Report from the Burrow

Forecast of the Prairie Dog

WildEarth Guardians
A Force for Nature

A Report from WildEarth Guardians
By Taylor Jones
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MISSION STATEMENT

WILDEARTH GUARDIANS protects and restores the
wildlife, wild places and wild rivers of the American West.

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Outside Reviewers:
Kristy Bly, Lauren McCain, Richard P. Reading, Con Slobodchikoff ("Prairie Dog Communication" section only), Lindsey Sterling-Krank. Review does not constitute an endorsement of the 2011 Report from the Burrow.

Report from the Burrow 2011: Forecast of the Prairie Dog

An expansive redefinition of the human relationship to nature requires not only an open international, national, state, county, and community-wide dialog, it also requires each human being, in their own way, to reexamine and redefine their physical and emotional relationship to non-human entities.
–Slobodchikoff et al. 2009, p. 209

The greatness of a nation and its moral progress can be judged by the way its animals are treated.
–Mahatma Gandhi

2010 was a year of intense and often acrimonious political debates. In the midst of divisive arguments about religion, health care, immigration, and financial reform, moderate voices struggled to be heard. Communication was a central issue in several key debates this year: the military ceased silencing its gay and lesbian soldiers by repealing "Don't Ask, Don't Tell"; and the release of massive amounts of information by WikiLeaks, while fraught with scandal, also pointed to the potential moral power of more transparent, open governments.

This year has shown us the continuing need to communicate across ideological lines in order to make positive progress for society as a whole. As a nation, we are searching for ways to communicate effectively; to create dialog, not just noise, and regain clarity of thoughts and goals. In celebration of Prairie Dog Day 2011, WildEarth Guardians' annual *Report from the Burrow* focuses on the incredible complexity of prairie dog communication.

Black-tailed prairie dog pups. Photo: Rich Reading

Far from being simple rodents, prairie dogs are intelligent, social animals with a complex communication system that qualifies as a language by most linguistic criteria. In-depth studies of prairie dog communications using sonograms, video recording, and controlled experiments have revealed a surprising wealth of information in prairie dog calls. The familiar "chirp" of a prairie dog standing upright and sounding the alarm encodes information about the type of predator coming, the speed at which it is approaching, and its color or size. Prairie dogs also have a complex social chatter that has yet to be "decoded" (See pages 23-26 for more information on prairie dog communication).

This year, the human friends of prairie dogs hope to encourage communication and

respect not only across ideological lines, but across species lines as well. Each prairie dog voice has as much to say in its colony as each human voice does in its own community. As each individual in human society contributes their labor, voice, intelligence, and skills to the greater human community, so each individual prairie dog contributes to the prairie dog community and to the ecosystem of the grasslands. Yet instead of treating these animals as fellow members of the community of life and finding ways to share space with them, humans have a long history of indiscriminant, inhumane prairie dog killing.

Some prairie dog shooting enthusiasts revel in "varmint blasting," promoting videos of prairie dogs being blown to bits by high-powered rifles with "maximum carnage."[1] Poisoning campaigns have decimated prairie dog towns. Rozol, a toxicant that the EPA has registered for use on prairie dogs across their range, causes long, lingering deaths. Since Rozol is an anticoagulant, poisoned prairie dogs bleed to death through all their orifices and even their skin; it can take anywhere from several days to two weeks for the poison to kill them. Disoriented and weak, the dying prairie dogs wander away from their burrows and are easy targets for predators. But since anticoagulants linger in the bodies of dead animals, eating poisoned prairie dogs can be deadly for both predators and scavengers. Poisoned prairie dog towns can become killing fields for badgers, coyotes, hawks, eagles, foxes, and many other animals that scavenge on the contaminated carcasses. Prairie dogs are also killed with other types of poison bait, gassed and suffocated in their burrows, and blown up by the Rodenator, which ignites a mixture of propane and oxygen underground to kill or maim the animal and flatten its burrow with an explosion. Prairie dogs additionally suffer from plague (introduced to North America in the late 1800s), habitat loss to development, agriculture, and oil and gas drilling, and inadequate regulatory protections.

If, as Gandhi suggests, our greatness and moral progress can be judged by how we treat prairie dogs, then truly as a nation we are in a sad state. Without evaluating our ethical and moral responsibilities towards the animals who share our world, we are on the fast track to becoming victims of our own carelessness. The prairie dog is a crucial part of the life-support system of the Great Plains, an incredible ecosystem which stores carbon, filters water, and supports a broad diversity of species. Without prairie dogs, our native grasslands are impoverished. This year, we want to stop the silencing of prairie dogs. We want to hear their voices across their native grasslands and see the effects of their presence on the ecosystem.

Executive Summary

Each year, WildEarth Guardians releases our *Report from the Burrow: Forecast of the Prairie Dog* on Prairie Dog Day—also Groundhog Day (Feb. 2). We linked these two holidays because both burrowing rodents provide us predictions of the future. Famous groundhog Punxsutawney Phil entertains us, foretelling the length of winter. The status of

[1] See Velocity Film's "Prairie Dog Be Gone" website at http://dogbegone.com for examples.

our prairie dog populations predicts the future of the western prairie ecosystems they create and sustain. Collectively, prairie dogs have lost between 93-99% of their historic range in the last 150 years.

Report from the Burrow assesses the state of prairie dog populations range-wide by evaluating the performance of government agencies responsible for prairie dog protection during the last year. This report is a tool for the public to hold state and federal government institutions accountable; the collective of state and federal agencies are legally bound to protect our wildlife and wildlife habitat.

How did they do this year? The answer is: pretty good to horribly. No federal or state agency has yet earned an A. Arizona continues to hold the lead among the states with a B. A few states and agencies improved their grade from last year, including the National Park Service and the Forest Service. Some grades dropped. We are disappointed in the Fish and Wildlife Service, whose grade continues to drop from a D+ to a D. This year we added U.S.D.A.'s Wildlife Services and the Federal Aviation Administration, as their actions towards prairie dogs deserved attention – not in a good way, unfortunately.

Actions government agencies should take to protect and recover prairie dogs include:

- Upgrading the Utah prairie dog's status from Threatened to Endangered;
- Granting prompt, range-wide protection of all unlisted species of prairie dogs—the black-tailed, white-tailed, and Gunnison's—under the Endangered Species Act;
- Banning poisoning and shooting of any prairie dogs, especially on public lands;
- Immediately banning Rozol and Kaput-D prairie dog toxicants;
- Supporting active efforts to prevent plague outbreaks;
- Prohibiting destruction of prairie dog habitat on public lands from oil and gas drilling, off-road vehicles, and other harmful land uses;
- Eliminating subsidies that contribute to habitat destruction and prairie dog killing;
- Preventing the loss of Mexican prairie dog habitat to farming; and
- Carrying out other steps necessary to protect and recover prairie dog populations.

We need our state and federal agencies to make, implement, and enforce policies to safeguard prairie dogs, but prairie dogs equally need the help of individual citizens. Raise your voice for prairie dogs. Contact your members of Congress and your state and federal wildlife officials and ask them to develop stronger policies to protect these persecuted animals and their habitats. As each prairie dog warns its colony of danger approaching, so too can you raise your voice to warn of the dangers of ecological collapse and biodiversity loss and to demand respect and humane treatment for prairie dogs and the myriad species associated with their colonies.

The Grading System

We evaluate the U.S. state and federal prairie dog managing agencies on their past year's performance in restoring and protecting prairie dogs and habitat. We use a standard four-

point grading system. An "A" or 4.0 points signifies excellent performance; an "F" or 0 is a failing grade. We use seven categories to determine final grades that are modeled on the Endangered Species Act's five criteria used to determine eligibility for federal protection.

1. **Conserve:** The extent federal or state agencies are progressing toward final conservation plans and actively working to recover and protect prairie dogs.
2. **Habitat:** The degree to which states or federal agencies are working toward restoring prairie dog habitat or allowing habitat destruction from oil and gas drilling; livestock grazing that promotes weed and woody shrub encroachment; and off-road vehicle use, for example.
3. **Shooting:** Federal and state limits on prairie dog shooting for recreation and control are evaluated as the key problem in this category.
4. **Plague:** Based on agency commitments to plague monitoring and mitigation.
5. **Policies:** An assessment of policies that further prairie dog conservation or contribute to prairie dog decline.
6. **Poison:** Factors include the level of lethal control allowed, existence of poisoning subsidies or direct support, mandatory poisoning policies, and control restrictions.
7. **Monitor:** Based on frequency of population surveys, robustness of survey methods, records kept on threats, and public access to monitoring data.

