

**Report of a Survey for
Night-blooming Cereus (*Peniocereus greggii* var. *greggii*)
at the
New Mexico Army National Guard
Black Mountain Training Area**



2005



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Final Report - August 2005

Summary

The U.S. Army, faced with the challenge of fulfilling its military mission without compromising responsible land stewardship, has initiated a biological resources management program for lands under their jurisdiction in New Mexico. As part of this program, a floral survey addressing night-blooming cereus (*Peniocereus greggii* var. *greggii*), a Federal Species of Concern and State Endangered Species, was conducted at the Black Mountain Training Area near Deming, New Mexico. The health of this species warrants concern as its range is limited and its populations threatened by over-collection by both cactus collectors and herbalists.

The survey detected 69 night-blooming cereus locations containing 79 basal stems, distributed in a narrow band on the south-facing footslope of Black Mountain.

Recommendations include the continuation of the monitoring program to assess long-term population trends, a general survey to find nearby populations, and the development of Training Area Management Units to minimize harm to night-blooming cereus habitat.

¹ Work submitted in partial fulfillment of Contract No. 03-705-0900-007 from the New Mexico Army National Guard, Santa Fe, NM to Natural Heritage New Mexico, Biology Department, University of New Mexico, Albuquerque, NM. NMNHP Report: 05-GTR-288.

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Introduction

The New Mexico Army National Guard (NMARNG) faces the challenge of meeting environmental recommendations and requirements while continuing its military mission on training grounds under its control. Specifically, per agreement with the Bureau of Land Management (BLM), NMARNG agreed to cooperate in the investigation of plant and wildlife resources to support sound natural resource management on the Black Mountain Training Area (BMTA). As a result of this agreement, Natural Heritage New Mexico (NHNM) conducted inventories of biological resources at BMTA beginning in 1997. During an initial floristic inventory in 1997, a single night-blooming cereus, (*Peniocereus greggii* var. *greggii*) was found on the eastern ridge of Black Mountain (Ladyman and Chauvin, 1998).

Night-blooming cereus is a Federal Species of Concern and State Endangered Species. Its distribution is patchy, occurring in Doña Ana, Grant, Hidalgo, and Luna Counties in New Mexico (Figure 1); in the Big Bend Region of Texas; and in Chihuahua, Mexico.

Following the initial discovery, a specific survey for night-blooming cereus was conducted at BMTA in May 2003, as part of a biological resources management program developed in cooperation with NHNM at the University of New Mexico (UNM).

Methods

The search for night-blooming cereus was conducted in two phases during October 2003. First, all habitat at BMTA was searched for night-blooming cereus during the characterization of 51 vegetation plots collected for construction of a vegetation map. The results of this search narrowed our focus to Chihuahuan Desert scrub dominated by creosotebush (*Larrea tridentata*) on the south-facing footslope of Black Mountain (Figure 2).

During the search of the footslope (Figure 2), three researchers walked approximately 20 m apart. When night-blooming cereus was detected, researchers walked approximately 10 m apart, collecting GPS locations and plant measurements.

For each plant the number of stems and branches was recorded. Stems less than 0.5 m apart were considered one location. No attempt was made to determine if stems within 0.5 m of each other originated from separate tubers. Both the number and state, live or dead, of branches for each stem were recorded.

Availability of plant resources (nutrients, water, etc.) can be indicated by clusters of plants exhibiting differences in the occurrence of stems, branching, and dead branches. Patterns in distribution are visually assessed using ArcGis 9.

