FY 22 Final Report and FY 2023 Interim Report

Post-wildfire habitat use by the Peñasco least chipmunk, 2022-2023

(SWW Agreement 211015; NMSU GR0007323)

South face of Nogal Peak in the Lincoln National Forest, December 2022
(Photo credit William Grooms)

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Overview of Accomplishments to Date

2022 Field Season. During 2022 (year 1 of this project), we hired a new graduate student, William Grooms, to replace the previous student who resigned her position. William completed the first year of course work towards his M.S. degree, including courses in occupancy modeling and GIS, which are applicable to this project. We retained one undergraduate field assistant from the previous year and hired a second field assistant in February 2022. Both field assistants are current on all required NMSU trainings and have received extensive training in the identification of the focal chipmunk species.

Field data collection for the first year of the study (i.e., 2022 field season) began on 17 June 2022 (it was delayed due to a wildfire in the study area) and continued through 20 December 2022. During this field season, camera surveys were conducted on the south face of Nogal Peak at and around historical Peñasco least chipmunk (PLC; *Neotamias minimus astristriatus*) detection sites and at sites with similar habitat characteristics, terrain features, and elevation. A total of 69 unique sites were surveyed (Figure 1) for a cumulative total of 4,040 camera days (Table 1). Details of all survey locations are in Appendix 1. At least one chipmunk of any species was detected at 54 sites and vegetation data were collected at 47 sites (Table 1). This effort resulted in the collection of > 1.5 million photos (Table 1). Many of these photos were of non-target species or were the result of false camera activations while the cameras were inaccessible due to personnel changes or forest closures. Cataloguing and identifying this number of photos posed a logistical challenge. In an effort to reduce the number of low-value photos collected in the 2023 field season, we evaluated our field methods and identified elements that can be improved. In the future, we will ensure that vegetation is removed from the cameras' fields of view, attempt to avoid placing cameras along game trails or in other areas where larger wildlife might upset the cameras, and make more frequent visits to check and reset the cameras. Of the photos collected in 2022, 3,546 contained an image of a chipmunk of any species. As of the time of this report, some photos from one camera site (N-063) from the 2022 field season have been confirmed to be of a PLC. There are other sites with potential PLC detections, and efforts to accurately identify the chipmunk photos from these sites are ongoing.

Table 1. Summary of the 2022 field season (17 June - 20 December 2023) and the 2023 field season to date (7 April 2023 – 8 June 2023). "Camera days" indicates the duration of a camera's deployment, including time when the camera was out of service due to factors that might include battery failure, SD card capacity having been met, disturbance by other wildlife, etc. "Sites with chipmunk detections" and "Chipmunk photos" include detections of any species of chipmunk.

Field season	Camera sites	Camera days	Sites w/ chipmunk detections	Vegetation surveys	Total photos collected	Chipmunk photos
2022	69	4,040	54	47	1,559,111	3,546
2023	31	996	In progress	In progress	73,403	In progress

2023 Field Season. We began field work for the 2023 field season on 7 April 2023. As of 8 June 2023, we have deployed cameras at 31 sites (Figure 1; Appendix 1) for a cumulative total of 996 camera days (Table 1). The 2023 survey effort includes placing cameras at all historic PLC detection locations and on the north face of Nogal Peak.

