CONSERVATION PLAN FOR BLACK-TAILED AND WHITE-TAILED PRAIRIE DOGS IN MONTANA

MONTANA PRAIRIE DOG WORKING GROUP
JANUARY 2002

The Conservation Plan for Black-tailed and White-tailed Prairie Dogs in Montana is approved:

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ACKNOWLEDGMENTS

Montana Fish, Wildlife & Parks (FWP) sincerely appreciates the time and effort that members of the Montana Prairie Dog Working Group (MPDWG) devoted to developing this document. The goal, objectives, and strategies outlined in this plan were developed by the MPDWG during October 1999 and March 2000 work sessions.

Participants in a Prairie Dog Planning Workshop held on October 15, 1999 in Lewistown, Montana, provided comment on a June 1999 draft of this document. Public comment on a November 24, 1999 draft of this plan was received during December 1999 and January 2000. An editorial committee composed of Dennis Flath, John Grensten, Steve Pilcher, Terry Lonner and Heidi Youmans incorporated input from members of the MPDWG and the public in a June 6, 2000 draft and subsequent drafts.

Most of the text appearing in the appendix was prepared by Craig Knowles of FaunaWest Wildlife Consultants, under contract to FWP. The text draws heavily on Craig's intimate knowledge of prairie dog ecology and issues surrounding management of these controversial species.

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PREFACE

This conservation plan is a result of the efforts of the Montana Prairie Dog Working Group (MPDWG). It should not be construed, however, to represent the policies and positions of all member individuals and groups. The MPDWG provides advice to resource managers and is composed of agency and Tribal representatives, and private interests concerned with conservation and management of prairie dogs in Montana. The MPDWG is a forum where these entities are collaborating to achieve appropriate prairie dog conservation while viable prairie dog populations still remain.

Work toward a prairie dog conservation plan was initiated in 1988 with publication of the Montana Prairie Dog Management Guidelines (Montana Black- footed Ferret Working Group, 1988). Since that time it has become apparent that a complex issue such as prairie dog management requires more definitive attention. The MPDWG was organized in 1996 and began working toward a statewide plan in 1998. A 1998 petition to list the black-tailed prairie dog as "threatened" under the Endangered Species Act of 1973, as amended (ESA) induced the Working Group to accelerate its efforts to complete a conservation plan. Conservation and management strategies outlined in this plan embody the prairie dog management guidelines published by the MBFFWG in 1988.

This conservation plan is intended to be flexible enough to respond to changing conditions, either in the status of prairie dog populations, or social and economic circumstances. A standing subcommittee of the MPDWG will conduct an annual review of this plan. The public will be provided opportunity to comment on proposed changes. The annual review process will provide opportunities to make necessary adjustments to best accommodate the needs of prairie dogs and associated species, as well as the changing demands and expectations of the general public, affected stakeholders, and the agencies responsible for conservation of Montana's wildlife and rangeland resources.

INTRODUCTION

Black-tailed and white-tailed prairie dogs (*Cynomys ludovicianus* and *C. leucurus*) are native to Montana. The black-tailed prairie dog was abundant and widely distributed throughout grassland and shrub/grassland habitats east of the Continental Divide during the 1800s (Cooper 1869a, 1869b, Coues 1878, Messiter 1890, Stuart 1902, Chittenden and Richardson 1905, Cameron 1907, and Burroughs 1961). The historic range of the white-tailed prairie dog was restricted to shrub/grassland habitats of the valleys located between the Beartooth and Pryor Mountain ranges in south central Montana (Hollister 1916, Flath 1979). Both species declined in abundance during the 20th century (Flath and Clark 1986, Campbell 1989, Knowles 1999a, Flath 1979, Knowles 1999b), although it must be understood that this decline was not linear, but rather a series of increases and decreases leading to the current population level.

The first statewide inventory of prairie dog colonies in Montana was conducted during the mid-1980s and yielded an estimate of 120,000 to 130,000 acres of black-tailed prairie dogs (Campbell 1989). During 1996-1998, the majority of known prairie dog colonies (black-tailed and white-tailed) in Montana were mapped (Knowles 1998). This inventory effort was conducted by Montana Fish, Wildlife & Parks (FWP), U.S. Bureau of Indian Affairs (BIA), U.S. Fish and Wildlife Service (FWS), and U.S. Bureau of Land Management (BLM). Where current mapping data were not available, the most recent information was used to derive a minimum, statewide prairie dog acreage estimate. The only major prairie dog complex lacking recent survey information was the Crow Reservation, where the most recent mapping effort had been conducted in 1991. The 1996-98 statewide survey accounted for a minimum of 1,350 black-tailed prairie dog colonies occupying a minimum of 66,000 acres (Knowles 1998). The current 2001 black-tailed prairie dog population is estimated to occupy 90,000 acres, of which 62,000 acres are on non-Tribal lands.

Results of the 1996-98 statewide survey do not include prairie dog colonies located in areas where access for the purpose of surveying and mapping was not obtained. Likewise, they do not include results of localized survey and mapping efforts conducted since 1998. Prairie dog acreage documented subsequent to the 1996-98 statewide survey include an estimated 10,000 to 12,000 acres on the Crow Reservation (G. Kaiser, BIA, 2000, personal communication) and 146 additional acres mapped on the Custer National Forest (D. Sasse, USFS, 2000, personal communication). Locations (GPS) of 509 potential prairie dog colonies were recorded by FWP personnel during aerial antelope surveys conducted in 1998 and 1999. Prairie dog colony locations obtained during aerial surveys but not documented during the 1996-98 survey are not included in the statewide database because they have not yet been surveyed to eliminate colonies that are vacant or occupied by Richardson's ground squirrels *(Spermophilus richarsonii*), rather than black-tailed prairie dogs. Collectively, data obtained since completion of the 1996-98 statewide survey (Knowles 1998) indicate that the total number of prairie dog colonies currently documented, as well as the number of acres occupied by prairie dogs, probably underestimates the state's black-tailed prairie dog population.

Some prairie dog acreage has been lost to a recent outbreak of plague on the Ft. Belknap Reservation in 1999 and 2000, and on both Ft. Belknap and nearby BLM land in 2001, but the net effect of these events has not yet been evaluated.

Historic prairie dog declines can be attributed to intensive eradication programs (Anderson et al. 1986) and agricultural conversion of native rangelands (Lesica 1995). Recent declines are attributed to a combination of sylvatic plague (FaunaWest 1998), urbanization (Knowles and Weggenman 1998), and recreational shooting (Vosburg and Irby 1998). Although the black-tailed prairie dog is not threatened with extinction in Montana, the fact that current numbers are much less than historic numbers indicates a need to develop and implement a conservation plan.

Flath and Clark (1986) estimated that roughly 1,500,000 acres of Montana were occupied by prairie dogs during the 1907 – 1914 period. The 90% confidence interval for this estimate yields 1,506,579 $\pm$ 112,331 acres (D. Flath, FWP 2000, personal communication). Based upon the 1996-98 statewide prairie dog survey (FaunaWest 1998) and additional occupied acreage documented from 1998 to 2001, an estimated 90,000 acres of Montana are currently occupied by prairie dogs, with an estimated 62,000 acres of that occupied acreage on non-Tribal lands. Based upon the history of toxicant use and the advent of plague, prairie dog population highs are believed to have occurred in 1916, 1947 and 1988 and population lows are believed to have occurred in 1940 and 1974 (D. Flath, FWP 2000, personal communication). Population highs are assumed to have existed just prior to implementation of major poisoning programs and lows probably occurred at the point that broad scale poisoning programs had run their course. The Biological Survey Program for Predator and Rodent Control in the West was applied in Montana from 1916 to 1940; use of compound 1080 was initiated in 1948 and tapered off after 1974; and major plague outbreaks occurred in Montana after 1988.

Black-tailed prairie dogs provide unique habitat for a variety of prairie wildlife species. In Montana, four species associated with prairie dogs: black-footed ferret (*Mustela nigripes*), burrowing owl (*Athene cunicularia*), mountain plover (*Charadrius montanus*), and ferruginous hawk (*Buteo regalis*) are uncommon relative to historic populations (Allen 1874). Additional associations between prairie dogs and other wildlife and plant species are noted or documented but ecological relationships have not been fully investigated.

Besides black-tailed prairie dogs, other associated species have been considered for protection under the Endangered Species Act (ESA). The black-footed ferret, a prairie dog obligate, was listed as endangered in 1964, and continued in that status with passage of the current ESA in 1973. The ferruginous hawk was petitioned for listing in 1991 but the petition was denied by the U.S. Fish and Wildlife Service (FWS). The mountain plover was proposed for listing as threatened in 1999.

The black-tailed prairie dog, white-tailed prairie dog, mountain plover, ferruginous hawk and burrowing owl are considered "animal species of concern" by Montana FWP and the Montana

Natural Heritage Program. Rather than a legal classification, this informal designation indicates relative rarity, the existence of threats to the species, or lack of status and trend information. This status is used by FWP to prioritize research and management needs among nongame wildlife species.

The Regional Forester of the USFS is directed to identify a list of sensitive species occurring within National Forest boundaries and develop management strategies that avoid actions that may cause a species to become threatened or endangered (FSM 2670.22). The Northern Region, USFS sensitive species list includes both the black-tailed and the white-tailed prairie dog. The BLM list of special status species (BLM 6840 Manual) likewise includes both the black-tailed and the white-tailed prairie dog.