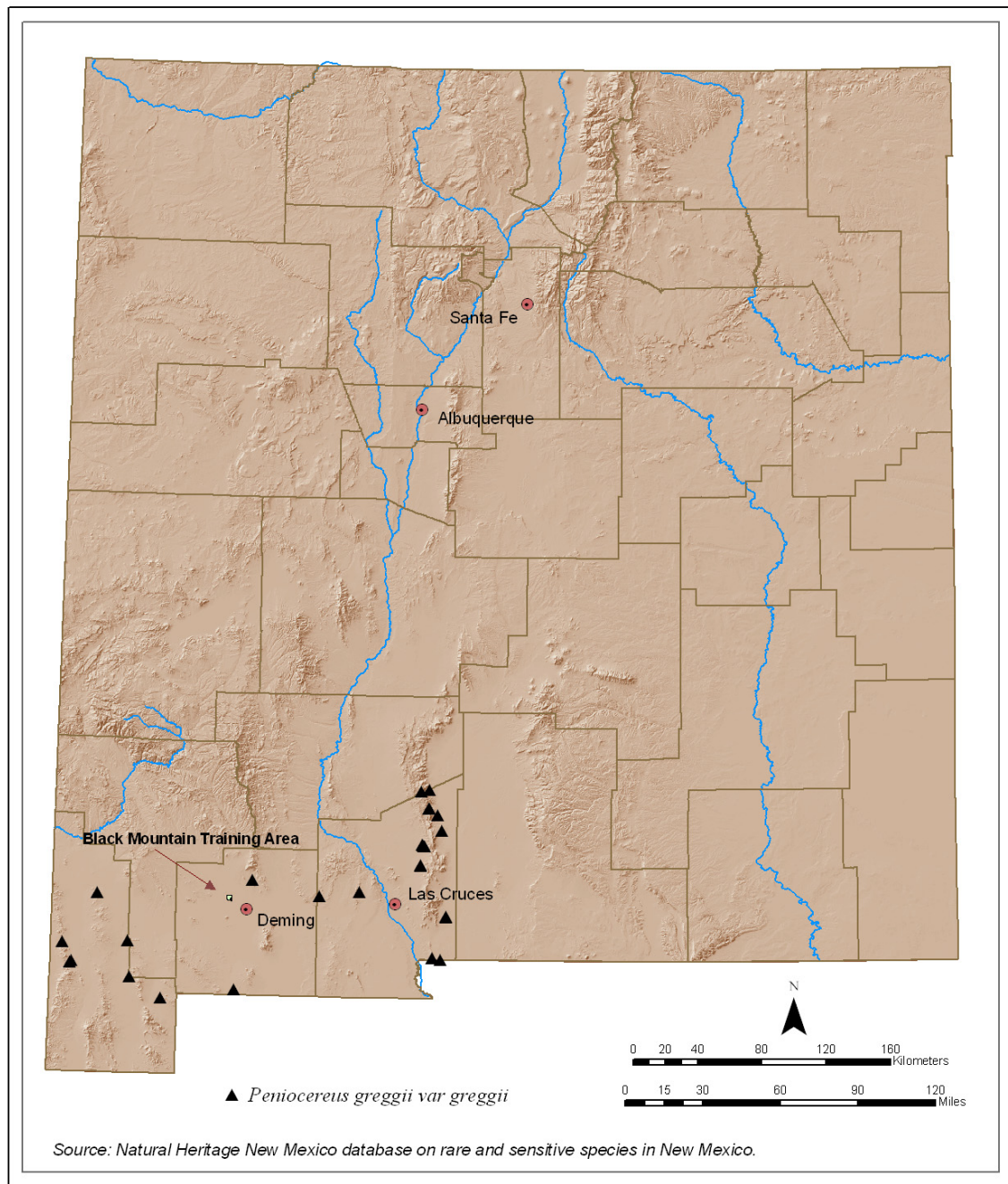


Figure 1. Documented locations of night-blooming cereus in New Mexico.

