

Population Status of Burrowing Owls (*Athene cunicularia*) in New Mexico 2002-2003



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EXECUTIVE SUMMARY

The New Mexico Department of Game and Fish - Share With Wildlife (SwW) funded Hawks Aloft, Inc. (HAI) to monitor the Burrowing Owl (*Athene cunicularia*) population throughout New Mexico from 2002-2006. This study: (1) documents all volunteer sightings through the New Mexico Burrowing Owl Working Group (NMBOWG), (2) records new owl populations not associated with urban or heavily managed lands, and (3) determines the population status in these areas.

Hawks Aloft, Inc. began compiling owl observations from volunteers in 2002. Citizens reported Burrowing Owl observations from 15 of New Mexico's 33 counties in 2002, in which 410 owls were observed. In 2003, 179 owls were reported from 12 counties.

Monitoring of new Burrowing Owl populations began in 2003 because funding was limited. We choose to monitor three rural populations of Burrowing Owls in the Estancia Valley in Torrance County because previous studies in New Mexico have focused on urban areas. Monitoring began in late April and continued through June 2003. We observed 121 owls in the Estancia Valley, including 45 adults and 76 fledglings.

A total of 410 owls from the NMBOWG observations were detected in 2002 occupying 45% of the counties while in 2003 a total of 300 Burrowing Owls were detected in 39% of the counties from the NMBOWG observations and HAI monitoring in the Estancia Valley.

INTRODUCTION

The Burrowing Owl has shown population declines in certain areas of the United States (Haug et al. 1993). As a whole, Breeding Bird Survey (BBS) data from 1996-2001 shows a 1.5% per year decline in the U.S. (Sauer et al. 2003). Burrowing Owls are federally protected in the United States and Mexico by the Migratory Bird Treaty Act of 1918 (Klute et al. 2003). The United States Fish and Wildlife Service lists the Burrowing Owl as a National Bird of Conservation Concern (Klute et al. 2003). In New Mexico, the Burrowing Owl receives no additional protection and has not been designated with any legal status. However, National Partners in Flight lists the Burrowing Owl as a high responsibility bird (NM PIF 2003).

Populations in New Mexico also have shown declines in some areas, while exhibiting stable or increasing population levels in other areas (Arrowood et al. 2001). Statewide, the BBS shows an increase in population trends of 0.7% per year between 1966 and 2001 (Sauer et al. 2003); however, trends may not be precise due to small sample sizes (Arrowood et al. 2001). Two long-term urban studies in New Mexico have shown declines in Burrowing Owl population: Holloman Air Force Base (Borgmann 2003a) and Kirtland Air Force Base (Borgmann 2003b). A third intensive study at New Mexico State University also conducted in an urban environment found that nesting success in human-altered conditions was higher than natural areas (Botelho and Arrowood 1996).

Because Burrowing Owls have shown regional declines and only a limited number of urban areas in New Mexico have been intensively studied, the need for comprehensive, statewide population monitoring was addressed in 2001 by multiple

government agencies and non-governmental organizations. As a result, the NMBOWG was formed. The goal of this group is to acquire data on a volunteer basis from government and state agencies, non-profit and private organizations, and New Mexico citizen scientists, in order to provide a statewide assessment of Burrowing Owls (Hawks Aloft, Inc. 2003).

The New Mexico Department of Game and Fish supports SwW, a non-profit program dedicated to assisting New Mexico wildlife in need. The focus of this program includes research, public education, habitat protection, and wildlife rehabilitation. Share with Wildlife provided funding for HAI to conduct regular monitoring of selected Burrowing Owl nesting sites in rural New Mexico and to compile reported owl sightings from NMBOWG.

STUDY AREA

New Mexico Burrowing Owl Working Group

The NMBOWG has received observations from volunteers throughout the state. Volunteers statewide submitted their observations via the online form, email and regular mail. Many sightings were concentrated in or near urban areas.

Estancia Populations

Three rural Burrowing Owl populations were located in the Estancia Valley in Torrance County, approximately 60 kilometers east of Albuquerque. All three sites are located on private property that is currently for sale. The first site is located approximately eight kilometers southwest of Estancia. The second site is approximately

eleven kilometers north/northeast of Estancia. The third is located approximately two kilometers southwest of Moriarty. All owl populations were located in prairie dog towns, although prairie dogs were only observed at sites two and three. Cattle also were present at site three.

Habitat at all sites consists of open rangeland with short vegetation. William A. Dick-Peddie (1993) classifies this area of Torrance County as Closed Basin Scrub Vegetation. Dominant vegetation may include fourwing saltbush (*Atriplex canescens*) and, shadscale (*Atriplex confertifolia*). The subdominant vegetation may include red sage (*Kochia americana*), fathen (*Atriplex patula*), mat saltbush (*Atriplex corrugata*), and greasewood (*Sarcobatus vermiculatus*) (Dick-Peddie 1993).

METHODS

New Mexico Burrowing Owl Working Group

Hawks Aloft, Inc. houses the NMBOWG online observation form on our website, www.hawksaloft.org. The general public can access the website and report owl sightings via the internet. New Mexico Burrowing Owl Working Group pamphlets are also distributed at HAI outreach events, such as the NM State Fair, Bosque del Apache - Festival of the Cranes, and the Rio Grande Nature Center. The various government and state agencies as well as private and non-profit organizations that form NMBOWG also have access to the pamphlets and website.

Observations for 2002 and 2003 were organized by county. We chose 30 September as the cut off for observations each year to distinguish resident verses migrating owls. A database of observer name, contact information and observation data

is maintained, and yearly submission of owl observations is encouraged by mass mailings at the end of each breeding season.

Estancia Population

Observations of the Estancia Valley population began in 2003, because funding was not available in 2002. HAI located three populations of Burrowing Owls in the Estancia Valley. Initial observations of site one and two began 29 April 2003, and observations began 9 June 2003 for site three. Subsequent observations for site one and two took place on 9 and 22 June, respectively. A second observation was conducted at site three on 22 June 2003. Observations were conducted at a distance of approximately 100 meters with 8x50 binoculars. Information collected on data sheets included observer, number of adult and young owls, prairie dog presence, and Universal Transverse Mercator (UTM) coordinates. Birds were not banded this year due to the delay in locating new owl populations. This information is included with the NMBOWG data.