OVERVIEW OF CONSERVATION PLANNING

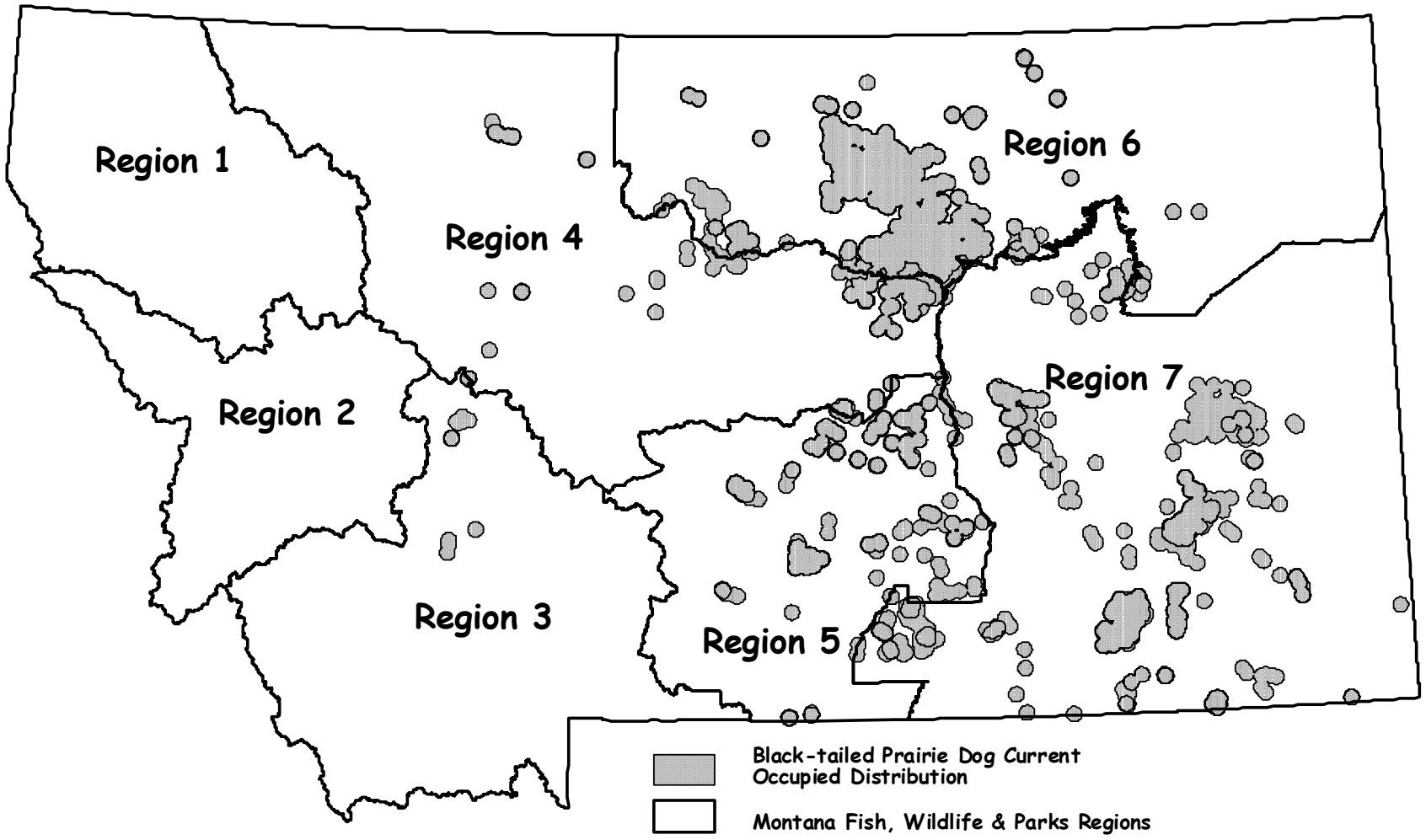
A species conservation plan enumerates conservation efforts (actions, activities, programs) designed to benefit one or more sensitive species. Such a plan is the outcome of a comprehensive assessment of a species or group of species over a large geographic area and strategies designed to promote long-term conservation of a species or group of species. Conservation planning focuses on interagency cooperation with a strong emphasis on voluntary compliance. Common components of conservation planning include scientific assessment of current conditions, science-based parameters for species conservation/recovery, identification of management strategies that result in desired outcomes, and commitment to tasks by responsible entities. Conservation planning should assist in conserving or enhancing a declining species, help avoid the need to list a species under the federal ESA, preserve management flexibility, and involve all affected interests in reviewing, commenting on and participating in plan elements.

In the case of a species proposed for listing under the ESA, the conservation plan will be evaluated by the FWS based upon: 1) the certainty that the stated actions will be implemented; and, 2) the certainty that the conservation effort will be effective. The conservation efforts outlined in the plan must contribute to making listing of the species unnecessary.

CONSERVATION AND MANAGEMENT STRATEGIES

Black-tailed prairie dogs in Montana still maintain healthy populations distributed throughout the state (Figure 1). The current range of the black-tailed prairie dog (Figure 2) is roughly 90% of the known historic range presented by Hall (1981). Comparison of Figures 1 and 2 reveals the relationship between historic distribution and current distribution.

Substantial behavioral differences exist between black-tailed and white-tailed prairie dogs. Consequently, conservation needs of the two species are drastically different. This document focuses primarily on management strategies for the black-tailed prairie dog.



Black-tailed prairie dog current occupied distribution based on 5km buffers of Global Positioning System (GPS) locations of observed prairie dog towns. GPS data collected by state, federal and tribal wildlife biologists between 1997 and 2000. Montana Fish, Wildlife & Parks regions digitized at 1:250,000 and1:100,000 by the Information Services Unit, Montana Fish, Wildlife & Parks, Kalispell, MT.

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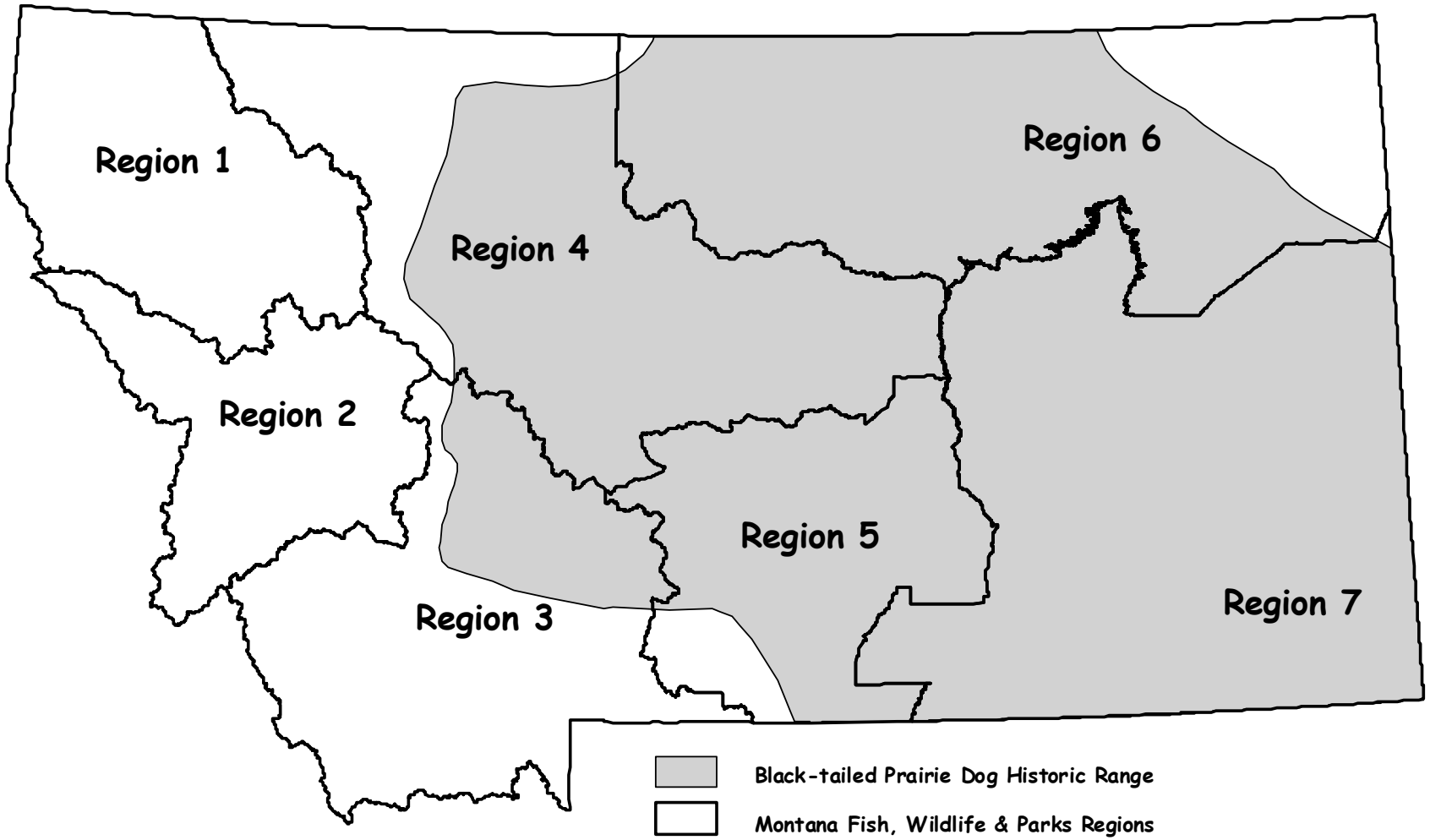
Figure 1. Statewide map of black-tailed prairie dog current occupied distribution.