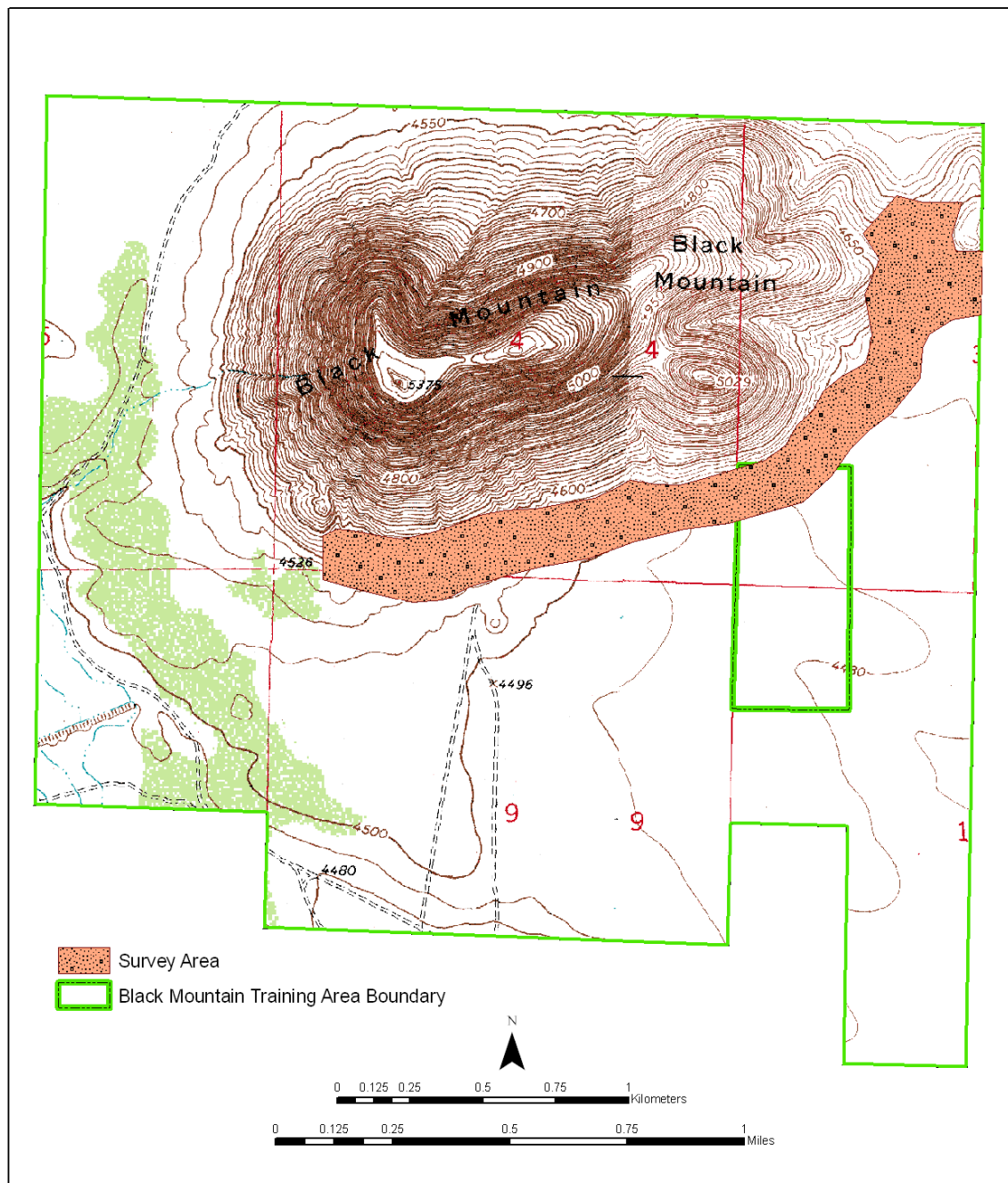


Figure 2. Area intensively searched for night-blooming cereus.

Results

Sixty-nine night-blooming cereus locations with a total of 79 basal stems were found in a narrow band on the south-facing footslope of Black Mountain (Figure 3 and Appendix A). The band is in Chihuahuan Desert Scrub with creosotebush (*Larrea tridentata*) the dominant shrub and tobosa (*Pleuraphis mutica*) the dominant grass. Most individuals are found in nurse creosotebush.

