September 25, 2025

Mary Davis,
Cimarron and Comanche National Grasslands
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Re: Grasslands Land Management Plan Revision – Draft Assessment and Species of Conservation Concern

Dear Ms. Davis:

Humane World for Animals and Dr. Lauren McCain appreciate the opportunity to participate in the Cimarron and Comanche National Grasslands ("CCNG") land management plan revision process. Thank you for accepting these comments on the draft potential Species of Conservation Concern ("SCC") and Draft Assessment.

For over 70 years, Humane World for Animals, formerly called the Humane Society of the United States and Humane Society International, has worked around the globe to tackle the root causes of animal cruelty and suffering to create permanent change. Driving toward the greatest global impact, we aim to achieve the vision behind our name: a more humane world. Humane World's Prairie Dog Conflict Resolution Team collaborates to foster coexistence with prairie dogs on the grassland- one of the most imperiled ecosystems in the world.

Dr. Lauren McCain is a social scientist and wildlife conservation advocate who lives in Denver, Colorado. She has worked to conserve prairie dogs and other imperiled species for close to 30 years. Dr. McCain has published scientific papers and book chapters on human attitudes toward prairie dogs. She was the first director of the Southern Plains Land Trust.

Please let us know if you have any questions. We look forward to continuing to participate in the CCNG management plan revision process.

Sincerely,

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I. Introduction

The CCNG Draft Assessment rightly recognizes the importance of the black-tailed prairie dog ("prairie dog"; *Cynomys ludovicianus*) as a keystone species and ecosystem driver for the grasslands. We have four primary recommendations that we detail below. They are: 1) the Draft Assessment should not assume prairie dog populations are stable; 2) the Draft Assessment should clearly identify the policies governing prairie dog shooting and poisoning on the CCNG; 3) the black-tailed prairie dog and other prairie dog associated species should be identified as a SCC; and 4) the black-footed ferret, which is listed as endangered under the Endangered Species Act (ESA) should be recognized as an at-risk species on the CCNG.

II. The Draft Assessment should not assume prairie dog populations are stable.

The Draft Assessment indicates that the CCNG's prairie dog population is stable; for example, page 62 states, "Areas of active prairie dog colonies fluctuate, but the colonies are stable or at pre-plague outbreak (2005-2006) level." The Draft Assessment repeats this assertion on page 65 and pages 8, 9, 31 of Appendix C. We disagree with this characterization. Prairie dog populations that have been affected by sylvatic plague like those on the CCNG are inherently unstable (Barrile et al. 2022; Davidson et al. 2022). As stated by Barrile et al. (2022: 2),

> Plague often causes >99% mortality in BTPD [black-tailed prairie dog] colonies during epizootics (Augustine et al., 2008; Cully & Williams, 2001). In areas affected by epizootic plague, BTPD population dynamics have shifted from relatively stable colony complexes that existed prior to European settlement of North America (Keuler et al., 2020; Knowles et al., 2002) to extreme boom-and-bust cycles (Davidson, Augustine, Jacobsen, et al., 2022). Colony dynamics are now more commonly characterized by catastrophic collapse due to plague ("busts"), followed by population recovery ("booms") leading up to the next epizootic (e.g., Augustine et al., 2008; Cully et al., 2010; Hartley et al., 2009; . . .).

Moreover, colonies that experience plague "busts" may not return to their pre-plague levels (Cully et al. 2010; Davidson et al. 2022, citing Seery and Matiatos 2000 and Hartley et al. 2009).

The assumption of prairie dog colony stability seems to be based on data in Table 1, "Prairie dog population changes from 1989 to 2024," of the Mammal Species Evaluations attached to the Draft Assessment. (See Table 1 from the Mammal Species Evaluations, which we have copied and pasted below.)

Table 1. Prairie dog population changes from 1989 to 2024.

Year	Cimarron NG Acres	Comanche NG Total Acres	Carrizo Unit (Comanche NG) Acres	Timpas Unit (Comanche NG) Acres
1989	750			
1992	1,082			
1995		6,279	5,724	551
1997	1,246			
1998	1,298			
1999	1,697		1,894	
2001	2,439	4,213	3,851	362
2002	3,321	5,702	5,127	575
2003	4,008	6,620	6,064	556
2004	5,634	12,128	11,592	563
2005	5,793	14,894	14,387	508
2006	5,660	6,774	5,786	998
2007	2,710	4,629	3,554	1,075
2008	1,337			
2009	2,154			
2010	3,066	7,186	6,169	1,017
2024	5,151	14,633	10,396	4,237

(From CCNG. 2025. Mammal Species Evaluation, Black-tailed Prairie Dog, Table 1. pgs. 11-12.)