Black-tailed prairie dog historic range based on Hall, E.R. 1981. Mammals of North America. Edition 2. John Wiley and Sons, NT. 2 vols., 1, 181 pp. Historic range digitized "on screen" by the Information Services Unit, Montana Fish, Wildlife & Parks, Kalispell, MT. Montana Fish, Wildlife & Parks regions digitized at 1:250,000 and1:100,000 by the Information Services Unit, Montana Fish, Wildlife & Parks, Kalispell, MT.

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Figure 2. Statewide map of black-tailed prairie dog historic range.

Resource managers do not have a means to control plague outbreaks, landowner tolerance of prairie dogs on private lands, or how landowners choose to manage prairie dogs on their lands. The following recommendations are presented with recognition that those factors are currently beyond the control of state and federal resource managers. Therefore, the goal and objectives outlined in this plan can only be met in the absence of catastrophic plague events.

*The **GOAL** of this conservation plan for the state of Montana is to provide for management of prairie dog populations and habitats to ensure long-term viability of prairie dogs and associated species. Five objectives are deemed necessary to achieve this goal.*

OBJECTIVE #1

Confer legal status on prairie dogs that is consistent with policy provisions of Sections 87-5-102 and 103, MCA, and current management needs.

Prairie dogs are native to Montana and a significant component of short-grass and mixed-grass prairie communities. The legal classification of black-tailed and white-tailed prairie dogs should be consistent among agencies of state government and reflect the ecological values of these species. FWP statute 87-5-103 declares that it is state policy to ensure perpetuation of nongame wildlife as "members of ecosystems."

Montana statutes classify both prairie dog species as nongame species under FWP statute (87-5-102, MCA) and as vertebrate pests under Montana Department of Agriculture (MDA) statute (80-7-1101, MCA). The black-tailed prairie dog is also classified as a rodent for purposes of rodent control districts (7-22-2207(6), MCA). Multiple legal classifications presents the potential for conflicting management actions among agencies of state government. Montana Department of Agriculture believes that MDA statutes confer an advisory role in prairie dog management rather than actual management authority. The MDA provides advice to landowners who inquire about methods to control prairie dogs but does not advocate or conduct prairie dog control. Under provisions of the statutory rodent and vertebrate pest classifications, the Montana Department of Natural Resources and Conservation (DNRC) can require lessees of state school trust lands to control prairie dogs. However, this management option has not been exercised since the mid-1990s (K. Chappell, DNRC, 2000 personal communication).

STRATEGY A

Establish authority for conservation of prairie dogs as "nongame wildlife in need of management" (87-5-101 through 87-5-122, MCA) while simultaneously maintaining existing authority to control prairie dogs as pests (7-22-2207(6) and 80-7-1101, MCA), within the context of this plan.

HB 492 passed by the 2001 session of the Montana Legislature, established authority for FWP to designate prairie dogs as "nongame wildlife in need of management" and establish management regulations under those statutes. HB 492 provides for control of prairie dogs by counties, Montana Department of Agriculture and the Department of Natural Resources and Conservation on state school trust lands so long as management and control are consistent with this plan as approved by the above departments. HB 492 affirms the ability of landowners to control prairie dogs on private lands.

Management regulations for prairie dogs will be jointly established by Fish, Wildlife & Parks, and the Fish, Wildlife & Parks Commission and subject to public review in the same manner as annual rules are established for other species. Regulations pertaining to prairie dog shooting will be evaluated on an annual basis.

STRATEGY B

Designate black-tailed and white-tailed prairie dogs as "nongame wildlife in need of management" and establish necessary management regulations under provisions of 87-5-101 through 87-5-122 and 87-1-301(1)(a), MCA.

Management issues to be considered include timing and length of the period that shooting can take place, area closures, shooting permits and removal of prairie dogs from the wild for relocation, processing for ferret food and commercial use. Montana Department of Agriculture will continue to provide technical advice to landowners who need to contain the size of prairie dog colonies.

Proposed timeline: FWP proposes notice of rule-making process under Administrative Rules of Montana (ARM) to declare prairie dogs "nongame wildlife in need of management" by 8/25/01; FWP and the FWP Commission jointly declare prairie dogs to be nongame wildlife in need of management by 11/15/01; FWP and the FWP Commission adopt a seasonal shooting closure regulation by 11/15/01.

OBJECTIVE #2

Develop statewide and regional prairie dog distribution and abundance standards.

Statewide and regional prairie dog management objectives are measurable, incorporate abundance and distribution parameters required for long-term conservation of the species, recognize abundance and distribution requirements of other species associated with prairie dogs, and address threats posed by disease. In addition, management objectives recognize that the ecological value of an individual prairie dog colony for prairie dogs, as well as associated species, is affected by variables such as size and distance to the nearest neighboring colony. Prairie dog management objectives must also be sensitive to a multitude of social, economic and political issues.

Statewide targets for distribution and abundance of prairie dogs identified in this plan do not include prairie dog acreage on Tribal lands. Tribal governments in Montana have treaty rights to manage wildlife within Reservation borders, and Governor Judy Martz has reissued the state's proclamation to uphold a government-to-government relationship with the state's Indian tribes. This is consistent with former Secretary of the Interior Bruce Babbitt's Secretarial Order #3206. In the spirit of these administrative initiatives, the state will work to establish memoranda of understanding (MOUs) with the Tribes to achieve a coordinated approach to prairie dog management on lands under the different jurisdictions. Until such agreements are reached, targets established in this plan will only represent prairie dog colonies on non-Tribal lands. Once such agreements are reached, prairie dogs occupying Tribal lands will be added to Montana's objectives for occupied prairie dog acres. The goals presented in this plan are expressed as the base, non-Tribal acreage, with an estimate of total acreage and distribution once agreement with Tribal authorities provides the opportunity to blend the goals for the different jurisdictions.

STRATEGY A

Statewide Prairie Dog Abundance and Distribution Standards: Achieve a mix of prairie dog colonies and complexes (groups of colonies) capable of accommodating black-footed ferret recovery, supporting viable, well-distributed populations of other wildlife species associated with prairie dogs, and capable of sustaining a viable population of black-tailed prairie dogs distributed over 90% of the historic range of the species.

Based upon the most recent prairie dog inventory for Montana, Tribal lands (Fort Belknap, Crow and Northern Cheyenne Reservations) support 28% of the prairie dog acreage within the state. This acreage constitutes a potential Tribal contribution to Montana's prairie dog management objectives. However, until agreements with Tribes to coordinate prairie dog management efforts are complete, Tribal contributions to potential prairie dog habitat and occupied acreage will not be considered. Once the appropriate agreements are consummated, Tribally-managed prairie dog colonies will be incorporated into the statewide objectives.

The statewide prairie dog population goal provides for conservation of prairie dogs and of associated species according to three categories of prairie dog colonies, as determined by applying the "7K rule" for distance to nearest neighbor (in kilometers) adopted by the Interstate Black-tailed Prairie Dog Conservation Team:

Category 1: A minimum of two black-tailed prairie dog complexes sufficient to maintain viable populations of black-footed ferrets. These should be at least 100 kilometers apart, with each encompassing at least 5,000 acres of prairie dogs, but may range up to 12,000 acres, since complexes of this size have occurred in Montana in the recent past. Standards for these complexes will follow the "7K rule" adopted by the Interstate Black-tailed Prairie Dog Conservation Team. Acreage occupied by prairie dogs in category 1 is anticipated to total 10,000 to 24,000 acres.

Category 2: A total of 36,000 acres occupied by black-tailed prairie dogs, composed of at least 20 complexes of at least 1,000 acres, or more. These complexes would be defined using the "7K rule." As an example, this category could be represented by 20 complexes of 1800 acres in size or by 36 complexes of 1000 acres in size. Many combinations of complex sizes could be incorporated here, so long as the minimums are met.

Category 3: Complexes less than 1000 acres in size, as defined by the "7K rule," plus scattered, isolated colonies of any acreage. A major function of black-tailed prairie dog colonies in this category is to ensure continued distribution over 90% of the historical range of the species in Montana, and to accommodate distributional needs of associated species. The total acreage in this category is unknown but anticipated to be about 44,000 acres.

Currently, Montana's black-tailed prairie dog population is distributed over 90% of the historic range of the species. Achievement of the statewide abundance standard would result in an anticipated minimum of 90,000 to 104,000 acres occupied by black-tailed prairie dogs. It is estimated that this abundance standard would increase to 125,000 to 145,000 acres with the inclusion of prairie dog acreage on Tribal lands. A total of 125,000 acres is equivalent to the estimated 1988 population level and 145,000 acres approximates nearly 10% of Montana's estimated prairie dog population in 1908-14. The prairie dog population level reached in 1988 represented landowner tolerance for prairie dog abundance. It is, therefore, reasonable to assume that attainment of a statewide prairie dog population level exceeding that experienced in 1988, may be predicated upon the existence of a landowner incentive program.