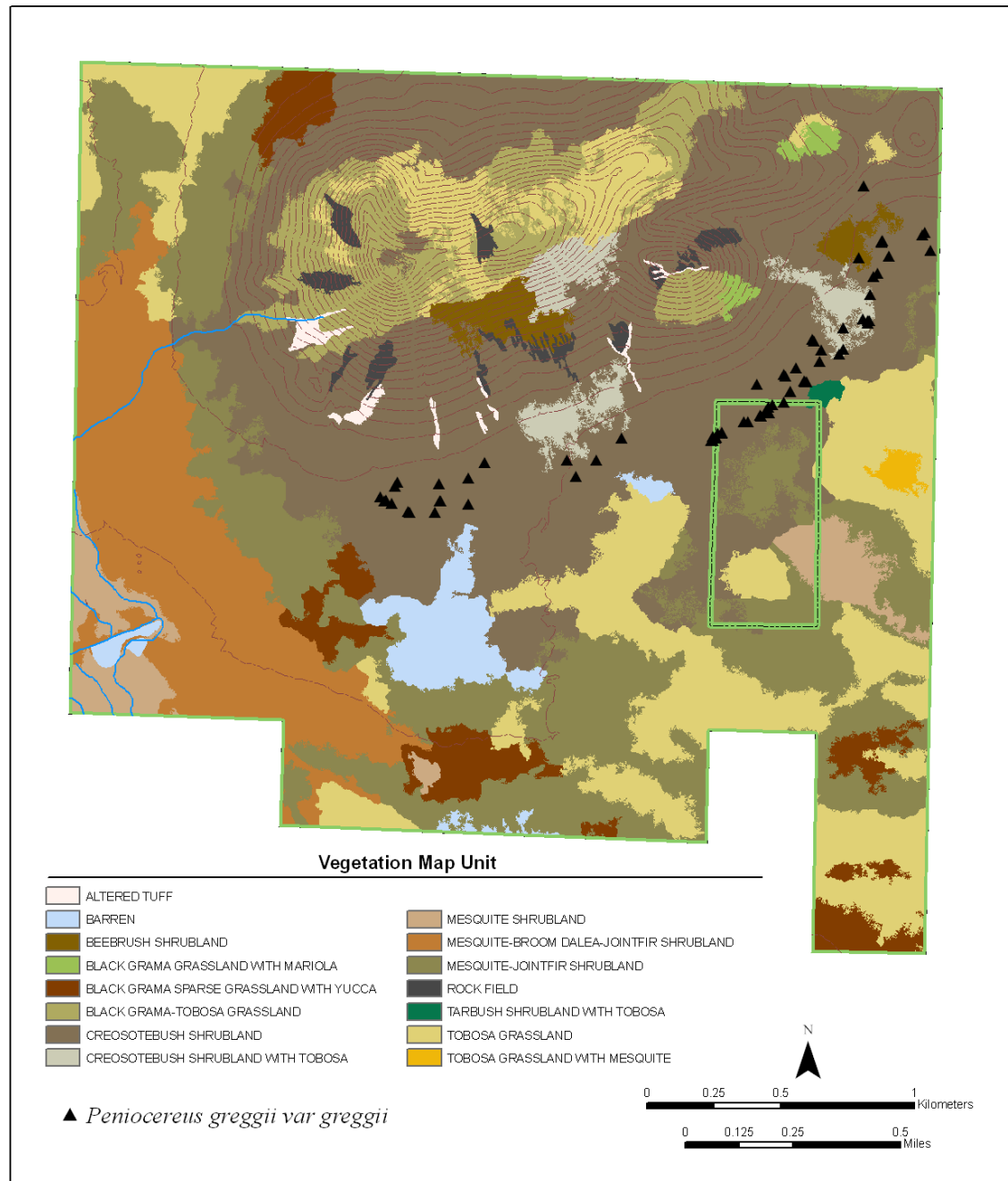


Figure 3. Night-blooming cereus locations per vegetation map unit (Neville et al. 2005) at BMTA.