The table does not include enough data to make a determination about prairie dog population stability. For example, there are no prairie dog colony acreage figures between 2010 and 2024. The prairie dog colonies on the Cimarron and/or Comanche could experience a deadly plague epizootic within the next few years.

Predicting when, where, and to what extent plague epizootics will occur in prairie dog colonies and complexes is complicated (Brinkerhoff et al. 2010; Johnson et al. 2011; Barrile et al. 2022; Davidson et al. 2022). Plague is a threat to long-term prairie dog persistence, especially when combined with other threats such as poisoning, shooting, and climate change.

III. The Draft Assessment should clearly identify the policies governing prairie dog poisoning and shooting on the CCNG.

The CCNG's Mammal Species Evaluation states that "[l]ethal control by poisoning does not occurs [*sic*] on the plan area but the prairies-dogs are hunted on the plan area" (CCNG 2025, Mammal Species Evaluations, pg. 10). Appendix A of the Draft Assessment states, "[r]ecreational shooting of prairie dogs is currently allowed on the Cimarron; . . . . By Colorado State regulation, recreational shooting on the Comanche is presently not allowed" (CCNG Draft Assessment, Appendix A, pg. 30). These two statements seem to conflict regarding whether prairie dog shooting is allowed on the Comanche. To clear up confusion over the shooting policy on the grasslands and provide clarity about the prairie dog poisoning policy, the revised CCNG assessment should identify the specific federal and state laws, regulations, and/or other policies that prohibit prairie dog poisoning and govern shooting.

IV. The black-tailed prairie dog and prairie dog associated species should be identified as a Species of Conservation Concern.

In accordance with the U.S. Forest Service's 2012 planning rule (36 C.F.R. 219) that governs national forest and grassland management planning, the regional forester must identify SCC. These are species that occur in the plan area of which the "best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area" (36 C.F.R. § 219.9(c)). The best available scientific information ("BASI") about the black-tailed prairie dog does indicate the regional forester should have substantial concern over the capability of the species to persist in the plan area over the long-term. Below, we provide scientific support for identifying the prairie dog as a SCC and argue the Regional Forester's process for selecting SCC unjustifiably de-selected the prairie dog from SCC designation.

A. The best available scientific information indicates there is substantial concern about the black-tailed prairie dog persisting in the plan area over the long-term.

The CCNG Draft Assessment states that black-tailed prairie dogs "now inhabit less than 1% of their historic range" (CCNG 2025, Appendix C, pg. 59-60, citing Aasal et al. 2015[1]). This data alone indicates substantial concern about the species' ability to persist. Moreover, Davidson et al (2023) found suitable habitat for the BTPD alarmingly reduced throughout the range. The study went on to identify southeast Colorado as an area of high conservation potential; it has a lot of suitable habitat though not necessarily a

[1] We could not find the Aasal et al. 2015 document in the Draft Assessment's bibliography.

corresponding amount of habitat occupied by prairie dogs (Davidson et al, 2025). See the Appendix for maps accompanied by distribution and range information relevant to the SCC determination.

Furthermore, myriad threats continue to decrease the BTPD population.

1. Plague

Sylvatic plague ("plague"), caused by the *Yersinia pestis* bacterium, is arguably the most severe threat to prairie dogs, with plague epizootics frequently killing 90-100 percent of the prairie dogs in a colony (Augustine et al. 2008; Cully et al. 2010; Tripp et al. 2016; Eads and Biggins 2017). The close proximity of prairie dogs within colonies facilitates the spread of disease by allowing fleas, the vectors for plague, to easily jump between the rodents (Biggings and Kosoy 2001). The disease is not native to the United States and was first introduced from Eurasia to California via ships in 1900 and progressively moved eastward, reaching the Great Plains in the United States by the 1930s-1940s (Cully et al. 2006). Cully and Williams (2001) summarized some of the impacts of plague to prairie dogs:

> Some of the important consequences of plague in prairie dogs are local extirpation of colonies, reduced colony size, increased variance in local population sizes, and increased distances between colonies . . . . The impacts of plague reduce the effectiveness of dispersal in demographic rescue among colonies and increase the probability of extinction of entire complexes.

Recovery from epizootic events is not guaranteed and, often, colonies subjected to plague will not reach pre-plague population levels. Hartley et al. (2009) found that within a 15-year period, 98 percent of the colonies studied experienced an epizootic event (73 percent within 10-years) and of those colonies, nearly half of the colonies remained inactive 5 years following the epizootic event, and 56 percent of the colonies did not reoccupy the pre-plague footprint within 10 years of the epizootic event (Hartley et al. 2009).