The total number of acres occupied by prairie dogs will vary between years, according to an array of environmental factors. Therefore, acreage estimates must be corroborated with survey data.

STRATEGY B

Regional Prairie Dog Abundance and Distribution Standards.

An effort is currently underway to compile historic and current prairie dog data, by FWP administrative region. Regional goals and objectives will be developed at the local level by people most familiar with local prairie dog populations. Within each FWP administrative region where prairie dog populations exist, FWP staff will work collaboratively with stakeholders to develop management goals and identify opportunities within the context of the statewide prairie dog conservation goal. The MPDWG will provide assistance with this process.

Regional management goals will consider:

- Ecological factors, including soil, vegetation characteristics and topography
- Land ownership pattern and prevailing land uses
- Social and economic impacts to landowners, individually and collectively
- Existing as well as potential size of complexes

- Prairie dog-associated species, existing and potential populations
- Relative ecological values of the individual prairie dog colonies and complexes
- Relation of individual complexes to other prairie dog complexes
- Prioritization of complexes according to values for associated species, existing and potential
- Other

In order to facilitate regional goal-setting, formation of local working groups, modeled after the Phillips County Prairie Ecosystem Action Council (formerly the Phillips County Black-footed Ferret Working Group), will be encouraged.

Responsibility for this effort rests with FWP. Pending new funding and/or redirection of staff time and operations funds, draft goals will be developed in collaboration with all affected stakeholders by December 2002, and finalized by June 2003.

STRATEGY C

Inventory and monitor prairie dog distribution and abundance

The purpose of inventorying and monitoring prairie dog distribution and abundance is to measure progress toward the goal and identify needed management actions. Statewide baseline information for both black-tailed and white-tailed prairie dogs, including significant black-tailed prairie dog complexes, has been summarized (FaunaWest 1998). For the most part, the number of colonies, acreage, and trend in occupied habitat is known for each major black-tailed prairie dog complex that currently exists. Other factors for which baseline data exists include land ownership patterns, and, for most complexes, occurrence of associated species.

A standing subcommittee of the MPDWG has been established and charged with developing a systematic approach to monitoring distribution and abundance of Montana's black-tailed prairie dog population. The prairie dog monitoring system should be designed to have the following capabilities:

- Ability to yield statistically valid results
- An inventory component
- A procedure for ground-truthing point data (including point data from aerial surveys)
- Sensitivity to changes in prairie dog distribution and abundance.
- Ability to detect and monitor effects of plague and other epizootic diseases
- Incorporation of occurrence data for associated species
- Cost-effective to implement

A component of MOUs between state and Tribal governments will specify monitoring frequencies, monitoring techniques and assigned monitoring responsibilities to ensure that data obtained by various jurisdictions are compatible.

The Montana Prairie Dog Working Group has worked with personnel of Montana's Natural Resource Information System (NRIS) and the Natural Heritage Program (NHP) to establish standards for collection and management of prairie dog data.

The total occupied-acreage (area occupied by active burrows) of a prairie dog colony is determined by ground-based mapping. Presently, the standard for mapping prairie dog colonies is use of a Global Positioning System (GPS) to record known points to serve as a basis for calculating occupied area. Outlining prairie dog colonies on aerial photos, or 1:24,000 USGS topographic maps based on field inspections, is useful but less accurate.

Point data recorded during aerial surveys is a first step in documenting new individual prairie dog colonies and monitoring statewide prairie dog distribution and total occupied acres. Ground-truthing of point data includes verification of species occupying the site (prairie dogs versus ground squirrels) and occupancy (presently occupied or vacant).

The subcommittee will develop draft monitoring protocol for review by the MPDWG by September 2001. The draft will be finalized by the MPDWG by February 2002.

Figure 3 displays known distribution of black-tailed prairie dog colonies in Montana with the ten largest prairie dog complexes identified. Table 1 lists the ten largest documented black-tailed prairie dog complexes in Montana, in order of occupied acreage.

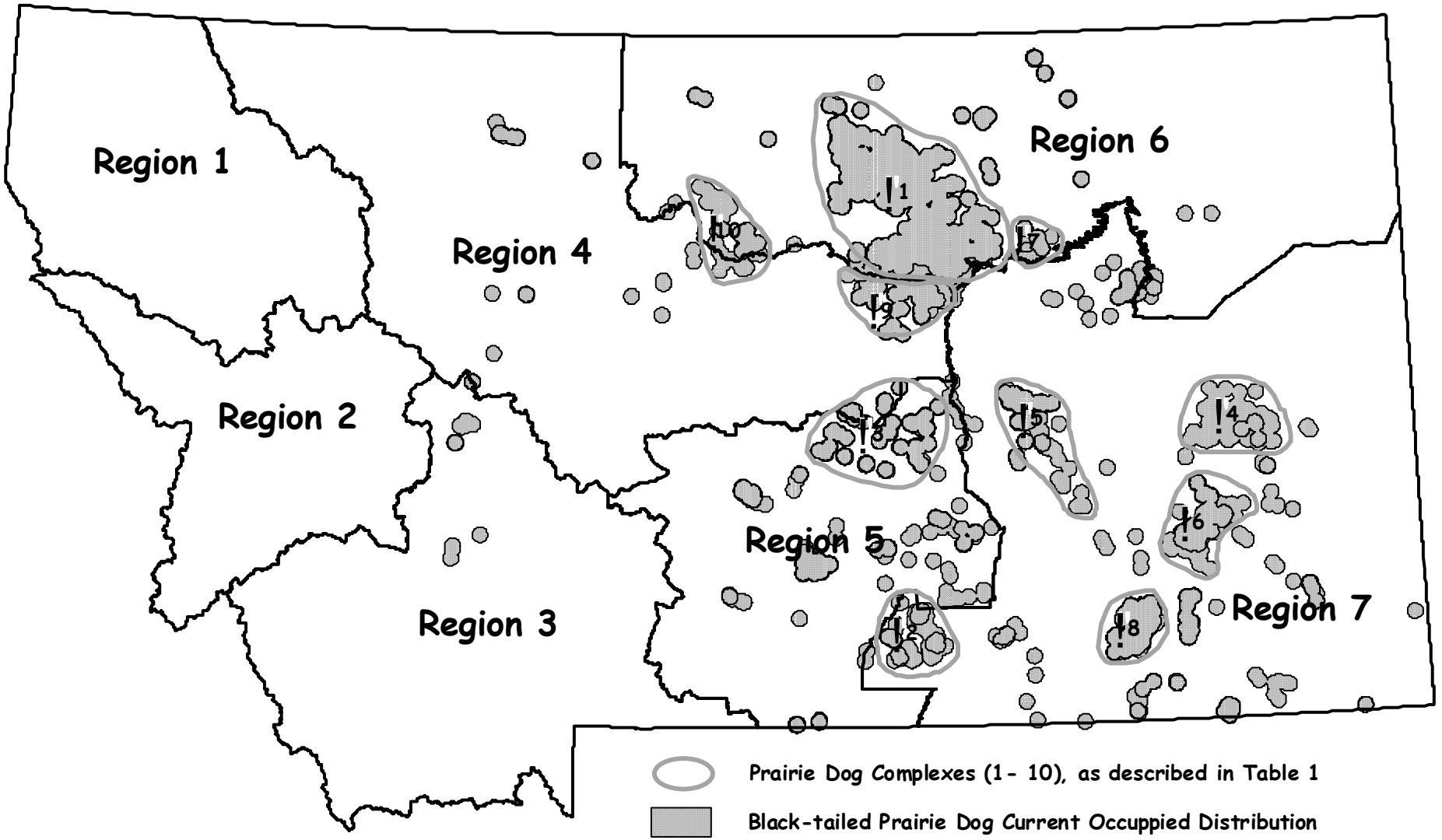
OBJECTIVE #3
Develop management protocol for prairie dog conservation on federal, state and private lands.

STRATEGY A

Modify existing programs and develop new programs that compensate private landowners and DNRC for having prairie dogs on their lands.

Programs with potential to provide incentives include:

- Monetary incentives, including CRP-type programs, under the Farm Bill
- Conservation Easements
- Leases
- Private landowners are exempted from shooting regulations adopted by FWP and the FWP Commission, to encourage prairie dog shooters to go to private lands, rather than public lands
- Revenue generated from prairie dog shooting (license fees, outfitting)
- Umbrella State Candidate Conservation Agreements with Assurances (CCAAs) with letters of inclusion for individual landowners.
- Safe Harbor Agreements
- Habitat Conservation Plans (HCPs)
- Other programs and new, innovative approaches



Prairie dog complexes digitized on screen by the Information Services Unit, Montana Fish, Wildlife & Parks, Kalispell, MT. Black-tailed prairie dog current occupied distribution based on 5km buffers of Global Positioning System (GPS) locations of observed prairie dog towns. GPS data collected by state, federal and tribal wildlife biologists between 1997 and 2000. Montana Fish, Wildlife & Parks regions digitized at 1:250,000 and 1:100,000 by the Information Services Unit, Montana Fish, Wildlife & Parks, Kalispell, MT.