The majority of locations have one basal stem (single: 59, 85.5%, double: 10, 14.5%). Two stems listed at the same location can be separated by as much as 43 cm, but are typically within 20 cm of each other. As many as 11 branches, live or dead, are found per stem (unbranched 23, 29.1%; two branches: 15, 19.0%; three branches: 13, 16.4%; four branches: 8, 10.1%; five branches: 11, 13.9%; six branches: 3, 3.8%; seven branches: 3, 3.8%; nine branches: 1, 1.3%; 10 branches: 1, 1.3%; 11 branches: 1, 1.3%). As many as 10 live branches are found per stem (unbranched 44, 55.7%; two branches: 18, 22.8%; three branches: 11, 13.9%; four branches: 2, 2.5%; five branches: 2, 2.5%; seven branches: 1, 1.3%; 10 branches: 1, 1.3%). The 39 stems (49.4%) exhibiting dead branches have, on average, 55.0% dead branches.

There is no apparent distributional pattern of stems (Figure 4), number of branches, or live/dead branches (Figure 5 and Figure 6).

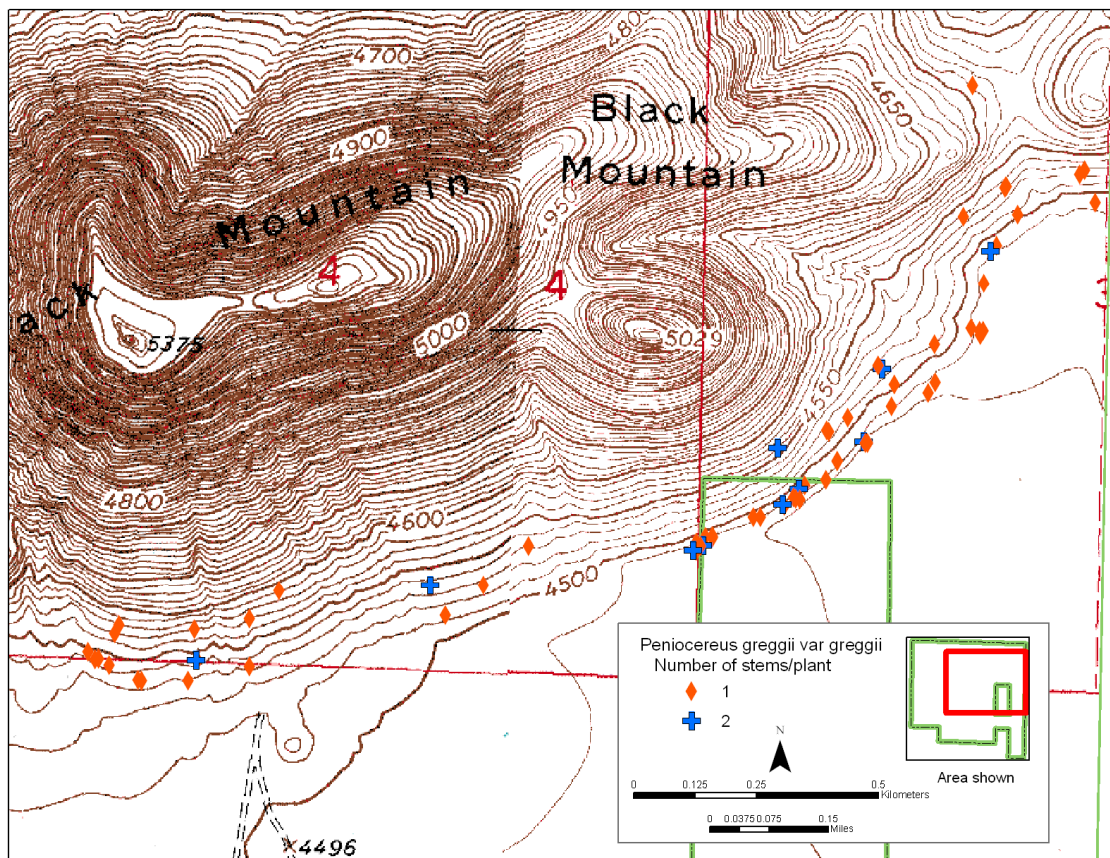


Figure 4. Distribution of night-blooming cereus single and double basal stems.