RESULTS

New Mexico Burrowing Owl Working Group

In 2002, 45% ($n = 15$) of the counties had Burrowing Owl observations reported by volunteers. The number of observations per county ranged from one sighting to 27, with a total of 88 observations (Table 1, Fig. 1). Because Bernalillo County included two observations for the same population of owls, only one observation was included in the observations per county count. Of these observations, 410 individuals were detected

(Table 1, Fig. 2). We did not include the age of owls, because this information was not consistently provided.

In 2003, we received reports from 39% (n = 13) of the counties in New Mexico. A total of 48 observations were recorded in New Mexico (Table 1, Fig.3). Both Socorro and Valencia County included two observations submitted for the same population of owls; therefore, only one observation was included. The 48 observations included a total of 300 Burrowing Owls (Table 1, Fig. 4).

When combining observations for 2002 and 2003, 51% (n = 17) of the counties are occupied, with a total of 136 observations (Table 1, Fig. 5). Of these observations, a total of 710 owls were reported (Table 1, Fig 6). This total is a summation of owls reported by NMBOWG volunteers and HAI observations, not total owl population numbers.

County	Observations	Observations	Burrowing	Burrowing
Bernillo	27*	4	107	32
Cibola	1	1	2	2
Harding	1		8	
Luna			10	1
Otero			15	
Roosevelt	4	2	66	7
Santa Fe	1		3	
Socorro	1	4*	1	3
Torrance	1	3	3	21
Valencia	2	1	12	15
Valencia	1	2*	13	5
Total	48	49	410	206

*Two observations submitted for the same population of owls. Only one was placed on maps (Fig 1, 3, 5).

-Signifies that these were no observations reported for this county during that year.

**Reports submitted by the New Mexico Burrowing Owl Working Group

Esperanza Population

The data collected in 2003 reflect each site as a whole. Individual burrow and number of owls per burrow are not reported, because the populations were located late in the season. Sixteen adults and 21 fledglings were observed at site one. At site two, 28 adults and 53 fledglings were observed and only one adult was observed at site three. In total, 121 Burrowing Owls were observed in the Esmeralda Valley, including 43 adults and 78 fledglings. These numbers are included in the NMBOWG totals.

Table 1. Burrowing Owl observations and density by New Mexico County in 2002 and 2003.**

County	Number of Observations 2002	Number of Observations 2003	Number of Burrowing Owls 2002	Number of Burrowing Owls 2003
Bernalillo	27*	4	107	32
Chaves	12	13	75	56
Cibola	1	1	2	2
Dona Ana	4	2	25	5
Harding	1	-	8	-
Hidalgo	3	1	10	1
Luna	9	-	15	-
Otero	4	-	20	-
Roosevelt	4	2	66	7
Sandoval	-	3	-	16
Santa Fe	1	-	2	-
San Juan	12	9	51	29
Socorro	1	4*	1	5
Taos	-	2	-	3
Torrance	1	3	3	121
Union	4	1	12	15
Valencia	4	3*	13	8
Total	88	48	410	300

*Two observations submitted for the same population of owls. Only one was plotted on maps (Fig 1, 3, 5).

-Signifies that there were no observations reported for this county during that year.

**Reports submitted by the New Mexico Burrowing Owl Working Group

Estancia Population

The data collected in 2003 reflect each site as a whole. Individual burrow and number of owls per burrow are not reported, because the populations were located late in the season. Sixteen adults and 21 fledglings were observed at site one. At site two, 28 adults and 55 fledglings were observed and only one adult was observed at site three. In total, 121 Burrowing Owls were observed in the Estancia Valley, including 45 adults and 76 fledglings. These numbers are included in the NMBOWG totals.