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Montana Fish, Wildlife & Parks

Figure 3. Statewide map of black-tailed prairie dog current occupied distribution, with the ten largest prairie dog complexes identified (refer to Table 1).

Table 1. The ten largest documented prairie dog complexes in Montana in 2000 (based on 7K distance to nearest neighbor).

Size Rank	Location	Land Ownership	1990s Acreage	Associated Species[1]
1	Phillips & Blaine Co.	BLM, FWS, State, Tribal, Private	29,200[2]	bff, buow, mopl, feha
2	Crow Reservation	Tribal	10,000-12,000[3]	feha, buow
3	Upper Mussel-shell	Private some BLM some FWS	6,598	feha, buow, mopl
4	Custer Crk. Prairie Co.	Private, BLM	6,000	feha, buow
5	Ingomar	Private, some BLM	2,886	mopl, buow, feha
6	Lower Tongue River	BLM, Private	2,331	(unknown)
7	Valley Co.	BLM, Private	1,458	buow, feha
8	Upper Tongue River	Tribal, FS	1,172[4]+	buow (few) feha (few)
9	Fergus & Petroleum Co.	BLM, FWS	959	buow, mopl
10	Big Sandy	Private, State some BLM	582	buow, feha

[1] bff=black-footed ferret; buow=burrowing owl; mopl=mountain plover; feha=ferruginous hawk

[2] *29,200 ac in 2000 comprised of 11,000 BLM, state and private (J. Grensten, BLM 2000, personal communication); 3700 CMR (R. Matchett, CMR 1999, personal communication); and 14,500 on Ft Belknap (T. Vosburgh, Fort Belknap 1999, personal communication).*

[3] *A portion of the Crow Reservation was mapped in 1999. The Crow Reservation supports an estimated 10,000 – 12,000 acres of prairie dogs (G. Kaiser, BIA 2000, personal communication).*

[4] *Includes 776 acres (237 private, 539 FS) mapped in 1999 (D. Sasse, USFS 2000, personal communication)*

Results of the 1998 statewide survey (Knowles 1998), indicate that 37% of the black-tailed

prairie dog colonies in Montana, including 3 of the 10 largest prairie dog complexes, encompass private lands and therefore would benefit from conservation easements.

Three Indian Reservations have black-tailed prairie dogs within and adjacent to Tribal boundaries. The Fort Belknap Reservation (Gros-Ventre and Assiniboine Tribes) manages 16,000 acres of prairie dogs. The Fort Belknap prairie dog management program provides for managed prairie dog shooting, reintroduction of the black-footed ferret and food (processed prairie dogs) for the captive ferret breeding program. A portion of prairie dog acreage on the Fort Belknap Reservation was impacted by plague in 1999, 2000 and 2001. In the early 1990s, the Northern Cheyenne Reservation had 10,000 acres of prairie dogs. Following plague, occupied acres dropped to 700 but had increased to about 2000 acres by 2000. These Tribes are participants in the InterTribal Prairie Ecosystem Restoration Consortium. A goal of this group is to establish a Tribal conservation plan for prairie dogs. The Crow Reservation has between 10,000 and 12,000 acres of prairie dogs. Although the Crow Tribe has not participated in the InterTribal Prairie Ecosystem Restoration Consortium, it is a likely participant.

Implementation of incentive programs will necessitate development of prioritization criteria to be applied by FWP regional staff.

STRATEGY B

Management Actions

Specific management actions to enhance prairie dog populations may include:

- Increase grazing intensity in localized areas, which may require water development, fencing, or increased stocking rate.
- Manipulate distribution of grazing pressure through strategic placement of salt and water, or water development.
- Controlled burning or other vegetation manipulation to increase potential for prairie dog establishment or colony expansion.
- No action, allowing prairie dogs to expand naturally.
- Management of prairie dog shooting to prevent reduction of prairie dog density (seasonal shooting closures); evaluation of the effects of shooting on prairie dogs and associated species; establish criteria for total shooting closures in response to reductions in colony size/density; and accomplish recovery of threatened and endangered species based on presence or absence of plague within a county.
- Relocation of prairie dogs to suitable sites where prairie dog colonies have been lost to plague, toxicants or other causes, or where population densities are very low (<5/acre). In order to facilitate relocation in a timely manner, replace the current case-by-case review and approval process with a programmatic relocation protocol.

Landowner tolerance for the presence of prairie dogs is predicated upon the ability to control/contain the size of prairie dog colonies on private lands. Prairie dog control may also

become necessary to alter distribution of prairie dogs within the bounds of landowner tolerance or to reduce disease potential. At some sites, expansion of prairie dog colonies may conflict with habitat requirements of other sensitive wildlife species (e.g., sagebrush habitat that serves as an important sage grouse wintering area). Specific management actions that may be applied on a case-by-case basis to reduce prairie dog populations may include:

- Complete elimination of a particular prairie dog colony with use of registered toxicants or by trapping and relocation.
- Containment, short of elimination, of a prairie dog colony with registered toxicants, with no follow-up.
- Density reduction of a given prairie dog colony through a directed shooting program, liberalized shooting season, or trapping for relocation.
- Periphery control or fragmentation of large colonies (>1000 acres) or elimination of some colonies within a complex using registered toxicants.
- Habitat alteration, including chisel plowing, scarifying or planting.
- Reduced grazing pressure, which may require additional fencing, fewer AUMs, or other livestock management methods.
- Recognize the sovereignty of Tribes to establish regulations on Tribal lands.
- Exempt private lands from shooting restrictions.
- Investigate new or innovative control methodology, such as use of birth control drugs or hormones.

Combinations of the above actions are appropriate and useful. Guidance on such combinations of management actions is found in the 1988 Montana Prairie Dog Management Guidelines (Montana Black-footed Ferret Working Group 1988).

The MPDWG will maintain an inventory of potential donor populations of both prairie dog species and identify habitat suitable for reintroduction. Priority should be given to populations scheduled for elimination or control and populations that exhibit an unusually high density (>25 per acre) that renders them vulnerable to disease or other stress-induced perturbations.

Wildlife reintroductions between ownerships (Tribal lands excepted) must be approved by the FWP Commission (87-5-711, MCA). Use of relocation to re-establish prairie dog colonies will require development of statewide translocation criteria and protocol, including measures to prevent introduction of disease to new sites. The MPDWG will develop programmatic translocation criteria and protocol and seek programmatic approval for translocations that comply with these standards, from the FWP Commission.

A subcommittee of the MPDWG will develop draft programmatic criteria and protocol for review by the MPDWG by September 2001. The finalized protocol will be presented to the FWP Commission by March, 2002.

STRATEGY C

Identify isolated prairie dog colonies in need of special consideration, assess their needs, and implement special management tasks, as appropriate.

A single prairie dog colony or complex situated more than 7 kilometers from the nearest neighbor colony is considered isolated by virtue of the low potential for genetic interchange between colonies. Isolated prairie dog colonies are important to maintaining statewide distribution of prairie dogs and distribution of species associated with prairie dogs. Isolated prairie dog colonies may also be important to recovery from plague epidemics. Because they are less vulnerable to plague than colonies within prairie dog complexes, isolated prairie dog colonies may serve as source populations for recolonization of areas depopulated by plague.

OBJECTIVE #4

Develop and implement a prairie ecosystem education program.

Since Koford's 1958 monograph on the black-tailed prairie dog (Koford 1958), much has been learned about the value of prairie dog colonies to other prairie species. However, the experience and concerns of agricultural operators and rangeland managers are not general knowledge. Efforts to convey accurate information to agency personnel and the general public must be enhanced in order to achieve a balanced view of the ecological role and economic impacts of prairie dogs.

STRATEGY A

Establish a subcommittee of MPDWG members charged with 1) identifying information needs, 2) compiling information that addresses those needs, and 3) developing a draft format for presenting the information and 4) solicit public relations expertise from the various agencies to develop implementation strategies and a public relations plan.

A MPDWG subcommittee was established in September 2000. The subcommittee will produce a draft prairie ecosystem education program by September 2001 and a public relations plan by March 2002.

STRATEGY B

Inform agency personnel about components of the prairie dog conservation plan through a series of internal workshops, presentations and work sessions for all involved agencies, entities and signatories.

Internal and public informational meetings are an on-going effort by member agencies of the MPDWG and should be incorporated into annual work plans.

STRATEGY C

Implement a tiered, community-based outreach effort, beginning with regional workshops (first tier) in each of the FWP administrative regions where prairie dogs exist, and involving all state and federal agencies and landowners within these regions.

The purpose of these workshops, to be held in Great Falls, Billings, Malta, and Miles City, is to work toward regional prairie dog abundance standards set forth in Objective No. 2, Strategy B. These workshops should be scheduled by the subcommittee established in Strategy B (above).

Following the first tier outreach, begin additional outreach by inviting the public to form focus groups based on individual agency actions (second tier), obtaining input from local working groups (third tier) and consolidating input for plan amendment and coordination.

STRATEGY D

Capitalize on public education opportunities offered by black-tailed prairie dog colonies located at Ulm Pishkun State Park (FWP), Prairie Dog State Monument (FWP), Fort Harrison (MT Army National Guard) and Holter Lake (BLM).

All are examples of small, protected black-tailed prairie dog colonies managed for public viewing, education, and other public benefits.

STRATEGY E

Address human health risks and concerns by developing and distributing information on prevention and recognition of plague in humans and publicize factual information on human health risks.