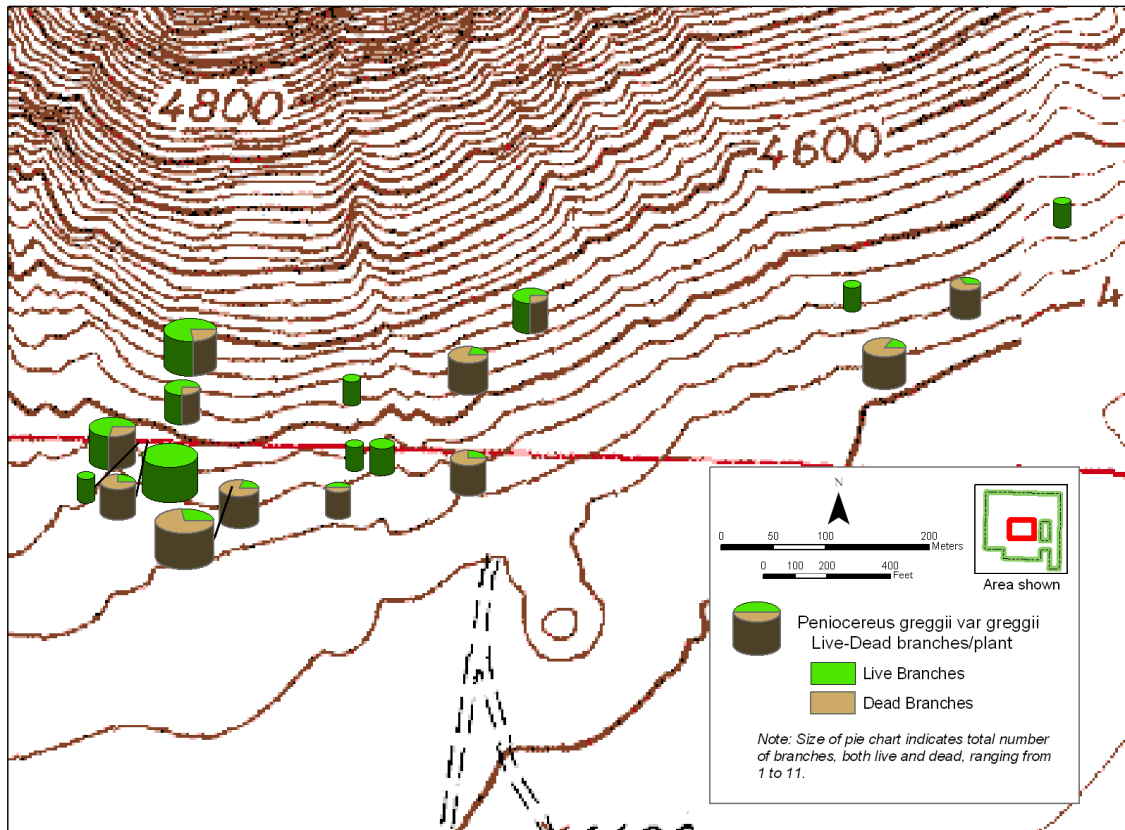


Figure 5. Relative numbers of night-blooming cereus branches both live and dead found on the western section of the Black Mountain Training Area.

Discussion and Recommendations

Night-blooming cereus is a rare plant with a limited distribution. It is threatened with extinction by the activities of both collectors and herbalists. This survey adds to the known occurrences of night-blooming cereus in southwestern New Mexico.

As part of NMARNG's stewardship responsibilities, we recommend a general survey for night-blooming cereus off BMTA and continuation of the monitoring program to assess long-term population trends. The plants at BMTA may be a larger more extensively distributed population, a portion of a small population with limited distribution, or a reproductively isolated founder or remnant population. Thus, a survey in the area surrounding BMTA would allow NMARNG to better understand the role the plants at BMTA play in the larger population dynamic. Understanding the population context together with the results of the monitoring program would allow NMARNG to determine the stability of the population and adaptively manage night-blooming cereus populations at BMTA.