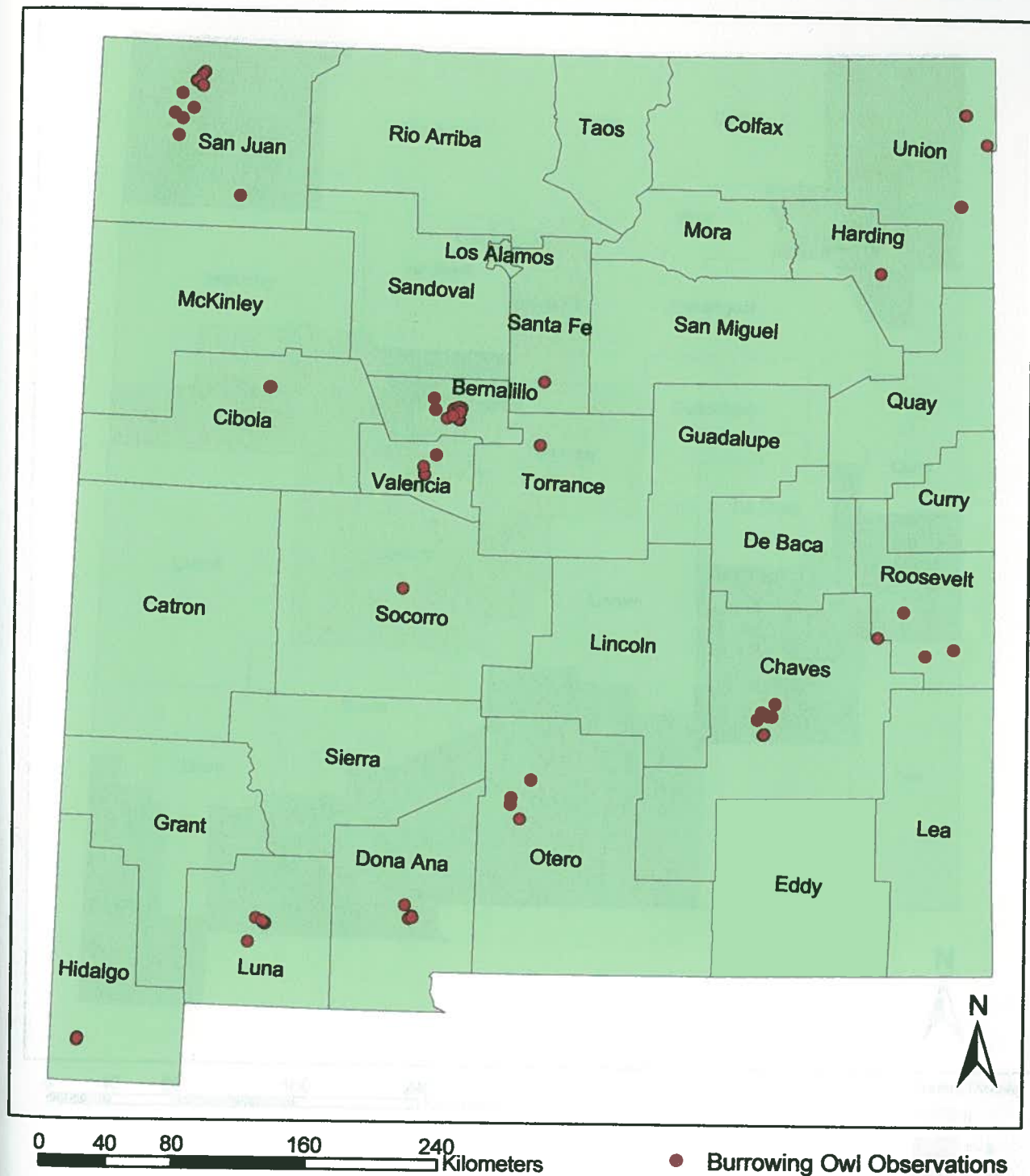


Fig. 1. Observations per county in New Mexico, 2002.

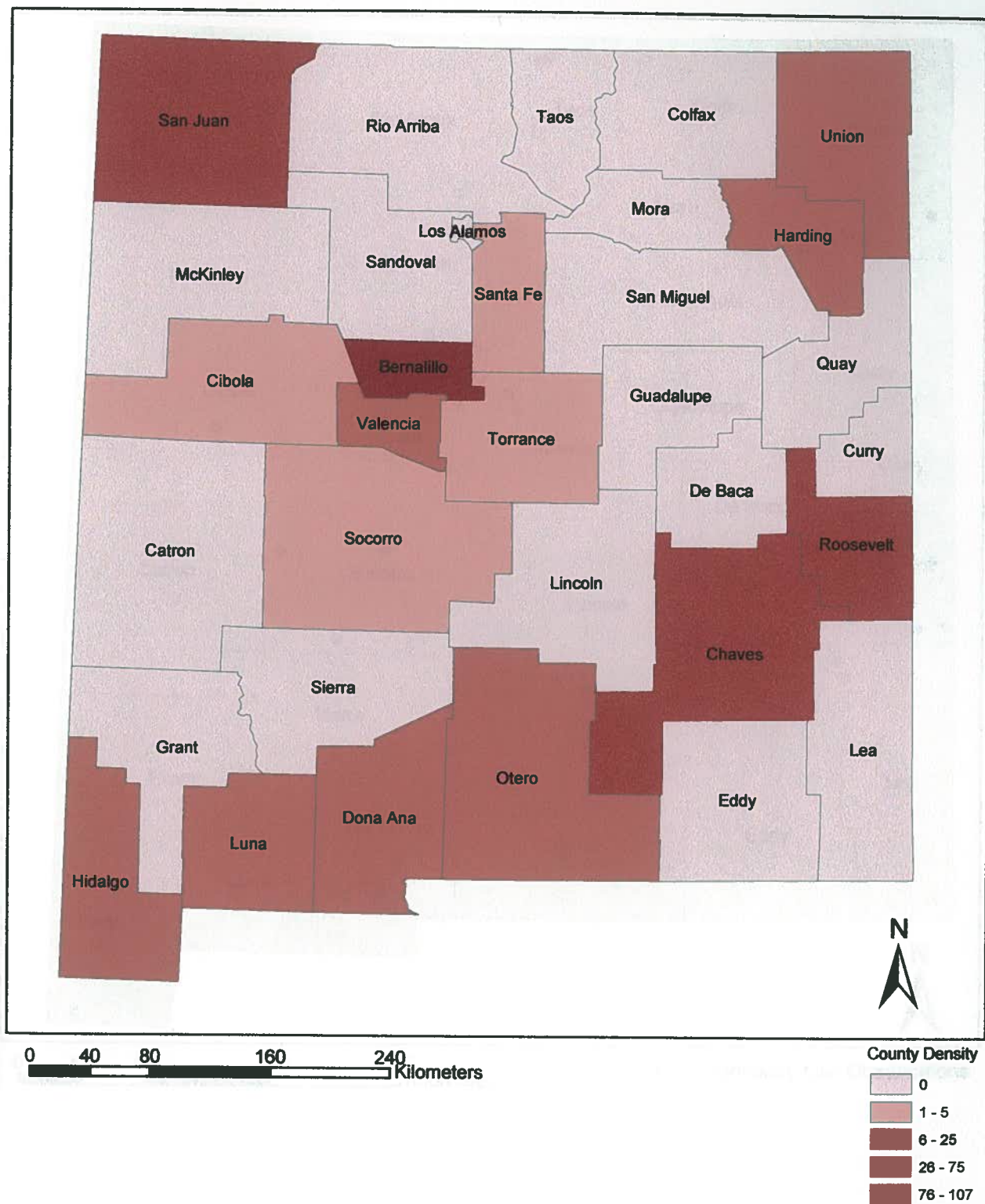


Fig. 2. Burrowing Owls densities per county in New Mexico, 2002.