This effort should include review and reprinting of the pamphlet produced by the Montana Department of Health and Human Services in 1998.

OBJECTIVE #5

Identify and support or conduct research projects designed to form solutions to short-term and long-term biological and social problems related to black-tailed prairie dog communities and their management.

STRATEGY A

Determine how plague and other significant diseases operate in the wild and how they can be managed.

Sylvatic plague is an exotic disease that is relatively new to Montana's prairie dog populations. Montana is fortunate to have pre- and post-plague data on prairie dog acreage in several frequently mapped prairie dog complexes (Northern Cheyenne and Fort Belknap Reservations, CMR, Phillips County, and Custer Creek). For some of these complexes there is also information on incidence of plague titers in blood taken from carnivores (N. Anderson, FWP, personal communication) and the occurrence of plague in fleas collected from prairie dog burrows (Knowles 1993, Knowles 1996, R. Matchett, CMR and T. Vosburgh, Fort Belknap, personal communication). Over the long-term, these data should help elucidate dynamics of the interactions between plague and prairie dog populations.

This strategy will entail efforts to:

- Document location, timing and duration of plague presence (e.g. historical records of die-offs, carnivore prevalence surveys, and flea sampling).
- Develop a reporting system for recording activity status of prairie dog colonies (to provide an early warning of possible presence of plague).
- Encourage systematic collection of drawn blood samples and/or Nobuto strip samples from carnivores throughout the state for plague testing (in collaboration with USDA:APHIS: Wildlife Services).
- Capitalize on the current opportunity to monitor plague activity on the Fort Belknap Reservation.
- Draft a formal request from all signatories to Montana's prairie dog conservation plan requesting that the Biological Resources Division (BRD) of the United States Geological Service (USGS) conduct plague research. Such a research effort should address practical management issues such as: the effectiveness of flea management (dusting), vaccines, the role of colony size, density and distribution, and the relationships between these factors and plague impacts and recovery.

Research of this magnitude will require a national effort, throughout the 11-state region. Obtaining participation by BRD in plague research is a priority of the Montana Prairie Dog Working Group. To that end, the MPDWG will attempt to enlist the help of other state working groups and the Western Association of Fish and Wildlife Agencies.

STRATEGY B

Document the degree of competition between prairie dogs and domestic livestock, and resulting economic impacts.

This will require initiating research studies at one or more sites that represent typical grazing situations in Montana. This could best be accomplished in collaboration with and through the Montana University System with study areas located at the USDA Agricultural Research Station (Fort Keogh), the Northern Cheyenne Reservation or other sites.

STRATEGY C

Determine how many, where, and the juxtaposition of black-tailed prairie dogs required to support viable populations and distribution of species associated with prairie dogs.

Direct relationships between prairie dogs and other wildlife species is most obvious in the case of the black-footed ferret, a prairie dog obligate species. Relationships among prairie dogs and other species that reside in or frequent prairie dog colonies are less definitive. Other species associated with prairie dogs include mountain plovers, burrowing owls and ferruginous hawks. There is a need to identify demographic attributes of prairie dog populations that will ensure maintenance of viable populations and distribution of species associated with prairie dogs.

STRATEGY D

Assess the impacts of shooting activity.

Prairie dog shooting is a popular activity. Initial research on prairie dog shooting indicates that it can increase the mortality rate of prairie dogs and limit growth rate of colonies. Further investigation of the effects of shooting should consider potential effects on species associated with prairie dogs, how shooting can be managed on a sustained yield basis to maintain prairie dogs at levels that also maintain associated species, and the social and economic benefits of shooting. Unknown aspects of prairie dog shooting in Montana include the effects of shooter numbers, number of days shooters spend shooting prairie dogs, number of shots fired per shooter and per day, numbers of prairie dogs killed locally and regionally, effects on associated species - including incidental take, and the potential for raptors to ingest lead in scavenged prairie dog carcasses.

STRATEGY E

Stay abreast of new scientific information that identifies factors that influence prairie dog population dynamics (e.g., physiography, soils, vegetation, grazing, predators, shooting, range sites, distribution and connectivity, genetic health, and weather).

WHITE-TAILED PRAIRIE DOG

Acreage occupied by white-tailed prairie dogs in southern Carbon County has declined substantially in recent years. Flath (1979) mapped the distribution of white-tailed prairie dogs in Montana during the 1970s and documented 15 colonies in Carbon County totaling about 773

acres. Flath re-examined 14 of 15 colony sites in 1997 and found only 2 colonies, totaling about 97 acres, remaining (D. Flath, 1998 FWP, personal communication).

In 1999, 2 additional small colonies of white-tailed prairie dogs were located, bringing total documented acreage to about 100 acres. So few white-tailed prairie dogs exist in Montana that even a single, small, isolated colony is significant, and an adequate search effort should be made to locate any unrecorded colonies. Each documented colony should be evaluated for its conservation potential based on land ownership, habitat, topography, estimated population, and proximity to other colonies.

Conversion of shrub/grassland habitats to agricultural lands and apparent sylvatic plague are probable causes of the decline in white-tailed prairie dogs in Montana. During the 1997 survey of one of the colonies where sylvatic plague was suspected, sagebrush plants were found growing in the silted-in mouths of old burrows. Of the three plants collected, one was 5 years old and two were 4 years old. This evidence implies that burrows were silted in, to the point of providing a suitable seed bed for sagebrush, as early as 1992. Considering soil type and precipitation in this area, it is logical to assume that siltation of vacant burrows could take place in 1-3 years. Therefore, white-tailed prairie dog colonies may have been impacted by plague as early as 1989, to 1991.

White-tailed prairie dogs in Montana are at the northern limit of their range and their decline during this century may represent a range contraction. The risk of the white-tailed prairie dog being extirpated from the state in the short-term future is high. White-tailed prairie dogs are present in significant numbers in Wyoming, immediately south of currently existing colonies in Montana.

In anticipation of the need to enhance Montana's white-tailed prairie dog population, donor populations in Montana and Wyoming have been identified and BLM and FWP have prepared a draft environmental assessment (EA) for reintroduction of white-tailed prairie dogs to formerly occupied sites on public lands. A successful reintroduction could ensure continued presence of the white-tailed prairie dog in the most northern portion of its natural range.

White-tailed prairie dogs would be live-trapped from colonies located on BLM or private lands in Montana or Wyoming, then transported to formerly occupied colony sites for release. Source white-tailed prairie dog colonies have been identified north of Greybull, Wyoming, and near Chance Bridge in Montana. The initial target would be to translocate approximately 70 to 350 white-tailed prairie dogs to 1-5 release sites. Potential release sites are Colonies #7 through #13 (Flath 1979). Colonies on private lands would be augmented only with landowner permission. Adjustments to this target may be necessary depending on prairie dog catch rates, success of translocation efforts and time required for monitoring. The proposed action would meet the mandate of Section 87-5-103(1), MCA, which states in part that nongame wildlife species should be …"perpetuated as members of ecosystems." Trapping and release methodology will be detailed in an EA jointly prepared by BLM and FWP.

Specific release areas would be mapped with GPS equipment. Records of number, sex, age, and location of all captures and releases would be maintained to facilitate monitoring. Active prairie dog areas resulting from translocations would be mapped annually for at least the ensuing 3 years. All white-tailed prairie dog colonies would be mapped at 2-5 year intervals.

Translocation of white-tailed prairie dogs from Chance Bridge and colonies north of Greybull, Wyoming, to the Warren complex will take place from July through September 2002. Follow-up translocations may take place during the following two to three years, depending upon the success of initial efforts.

APPENDIX

LIFE HISTORY DISCUSSION

Prairie dogs (*Cynomys* spp.) are ground-dwelling members of the squirrel family *(*Sciuridae*)* within the order of rodents (Rodentia). There are five species of prairie dogs endemic (native) to North America, two of which occur in Montana. The black-tailed prairie dog (*Cynomys ludovicianus*), is the most widely distributed species in Montana and is found in grassland and shrub/grassland habitats east of the Continental Divide. The white-tailed prairie dog (*Cynomys leucurus*) has a very limited distribution in shrub/grassland habitats in south central Montana.

Prairie dogs are semi-fossorial, digging burrows that provide protection from predators and weather. Adult prairie dogs weigh about 2 pounds and are 12-15 inches in total length. Physical adaptations for a semi-fossorial/terrestrial lifestyle include very small ears, short but stout limbs, reduced tail length, enlarged front claws, and eyes placed high on the head. Other unique adaptations for their colonial lifestyle include a loud voice, complex vocalizations, and visual body signals. Behavioral attributes of white-tailed and black-tailed prairie dogs are remarkably different (Flath 1978).

The black-tailed prairie dog is the most colonial of the five prairie dog species and also occurs in the highest densities. It is found in short and mixed-grass prairie habitats within the 10 to 20-inch precipitation zone, from northern Montana to southern Texas (Hall 1981). The white-tailed prairie dog and its sibling species occur in the shrub-grasslands of the intermountain west. Density of black-tailed prairie dogs within a colony during early summer following emergence of young is generally about 10 per acre, but density varies greatly within and between colonies. Prairie dog density during early spring may be half the peak summer density. Prairie dog density can be influenced by such factors as productivity of a site, annual precipitation, and age of the colony. White-tailed prairie dogs occur at much lower densities than black-tailed prairie dogs.

