area and locations of prairie dog colonies on Bureau of Land Management land in northern Catron County, New Mexico.