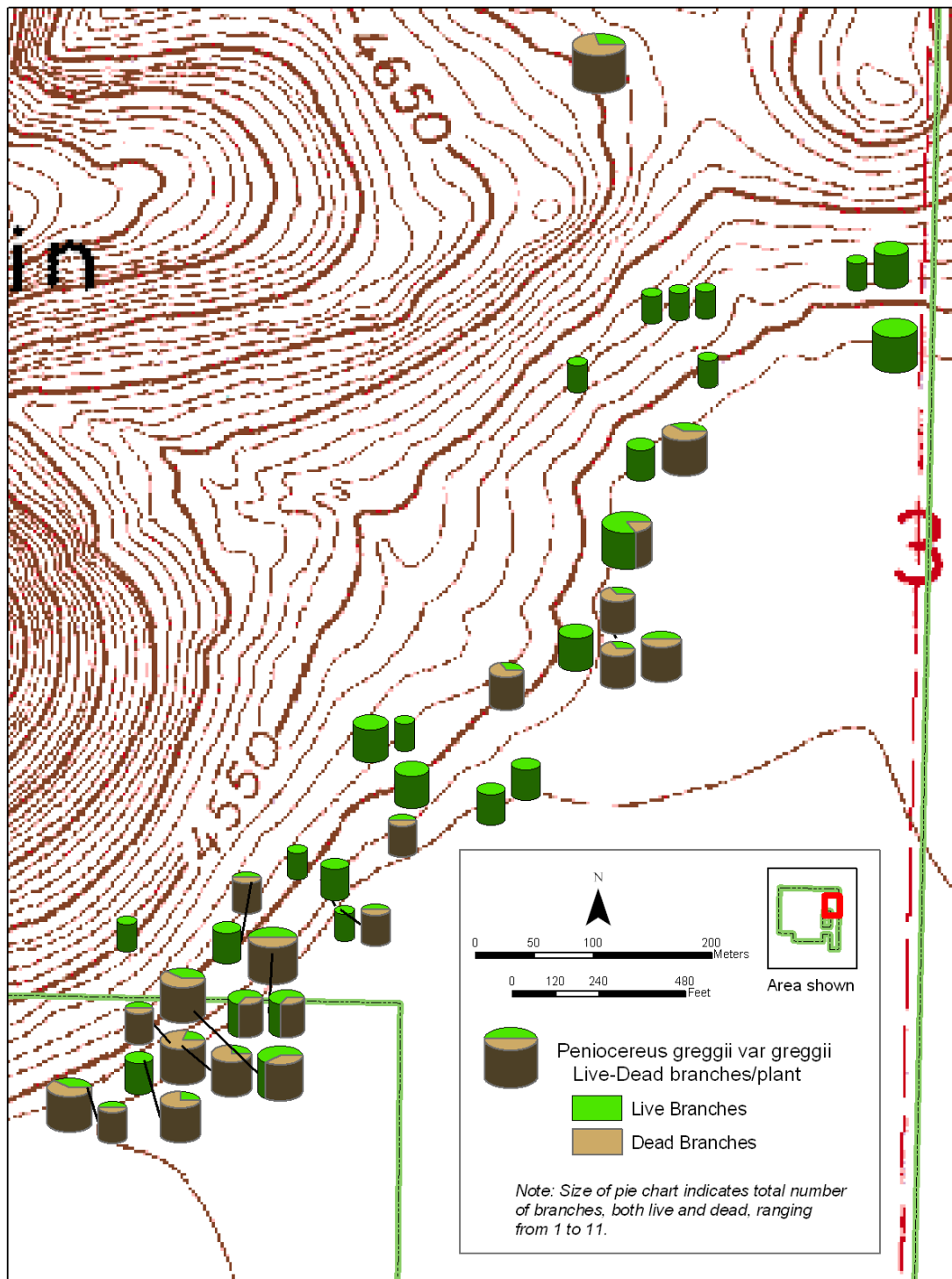


Figure 6. Relative numbers of branches both live and dead on night-blooming cereus found on the eastern section of the Black Mountain Training Area.