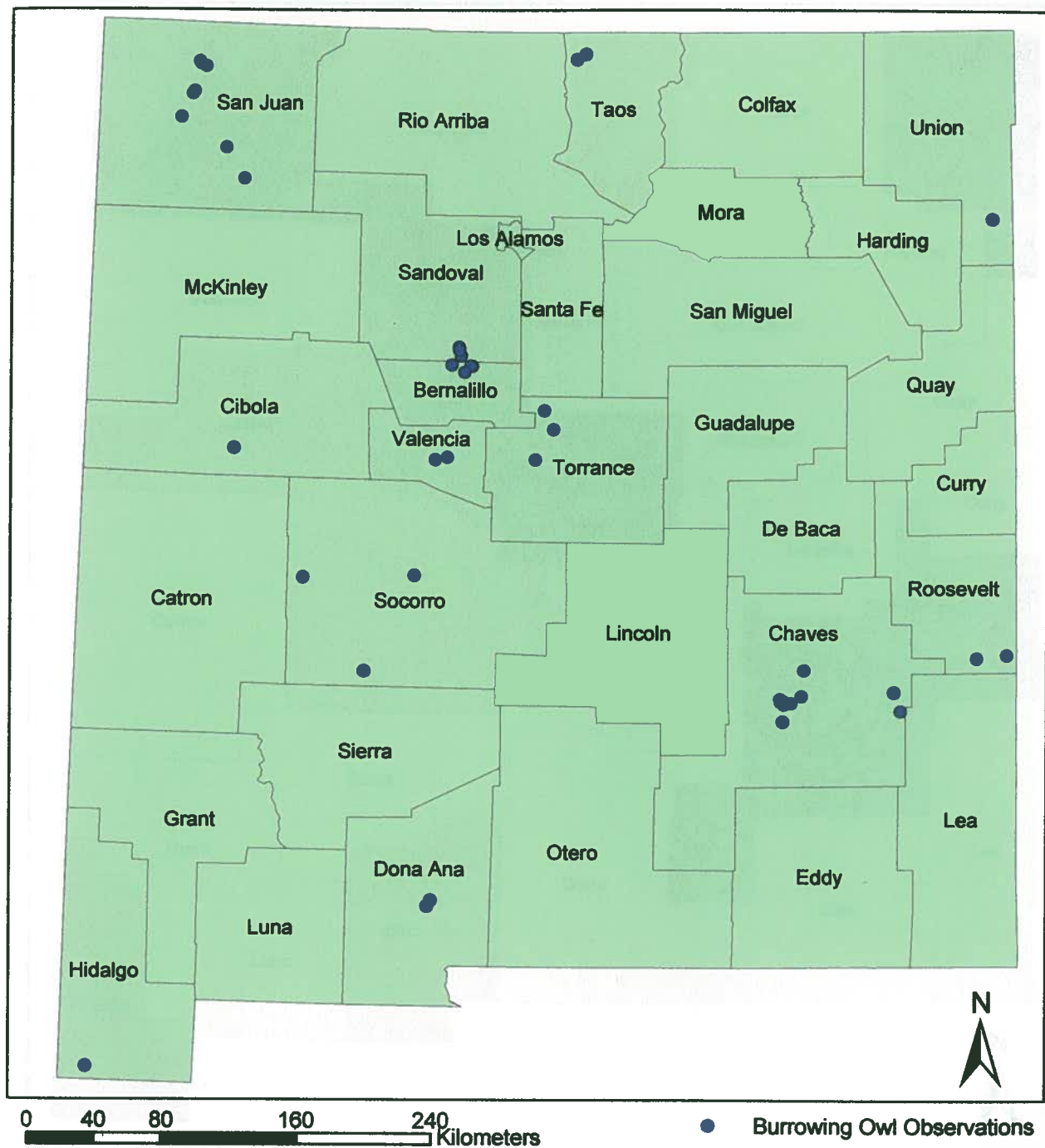


Fig. 3. Observations per county in New Mexico, 2003.