Prairie dogs breed once a year. The breeding season is late March and early April (Knowles 1987). The gestation period is about 35 days and young emerge from their natal burrows at 4-5 weeks of age in late May and early June. In-utero litter size averages 4-5 but post-emergence litter counts indicate some loss of young in burrows prior to emergence (up to 25%) (Knowles

1987). Annual variability in litter size appears to be influenced by annual precipitation. Emergence of young may occur a week or more earlier in southern Montana than in the northern part of the state. Although some female prairie dogs are capable of breeding at one year of age, few reproduce as yearlings. Very few female prairie dogs live to 5 years of age and it is unusual for males to live to age 4 (King 1955).

The black-tailed prairie dog colony is organized into discrete family units called coteries. A coterie typically consists of 1 adult male, 3-5 adult females and their young of the year (King 1955). In Montana, dispersal of black-tailed prairie dogs occurs from mid-May to early July, apparently as a result of social strife associated with the emergence of young prairie dogs (Knowles 1985). Although yearling males are commonly displaced during this period by territorial adult males, dispersing prairie dogs may include adult males and females. Dispersal includes movement within a colony (primarily to the perimeter), movement between colonies, and movement to unoccupied sites.

While intra-colony dispersal plays an important role in colony expansion, extra-colony dispersal plays a significant role in metapopulation function. Extra-colony dispersal determines the amount of genetic exchange between colonies, the probability of an abandoned colony being reoccupied, and the rate that prairie dogs can find and occupy suitable habitat across the landscape. Knowles (1984) observed extra-colony dispersing black-tailed prairie dogs to travel up to 6 miles from an existing colony.

HABITAT AFFINITY

Black-tailed prairie dogs are associated with grasslands and shrub/grasslands. Occupation of a site by prairie dogs generally results in reduction of vegetative cover due primarily to intensive grazing on grasses and clipping of shrubs. Forb species and overall plant species diversity tend to increase under prairie dog grazing (Coppock 1983). As a result of their burrowing activity and manipulation of the surface soil, prairie dogs increase the amount of bare ground within the colony (Knowles et al. 1982). However, prairie dogs do not appear to influence net above-ground plant production (Whicker and Detling 1988). Productivity of a site is influenced more by other factors such as soil fertility and annual precipitation.

Prairie dogs select for relatively level sites found in wide valley bottoms, rolling prairies and tops of broad ridges. In north central Montana approximately 82% of black-tailed prairie dog colonies are located close to livestock watering sites, dry lakes, or other areas where cattle congregate. In southeastern Montana, prairie dog colonies are frequently located in intensively grazed valley bottoms with intermittent or perennial streams (FaunaWest 1998).

Black-tailed prairie dogs are capable of colonizing a variety of shrub/grassland and grassland plant communities. The most frequently occupied habitat in Montana is dominated by western wheatgrass, blue grama and big sagebrush. Generally, the initial areas colonized by prairie dogs have a low density of sagebrush, but once established, prairie dog colonies will slowly expand into and kill dense sagebrush stands through repeated defoliation. Prairie dogs make limited use

of coulee bottom sites dominated by western wheatgrass and greasewood. Silty overflow sites dominated by Nuttall's saltbrush and dwarf stands of big sagebrush are also used by prairie dogs. These colonies occur in small openings in the greasewood and tend to be confined by vegetation and topography. In southeastern Montana, black-tailed prairie dogs can occupy areas dominated by western wheatgrass and silver sagebrush. Prairie dogs also make use of grassland sites dominated by western wheatgrass, needle-and-thread grass and blue grama. Areas seeded to crested wheatgrass are suitable for prairie dog colonization, as well. Generally, prairie dogs do not enter areas dominated by ponderosa pine and juniper or sites supporting deciduous trees such as plains cottonwood (*Populus deltoides*) or green ash (*Fraxinus pennsylvanica*).

SUMMARY OF SPECIES ASSOCIATED WITH PRAIRIE DOGS

A number of species are adapted to live in association with prairie dogs (Campbell and Clark 1981). These associations are based upon use of prairie dogs as a prey species, vegetation conditions resulting from prairie dog occupancy, or the presence of burrows created by prairie dogs. Some species' affinities for prairie dog colonies are well known, others less so. The following synopsis provides a brief overview of the species most commonly associated with prairie dogs:

BLACK-FOOTED FERRET: The black-footed ferret is an obligatory predator of prairie dogs and requires prairie dog burrows for shelter from weather and protection from larger predators. The black-footed ferret is listed as "endangered" under the Endangered Species Act (ESA). Recovery efforts have been underway in Montana since 1994.

BURROWING OWL: The breeding distribution of the western burrowing owl includes most of Montana. However, its primary breeding habitat is provided by black-tailed prairie dog colonies and to a lesser extent, ground squirrel (*Spermophilus* spp.) colonies. Research and population monitoring for this species is currently being conducted in Montana and is jointly funded by BIA, BLM and FWP.

MOUNTAIN PLOVER: The mountain plover was once common in many areas of Montana and is frequently associated with black-tailed prairie dogs. Mountain plovers require expanses of level topography, extremely short vegetation, and considerable bare ground (Knowles et al. 1982). These attributes are available on prairie dog towns, but may also be provided by other situations (Knowles et al. 1982, Knowles 1984).

FERRUGINOUS HAWK: The ferruginous hawk is a ground-nesting grassland Buteo that occurs primarily east of the Continental Divide in Montana. Ferruginous hawks concentrate on mammals as prey, and are particularly adept at taking prairie dogs, ground squirrels and pocket gophers.

OTHER SPECIES: A variety of other species are frequently observed in association with prairie dogs. The prairie falcon (*Falco mexicanus*) is an effective predator of juvenile prairie dogs. Golden eagles (*Aquila chryaetos*) frequently take prairie dogs, especially in years of low

lagomorph populations. The most abundant mammalian predator associated with prairie dog colonies is the badger (*Taxidea taxus*). Coyotes (*Canis latrans*) and bobcats (*Lynx rufus*) are often found on prairie dog towns. In areas with suitable habitat, bobcats make considerable use of prairie dogs. The long-tailed weasel (*Mustela frenata*), least weasel (*Mustela rixosa*), desert cottontail (*Sylvilagus auduboni*) and northern pocket gopher (*Thomomys talpoides*) are frequently observed on prairie dog colonies as well. Prairie rattlesnakes (*Crotalus viridis*) frequently use prairie dog burrows, and may appropriate some for hibernacula. An extensive list of species found on prairie dog colonies is presented by Campbell and Clark (1981).

ASSOCIATED SPECIES POPULATION CONCERNS

Viability factors identified for black-tailed prairie dogs also apply to associated species. However, prairie dog distribution and density affect associated species in different ways. High densities of prairie dogs may benefit ferrets and plovers, but do not equate to high population density for all other associated species, including those that are territorial (e.g., golden eagle). Density of prairie dogs within a colony may influence use by associated species as well (Desmond and Savidge 1998). The number of prairie dogs required to sustain a predator population may not be the same number needed to provide another species with suitable vegetation conditions. The size of prairie dog colonies and their distribution on the landscape will also influence their usefulness to associated species. Prairie dog colonies that are small or widely spaced may be less valuable to some associated species than a large colony or a complex of closely spaced colonies. Bird species associated with prairie dogs are better able to move between widely spaced colonies than the black-footed ferret and other, less mobile species. Clearly, prairie dog management must consider distributional needs of all species that are adapted to, and that use, the prairie dog town environment.

HISTORIC PERSPECTIVE

Both black-tailed and white-tailed prairie dogs are found only east of Continental Divide in Montana. Historic information indicates that the black-tailed prairie dog was not found in the extreme northeastern corner of Montana, in areas occupied by white-tailed prairie dogs in south central Montana, in the upper Beaverhead drainage, Gallatin Valley, and north and west of Cutbank. There are no pre-settlement records for the white-tailed prairie dog in Montana. Recent records indicate that during the 20th century, the white-tailed prairie dog is naturally occurring only in the triangular area bounded by Bridger, Crooked Creek and Robinson Draw (D. Flath, 1999 FWP, personal communication).

Historic abundance of black-tailed prairie dogs in Montana is unknown. However, there are many references that clearly indicate the species was common (Burroughs 1961, Chittenden and Richardson 1905, Cooper 1869a,b, Messiter 1890, Coues 1878, Stuart 1902, and Cameron 1907). Flath and Clark (1986) estimated black-tailed prairie dog acreage in southeastern Montana early in the century at 117,492 acres, based on railroad survey notes recorded between 1908 and 1914. The survey area included about 7.8% of the total Montana range of the species. Extrapolating the recorded density of black-tailed prairie dogs to the entire range of the species yields an

estimate of 1,506,923 acres of prairie dogs in Montana at that time (95% confidence interval = 1,394,569 to 1,619,231 acres).

The white-tailed prairie dog barely reaches the northerly point of its distribution in southern Carbon County (Hollister 1916). Flath (1979) mapped the distribution of white-tailed prairie dogs in Montana during the 1970s and documented 15 colonies totaling about 700 acres in Carbon County.