2. Poisoning

Prairie dog poisoning is widespread across the BTPD range. As state above, the CCNG's Mammal Species Evaluations at pg. 10, states, "[l]ethal control by poisoning does not occurs [*sic*] on the plan area . . . ." Again, we request that the CCNG identify the policy prohibiting prairie dog poisoning.

3. Shooting

Prairie dog shooting can cause high levels of localized mortality, which can cumulatively lead to population-level impacts (Reeve and Vosburgh 2006). Entire colonies can potentially be eliminated from shooting pressure (Knowles 1987). Small colonies may be particularly vulnerable to negative impacts from shooting (Knowles 2002). Additionally, heavy shooting episodes can trigger plague epizootics (Biggins and Eads 2019). We discuss these problems below, using the best available science to support our points.

Knowles (1987) studied controlled shooting study on two colonies in the Charles M. Russell National Wildlife Refuge in Montana and found shooting can cause the extirpation of prairie dog colonies. After a total of 40.3 hours of shooting over two years, there was a 74 percent decline in the number of adults at colony A. After a total of 42.5 hours of shooting over two years, there was a 100 percent decline in the number of adults at colony B. Only one juvenile prairie dog survived the shooting study.

Prairie dog shooting significantly reduces prairie dog populations and population densities, can trigger prairie dogs to abandon their colonies, and can slow prairie dog colony expansion rates (Livieri 1999). Irby and Vosburgh (1994) found that prairie dog shooters prefer higher densities of prairie dogs. This causes shooters to spread the pressure of their activity depending on population density, causing uniformity in prairie dog populations across colonies (Vosburgh 1996). Biologically, such uniformity is destabilizing to prairie dog populations. Keffer et al. (2000) found that after they shot 22 percent of the black-tailed prairie dogs on one colony as part of a controlled shooting study, 69 percent (212 individuals) of the remaining prairie dogs left the colony. One study revealed that a colony in Montana had a 15 percent annual expansion rate when prairie dogs were not hunted, contrasted with a 3 percent expansion rate when they were (Miller et al. 1993).

Shooting can reduce reproduction rates. Pauli (2005) systematically had 30 percent of the prairie dogs at five colonies shot and then compared the results to five untreated colonies. Shot colonies showed a 50 percent reduction in pregnancy rates and a 76 percent decline in reproductive output (id.). Stockrahm and Seabloom (1998) also reported a significant difference in productivity between females on colonies that experienced shooting and those that did not. Their analysis of placental scars on yearling females revealed that 90 percent on un-shot colonies tried to reproduce but only 32 percent attempted reproduction on colony sites in North Dakota that experienced shooting for over 20 years (id.).

A study by Eads and Biggins (2019) demonstrated signs that shooting may trigger flea-plague positive feedback cycles by causing flea carriers to migrate to the decreased number of live prairie dogs. A substantial amount of shooting pressure on a colony can also

reduce body condition for surviving prairie dogs, making the animals more susceptible to plague (Id.). During favorable weather conditions for the spread of plague, shooting may be even more likely to trigger a plague epizootic.

B. The best available scientific information indicates there is substantial concern about the black-tailed prairie dog persisting in the plan area over the long-term.

The imperiled species in the table below should be designated as SCC. Colorado Parks and Wildlife has already conducted a science-based assessment of their vulnerability and determined these species to be state species of greatest conservation need.

BTPD Associate Species and Colorado State Wildlife Action Plan Designation

Species	Designation*	Prairie Dog Association^
Golden Eagle	SGCN – Tier 1	strong, well documented benefits of association
Little Brown Myotis	SGCN – Tier 1	some documented evidence of a positive association
Mountain Plover	SGCN – Tier 1	strong, well documented benefits of association
Northern Hoary Bat	SGCN – Tier 1	some documented evidence of a positive association
Ornate Box Turtle	SGCN – Tier 1	some documented evidence of a positive association
Scaled Quail	SGCN – Tier 1	some documented evidence of a positive association
Thick-billed Longspur	SGCN – Tier 1	some documented evidence of a positive association
Burrowing Owl	SGCN – Tier 2	strong, well documented benefits of association
Chestnut-collared Longspur	SGCN – Tier 2	some documented evidence of a positive association
Long-billed Curlew	SGCN – Tier 2	some documented evidence of a positive association

* From Colorado Parks and Wildlife 2025.

^ From Reading 2009.