Adding complexity, sometimes more than one agency within one state develops and implements prairie dog policies. For example, the Colorado Division of Wildlife designates prairie dogs "small game" and species of "greatest conservation need," regulates prairie dog shooting, and co-regulates toxicant use with the Department of Agriculture, which designates prairie dogs as "destructive rodent pests." Different designations across agencies in the same state can cause management conflicts, mixed messages, or even downright contradictory actions.

Government agencies have committed to monitor and conserve prairie dogs (see box: State Commitments to Prairie Dog Conservation). The Western Association of Fish and Wildlife Agencies (WAFWA) established the *Memorandum of Understanding for Conservation of Species of Conservation Concern Associated with Prairie Ecosystems* that includes obligations to black-tailed, Gunnison's, and white-tailed prairie dogs (WAFWA 2006). Each state with prairie dogs is a signatory. Several states have *Comprehensive Wildlife Conservation Strategies* (CWCS) that establish conservation guidelines for prairie dogs. States within the black-tailed range also provide an annual report on progress towards the objectives outlined in the *Multi-State Conservation Plan for the Black-tailed Prairie Dog* (Luce 2003).

Agency Commitments to Prairie Dog Conservation

Multi-State Conservation Plan for the Black-tailed Prairie Dog. In 1998, several conservation organizations petitioned the U.S. Fish and Wildlife Service to list the black-tailed prairie dog under the Endangered Species Act. In 2000, the Fish and Wildlife Service made the species a candidate for listing. In response, the 11 state wildlife agencies within black-tailed prairie dog range formed the Interstate Black-tailed Prairie Dog Conservation Team to prevent federal listing. With the exception of Colorado and Nebraska, each state pledged to develop targets for prairie dog occupied acreage, contribute to a prairie dog complex greater than 5,000 acres, and have prairie dogs distributed across 75% of the counties in their historic range, among other objectives. The Conservation Team remained intact even subsequent to Fish and Wildlife's removal of the species from the candidate list

Comprehensive Wildlife Conservation Strategy (CWCS). In 2005, Congress mandated that each state develop Comprehensive Wildlife Conservation Strategies in order to receive federal wildlife grants and funding from the Wildlife Conservation and Restoration Program. Among eight plan requirements, a state's CWCS must include actions for conserving and monitoring priority species and habitat. Several state Conservation Strategies include prairie dogs as priority species for conservation action. Each state developed its own conservation measures to monitor and protect selected species.

The Western Association of Fish and Wildlife Agencies Memorandum of Understanding (MOU). In 2006, all 12 states within the range of the four U.S. prairie dog species and several federal agencies signed the WAFWA *Memorandum of Understanding for the Conservation and Management of Species of Conservation Concern Associated with Prairie Ecosystems*. The MOU directed that the agencies develop prairie dog management plans, maintain and enhance prairie wildlife (including prairie dogs) and habitat, and communicate policy and other changes with WAFWA, among other objectives. A Prairie Dog Conservation Team formed among the agencies that manage prairie dogs. Each agency signatory designated representative staff members to participate in annual meetings to provide prairie dog management progress reports.

The Report Card

GOV	CONSERVE	HABITAT	SHOOTING	PLAGUE	POLICIES	POISON	MONITOR	2010	FINAL
FEDERAL GOVERNMENT AGENCIES									
BLM	F	F	F	F	F	C	C	D	D-
EPA	N/A	N/A	N/A	N/A	F	F	N/A	F	F
FAA	F	F	F	N/A	F	F	N/A	N/A	F
FS	C	D	D	C	D	D	A	D+	C-
FWS	F	D	F	C	F	C	C	D+	D
NPS	B	B	B	C	B	C	A	B-	B
WS	F	N/A	F	N/A	F	F	N/A	N/A	F
STATE GOVERNMENTS									
AZ	A	B	C	B	B	C	B	B	B
CO	C	D	C	D	C	D	C	C-	C-
KS	C	F	F	C	F	F	B	D+	D
MT	B	C	F	F	F	D	C	D+	D
NE	F	F	F	F	F	F	F	F	F
NM	F	F	C	F	F	D	D	D	D-
ND	F	F	F	F	F	F	C	D-	F
OK	B	B	F	D	B	B	B	C	C+
SD	D	F	D	D	D	F	D	D-	D-
TX	C	C	F	F	C	F	B	D+	D+
UT	C	C	C	D	D	D	B	C-	C-
WY	C	D	F	F	C	F	C	D+	D

Grade Explanations

D- U.S. Bureau of Land Management (BLM)

The BLM manages vast expanses of public land across the West in Gunnison's, Utah, and white-tailed prairie dog habitat, though very little (proportionately) in the black-tailed range. The BLM routinely exempts companies from complying with rules that would protect prairie dog colonies and habitat on lands leased for oil and gas drilling. Few BLM lands have shooting restrictions, and the agency normally defers to state shooting regulations. The BLM conducts prairie dog surveys on some of its lands. They approved black-tailed prairie dog reintroduction onto BLM land in Arizona. Areas of Critical Environmental Concern (ACEC)[2] for the protection of white-tailed prairie dogs have been proposed, but the BLM has approved none of them: the agency does not believe they meet the "relevance and importance" criteria. BLM dismissed protests over the leasing of white-tailed prairie dog habitat, black-tailed prairie dog habitat, and potential black-footed ferret reintroduction sites for oil and gas drilling, lowering their "conserve" and "habitat" grades (BLM 2011). Recent Resource Management Plans (RMPs), such as the Little Snake Proposed RMP, do not adequately protect large, biologically important white-tailed prairie dog colonies from oil and gas drilling.

F U.S. Environmental Protection Agency (EPA)

Poisoned prairie dog. Photo: Jonathan Proctor

The EPA is responsible for approving and governing the use of toxicants under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The EPA has long approved zinc phosphide and aluminum phosphide for use on prairie dogs. In May of 2009, the EPA approved the use of the poison Rozol (chlorophacinone) to exterminate black-tailed prairie dogs in all 11 states within the species' range. The EPA approved Rozol in violation of FIFRA; the Endangered Species Act; the Migratory Bird Treaty Act; and the Bald and Golden Eagle Protection Act. The EPA also considered approving the toxicant Kaput-D (diphacinone) for the entire black-tailed prairie dog range. The EPA had been

[2] "ACEC" is a designation for areas where special management attention is needed to protect important historic, cultural and scenic values; fish, wildlife resources or other natural systems or processes; or to protect human life and safety from natural hazards.

issuing Special Local Needs registrations for both toxicants on a state-by-state basis. The Western Association of Fish and Wildlife Agencies requested that registrations for Rozol and Kaput-D be suspended pending the results of an EPA consultation with the U.S. Fish and Wildlife Service over potential impacts to endangered species. The Arizona Game and Fish Department, Colorado Division of Wildlife, and Nebraska Game and Parks Commission all wrote similar letters to the EPA. However, the Colorado and Nebraska Agriculture Departments both wrote the EPA letters in support of Rozol registration. Defenders of Wildlife and Audubon of Kansas sued the EPA in September 2009 to get Rozol registration repealed and Special Local Needs registrations of Kaput-D halted. EPA initiated consultation with the Fish and Wildlife Service on the poison's effects on endangered species. In September, EPA made a "likely to adversely affect" finding for a number of endangered and threatened species in regards to Rozol (Shelby and Grable 2010). However, the EPA did not suspend the use of Rozol, and the lawsuit remains active (Corn 2010).

F Federal Aviation Administration (FAA)

by Dr. Nicole J. Rosmarino

In response to the Hudson River airplane crash in New York City, caused by a collision with migratory Canada geese (not resident wildlife), the FAA went on the offensive against prairie dogs. The agency considers prairie dog burrows, the prairie dogs themselves, and other animals – from coyotes to birds – that are attracted to prairie dog towns to be hazards. As a result of FAA's no-prairie-dog edict, prairie dogs have been killed at airports in Albuquerque (NM), Santa Fe (NM), Flagstaff (AZ), Telluride (CO), Longmont (CO), and likely many other locations. In one instance in August 2010, a large, thriving Gunnison's prairie dog colony was destroyed at FAA's command at the Sunport Airport in Albuquerque, and Wildlife Services (see below, "Wildlife Services") poisoned some 14,000 burrows. This was despite the hard work for many years by prairie dog relocators Prairie Dog Pals, Prairie Ecosystems Associates, Ruby Bowman, and Christopher Boardman to regularly assist in airport management by moving prairie dogs to safe locations. The city of Longmont also worked very hard to implement non-lethal control, only to see their efforts overturned by the FAA requirements.

