Evaluation of Thunder Basin National Grassland 2020 Plan Amendment Draft as pertains to Mountain plover conservation and management

Summary: The Thunder Basin National Grassland (TBNG) 2020 plan amendment has been drafted to expand the toolkit for management and improve the ability of the USFS to manage for multiple uses. While the EIS and accompanying materials include detail about species of conservation concern including the mountain plover (*Charadrius montanus*), some of this information is inconsistent among documents. Further, some proposed management tools may be incompatible with management for plover habitat when prairie dog acreage in the landscape is low. Below we detail specific issues within the TBNG EIS and associated documents that are inconsistent with plover management, including supporting information based on our own research and the literature. There are two main issues discussed in this document **1) the use of density control when total colony area is below 7,500 acres and 2) prescription of colonies between 100 – 500 acres as target for mountain plover management.**

ISSUE 1. DENSITY CONTROL

Appendix A defines density control as "*A management action or set of management actions implemented with the intent to reduce the number of live prairie dogs within a prairie dog colony or some portion of a colony without reducing the total area of the colony. Such management actions would occur most often via the use of rodenticides but other control tools may be used*."(A-67) . Appendix B indicates that use of lethal density control would be "*limited to more productive ecological sites such as the loamy and lowland where the likelihood of achieving vegetation objectives is higher. Lethal density control would be considered when grass/forb ratios are shifting towards a community dominated by forbs and increased bare ground. This information should be recorded as pre-treatment monitoring data as required by the guideline listed below. Monitoring techniques may include, but would not be limited to: line point intercept, clipping by species, plant census, Daubenmire frames, and photopoints*." (B-4). This section also states that no more than 50% of a colony may be controlled in this way, and that post-treatment data will be collected.

As far as we know, there is no research examining the effect of "density control" on associated wildlife species including the mountain plover. However, the stated goal of reducing forb cover and bare ground is in direct conflict with the habitat requirements of mountain plover (Knopf and Miller 1994, Knopf and Wunder 2006, Duchardt et al. in press). Research in the Thunder Basin has indicated that bare ground and forb cover not only correlate with higher mountain plover densities, but areas with greater forb cover are more likely to be selected as nest sites (Duchardt et al. in press). While the focus on more productive ecological sites may somewhat mitigate this conflict, there is no evidence in the documents that any assessment of plover use will be made prior to application of density control (e.g., A-55).

Another issue is that there is no defined density threshold beyond which density control may be applied. The concern here is that if densities are reduced past a certain point, the basic ecological services of prairie dogs may no longer be available, and the controlled area may no longer be considered as a "colony" in the ecological sense. The unique ecosystem services of black-tailed prairie dogs (in contrast to some other species of prairie dogs) is directly related to higher densities and larger colony sizes (Hoogland Table 2.2). As a result, mountain plovers generally show stronger association with colonies of black-tailed prairie dogs vs. white-tailed prairie dogs (Knowles et al. 1982, Manning and White 2001), likely because the engineering effects of the former are much more

intense, especially in mixed-grass prairie (Baker et al. 2013). As such, reducing densities of black-tailed prairie dogs below a certain point may reduce or eliminate the value of those colonies for mountain plover.

We acknowledge that it is possible that densities of prairie dogs in the TBNG may exceed those observed in other systems, but we also know of no data currently available to support this assertion. **As such, we propose that the EIS and supporting documents must:**

1) **Identify a density threshold based on the literature, below which density control will not occur, and conduct surveys to determine densities prior to density control**

2) **Include wildlife surveys in the requirements that must be occur prior to the application of density control, specifically including surveys for mountain plover during the breeding season prior to application (to occur between April 20 – July 1)**

Regarding point 1, the USFS would decide which density survey method to use, which could include surveys of individual prairie dogs or burrows. Methods for such surveys are available in Johnson and Collinge 2004 and Powell et al. 1994, but many other resources exist. Once a survey methodology is selected, potential literature sources for identifying a density threshold include (but are not limited to):

A. Hoogland 1995, citing >10 individuals per hectare (>4 individuals per acre) (Table 2.2, included in this document)
B. Johnson and Collinge 2004, which indicates individual densities between 32-120 individuals per hectare (12-48/acre) or burrow densities between 100-674 burrows per ha (40-273 burrows per acre) (but note this work occurred in urban areas)
C. Ray et al. 2013 indicate burrow densities between ~50-100/ha (~20-40 burrows per acre), with burrowing owl abundance increasing with burrow density

We also note that an in-preparation manuscript using data from 2017 in the TBNG indicate increasing plover abundance with increasing burrow density, but highlight that these data were only from a very small subset of points within the landscape.