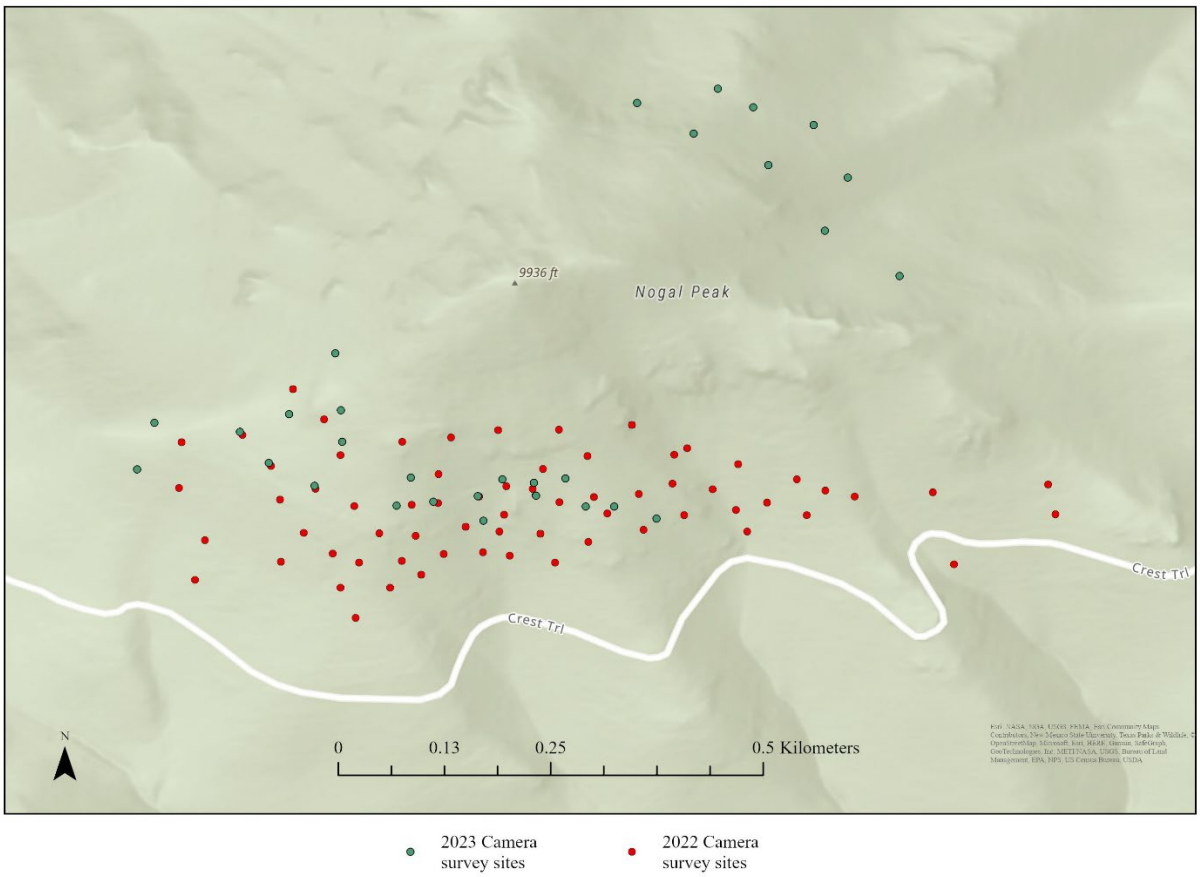

Figure 1. Sites surveyed for the least chipmunk during the 2022 and 2023 (as of 16 June 2023) field seasons are indicated by colored dots (2022: red; 2023 as of 16 June: green).

Lookout Mountain. The permanent monitoring cameras located on Lookout Mountain at historic PLC detection sites were maintained during FY23. The cameras remained in place throughout the winter months, but access to the cameras was limited due to snow. Cataloguing and identifying the photos collected at Lookout Mountain is on-going.

Project Modifications

There have been four major modifications to the study relative to the original scope of work. 1) The start of the 2022 field season was delayed to June (from April) due to wildfire closures. During that down period, a pilot study was conducted to determine if measurements taken from photos could be used to distinguish between the PLC and sympatric gray-footed chipmunk (GFC; *Neotamias canipes*). 2) The study design was changed from occupancy modeling to use-versus-availability, and associated logistic regression analyses, in order to allow us to target our survey effort to locate chipmunks as opposed to surveying random sites. 3) A new task was added to evaluate the habitat selection of the GFC in order to test for competition between the GFC and the PLC. 4) The selection of a new graduate student necessitated that the overall duration of the project be extended in order to provide adequate time to complete a thesis. William's anticipated thesis completion date is by the end the 2024 fall semester. The first three of these modifications to the agreement were communicated and approved in Amendment 1; modification 4 will be addressed with the year 3 Share with Wildlife project proposal submitted in June 2023.

Future Work

We will continue to survey for PLC in the Nogal Peak area, including sites on the north face of the mountain. During the 2023 field season, we anticipate surveying at least 100 sites, maximizing our survey efforts between the months of June and August. We will collect vegetation data from any site with a confirmed PLC detection and at a corresponding, paired random site. We will redeploy a camera at the 2022 detection site, collect vegetation data at that site and a paired random site as well as maintain a camera at that location for the duration of the 2023 field season. In addition, as logistics allow, we will leave cameras in place at sites with known PLC detections through October 2023 and then deploy them again by April 2024 in order to increase our knowledge about the timing of PLC hibernation. We will continue to maintain the long-term monitoring cameras located in known PLC home ranges on Lookout Mountain. Provided that our proposal for year 3 funds is successful, our goal is to have all data entry up to date and all photos catalogued by the end of October 2024 so that we can begin data analysis in November.

Acknowledgments

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