C- U.S. Forest Service (FS)

All four U.S. prairie dog species reside on National Forest units across the West. The Forest Service's National Grasslands in the Great Plains provide the best hope for protecting black-tailed prairie dogs due to sparse public lands in the region. The FS allows oil and gas drilling within prairie dog habitat. The FS defers to state regulations regarding prairie dog shooting in most cases. It has imposed shooting and poisoning bans in colonies on Buffalo Gap National Grassland where black-footed ferrets occur. Shooting is prohibited in Special Management Areas such as the 3.63 ferret area in Conata Basin, SD and the 3.63 ferret area in Thunder Basin National Grassland, WY, where poisoning is also prohibited. The agency is mitigating plague in key ferret recovery areas such as

Conata Basin and Thunder Basin. The Forest Service has amended land management plans to allow prairie dog poisoning on the Buffalo Gap, Fort Pierre, Grand River, Little Missouri, Oglala, Pawnee, and Thunder Basin National Grasslands. However for the first time the agency is requiring active restoration in Thunder Basin, including controlled burns to encourage prairie dog expansion, dusting colonies with insecticide to prevent plague, and relocating prairie dogs away from private lands instead of poisoning. The agency conducts regular population surveys.

D U.S. Fish and Wildlife Service (FWS)

The FWS oversees the Endangered Species Act. It is responsible for preventing wildlife extinctions and has management authority over federally listed species (currently only the Utah prairie dog, listed as threatened, and the Mexican prairie dog, listed as endangered. The FWS has no control over species management outside the U.S.). The FWS gets an F in policies this year for a variety of failures in legal protection of prairie dog species. In June, it found listing of the white-tailed prairie dog "not warranted." In September, a court struck down its 2007 decision not to upgrade the Utah prairie dog from threatened to endangered (see below: "Utah prairie dog"). The FWS got slammed again in September; a federal court in Arizona ruled that the Interior Secretary violated the law when he found only those Gunnison's prairie dogs located in montane habitat warranted ESA listing and those in lower-elevation prairie habitat did not (see below: "Gunnison's prairie dog"). On a positive note, in August FWS released a draft revised recovery plan for the Utah prairie dog. FWS improved its plan by recognizing that habitat enhancements and translocation are not sufficient for recovery. The plan also proposes to conserve complexes on non-Federal land and maintain connectivity between populations. However, the occupied acreage goals are actually less than the current acreage of Utah prairie dogs. The plan also defends a shooting rule that allows trapping or shooting of up to 6,000 Utah prairie dogs annually – nearly half the existing population. The draft plan is a step forward but cannot raise the FWS's "conserve" grade until it is improved, finalized, and enforceable.

B U.S. National Park Service (NPS)

The NPS manages mostly small colonies at National Parks, Monuments, and other NPS lands. There are at least 21 NPS units with prairie dogs; in 2008 the total NPS area occupied by prairie dogs was estimated at 14,576 acres (Licht et al. 2009). Three NPS units currently have over 1,000 acres occupied by prairie dogs: Badlands, Theodore Roosevelt, and Wind Cave, all in black-tailed prairie dog range. Dinosaur National Monument had over 1,000 acres of white-tailed prairie dogs, but suffered a plague event in 2008. It has not yet recovered significant acreage of prairie dogs. Four NPS units have completed management plans, and four units have plans in preparation.

Conflict between the National Parks' policy of managing for native wildlife, versus the need to be seen as a "good neighbor," has led NPS to poison prairie dogs at Badlands and

Wind Cave. As part of this management, lethal control (through rodenticide or shooting by park staff) is allowed at Wind Cave if the area occupied by prairie dogs exceeds 3,000 acres. However, products with chlorophacinone as the active ingredient (Rozol and others) are no longer used by the NPS for prairie dog control, due to the hazard of secondary poisoning. At several parks, managers may control prairie dogs by either non-lethal or lethal means when prairie dogs are a risk to public health, or causing damage to structures or facilities. The NPS attempts to monitor its land units for prairie dog colony changes and plague events. The agency tries to prevent plague risk by dusting with insecticide to kill fleas at several locations. The NPS celebrated Utah Prairie Dog Day at Bryce Canyon National Park for the first time in 2010, raising their "conserve" grade (Associated Press 2010).

F U.S.D.A. Wildlife Services (WS)

A branch of the U.S.D.A. charged with "wildlife damage management," WS gets an F for 2009.[3] In total, the agency killed more than four million animals in 2009 while spending $121,039,763. In 2009, WS shot 1,694 white-tailed prairie dogs; shot 387 Gunnison's prairie dogs and fumigated 625 burrows with an aluminum phosphide fumigant; shot or killed with aluminum phosphide 10,617 black-tailed prairie dogs and fumigated 13,252 burrows with an aluminum phosphide fumigant. WS did not relocate any prairie dogs, and (aside from two instances where the agency "dispersed" prairie dogs, an action which is not clearly defined) did not undertake any non-lethal management to mitigate the destruction of prairie dogs (WS 2009).

Prairie dog carcasses. In the 1920s, the Biological Survey, precursor to Wildlife Services, poisoned thousands of prairie dogs. Photo: U.S. Biological Survey

B Arizona *(Black-tailed and Gunnison's prairie dogs)*

Black-tailed and Gunnison's prairie dogs are both designated "species of greatest conservation need" by the Arizona Game and Fish Department (AZGFD). Arizona once had approximately 650,000 acres of black-tailed prairie dogs, but they were extirpated by

[3] Wildlife Services releases information on their operations one year behind, so their grade lags by one year as well.

poisoning campaigns in the 1900s. In 2008, the AZGFD reintroduced the species to areas in Las Cienegas National Conservation Area (one site on BLM land). AZGFD released 181 prairie dogs during 2008 and 2009 and continued this positive work in 2010, releasing 119 more black-tailed prairie dogs into a new area in Las Cienegas (AZGFD 2010). On the reintroduction sites, the state, in cooperation with the BLM, has made habitat improvements, taken measures to prevent plague, and prohibited shooting. The state's goal is to have 7,100 acres of black-tailed prairie dogs.

For Gunnison's prairie dogs, the state's goal is to recover 75% of the area occupied in the early 1900s before major poisoning campaigns began. Arizona once had approximately 6,635,280 acres of Gunnison's prairie dogs. The state mapped 108,353 acres of Gunnison's prairie dogs (excluding tribal land – this number is a minimum count)(Underwood 2007). Shooting Gunnison's prairie dogs is allowed with the exception of a spring closure during the breeding season from April 1 – June 15. The state does not limit poisoning of Gunnison's prairie dogs. The state monitors both species for plague and treated the black-footed ferret reintroduction site on the Espee Ranch to reduce the impacts of plague.

C- Colorado *(Black-tailed, Gunnison's, and white-tailed prairie dogs)*

Colorado once had between 3,000,000 – 7,000,000 acres of black-tailed prairie dogs. The Colorado Division of Wildlife (CDOW) reported that the state had 788,657 occupied acres of black-tailed prairie dogs in 2006 (Odell et al. 2008). Colorado's three prairie dog species are all designated as "small game." Under the state's Comprehensive Wildlife Conservation Strategy, all prairie dog species are listed as "species of greatest conservation need." The Colorado Department of Agriculture designates prairie dogs as "destructive rodent pests." The CDOW issued its final *Gunnison's and White-tailed Prairie Dog Conservation Strategy* in July 2010. CDOW puts significant effort and resources into monitoring areas occupied by prairie dogs and assisting other states with surveys and planning. CDOW estimates positive or negative changes in occupancy for Gunnison's and white-tailed prairie dogs (Seglund and Schnurr 2010). However, its estimates of occupied acreage of black-tailed prairie dogs are controversial. CDOW's implementation of the aerial survey method has been criticized by scientists concerned that it may overestimate acreage. The CDOW has not cooperated with outside entities in addressing criticisms of their monitoring method. The aerial survey method used for black-tailed prairie dogs is unable to locate 1,000-acre or 5,000-acre focal areas for more intensive management, a stated objective in the *Multi-State Conservation Plan for the Black-tailed Prairie Dog*. The CDOW instituted a *Conservation Plan for Grassland Species* in 2003 that includes provisions for conserving black-tailed prairie dogs and associated species. Because Colorado's black-tailed prairie dog estimate exceeds CDOW's acreage objective, the agency is not undertaking active conservation measures under the *Grasslands Conservation Plan*. The state's unique relocation law, SB 99-111, requires anyone wishing to relocate prairie dogs across county lines to obtain the approval of both the wildlife

commission and the county. This law continues to inhibit relocation of prairie dogs from areas slated for development into other areas, including public lands. The law also inhibits the potential formation of larger-scale reserves of receiving sites with significant conservation potential. However, the state holds two conservation easements intended in part to protect Gunnison's and black-tailed prairie dogs. Colorado has a spring seasonal shooting closure on public lands from the end of February until June 15 for all three species. Colorado had an opportunity to ban recreational shooting of prairie dogs in 2008, but the Colorado Wildlife Commission unanimously voted down the proposed ban, failing to address the animal cruelty issues involved and failing to consider even a public lands shooting restriction.[4] The CDOW conducts a variety of prairie dog education programs targeted to landowners and K-12 students.