Based on the above, in areas of known mountain plover habitat a minimum density below which poisoning should not occur could either be determined as 4-12 prairie dogs /acre or 40 burrows/acre (note that the threshold for dogs/acre may need to be adjusted for time of year of survey, as densities should naturally be higher when pups are emerging in the spring) . We acknowledge that other materials may be available to determine this number, but these should be stated explicitly within the EIS. Regarding point 2, we suggest inclusion of text concerning plover surveys the summer prior to proposed density control.

ISSUE 2. PROPOSED COLONY SIZES

Appendix A states: "To optimize habitat heterogeneity for mountain plover, prairie dog colonies should vary in size up to approximately 1,000 acres with an emphasis on colonies of 200 to 500 acres. Guideline" (A-3). While generally this guideline is a good goal, the numbers presented here are lower than those available in the literature. Further, these numbers are not consistent with those reported in the accompanying *Biological Evaluation of Animal Species and Potential Animal Species of Conservation Concern Report.* On page 139 of this document it states that peak plover densities are typically reached on colonies between 250 – 800 acres, while page 142 it cites that within the TBNG peak densities are generally observed on colonies between 250 and 1,250 acres in size. Either

of these ranges has merit as pertains to the literature. However, the upward boundary of 500 acres does not occur anywhere within the species evaluation, and to our knowledge does not have support in the literature. **We propose that the EIS should alter the wording on page A-3 to reflect the information within the Biological evaluation.**

Supporting information

Baker, B. W., D. J. Augustine, J. A. Sedgwick, and B. C. Lubow (2013). Ecosystem engineering varies spatially : a test of the vegetation modification paradigm for prairie dogs. 230–239.

Duchardt, C.J. , Augustine, D.M., and Beck, J.L. Drivers of mountain plover habitat selection and nest survival on large prairie dog colonies. The Condor – Ornithological Applications (*in press*).

Hoogland, J. L. (1995). The Black-Tailed Prairie Dog: Social Life of a Burrowing Mammal. University of Chicago Press, Chicago, IL.

Johnson, W., and S. Collinge (2004). Landscape effects on black-tailed prairie dog colonies. Biological Conservation.

Knopf, F. L., and B. J. Miller (1994). Charadrius or bare-ground plover ? The Auk 111:504–506.

Knopf FL, Wunder MB (2006) Mountain plover (*Charadrius montanus*). In: Poole A (ed) In the birds of North America online. Cornell Laboratory of Ornithology, Ithaca

Powell, K., R. J. . Robel, K. E. . Kemp, and M. . D. Nellis (1994). Aboveground Counts of Black-Tailed Prairie Dogs : Temporal Nature and Relationship to Burrow Entrance Density. Journal of Wildlife Management 58:361–366.

Ray, J. D., N. E. McIntyre, M. C. Wallace, A. P. Teaschner, and M. G. Schoenhals (2016). Factors Influencing Burrowing Owl Abundance in Prairie Dog Colonies on the Southern High Plains of Texas. Journal of Raptor Research 50:185–193.

Table 2.2 from *The black-tailed prairie dog: Social life of a burrowing mammal* (Hoogland 1995)

Table 2.2. Descriptions of the Five Species of Prairie Dogs

	Black-tailed prairie dog	Mexican prairie dog	Gunnison's prairie dog	White-tailed prairie dog	Utah prairie dog
Range	Narrow belt from southern Canada to northern Mexico	Central Mexico	Arizona, Colorado, New Mexico, Utah	Colorado, Montana, Utah, Wyoming	Utah
Habitat	Low-grass prairie	Low-grass prairie	High-grass prairie	High-grass prairie	High-grass prairie
Altitude (meters)	700–1,700	700–1,700	1,700–3,000	1,700–3,000	1,700–3,000
Sexual dimorphism (adult male body mass/ adult female body mass)	About 15%	About 15%	>20%	>20%	>20%
Length of tail (mm)	60–100	90–110	30–65	30–65	30–65
Number of teats	8	8	10	10	10
Tail with black tip	Yes	Yes	No	No	No
Black spot above eye	No	No	No	Yes	Yes
Fleas	Common	Common	Common	Common	Common
Lice	Common	?	Rare	Common	Rare
Ticks	Rare	Rare	Rare	Rare	Rare
Typical colony size (adults and yearlings)	>1,000	?	<500	<500	<500
Typical colony density (adults and yearlings per hectare)	>10	<7?	<7	<7	<7