C. The Regional Forester's Species of Conservation Concern identification process is flawed.

The National Forest Management Act ("NFMA") imposes a substantive duty that requires the Forest Service, as it develops and revises plans, to "provide for the diversity of plant and animal communities" in all units of the National Forest System (16 U.S.C. § 1604(g)(3)(B)). The 2012 Planning Rule directs the Forest Service to "provide the ecological conditions to both maintain the diversity of plant and animal communities and support the persistence of most native species in the plan area" (36 C.F.R. § 219.9). The SCC identification process used for the CCNG is not consistent with the Forest Service's planning directives (and, thus NFMA), fails to use and document BASI, and results in excluding imperiled species that warrant inclusion on the SCC list.

Under the 2012 Planning Rule, a SCC "is a species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area and for which the regional forester has determined that the best available

scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area" (36 C.F.R. § 219.9(c)). The regional forester has discretion in determining SCC for a national grassland; however, such determinations cannot be arbitrary and must be made based on the BASI (36 C.F.R. § 219.3).

The Forest Service's Land Management Planning Handbook offers direction for regional foresters on determining species of conservation concern. The handbook notes that the criteria for identifying species of conservation concern are also the criteria for identifying potential species of conservation concern (FSH 1909.12.52c). The criteria for determining SCC are:

1. The species is native to, and known to occur in, the plan area; and
2. The best available scientific information about the species indicates substantial concern about the species' capability to persist over the long term in the plan area.

The two criteria, naturally, match the 2012 Planning Rule's SCC definition. The handbook (*Id*. at 12.52d) further directs that species in the following categories should be considered as potential SCC:

a. Species with status ranks of G/T3 or S1 or S2 on the NatureServe ranking system.
b. Species listed as threatened or endangered by relevant States, federally recognized Tribes, or Alaska Native Corporations.
c. Species identified by Federal, State, federally recognized Tribes, or Alaska Native Corporations as a high priority for conservation.
d. Species identified as species of conservation concern in adjoining National Forest System plan areas (including plan areas across regional boundaries).
e. Species that have been petitioned for Federal listing and for which a positive "90-day finding" has been made.
f. Species for which the best available scientific information indicates there is local conservation concern about the species' capability to persist over the long-term in the plan area due to:

(1) Significant threats, caused by stressors on and off the plan area, to populations or the ecological conditions they depend upon (habitat). These threats include climate change.
(2) Declining trends in populations or habitat in the plan area.
(3) Restricted ranges (with corresponding narrow endemics, disjunct populations, or species at the edge of their range).

(4) Low population numbers or restricted ecological conditions (habitat) within the plan area.

In determining SCC for the CCNG management plan revision, the regional forester decided that substantial concern about a species' capability to persist over the long-term in the plan area is warranted only if, at the time of plan development, the best scientific information indicates that the species has either:

1) A NatureServe Ranking of G/T 1 or 2 for which there is no evidence that the known threats to that species do not operate on the planning unit; **or**
2) A species does not have a NatureServe Ranking of G/T 1 or 2 but all four of the indicators of conservation concern are demonstrated for that species. Those indicators of conservation concern are:
    a. Indicator 1. Significant threats, caused by stressors on and off the plan area, to populations or the ecological conditions they depend upon (habitat). These threats include climate change.
    b. Indicator 2. Declining trends in populations or habitat in the plan area;
    c. Indicator 3. Restricted ranges (with corresponding narrow endemics, disjunct populations, or species at the edge of their range);
    d. Indicator 4. Low population numbers or restricted ecological conditions (habitat) within the plan area.

The regional forester's four indicators of conservation concern are taken directly from the handbook (*See* FSH 1909.12.52d(3)(f)). The handbook's listing of factors indicating local conservation concern about the species' capability to persist over the long-term in the plan area is neither conjunctive nor disjunctive.

The regional forester has not provided any explanation for why a species meeting fewer than four indicators cannot rise to the level of substantial concern about its capability to persist over the long-term. The regional forester's requirement that all four indicators of local conservation concern be present for there to be substantial concern about a species' capability to persist over the long-term is a misapplication of the directives and sets the bar for SCC designation inconsistently and illegitimately high given the 2012 Planning Rule's directive to "provide for the diversity of plant and animal communities, within Forest Service authority and consistent with the inherent capability of the plan area" (36 C.F.R. § 219.9). The handbook does not direct the Forest Service to prohibit SCC determinations for species that do not meet all four indicators, and the regional forester has not provided any meaningful rationale that shows there cannot or should not be substantial concern about a species' capability to persist in the absence of even one of the four indicators. In fact, a species experiencing a subset of the four indicators can be vulnerable to extirpation in the plan area.