D Kansas *(Black-tailed prairie dogs)*

Kansas historically had 2,000,000 – 7,503,000 acres of prairie dogs. Kansas' most recent prairie dog survey from 2008 found 148,000 acres of prairie dogs. The black-tailed prairie dog is listed as a species of "greatest conservation need" in Kansas' Comprehensive Wildlife Conservation Strategy, which provides some management guidance but no regulated protection. The Kansas Department of Wildlife and Parks (KDWP) classifies black-tailed prairie dogs as a "wildlife" species and has a prairie dog conservation plan. KDWP's goal is to maintain 130,000 occupied acres of prairie dogs and increase the number to 150,000 acres by 2012 if incentive programs are developed (KSPDWG 2002). The KDWP signed onto a letter to the Environmental Protection Agency, written by the Western Association of Fish and Wildlife Agencies, to suspend the use of Rozol and Kaput-D until further evaluations could be conducted. However, the KDWP does not have authority over the use of the toxicants, and poisons are widely used in the state to exterminate prairie dogs. State laws give poisoning control to counties. Kansas Statute 80-1202, passed in 1901, allows counties to poison prairie dogs on private land without the owner's permission and at their expense. Logan County, KS, has been trying to use this statute to force the extermination of prairie dogs on the Haverfield/Barnhardt/Blank Complex, a ranch property where landowners have been working with Audubon of Kansas to conserve the largest complex of black-tailed prairie dogs in Kansas and reintroduce black-footed ferrets. In September 2010, a judge denied the county's suit to poison prairie dogs on the properties, saying the county would violate the Endangered Species Act (Stumpe 2010). Kansas maintains no limit or seasonal closure for prairie dog shooting. Both residents and non-residents need a license to shoot prairie dogs. The KDWP monitors about 2,000 acres to detect plague but does not take actions to prevent or mitigate disease outbreaks. Kansas offers Landowner Incentive Program grants paying up to 75% of the cost for projects that benefit species of greatest conservation need, including black-tailed prairie dogs. Kansas gets an F in "poison" and "policies" for trying to

[4] "A Petition for Rulemaking pursuant to COLO. REV. STAT. 24-4-103 to Ban Shooting of Live Animals as Targets," available at http://wildlife.state.co.us/NR/rdonlyres/A1DEB481-3E53-4EDA-AAE7-6ED7A1870825/0/CitizenPetitionNoLiveTargetsMarch08.pdf

mandate the poisoning of one of the only prairie dog colonies in the state large enough to support black-footed ferrets. However, the KDWP supported the September relocation of 189 imperiled prairie dogs into a private conservation area in southern Kansas. We hope this may lead to raising their "conserve" grade in the future.

D Montana *(Black-tailed and white-tailed prairie dogs)*

Montana once had 1,471,000 – 10,667,000 acres of black-tailed prairie dogs. The state's 2008 survey found 193,239 acres of occupied colonies and 30,199 acres of inactive colonies (Estimation of Active and Inactive Black-Tailed Prairie Dog (*Cynomys ludovicianus*) Colony Area in Montana, in prep). Montana is at the northern edge of white-tailed prairie dog distribution. Current known estimates of occupied acreage range from 118 acres (Knowles 2004) to 366 acres (Atkinson and Atkinson 2005) in 11 colonies. White-tailed prairie dog colonies in Montana have not been rigorously mapped since 2005, yet at least 8 of the 11 colonies remain active. One of the 8 colonies was re-established through translocation efforts. In 2010, bad weather caused efforts to relocate white-tailed prairie dogs from Wyoming to fail. The Environmental Assessment that allowed these relocations recently expired. Montana Department of Fish, Wildlife, and Parks (MFWP) has no imminent plan to relocate white-tailed prairie dogs. MFWP co-funded an additional statewide survey effort to estimate occupied acreage for both species in 2010. Final results are pending. Survey and monitoring findings are being included in modeling efforts and conservation planning efforts such as the Crucial Areas Planning System.[5]

Montana's Comprehensive Wildlife Conservation Strategy lists both species as high priority "species of concern," but this provides no conservation mandate. MFWP also has a prairie dog conservation plan and classifies both species as "species of concern." However, Montana's Department of Agriculture has more authority over prairie dog management than MFWP. The Department of Agriculture designates both black- and white-tailed prairie dogs "vertebrate pests." The state conservation plan applies in situations outside of Department of Agriculture authority and is being implemented when and where possible to conserve and manage habitat and populations. MFWP and non-government organizations are trying to identify ways to conserve prairie dogs. Montana once prohibited WTPD shooting, but the protective regulation has lapsed. Shooting of both species is currently unlimited and a license is not required (FWS 2010). Shooting is prohibited, however, within some National Wildlife Refuges (e.g., Charles M. Russell National Wildlife Refuge). Prairie dog poisoning is unregulated, except in black-footed ferret recovery areas or if the area to be treated exceeds 80 acres in size (Nistler 2009). MFWP is exploring other options to gain management authority over prairie dogs that would allow some regulation of poisoning and/or shooting. The state does not monitor or mitigate for plague. The state holds some conservation easements on private property to

[5] More information at http://fwp.mt.gov/wildthings/conservationInAction/crucialAreas.html.

protect a variety of wildlife species but does not quantify the program's results or prairie dog acres protected.

F **Nebraska** ***(Black-tailed prairie dogs)***

Nebraska once had 6,000,000 – 9,021,000 acres of black-tailed prairie dogs. The state estimated it had 136,862 prairie dogs in 2003. In 2002 the Nebraska Game and Parks Board of Commissioners ordered the state's Game and Parks Department to stop all prairie dog conservation activities, including development of a conservation plan and monitoring (Johnsgard 2005). The ban on research was later rescinded but the state so far has done little to conserve prairie dogs. Nebraska has no limits on shooting prairie dogs, except that non-residents need a license. The state's wildlife agency initially rejected a proposal to reintroduce prairie dogs to 40 acres of a private nature sanctuary (Duggan 2010). But in a heartening development, after further negotiations the agency decided to allow the reintroduction (Duggan 2011). We hope to see further actions of this sort and maybe even a raise in Nebraska's grade next year.

D- **New Mexico** ***(Black-tailed and Gunnison's prairie dogs)***

Historically, between 6,640,000 and 8,950,000 acres were occupied by prairie dogs in New Mexico. A 2004 survey of black-tailed prairie dogs estimated that there were approximately 40,000 occupied acres in the state. No reliable estimates of the Gunnison's prairie dog population in New Mexico are available. Both prairie dog species are listed as "species of greatest conservation need" in New Mexico's Comprehensive Wildlife Conservation Strategy. The state released a draft conservation plan for the Gunnison's prairie dog in 2008, but it has not yet been finalized. Shooting is banned on state trust lands but is otherwise unrestricted. The state does not monitor or mitigate for plague. The state has an incentive program for landowners to protect prairie dogs, but no landowners have enrolled.

F **North Dakota** ***(Black-tailed prairie dogs)***

Prairie dogs once inhabited an area of about 2,000,000 acres in North Dakota. Based on the state's last survey in 2006, prairie dog occupied acreage has decreased to 22,597 acres. The state's Comprehensive Wildlife Conservation Strategy lists the black-tailed prairie dog as a "species of concern." The state's prairie dog management plan lists maintaining a viable population in the state as its goal – this number may fall well below the amount needed to sustain prairie dog-dependent species (Williams 2002). The North Dakota Department of Agriculture designates prairie dogs as a "pest species." Poisoning is legal on private lands and illegal on public lands, although it does occur there (Hagen et al. 2005). Except for requiring non-residents to obtain a license, North Dakota has no

limits on prairie dog shooting. The North Dakota Game and Fish Department provides a map of prairie dog town locations to hunters on their website.

C+ **Oklahoma** ***(Black-tailed prairie dogs)***

Oklahoma once had ~950,000 acres of optimal potential prairie dog habitat. The most current estimate of occupied acreage is 42,000, with declines from the 2006 estimate due to plague outbreaks in the panhandle. Oklahoma is adopting a new survey methodology using state-wide aerial photos. The Oklahoma Department of Wildlife Conservation (ODWC) classifies prairie dogs as wildlife-nongame and they are listed as "species of concern" in the state's Comprehensive Wildlife Conservation Strategy. The state does not issue poisoning permits to private landowners in counties that have less than 1,000 prairie dogs or 100 occupied acres. Landowners with 10 or more occupied acres can enroll in a Landowner Incentive Program and receive an annual incentive payment for the occupied acres. They can also receive incentive payments for preserving native rangeland adjacent to the prairie dog colony for expansion. Thirty-five landowners and over 16,000 acres are enrolled in the program. These conservation agreements have a term of 10 years. Oklahoma is the only state that requires a permit for any prairie dog poisoning on private lands and prohibits killing of prairie dogs with explosives. A license is required, but shooting is unlimited on most lands, although the Department could implement a season. Shooting prairie dogs is prohibited on Wildlife Management areas owned or managed by the ODWC, but most of the prairie dog acreage in Oklahoma is on private lands. The state monitors but does not mitigate for plague.