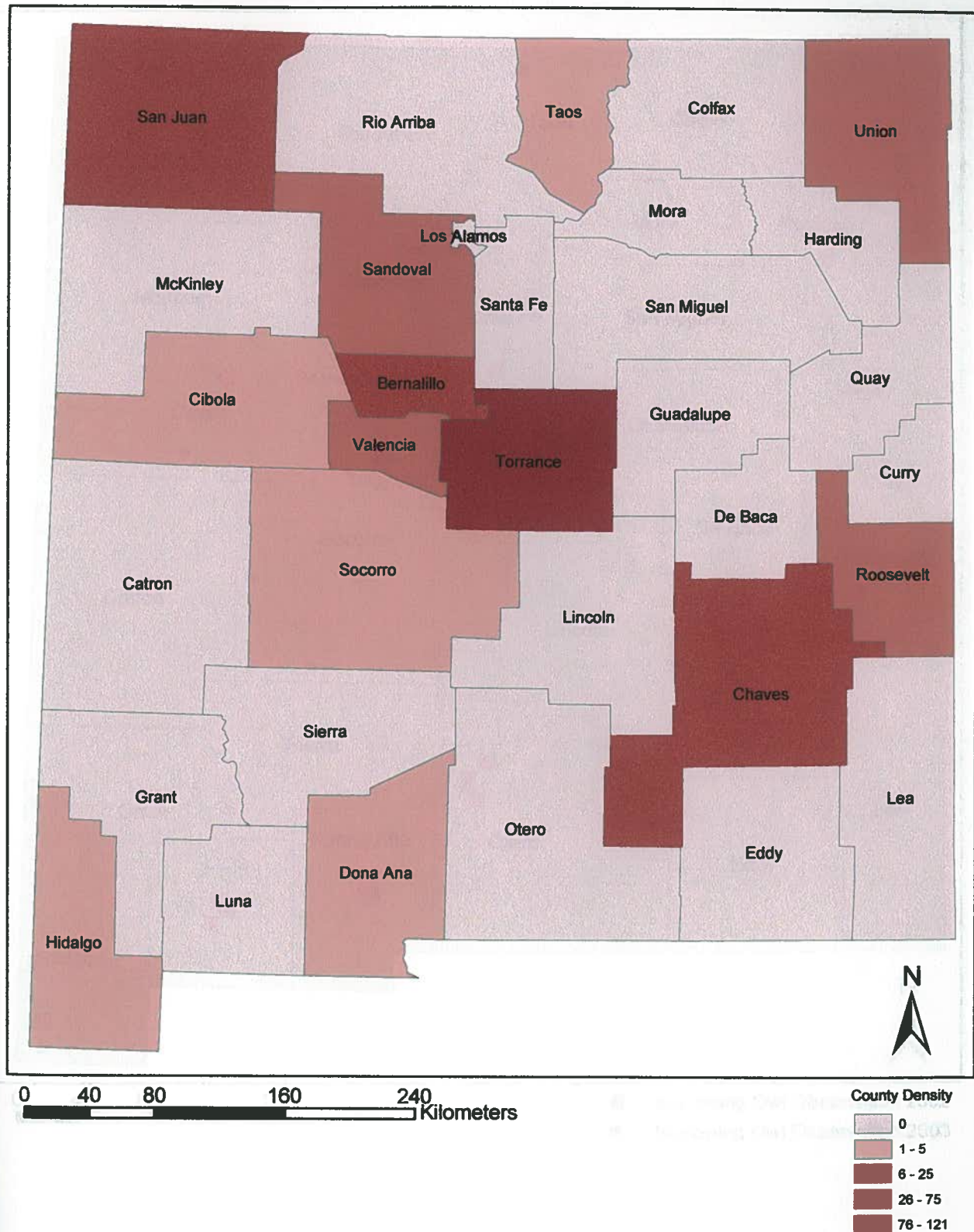


Fig. 4. Burrowing Owl densities per county in New Mexico, 2003.

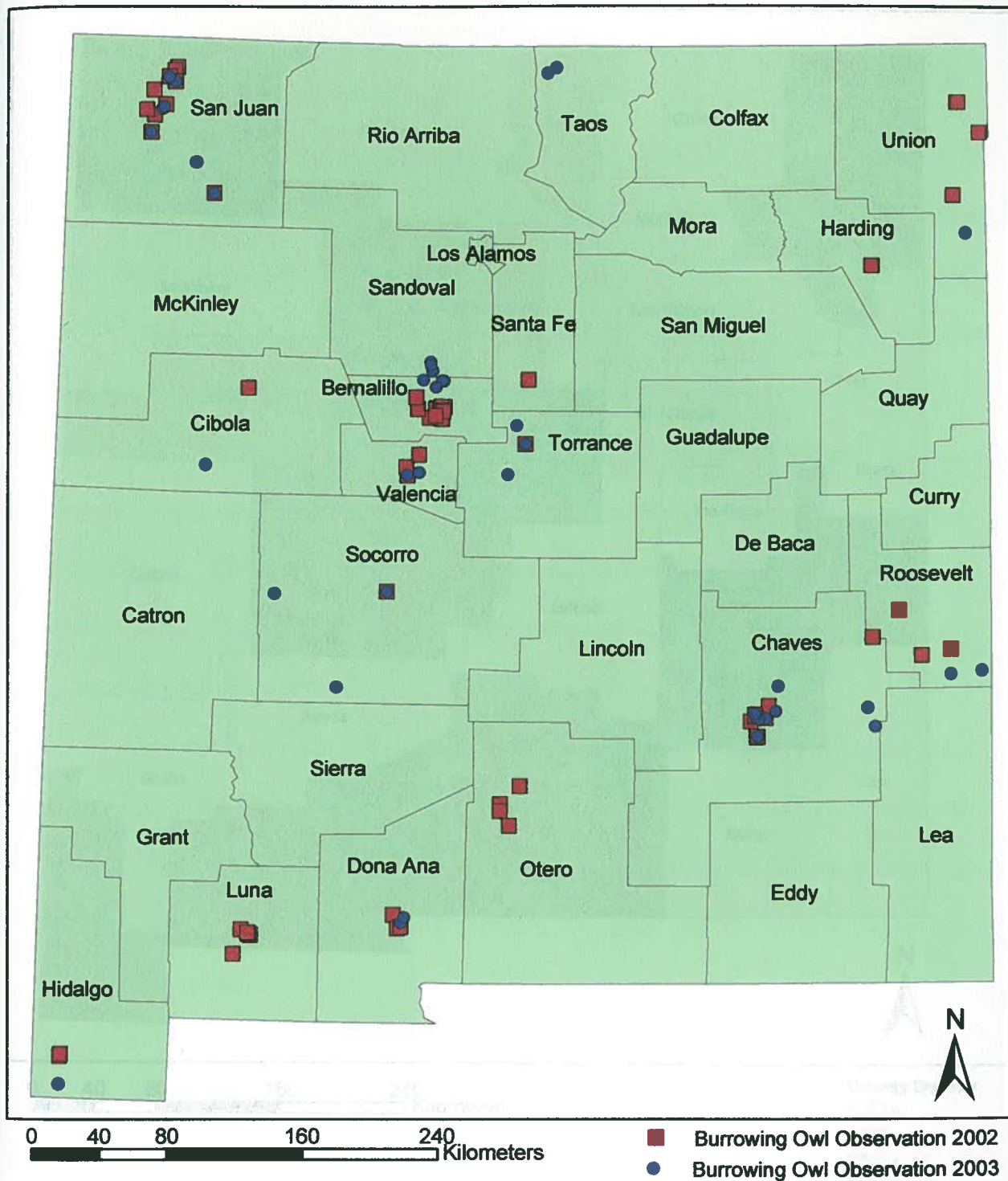


Fig. 5. Combined observations per county in New Mexico, 2002 and 2003.