The regional forester's approach to determining SCC is arbitrary and could leave imperiled species vulnerable and without meaningful protections to ensure that activities on the CCNG would not contribute to these species' needs for listing under the U.S. Endangered Species Act ("ESA"). Under the ESA, a species need only meet "one or more" of five factors to be listed as threatened or endangered. The listing factors include threats (factors 1-3), "inadequacy of existing regulatory mechanisms" (factor 4), "or" "'[o]ther factors' affecting the species continued existence" (factor 5) (16 U.S.C. § 1533(a)(1)). It is thus harder for a species to qualify as a species of conservation concern per this regional forester's approach than it is for a species to qualify as threatened or endangered under the ESA.

Under the 2012 Planning Rule, the BASI must be used and sufficiently documented, for the Regional Forester to determine: 1) which species are "known to occur in the plan area" and 2) the species for which a substantial concern exists about their "capability to persist over the long-term in the plan area" (36 C.F.R. § 219.9(c)).

The International Union for Conservation of Nature (IUCN) requires species meet just one of the five criteria it uses to identify species "critically endangered," "endangered," or "vulnerable." These criteria from the IUCN Standards and Petitions Committee (2019) include:

A. Population size reduction (past, present and/or projected)
B. Geographic range size, and fragmentation, few locations, decline or fluctuations
C. Small and declining population size and fragmentation, fluctuations, or few subpopulations
D. Very small population or very restricted distribution
E. Quantitative analysis of extinction risk (e.g., Population Viability Analysis)

The IUCN (2019) *Guidelines for Using the IUCN Red List Categories and Criteria*, directs that,

> To list a particular taxon in any of the categories of threat, only one of the criteria, A, B, C, D, or E needs to be met. … Only the criteria for the highest category of threat that the taxon qualifies for should be listed. For example, if a taxon qualifies for criteria A, B, and C in the Vulnerable and Endangered category and only criterion A in the Critically Endangered category, then only the criterion A met in the Critically Endangered category should be listed (the highest category of threat). [emphasis added]

The IUCN guidelines go on to explain, "[l]isting under the highest category of threat (instead of, for instance, averaging extinction risk across the five criteria) ensures a more precautionary approach to making urgent decisions based on limited information." IUCN 2019 at 74. The criteria and protocol the IUCN uses for ranking imperiled species is based in substantial science (See Harris et al. 2011 ; Betts et al. 2019; Bland et al. 2019). It is illogical that the Region 2 SCC determination rules set a higher standard than both the U.S. Fish and Wildlife Service for the ESA and the IUCN for the Red List.

V. The black-footed ferret should be recognized as an at-risk species on the CCNG.

The Forest Service is obligated to comply with Section 7(a)(1) of the ESA, which mandates that federal agencies implement programs to conserve (i.e., help recover) threatened and endangered species—in this case, the federally endangered black-footed ferret. Black-footed ferrets have been reintroduced to southeastern Colorado, not far from the Carrizo Unit of the Comanche, and it is conceivable that ferrets have migrated to the CCNG.

The Forest Service is required under the ESA to promote recovery of federally threatened and endangered species. Congress enacted the ESA to provide "a program for the conservation of … endangered species and threatened species" (16 U.S.C. § 1531(b)). Section 2(c) of the ESA establishes that it is "the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act" (16 U.S.C. § 1531(c)(1)). Section 7(a)(1) of the Act mandates that federal agencies "utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species" (16 U.S.C. § 1536(a)(1)). The ESA defines "conservation" to mean "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this [Act] are no longer necessary" (16 U.S.C. § 1532(3)).

Black-footed ferrets depend on prairie dogs as their primary prey and use prairie dog burrows for denning and shelter.

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VII. Appendix

Abundance and distribution of suitable habitat

Several university, government, and non-governmental organization scientists conducted a major project, called Homes on the Range (HOTR), to model and map remaining suitable habitat and potential conservation areas (see Section IV.C, below) across the BTPD range. [2] The datasets, models, and maps generated by the HOTR project are intended to inform conservation planning, including federal lands. For more information about the HOTR project, see the project website hosted by the Colorado Natural Heritage Program, available at: https://cnhp.colostate.edu/projects/hotr/. The site includes data, static maps, an interactive map, a story map, methodological details, and the project's final report.

The HOTR project developed a habitat suitability model (HSM) based on prairie dog occupancy—presence or absence of prairie dogs—across the BTPD range, using data from MacDonald et al (2015). The soil types, land cover types, topography, and climatic characteristics identified where prairie dogs occurred were layered together using GIS to build the HSM. The HSM detected approximately 51 million acres of suitable habitat across the historic BTPD range. However, less than 4% of this suitable habitat is occupied by prairie dogs. See Figure 1 below.