Furthermore, we recommend, through the development of Training Area Management Units, that NMARNG personnel be notified that the area contains a protected cactus and are told not to disturb any cactus or cactus-like plant within this area. Using a general term such as cactus requires little training and minimizes the likelihood of collection.

Lastly, to minimize harm to the habitat, vehicle traffic should be limited to roadways and NMARNG should consider the impact development would have on night-blooming cereus populations.

Acknowledgements

Charlie Jackson helped collect and Amanda Browder helped collect and manage data for this project. Teri Neville helped construct figures for this report. Rebecca Keeshen helped edit this report.

Literature Cited

Ladyman, J. and Yvonne Chauvin. 1998. A Floristic Study of Rare and Sensitive Species at the New Mexico Army National Guard Roswell (WETS) and Black Mountain Training Sites. Report submitted to the NM Army National Guard Environmental Office, Santa Fe, NM by Natural Heritage New Mexico.

Neville, Teri, Yvonne Chauvin, Emily Clary, Paul Arbetan, Paul Neville, and Esteban Muldavin, 2005. The Vegetation of the New Mexico Army National Guard Black Mountain Training Area. Report to be submitted to the NM Army National Guard Environmental Office, Santa Fe, NM by Natural Heritage New Mexico November 2005.

Appendix A - Night-blooming cereus locations and number of stems at the Black Mountain Training Area. Locations are in NAD 27, zone 13N.

NAME	EASTING	NORTHING	STEMS
P02	230376	3581120	1
P03a	230379	3581124	1
P03b	230378	3581123	1
P04	230292	3581062	1
P05	230539	3581157	1
P06	230529	3581148	1
P07	230561	3581090	1
P08	230360	3581002	1
P09	230346	3580991	2
P10	230334	3580925	1
P11	230307	3580833	1
P12	230325	3580827	1
P13	230332	3580826	1
P14	230326	3580818	1
P15	230232	3580800	1
P16	230234	3580721	1
P17	230219	3580700	1
P18	230151	3580717	1
P19	230144	3580673	1
P20	230055	3580649	1
P21	230125	3580749	2
P22	230117	3580756	1
P23	230310	3581329	1
P24a	230034	3580560	1
P24b	230034	3580561	1
P25	230011	3580523	1
P26	229967	3580511	1
P27	229954	3580504	2
P28	229957	3580482	1
P29	229948	3580484	1
P30	229945	3580487	1
P31	229925	3580470	1
P32	229921	3580472	2
P33	229877	3580447	1
P34	229862	3580447	1
P35	229779	3580408	1
P36	229778	3580405	1
P37	229764	3580406	1
P38	229758	3580389	2
P39	229746	3580394	1
P40	229754	3580387	1

Appendix A (continued) - Night-blooming cereus locations and number of stems at the Black Mountain Training Area. Locations are in NAD 27, zone 13N.

NAME	EASTING	NORTHING	STEMS
P41	229746	3580377	1
P42	229738	3580379	2
P43	230016	3580620	1
P44	230012	3580624	1
P45	230087	3580600	2
P46	230091	3580597	1
P47	230095	3580597	1
P48	228832	3580238	1
P49	228726	3580153	1
P50	228723	3580153	2
P51	228892	3580295	1
P52	229232	3580245	1
P53	229310	3580306	1
P54	229201	3580306	2
P55	229403	3580387	1
P56	228720	3580216	1
P57	228565	3580224	1
P58	228557	3580207	1
P59	228502	3580169	1
P60	228516	3580154	1
P61	228524	3580156	1
P62	228545	3580142	1
P63	228605	3580112	1
P64	228612	3580110	1
P65	228707	3580111	1
P66	228832	3580139	1
P67	229911	3580588	2
P68	230403	3581066	1