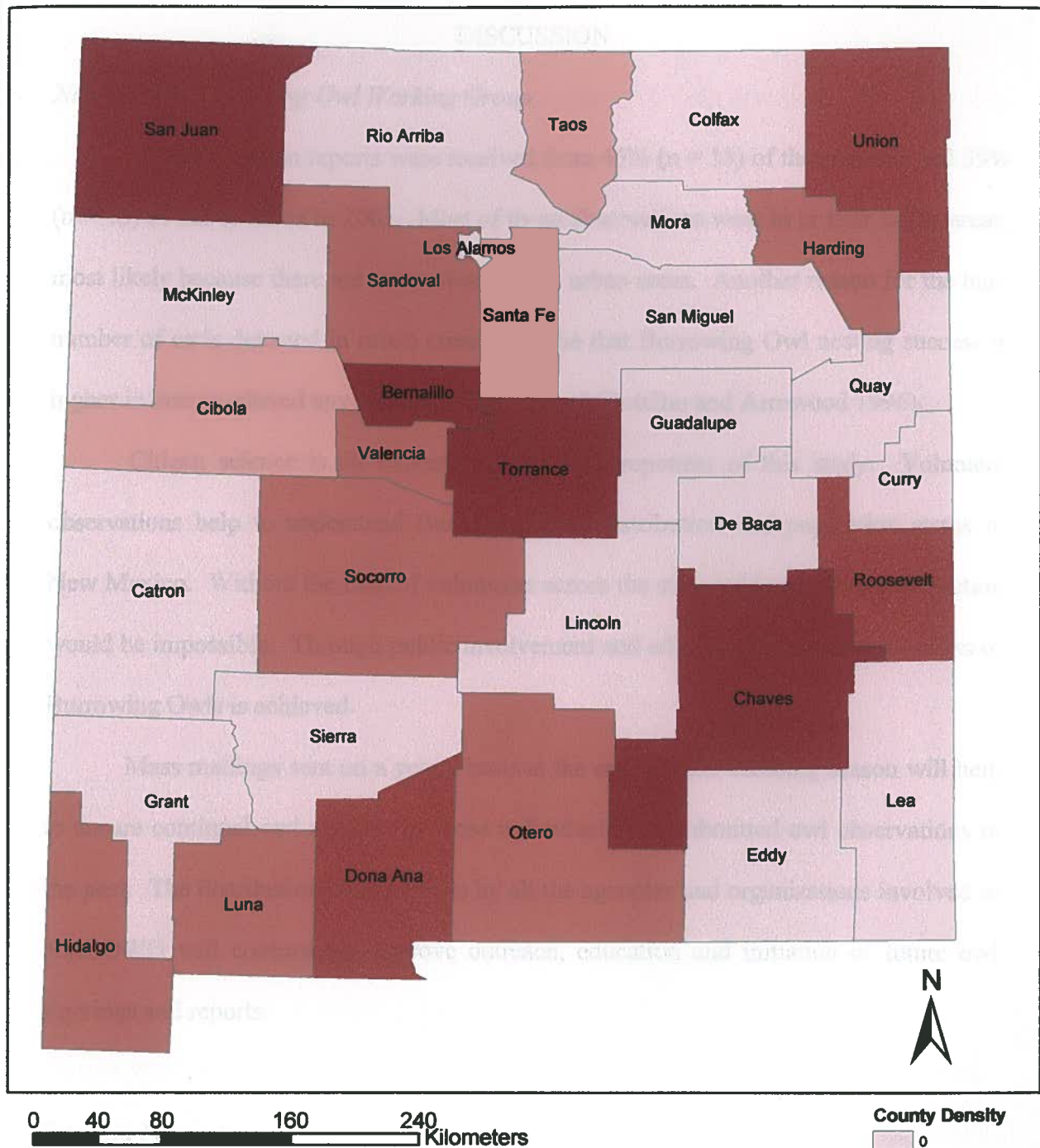


Fig. 6. Combined Burrowing Owl densities per county in New Mexico, 2002 and 2003.

DISCUSSION

New Mexico Burrowing Owl Working Group

In 2002, citizen reports were received from 45% ($n = 15$) of the counties and 39% ($n = 13$) of the counties in 2003. Most of these observations were in or near urban areas, most likely because there are more observers in urban areas. Another reason for the high number of owls detected in urban areas could be that Burrowing Owl nesting success is higher in human-altered environments than natural (Botelho and Arrowood 1996).

Citizen science is an extremely valuable component of this study. Volunteer observations help to understand Burrowing Owl distribution and population status in New Mexico. Without the help of volunteers across the state, widespread data collection would be impossible. Through public involvement and education, a greater awareness of Burrowing Owls is achieved.

Mass mailings sent on a yearly basis at the end of each breeding season will help to ensure continual owl updates by those individuals that submitted owl observations in the past. The distribution of pamphlets by all the agencies and organizations involved in NMBOWG will continue to improve outreach, education and initiation of future owl sightings and reports.

Estancia Population

A substantial number of Burrowing Owls were located in the Estancia Valley, and could be the largest population of owls in the state. Because these owls were not banded it was difficult to make accurate counts of birds. Banding did not take place this year because new populations were not located until late April and because we were unable to

obtain landowner permission. Banding will occur in future years at sites one and two if land access is permitted. Banding these populations will help determine site fidelity and reproductive success. These populations are located on land that is currently for sale and the future use of the land is unknown. Future use may affect these owl populations.