Figure 1. Suitable BTPD Habitat Compared with Occupied Habitat Across the Range

State	Suitable habitat (ac)*	Area occupied by BTPDs (ac)^	Percent of suitable habitat occupied by BTPDs
AZ	14,571	34	0.23%
CO	**14,270,425**	**532,251**	**3.73%**
KS	2,916,783	154,775	5.31%
MT	7,250,247	184,055	2.54%
NE	2,052,724	89,208	4.35%
NM	3,931,848	124,098	3.16%
ND	603,174	15,561	2.58%
OK	1,713,129	81,224	4.74%
SD	6,790,676	224,145	3.30%
TX	4,617,417	238,871	5.17%

[2] Institutions involved with HOTR include Colorado Natural Heritage Program, Colorado State University (Dept. of Fish, Wildlife and Conservation Biology), Western Association of Fish & Wildlife Agencies, USDA-Agricultural Research Service, Universidade Federal do Paraná (Brazil), Humane Society of the United States (now Humane World for Animals), Boise State University, University of Kansas (Kansas Biological Survey & Center for Ecological Research). See also the final HOTR report, Identifying Potential Landscapes for Conservation across the Grasslands of North America: Integrating Keystone Species, Land Use Patterns, and Climate Change to Enhance Current and Future Grassland Restoration Efforts. Available at: https://cnhp.colostate.edu/wp-content/uploads/download/documents/2022/Final-HOTR-Report-Davidson-et-al.-7-14-2022.pdf.

State	Suitable habitat (ac)*	Area occupied by BTPDs (ac)^	Percent of suitable habitat occupied by BTPDs
WY	7,370,049	288,606	3.92%
TOTAL	**51,531,289**	**1,932,826**	**3.75%**

* From Davidson et al. (2023).[3]

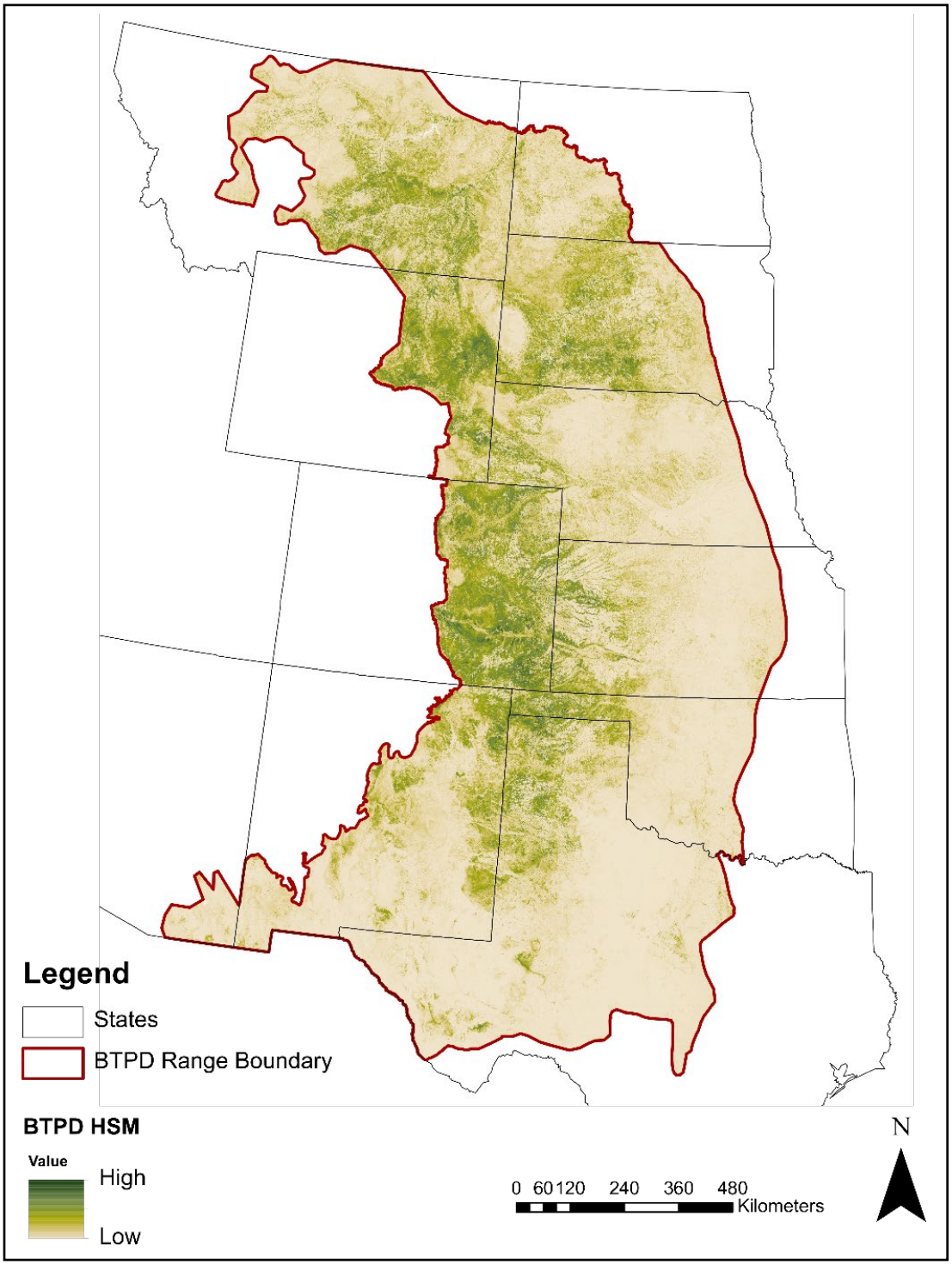
^ From MacDonald et al. (2015). [4]