D- **South Dakota** ***(Black-tailed prairie dogs)***

Between 1,757,000 – 6,411,000 acres of prairie dogs once existed in South Dakota. The South Dakota Game, Fish and Parks Department (SDGFP) estimated that it had 630,849 acres in its 2008 survey. South Dakota classifies the black-tailed prairie dog as a "pest" species. The SDGFP underwrites poisoning costs on private and state lands. South Dakota's Agriculture Department sells prairie dog poison to landowners. The South Dakota Supreme Court recently ruled that the state is obligated to control prairie dogs that migrate from public to private land, and landowners may be eligible for monetary recovery of damages (Cook 2010). The ruling is harmful to prairie dog conservation prospects, but since SDGFP fought the ruling we did not downgrade the state. There is a spring shooting closure on public lands, but representatives recently introduced House Bill 1047, which if enacted would end the shooting closure.[6] An incentive program pays $18 an acre to landowners who agree to not poison or shoot prairie dogs within black-footed ferret recovery areas, and $10 in other areas. South Dakota does some plague monitoring but no mitigation.

[6] Follow the bill at http://legis.state.sd.us/sessions/2011/Bill.aspx?Bill=1047.

D+ Texas *(Black-tailed prairie dogs)*

At one time, Texas had 16,703,000 – 57,600,000 acres of black-tailed prairie dogs. The Texas Parks and Wildlife Department estimated 115,000 acres in its 2006 survey. As part of its long-term commitment to monitoring prairie dogs, the state began a survey of priority areas identified in the Texas Black-tailed Prairie Dog Management Plan in 2010 and plans to complete it in the spring of 2011. The Texas Parks and Wildlife Department designated the black-tailed prairie dogs a nongame and priority "species of concern." Texas' management plan calls for a goal of 293,129 acres of occupied habitat by 2011 (TXPDWG 2004). Two landowners are enrolled in an incentive program that protects almost 3,600 acres of prairie dogs and their habitat. Texas allows unlimited prairie dog shooting with a license. The state also allows live-collecting of less than 25 without a permit; capture and holding of more than 25 with a non-game permit; and capture and selling with a non-game commercial dealer's permit. According to state records, commercial nongame permit holders collected 918 and sold 1,938 prairie dogs from August 1, 2009 through July 31, 2010. The state also maintains a voluntary prairie dog colony monitoring program meant to promote conservation. The state agriculture department distributes poison but requests are decreasing. The state monitors but does not generally mitigate for plague. The state has formed a Texas Black-footed Ferret Working Group to assess the feasibility of reintroducing black-footed ferrets.

C- Utah *(Gunnison's, Utah, and white-tailed prairie dogs)*

In 2010, the Utah Division of Wildlife Resources (UDWR) reported a spring count of 5,648 adult Utah prairie dogs during its annual trend count.[7] The U.S. Fish and Wildlife Service has authority over Utah prairie dog recovery efforts, because the species is federally listed as threatened. The Service delegates most field work to the state. The UDWR has relocated Utah prairie dogs from private lands and the Cedar Ridge Municipal Golf Course to federal public lands. Relocation has had only mixed success, resulting in very low survival rates of 10% or less (see below, "Utah prairie dog"). However, the state has made some improvements in its relocation methods in the last few years. A committee headed by the governor's office is considering ways to speed the removal of the Utah prairie dog from the Threatened list. One of the committee's main goals is removal of protections in Iron County where prairie dogs are threatened by development. The group is pushing for genetic testing of the Utah prairie dog, claiming that they may be the same as the white-tailed prairie dog (Loomis 2010), a claim not supported by science. Gunnison's and white-tailed prairie dogs are considered "species of concern" under the Utah Wildlife Action Plan. Utah bans shooting of Gunnison's and white-tailed prairie

[7] The Utah Division of Wildlife Resources doubles this count to provide an adult population estimate; the count is designed for estimating population trends.

dogs on public lands during breeding season, April 1 – June 15. Shooting of white-tailed prairie dogs is not permitted in the Coyote Basin black-footed ferret recovery area.

Utah adopted a *Gunnison's Prairie Dog and White-tailed Prairie Dog Conservation Plan* in 2007. In accordance with the plan, the state has undertaken state-wide occupancy surveys for both species as part of a range-wide modeling effort. The state surveyed for white-tailed prairie dogs in 2008 and for Gunnison's prairie dogs in 2007 and 2010. The study shows a decline in Gunnison's prairie dogs, but as these occupancy estimates were designed to be part of a range-wide model, there is a large amount of variation in the estimates of occupancy in Utah alone and the significance of changes in occupancy is difficult to determine. The range-wide model is still in progress.

D Wyoming *(Black-tailed and white-tailed prairie dogs)*

The *Multi-state Conservation Plan for Black-tailed Prairie Dogs* estimates that Wyoming has around 22,000,000 acres of potential black-tailed prairie dog habitat (Luce 2003). The Wyoming Game and Fish Department surveyed its black-tailed prairie dog populations in 2006 and estimated 229,607 occupied acres (Grenier et al. 2007). The department surveyed again in 2009, but the sample size selected was too small to account for the variance. Therefore the usefulness of this survey for monitoring population trends is questionable (Grenier 2010). The state wildlife department estimated that Wyoming had 27,822,847 acres of potential white-tailed prairie dog habitat. The department conducted a statewide white-tailed prairie dog aerial survey in 2008 and estimated 2,893,487 colony acres (plus or minus 520,890 acres)(Grenier and Filipi 2009). Both white- and black-tailed prairie dogs are designated as a "non-game species of special concern" by Wyoming's wildlife agency and a "pest" by the agriculture department. The state establishes private land conservation easements to protect a variety of species. One conservation easement protects white-tailed prairie dogs. Through the Landowner Incentive Program, the state has enrolled four landowners to protect 487 acres of black-tailed prairie dogs around Thunder Basin National Grassland (Krueger 2009). Wyoming has no limits on shooting. The state does not monitor or mitigate for plague. Wyoming law puts prairie dog poisoning in county hands. This year, Wyoming approved prairie dog relocation into Thunder Basin National Grassland.

Status of the Five Prairie Dog Species

Prairie dogs are not receiving the policy safeguards they deserve. Despite the dramatic decline of prairie dogs within the last 150 years and the ensuing imperilment of species that depend on them, many government agencies in charge of wildlife conservation refuse to take this crisis seriously. Part of the problem is a lack of standardized monitoring methods across states; some state wildlife agencies continue to use methods that may overestimate the area occupied by prairie dogs, or which cannot sufficiently detect when and to what extent prairie dog populations are in decline. Hopefully, the planned release of *Recommended Methods for Range-wide Monitoring of Prairie Dogs in the United States,* an in-progress report by the U.S. Geological Survey, will help standardize survey methods across states, prevent biased estimates, and inspire better conservation planning.

Black-tailed prairie dog

Black-tailed prairie dog. Photo: Rich Reading

The black-tailed prairie dog remains in peril. Poisoning and shooting continue unabated since the species was last denied listing in 2009. Rozol is still used to poison black-tailed prairie dogs across their range despite the inhumane deaths it causes, its clear dangers to other wildlife, and ongoing litigation to stop its use. Plague continues to decimate colonies – prairie dogs have little or no immunity to this disease, which was introduced to North America in the late 1800s. The black-tailed prairie dog population once numbered in the billions and ranged across 11 U.S. states and portions of Mexico and Canada. Plowing up native grasslands for agriculture, particularly in the eastern portions of the species' range, has resulted in the permanent loss of approximately 40% of their original habitat. The animals have been eliminated from up to 99% of their historic range in the last 150 years.