ACKNOWLEDGMENTS

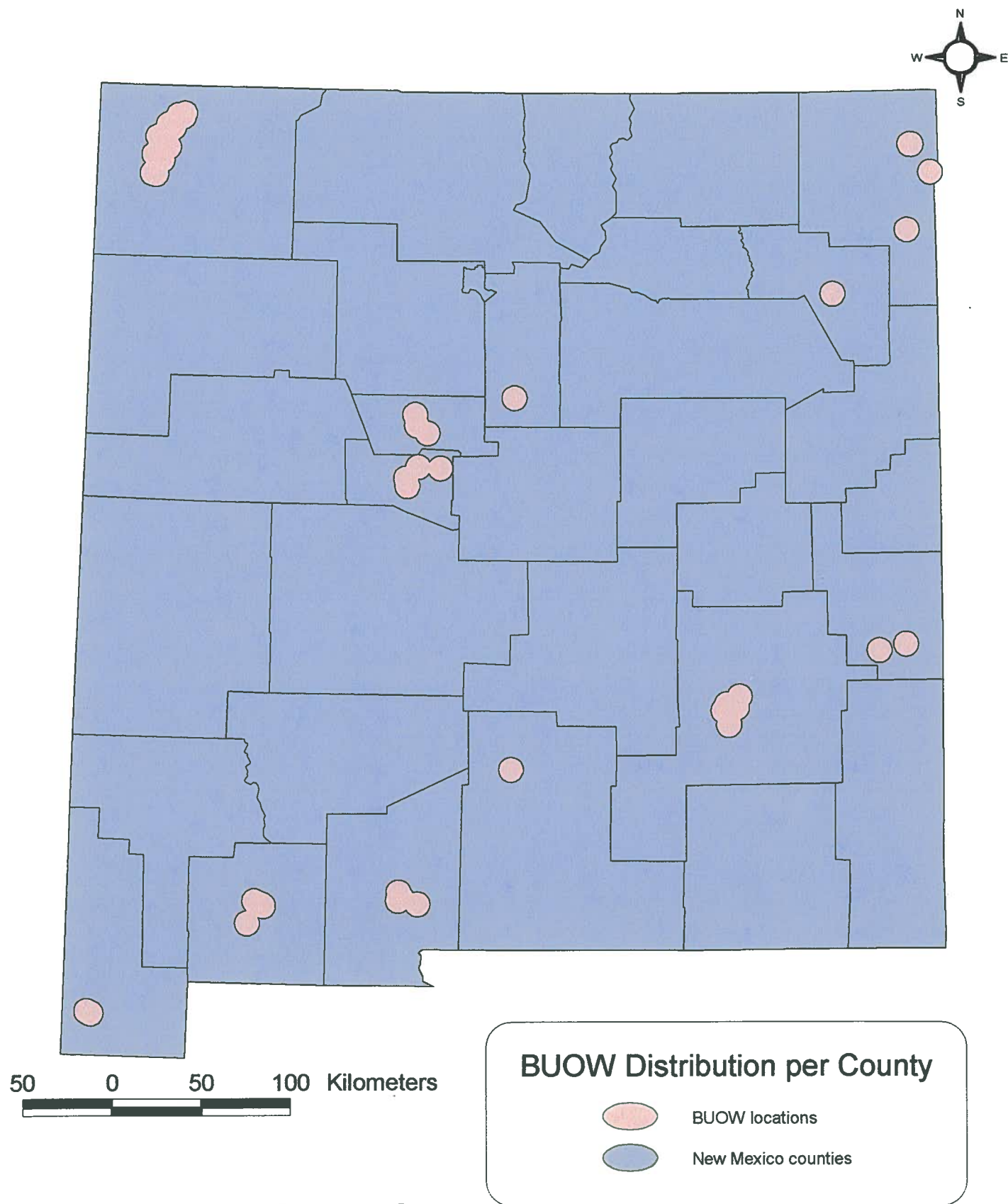
Funding for this project was provided by New Mexico Department of Game and Fish-Share With Wildlife. This project would not be possible without the volunteers who submitted information to the New Mexico Burrowing Owl Working Group. This report was prepared by Lorraine McInnes, with assistance from Gail Garber, Kathi Borgmann and Mike Stake. Pam Clark conducted the observations in the Estancia Valley. Cover photo taken by David Powell.

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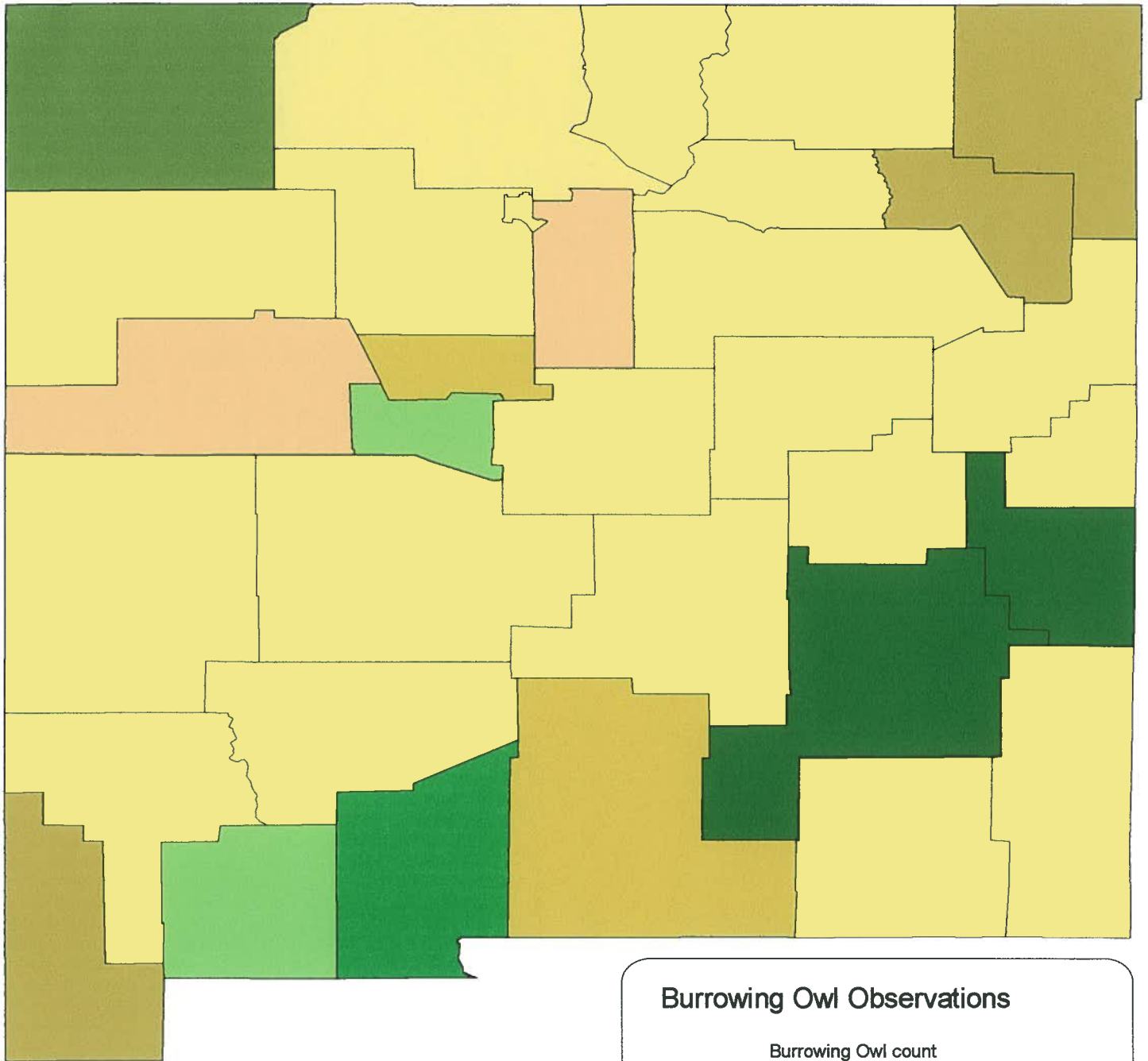
Distribution of Burrowing Owl Observations 2002