States with the most suitable habitat include Colorado (14.2 million ac), Montana (7.25 million ac), and South Dakota (6.8 million ac). The map depicted in Figure 2 below shows the demonstrable loss of habitat suitability in the eastern portion of the historical range, which is due largely due to cropland conversion, and loss in the south, where drought and desertification are the most significant factors.

[3] Davidson, A.D. et al. 2023. Present and future suitable habitat for the black-tailed prairie dog ecosystem. Biological Conservation. 286: 110241. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0006320723003427.

[4] McDonald, L. et al. 2015. Range-wide monitoring of black-tailed prairie dogs in the United States: pilot study. Western EcoSystems Technology, Inc. (WEST, Inc.). Available at: https://www.researchgate.net/profile/Lyman-Mcdonald/publication/293488855_Range-Wide_Monitoring_of_Black-Tailed_Prairie_Dogs_in_the_United_States_Pilot_Study/links/56b914fb08ae3b658a88c699/Range-Wide-Monitoring-of-Black-Tailed-Prairie-Dogs-in-the-United-States-Pilot-Study.pdf.

Figure 2. Suitable Habitat Gradient Across the BTPD Range



BTPD ensemble habitat suitability model, under current climate. Dark green shows areas of highest habitat suitability for BTPDs, and beige shows areas of lowest suitability. Davidson et al. (2023: 110247)

Regarding suitable habitat in Colorado, Davidson et al. (2023) reported that

> [T]he most suitable habitat for the BTPD ecosystem under the current climate extends largely from northern and eastern New Mexico and the panhandle of Texas and Oklahoma through eastern Colorado, Wyoming, and Montana. Under current conditions, the region containing the most extensive and contiguous patches of suitable habitat for BTPDs occurs in the nine counties of southeastern Colorado (Baca, Las Animas, Huerfano, Pueblo, Crowley, Otero, Bent, Prowers and Kiowa), which encompass 10.4 million ac within the historic BTPD range. Within this region, we identified 6.4 million ac of moderate or high-quality BTPD habitat, primarily on gently undulating shortgrass plains. These plains are occasionally dissected by unsuitable or low-quality habitat associated with rugged canyonlands along the Purgatoire River and floodplains or cropland along the Arkansas River. The region is bounded on the south by mesas and canyonlands along the New Mexico/Oklahoma borders, and on the east by rowcrop agriculture near the Kansas border. Of the medium to high-quality habitat occurring in this region, 372,725 ac or 5.75% is on the Comanche National Grassland and 194,719 ac or 3.00% is on lands managed by the Department of Defense for military training.[5]

From a rangewide perspective, Colorado remains a priority state in both current and projected climate scenarios. Yet, only 4% of that habitat is occupied by prairie. Like Davidson et al. (2025), we suggest BTPD conservation might be best maximized by focusing on those areas in Figure 3 that have High Conservation Potential (HCP).