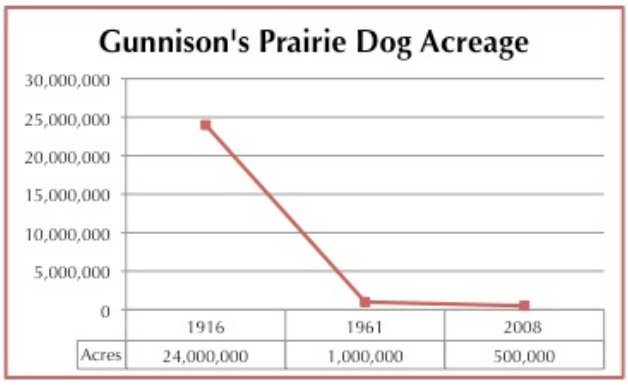
Gunnison's prairie dog

Gunnison's prairie dogs won a battle in court this year that may get them one step closer to protection across their whole range under the Endangered Species Act. In 2008, the Fish and Wildlife Service determined that "montane" populations of the species in southwestern Colorado and south-central and north-central New Mexico warrant federal listing. The Service deemed that lower elevation "prairie" populations in Arizona, Utah, and portions of Colorado and New Mexico did not deserve federal protection. In March 2009, WildEarth Guardians sued the Fish and Wildlife Service, arguing that the entire Gunnison's prairie dog population in its original range in Arizona, Colorado, New

Gunnison's prairie dog. Photo: Jess Alford

Mexico, and Utah should be granted federal protection. This year, a federal court in Arizona ruled that the FWS violated the Endangered Species Act by splitting the Gunnison's population into arbitrary segments. Though the ESA allows for subspecies or distinct population segments to be listed separately, the FWS did not use either of those criteria to divide the population. U.S. District Court Judge Frederick J. Martone wrote, "While there may be ways to treat prairie dogs in the prairie differently than prairie dogs in the mountains under the [ESA], altering Congress's definition of endangered and threatened species is not one of them." The court ordered FWS to revisit the finding, but Secretary of the Interior Ken Salazar is appealing the decision.

The Gunnison's prairie dog population has declined by 98-99% across its historic range; occupied area declined from ~24,000,000 acres in 1916 to 500,000 acres or less in 2008. Land development and oil and gas operations are particular threats; FWS predicts that urban and suburban sprawl and commercial development will impact 49% of Colorado's Gunnison's prairie dog habitat by 2020. The greatest threat to the Gunnison's prairie dog is still plague, which can cause 100% mortality of a colony. The impacts of plague, combined with the effects of continued shooting, poisoning, and habitat loss, means that Gunnison's prairie dogs continue to decline as they await full-scale protections.



Mexican prairie dog *(by Dr. Nicole J. Rosmarino)*

In January 2010, Mexican scientists and conservationists discovered extensive ongoing damage to the largest remaining prairie dog colony in Coahuila, Mexico. Altogether, over 300 acres of the colony was plowed. While the Mexican federal government agency, Procuradaría Federal de Protección al Ambiente, stopped the activity within two days, this agency later declined to prosecute the extensive harm that had already occurred, rejecting a complaint filed by scientist Dr. Francisco Valdés Perezgasga.

The biggest threat to Mexican prairie dogs is loss of habitat to potato farming for the junk food industry. The primary buyer of the potatoes is U.S.-based Frito Lay, Inc., a subsidiary of PepsiCo, Inc. Concerned Mexicans are urging U.S. citizens to contact PepsiCo and ask

Mexican prairie dog. Photo: Rurik List

the company to stop buying potatoes from farms within Mexican prairie dog habitat.[8]

The Mexican government outlawed killing Mexican prairie dogs in 2004. The species is protected under the U.S. Endangered Species Act as Endangered. Agriculture in the state of Nuevo León remains the biggest threat to Mexican prairie dogs. Conservation organizations, including Pronatura Noreste and Profauna, and Mexican and U.S. scientists are working to protect the animals and their habitat.

Only 2% of the species' population still exists. Colonies have shrunk and disappeared. Mexican prairie dogs in the southeastern-most areas of Coahuila State and northern-most areas of San Luis Potosí State had been experiencing some population stability from 2006-2009. With the degradation of the largest colony in Coahuila, this species' future is less secure than ever.

Utah prairie dog

Utah prairie dog. Photo: Jess Alford

Utah prairie dogs are listed as threatened under the Endangered Species Act. Despite this listing, Utah prairie dogs still face considerable threats including habitat loss, plague, and livestock grazing. The Utah prairie dog population has declined from ~100,000 to ~11,000 adults. This year, FWS released its draft revised recovery plan for the Utah prairie dog, after significant delays. FWS improved its plan by recognizing that habitat enhancements and translocation are not sufficient for recovery. The plan also proposes to conserve complexes on non-Federal land and maintain connectivity between populations. However, the occupied acreage goals are actually less than the current acreage of Utah prairie dogs. The plan also defends a shooting rule that allows trapping or shooting of up to 6,000 Utah prairie dogs annually – nearly half the existing population. In 2007, the agency acknowledged that the special rule is biologically indefensible but has yet to withdraw or revise it.

[8]Visit http://perritomexicano.blogspot.com/ to read more and take action.

Relocation remains part of the recovery plan, but so far relocation has had only mixed success, resulting in very low survival rates of 10% or less. For example, the 2009 census at the Berry Springs relocation site counted 90 prairie dogs, versus the 1,535 that had been moved to the site in the previous three years. Ironically, the relocation was done to mitigate the destruction of one of the largest UPD colonies in existence – the Cedar Ridge Golf Course. The FWS has been trying to improve its success by moving family groups together and using nest boxes inside artificially constructed burrows. But for this imperiled species, relocation should only be used in limited circumstances and as a last resort.

In 2009, the Fish and Wildlife Service finalized a Programmatic Safe Harbor Agreement that pertains to all Utah prairie dogs on private lands—about 70% of the entire population. Private landowners can choose to enter into an agreement with a non-governmental entity called the Panoramaland Resource Conservation and Development Council, Inc. Enrolled landowners agree to carry out some conservation measures for Utah prairie dogs in exchange for protection against prosecution if the landowner unintentionally kills prairie dogs or destroys prairie dog habitat while undertaking land use activities, such as farming. As of 2010, five individual Utah prairie dog Safe Harbor Agreements are in place covering approximately 1,230 acres (FWS 2009).

In 2003, WildEarth Guardians and other conservation groups and individuals submitted a petition to reclassify Utah prairie dogs from threatened to endangered in collaboration with other groups and individuals. In 2007, the Fish and Wildlife Service refused to upgrade the species, and we challenged that decision with a lawsuit. This year, Utah prairie dogs won a victory when the court ruled that FWS did not adequately explain why an 87% reduction in range was not a sufficient reason to upgrade protections. They were ordered to revisit the finding, and to take cumulative effects of threats into account. Interior Secretary Ken Salazar is also appealing this decision.

White-tailed prairie dog

It was a disappointing year for the white-tailed prairie dog. They were deemed "not warranted" for listing under the Endangered Species Act. This is despite the fact that since the late 1800s, the species' range has declined an estimated 92 – 98% (CNE et al. 2002).

White-tailed prairie dog. Photo: Rich Reading

White-tailed prairie dogs are found in Utah, Colorado, Wyoming, and a small area of southern

Montana. The majority (56%) of white-tailed prairie dog habitat is on BLM land. A high percentage of the species' range is leased by BLM for oil and gas drilling: about 50% of occupied areas that have been mapped in Utah, 30% of predicted range in Colorado, and 27% of the gross range in Wyoming (gross range indicates the boundaries of the species range, not the area of range occupied or suitable)(FWS 2010). Though Areas of Critical Environmental Concern have been proposed to protect white-tailed prairie dog colonies, none have been implemented.

Listing of the white-tailed prairie dog would have mitigated the threats it faces from oil and gas development, habitat fragmentation, poisoning, and shooting. Failure to list removes a strong incentive for states to recover and protect the species.

Prairie Dog Communication

The calls of prairie dogs are one of their most noticeable features. Their yips, which sounded like distant dogs barking to early Europeans, are probably the source of their name. Those calls are also their best defense. Communication is one of the prairie dog's most important survival tactics. Prairie dog alarm calls alert other prairie dogs to approaching predators and allow them to rapidly take cover. Recent research has revealed that the warning call is far more complex than previously thought (Slobodchikoff et al. 2009).

A black-tailed prairie dog stands at alert.
Photo: Rich Reading

If a predator approaches a colony of Gunnison's prairie dogs, the first prairie dog to detect the threat will sound the alarm. But the type of alarm, and the reaction of the other prairie dogs, differs depending on the threat. If a ferruginous hawk comes swooping out of the sky, the caller will give one short bark and dive into its hole, followed rapidly by the other animals in the hawk's flight path. The other prairie dogs, at a safer distance, will stand on their hind legs and keep an eye on the hawk. But in contrast, when a coyote comes in sight, multiple prairie dogs will begin to call, and all the animals will run to the edge of their burrows and stand upright, watching the coyote. Animals that were underground will come to the surface to keep an eye on it. They have unique calls for badgers, humans, skunks, and domestic dogs as well.