NM Burrowing Owl Working Group

* Please note that these points only represent Burrowing Owl locations for which we could obtain UTM coordinates *

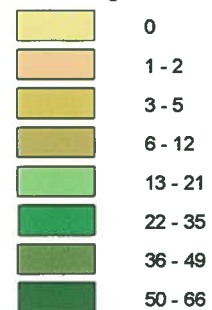
Burrowing Owl Distribution per County 2002



100 0 100 Kilometers

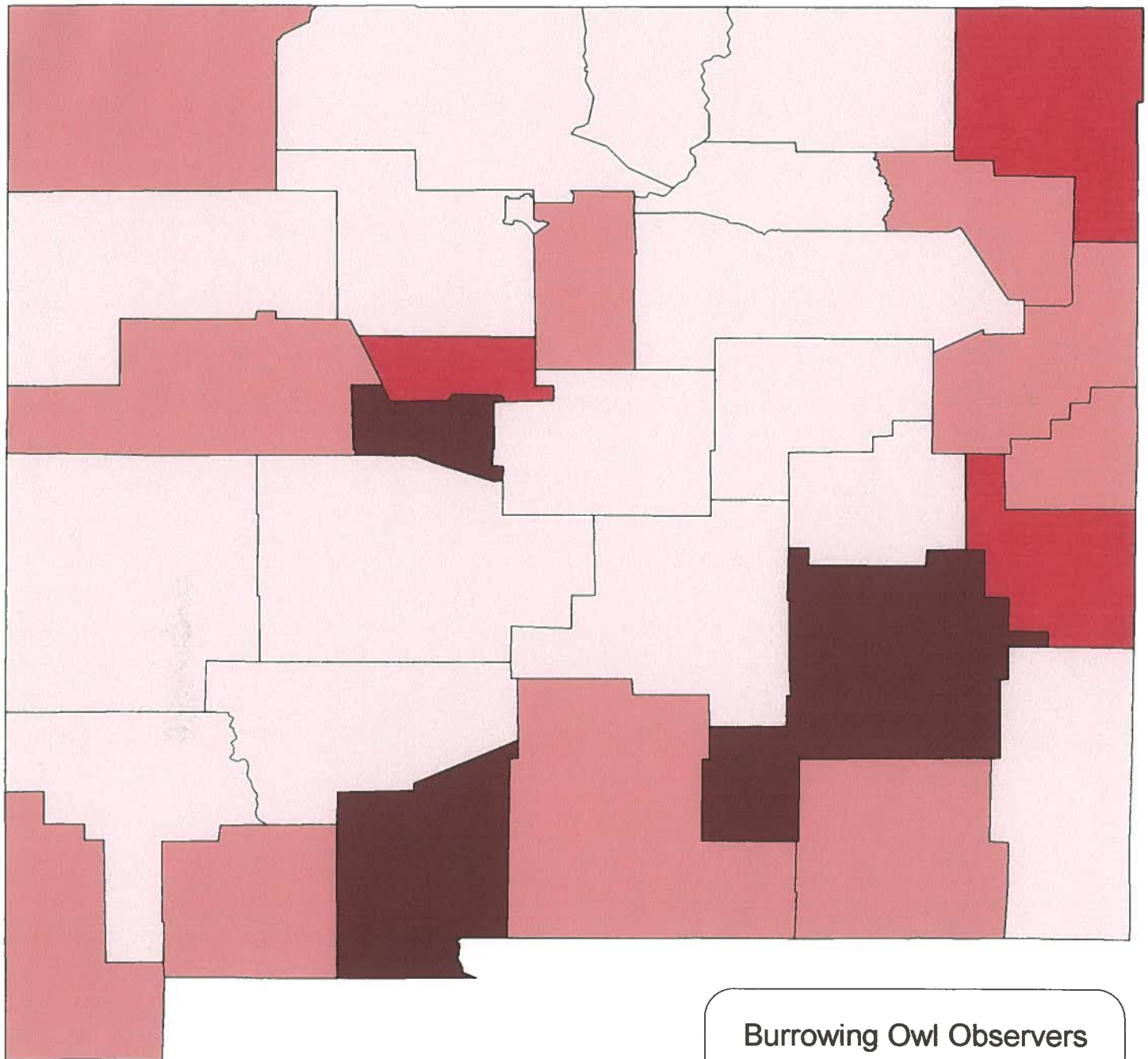
Burrowing Owl Observations

Burrowing Owl count



NM Burrowing Owl Working Group

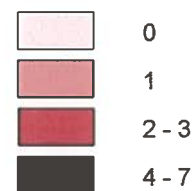
Burrowing Owl Observers per County 2002



100 0 100 Kilometers

Burrowing Owl Observers

Observer count



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