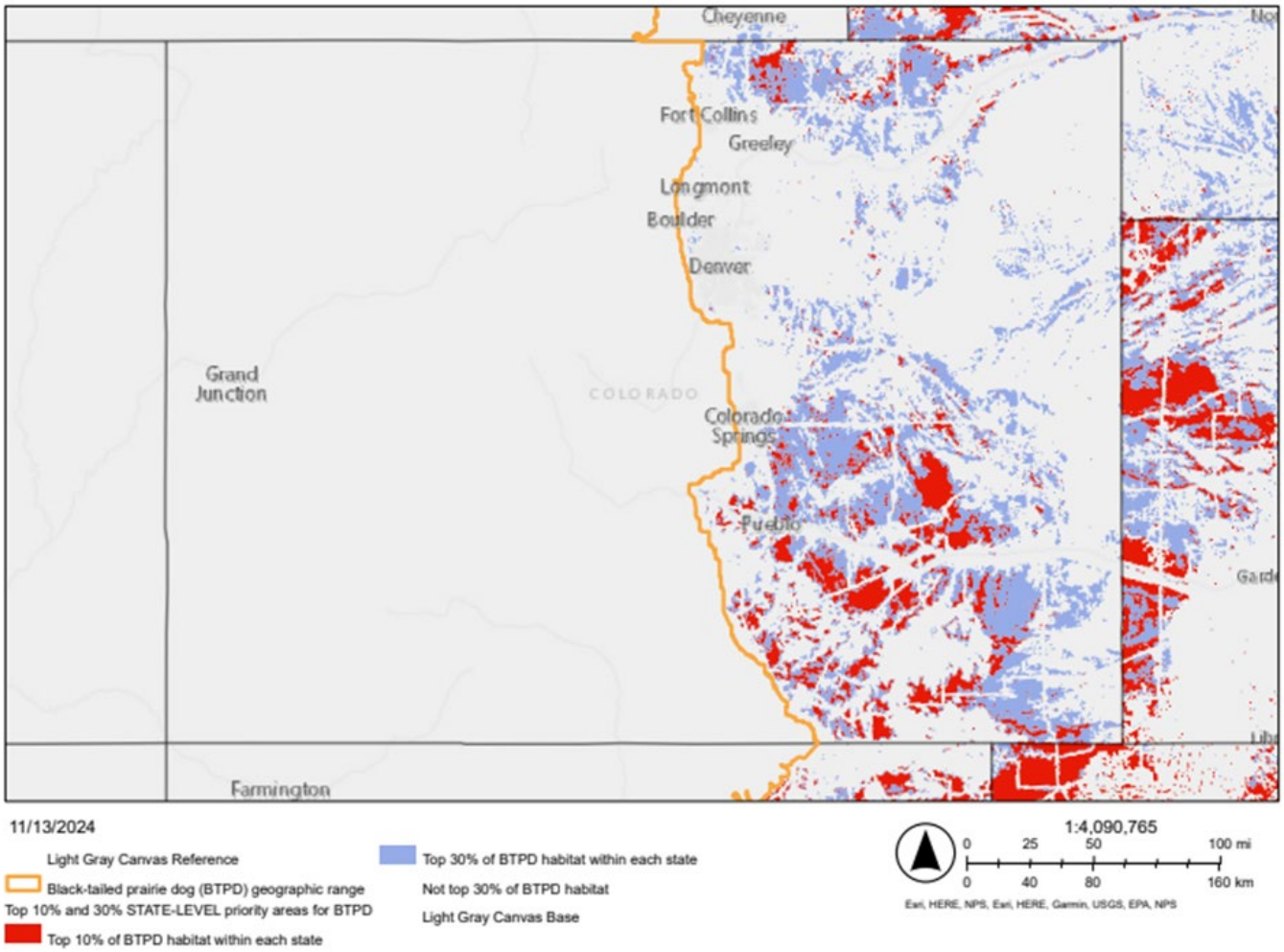
Areas with the highest conservation potential

Despite the profound loss of BTPDs and suitable habitat, there are still substantial areas in the range that could be restored and conserved to recover more places where prairie dogs could carry out all of their keystone functions. In an effort to prioritize conservation implementation, the HOTR project identified the top 10 and 30% of lands with the Highest Conservation Potential (HCP) rangewide and for each state under current and future climate scenarios. Davidson et al. (2025) used Zonation, an approach and software for spatial conservation prioritization, to select HCP areas for the conservation of the prairie dog ecosystem. Data layers incorporated include climate change scenarios, threats to

[5] Davidson, A.D. et al. 2023. Present and future suitable habitat for the black-tailed prairie dog ecosystem. Biological Conservation. 286: 110241. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0006320723003427.

habitat, connectivity, and land use. A first of its kind, this model also included social and political spatial data in the analysis**.**

Figure 3. Top 10% and 30% State-level Priority Areas for BTPDs in Colorado



Specifically, the Comanche & Cimarron National Grasslands, Southern Plains Land Trust and the May Ranch and the Chemical Materials Activity-West (formerly known as the Pueblo Depot) prairie dog conservation area flanked by Chico Basin Ranch State Land Board lands to the north represent occupied colonies in prime habitat. These results illustrate the substantial potential for conserving the BTPD ecosystem in Colorado, given the relatively large amount of remaining available habitat and area occupied by prairie dogs.