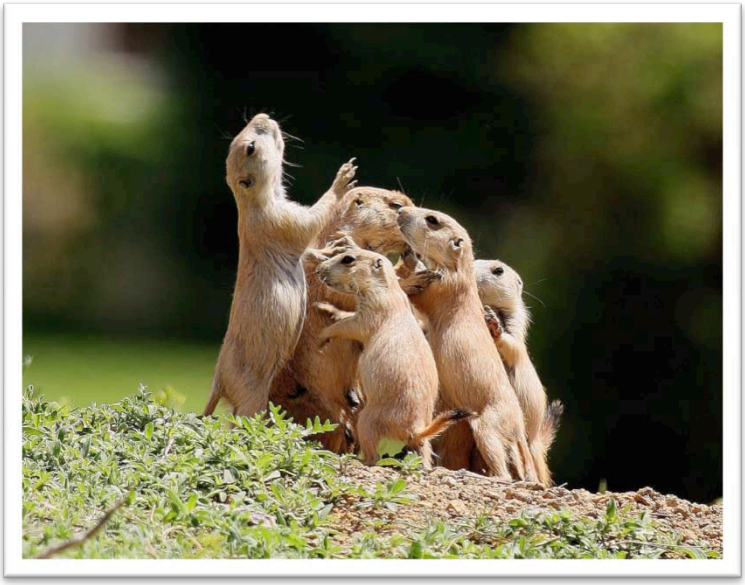
Even more remarkable, it seems that prairie dogs can distinguish between individuals of the same species by size and color. A human wearing a green shirt will elicit a call for "human," with elements that differ significantly from the call for the same human in a blue shirt. They appear to remember and react to different levels of threat from different individuals. For example, in one experiment, black-tailed prairie dogs reacted with more alarm to one individual when they saw him after he fired a shotgun, and included a new element in their call for "human" that apparently referred to the gun (Frederiksen and Slobodchikoff 2007).

Prairie dogs also have the ability to create new "words," as was demonstrated by an experiment on a colony of Gunnison's prairie dogs. A skunk silhouette elicited one sort of call, and a coyote silhouette another. What was more surprising was their response to an

oval silhouette. The prairie dogs had never seen such a thing before, but they all let out the same kind of call in response to the appearance of the oval. Either they created a new word for it that was passed among the colony, or they combined existing elements in their communications to describe it in a consistent way (Slobodchikoff et al. 2009, 74).

Why would prairie dogs evolve such a complex set of warning calls, enabling them to distinguish among individual predators? One theory is that it is a response to different hunting styles between predators. Since the colony is always in the same place, the same predators may return time and time again. If you were a prairie dog deciding whether or not to emerge from your burrow after a coyote appearance, it would be important to know whether this coyote was the one who rushes at prairie dogs in the open, or the one who lies in wait at the mouth of a burrow for prairie dogs to emerge (Id. 76).

As for why prairie dogs have evolved the warning system in the first place; they were early adopters of the principle of "sticking together." Being part of a large group of alert prairie dogs likely means that each individual has extra time to concentrate on gathering food, defending territory, and the other business of running a colony (Id. 28). There is a high level of relatedness among all prairie dogs in a colony – any two prairie dogs in a colony, even if they live in separate territories, may be as closely related as a pair of human siblings (Id. 48). From an evolutionary perspective, genes that encourage protecting close relatives tend to get passed on – for prairie dogs, "relatives" is a pretty inclusive term.



Black-tailed prairie dogs starting a jump-yip. Photo: Sandy Nervig

Gunnison's prairie dog communications have been the most intensively studied, but the other species of prairie dog have similar communications system. Black-tailed prairie dogs have been shown to distinguish between types of predators and between different humans in much the same way that Gunnison's do. They also have a vocalization not found in the other species – the jump-yip. The prairie dog giving the jump-yip stands on its hind legs, reaches to the sky with its front legs, throws its head back, and gives out a single yip. Once one prairie dog starts, the jump-yip may travel through the colony like a wave. The meaning of the jump-yip is not yet clear, though different types of jump-yip have been associated with different types and sizes of snake. Depending on the context, it could also be a territorial advertisement, a warning signal, or

an "all-clear" signal (Id. 78). With further analysis, scientists may be able to decode the different varieties of jump-yip.

Interestingly, prairie dogs seem to have regional dialects—essentially their own version of Southern vs. Brooklyn accents. There are slightly different acoustic features in alarm calls for specific predators in different colonies, and the differences increase with distance (Id. 78). Though recognizably the same in basic structure, one call might sound like "Hey youse," and the other like "Hey y'all."

Warning calls are the easiest vocalizations to study and decode, as they occur in response to specific events that human observers can easily see. But prairie dogs also appear to have more casual social vocalizations, during which one animal will chatter and another will respond. It is difficult to assign any meaning to these chatters, as many of them are not associated with specific behaviors, but superficially they are surprisingly similar in structure to human conversations. They also have several varieties of non-vocal communication, including tail-flagging, odor cues, and "kissing." The greet-kiss can occur between any two individuals in a colony, and is pretty much what it sounds like – the animals greet each other by opening their mouths and pressing their tongues together. They may do this to exchange information about food, to recognize individuals (which would be useful in dark burrows), or perhaps to maintain dominance hierarchies; the function of the greet-kiss is not yet understood (Id. 57). Perhaps it is simply a social nicety, like humans kissing each other on the cheek.

Utah prairie dogs greet-kissing. Photo: National Park Service

Is the complex system of communication among prairie dogs a language? According to certain criteria, it almost certainly is. The definition of language is difficult to pin down, but prairie dog communication has all the criteria for language that matter to linguists. In 1960, Charles Hockett proposed a series of criteria for language; prairie dog communication meets all of them (C. Slobodchikoff, pers. comm.). Prairie dog "words" are made up of acoustic elements similar to phonemes, elements that in human language have no intrinsic meaning but can be combined into meaningful words (Slobodchikoff and Placer 2006). Prairie dogs create new signals in response to new objects and situations. Prairie dogs appear to transmit language through learning (C. Slobodchikoff, pers. comm.).

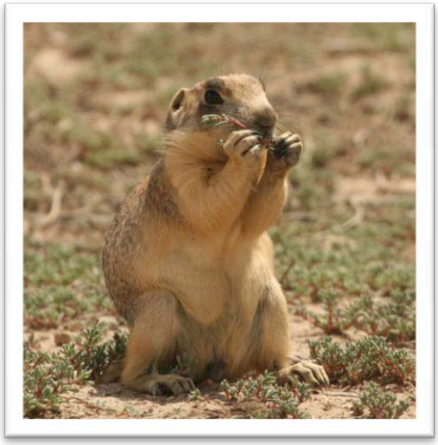
The Animal Language Institute notes three defining characteristics of human language:

- A rule-governed grammar that is known and shared by all speakers of a language

- The intention by speakers to communicate and transfer meaningful information
- The use of language as a tool to manipulate one's own environment and affect the behavior of others

Prairie dog alarm calls are made up of acoustic elements combined in consistent ways to transmit information about what's happening around them. Prairie dogs use communication to affect the behavior of others – different alarm calls elicit different behaviors. Prairie dogs giving the alarm calls intend to communicate meaningful information to other prairie dogs about what to expect from an approaching predator. Prairie dog communication does as much for prairie dogs, in its own way, as human language does for us.

People who work with prairie dogs have no problem saying they have distinct personalities, from the big, calm one who relaxes in the cage like he's on vacation, to the feisty female who throws hay at anyone who tries to take her out of the holding pen. Prairie dog pups use their time in individual ways, suggesting distinct personalities (Slobodchikoff et al. 2009, 60). Some prairie dogs are brave, and some are timid. And, like many human groups, prairie dog colonies often have a worrywart – one nervous animal that alarm calls constantly. The other animals generally ignore them (Id. 63).



White-tailed prairie dog. Photo: Rich Reading

Seeing prairie dogs as language-using individuals may require us to rethink some of our assumptions about our relationship with other animals. We continue to draw boundary lines, claiming a certain attribute that makes us human – tool using, language, altruism. But as we learn more about the natural world, those lines continue to shift and blur. Apes and crows have been known to use tools – even a mollusk, the intelligent octopus, has been seen carrying a half-coconut shell around to use as a shelter (Kaplan 2009). African gray parrots can grasp the concept of zero (Pepperberg and Gordon 2005). Gorillas can learn sign language. Chimpanzees hunt with spears (Roach 2007). Dolphins and whales have complex songs. Elephants stay in touch when 2-4 kilometers apart with low-frequency rumbles (Langbauer 2000). During their ancient mating ritual, lesser prairie-chicken males emit a "boom" which can travel for miles. Even as humans take up more and more of the globe's resources, we are learning that the line between us and the animals with whom we share the world is not so clear-cut. We may say that altruism is one of the things that separate us from the beasts, yet we so rarely extend it beyond our own species. As we learn more about the inner lives of animals, our morality may expand to make more room for their needs and wants. Perhaps knowing that prairie dogs have a language can change our relationship to them from dominion to compassion before it is too late.

Prairie Dog Heroes

Loving What You Study: Scientists Who Safeguard Their Subjects

The three individuals we are honoring in this year's report have a lot in common: they have each broadened our scientific understanding of prairie dogs, they've worked together to do so, and they've also advocated – through their writing and in-person – for better policies for the prairie dog ecosystem. Each of them has also invested their personal time and energy in protecting prairie dog colonies on private lands they own or manage. Yes, they are prairie dog super-heroes, going above and beyond to safeguard these keystone creatures.

Rich Reading, Ph.D. Rich's studies of the prairie dog ecosystem span more than two decades, beginning in 1988 with his assessment of a potential reintroduction site for black-footed ferrets in Montana. That work evolved into his doctoral dissertation at Yale University. The ferret site became among the first to host the return of this endangered carnivore to the wild. Rich bridges the gap between the natural and social sciences, collecting rigorous information to inform and improve prairie dog ecosystem conservation. Rich's ecological work focuses on prairie dog colony characteristics, understanding and documenting how prairie dogs influence the biodiversity of the grasslands they inhabit, and developing better monitoring techniques for black-tailed prairie dogs. His social science research (including studies conducted with his wife, Dr. Lauren McCain) seeks to understand the values and attitudes people hold toward prairie dogs, factors that influence those values and attitudes, and policy issues associated with prairie dog conservation efforts. Rich has published extensively about prairie dogs and members of the prairie dog ecosystem, including a book he co-authored with Dr. Brian Miller and Steve Forrest (*Prairie Night*), and over 25 scientific articles and book chapters on prairie dog ecosystem members, particularly the black-footed ferret. Rich has visited hundreds of prairie dog colonies of all species (except Mexican prairie dogs) and has protected prairie dogs on private land he owns in Colorado.

Lauren McCain and Rich Reading. Photo: Glyn Maude

Lauren McCain, Ph.D. When it comes to prairie dog protection, Lauren wears many hats. Over the past 15 years, she has pressed for prairie dog management reform at all levels of government, taking on the four horsemen of the prairie dog apocalypse: bulldozers, poisons, guns, and plague. Just a glimpse shows her challenging prairie dog poisoning on public lands, including the Buffalo Gap, Pawnee, and Thunder Basin National Grasslands; successfully

protesting prairie dog shooting contests in Colorado; writing detailed scientific petitions and comments underscoring the need for federal safeguards for black-tailed prairie dogs, Gunnison's prairie dogs, Utah prairie dogs, mountain plovers, black-footed ferrets, and other members of the prairie dog ecosystem; and promoting local prairie dog safeguards in Boulder, Louisville, and Lafayette, by attending public hearings and providing technical comments on open space plans. Her skill as a policy analyst, combined with her firm but always reasonable manner, has resulted in thousands of prairie dog lives saved. Lauren has also collaborated with her husband, Dr. Rich Reading, and other Denver Zoo colleagues in scientific studies of prairie dog attitudes and knowledge among key players: public land managers and government wildlife agency employees. The results of these studies have been published in several book chapters and articles. While still a graduate student and driven by her passion for on-the-ground refuges for wildlife, Lauren helped to found the Southern Plains Land Trust, which acquires and safeguards private lands to benefit prairie dogs and other prairie wildlife.

Brian Miller, Ph.D. From the high plains of Wyoming to desert grasslands in Chihuahua, Brian has been a force for prairie dog ecosystem conservation since the 1980s. Brian's doctoral work at the University of Wyoming and post-doctoral work at the Smithsonian (National Zoo) centered on behavioral ecology and conservation of black-footed ferrets. His research resulted in techniques still used for all ferrets raised for the ferret reintroduction program, for which he received an Outstanding Service Award from the U.S. Fish and Wildlife Service. Brian has had long stints at the National University of Mexico (UNAM) and the Denver Zoo. During his time at UNAM, he helped establish a protected area in northern Chihuahua, on the largest remaining black-tailed prairie dog complex in North America. At the Denver Zoo, Brian collaborated with Dr. Rich Reading on a variety of mammal studies, including members of the prairie dog ecosystem. As mentioned above, Rich and Brian collaborated on the book *Prairie Night*. Brian has written approximately 20 articles on prairie dogs, many with Rich. He has been an expert witness in several court proceedings aimed at curtailing prairie dog poisoning. His main research interest concerns the role of highly interactive species in regulating ecosystem processes, and how to improve protection for those species when designing reserves. Brian now manages the Wind River Ranch, to which he has restored Gunnison's prairie dogs (whisked away from urban dangers) and bison. He has also established ranch projects that restore grasslands, wetlands, and the Mora River. About 700 school-children visit annually to learn about these endeavors.

Dr. Brian Miller with his wife, Carina, and their two girls. Photo: Chris Wemmer

By Dr. Nicole J. Rosmarino

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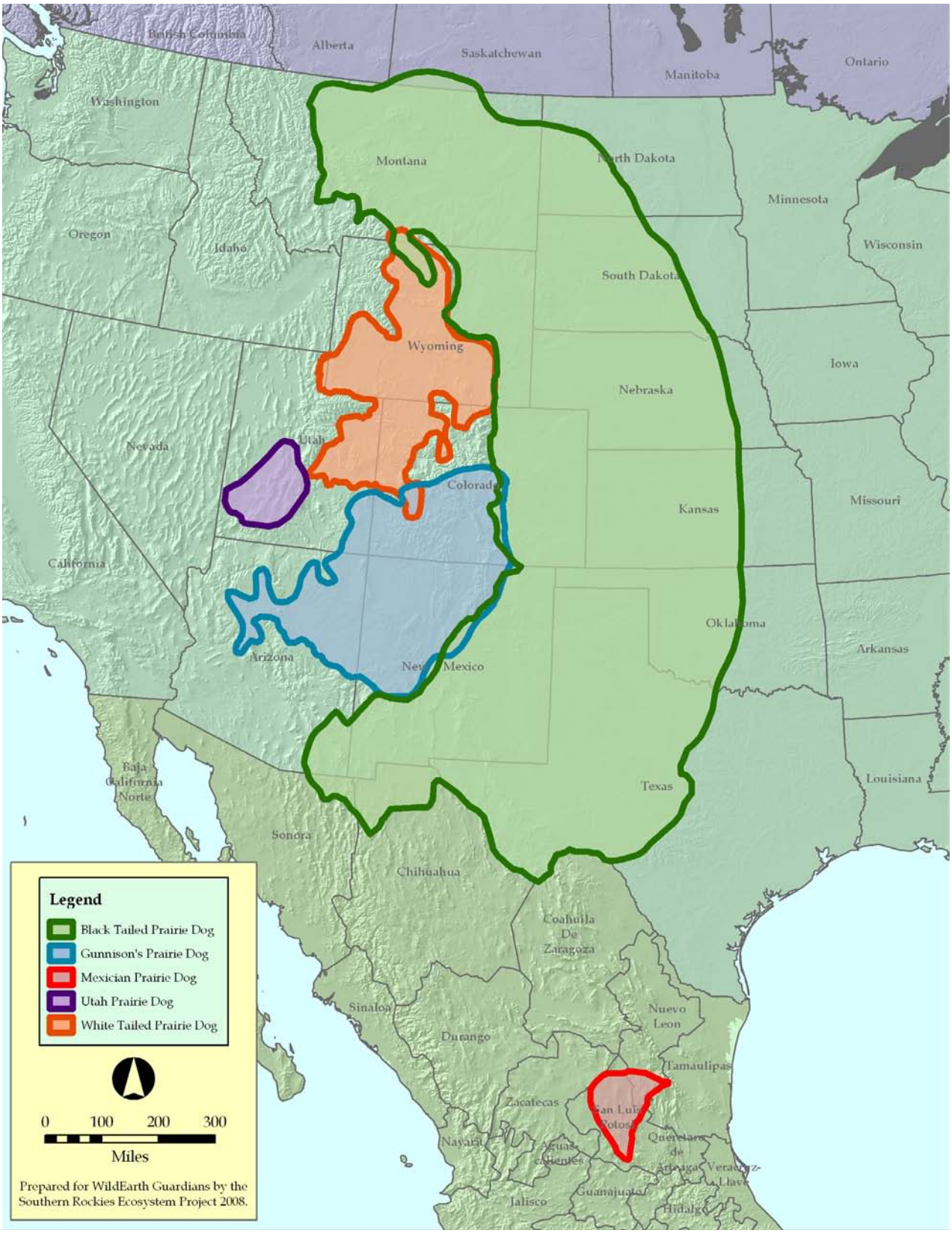
Prairie Dog Range Map



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