RECENT STATUS OF PRAIRIE DOGS IN MONTANA

An inventory of black and white-tailed prairie dogs in Montana was completed during a 2-year period, 1996 through 1998 (FaunaWest 1998). Data from 1996-98 surveys conducted by FaunaWest were combined with survey information collected by BLM in the Phillips, Judith, and Big Dry Resource Areas and recent mapping data for the CMR and the Fort Belknap, Northern Cheyenne and Crow Reservations. The combined Montana data resulted in a minimum estimate of 1,353 active black-tailed prairie dog colonies totaling 66,139 acres. There were relatively few large prairie dog colonies (Figure 4) and the average size was 49 acres.

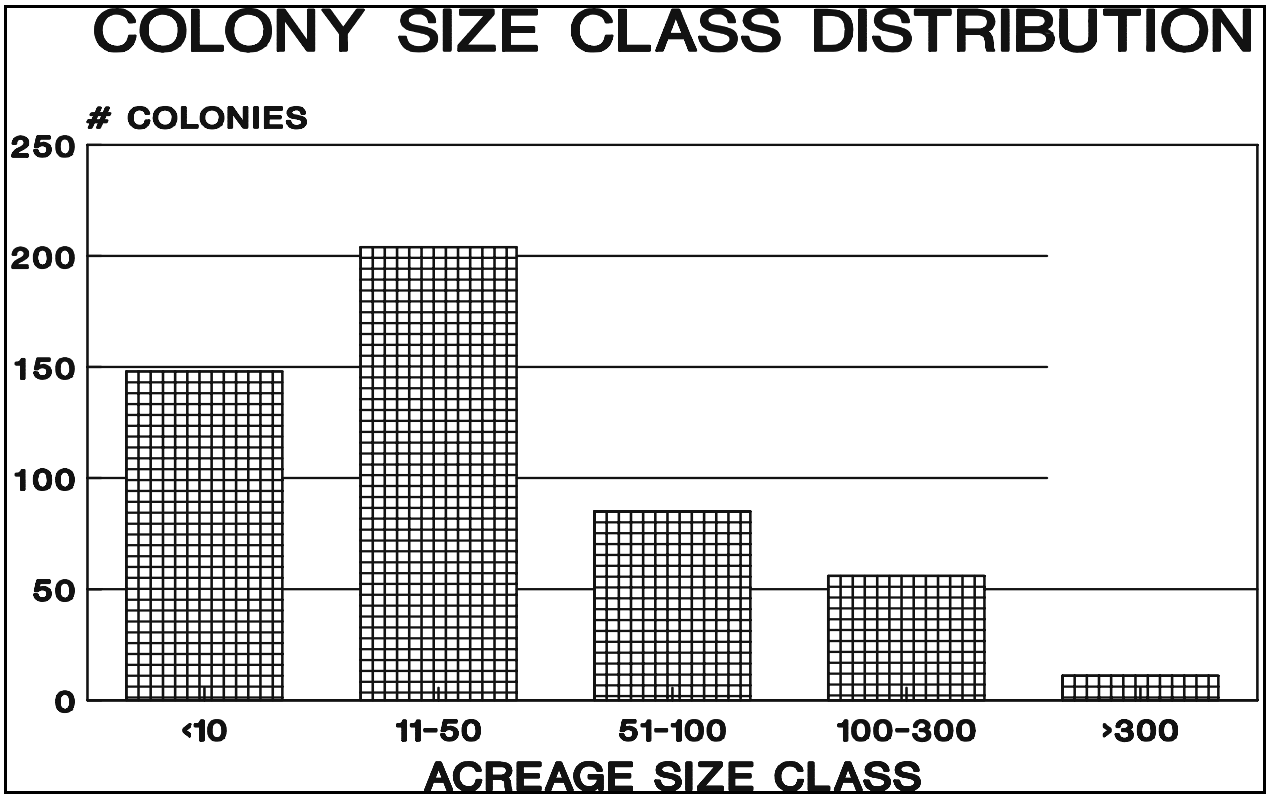

Figure 4. Distribution of prairie dog colony size classes for colonies mapped during the 1996-98 inventory.

The database generated during the course of the 1996-98 survey does not include some CMR prairie dog colonies; results of a survey and mapping effort on a portion of the Crow Reservation or 509 GPS locations of prairie dog colonies recorded by FWP personnel during aerial antelope surveys in 1998 and 1999 (not yet ground-truthed or mapped). Collectively, these data reinforce the fact that both the number of colonies and occupied acres currently documented for Montana and reported by FaunaWest (1998) are minimum figures that may significantly underestimate the current size of the state's black-tailed prairie dog population.

Relative to historic conditions, today's population of black-tailed prairie dogs is fragmented and prairie dogs have been extirpated from local areas of the state such as Richland County, most of Carter County and portions of other counties. Despite a decline in acreage and reduction in distribution, Montana still has substantial numbers of black-tailed prairie dogs (C. Knowles 1998, personal communication).

A REVIEW OF PAST PRAIRIE DOG CONSERVATION PLANNING

Black-tailed prairie dogs colonies fall under a variety of land management policies implemented by federal, state, Tribal and private entities. Some Federal land management agencies have addressed prairie dog management in planning documents (Table 2).

The first written record expressing concern for the future of the black-tailed prairie dog in Montana was in 1935 when O.J. Murie conducted a biological survey (Murie 1937) of the proposed Fort Peck Game Range (now the C. M. Russell National Wildlife Refuge (CMR). In his report, Murie noted that prairie dogs were largely gone north of the Missouri River as a result of poisoning campaigns and were greatly reduced south of the river. Murie noted that the black-footed ferret was dependent upon prairie dogs and that the species would disappear if prairie dogs were not protected in some areas. He recommended that prairie dogs be protected on the proposed refuge to ensure the long-term survival of ferrets and burrowing owls. His recommendations were not heeded until 1964, when only 625 acres of prairie dogs remained on the CMR. Prairie dog poisoning on the refuge was terminated that year after the black-footed ferret was identified by the U.S. Fish and Wildlife Service (FWS) as one of the nation's most endangered mammals.

In 1976 the CMR produced a prairie dog management plan (USFWS 1976a) which followed a comprehensive 1974 prairie dog mapping effort of the refuge that disclosed that prairie dog acreage had increased to 4,464 acres, following 10 years of protection (MacEneany and Jensen 1974).

The 1976 management plan developed objectives for black-tailed prairie dog management and based on this document, a control plan for prairie dogs on the CMR was written in 1976 (USFWS 1976b). The control plan recommended approximately a 72% reduction in prairie dog acres across the refuge. Justification for this control was that prairie dogs, "like most other wildlife species need to be managed" and that the refuge "could not permit their continued rate of unimpeded expansion and its concurrent loss of vegetative cover and deterioration of

watershed conditions." This control plan was never implemented. A 1985 CMR Management Plan/EIS recommended that prairie dog acreage be allowed to increase to 10,000 acres (USFWS 1985).

Table 2. List of federal, state and Tribal agencies with black-tailed prairie dogs occurring on lands under their respective jurisdictions.

Agency	Planning Documents that Address Prairie Dogs	Target Prairie Dog Acreage	Current (minimum) Prairie Dog Acreage
BLM			
Phillips	Yes	12,346*	11,100[1]
Valley	Yes	874	
Judith	Yes	71	
Havre	Yes	100*	
Big Dry	Yes	Not Specified	
Powder River	Yes	Not Specified	
Billings	Yes	Not Specified	
Butte	No	None	
Great Falls	No	None	0
CMR	Yes	10,000*	5,000
Custer Forest	Yes	300	323
Bur. Rec.	No	None	181
FWP	Conservation easements State Parks	Maintain existing colonies (on 4 ranches); 2 colonies in State Parks are protected.	
State Lands	No	None	3,960
Reservations			
Ft. Belknap	Unapproved	11,500**	15,000
N. Cheyenne	Yes	11,500**	1,200
Crow	No	None	10-12,000[2]
Dept. of Military Affairs	Yes	2	1

* maximum acreage allowed

** control is provided for if acreage exceeds target level

[1] A goal of the Judith-Valley-Phillips RMP is cooperative maintenance of ~26,000 acres occupied by prairie dog colonies within the 7 km complex in Phillips County: 12,346 BLM, 5,800 CMR, 2,012 DNRC and 5,821 private.

[2] There are 10,000-12,000 acres of prairie dog colonies on the Crow Reservation (G. Kaiser, 2000 BIA personal communication)

Around 1979, Jeff Shryer (BLM, Lewistown District) developed a draft habitat management plan for prairie dog ecosystems (USDI: BLM undated). This document was the first time a Montana resource management agency referred to prairie dogs and associated plant and animals species collectively as the "prairie dog ecosystem." It may have been the first use of this terminology anywhere. This plan addressed management of prairie dogs (both white-tailed and black-tailed) with a broad scale perspective while expressing the need to maintain sufficient acreage and distribution of prairie dogs on public lands to ensure long-term survival of associated species. The draft plan provided for control of prairie dogs in areas of documented resource damage but only if control did not conflict with meeting objectives of long-term sustainability of associated species. This document was progressive in that it emphasized the ecological importance of prairie dogs. The plan did not receive internal or formal public review and therefore never got beyond the internal draft stage.

During 1981, the Malta BLM office developed an environmental assessment for the Long Coulee Allotment Management Plan. This plan addressed three management alternatives. Management
of black-tailed prairie dogs was included in each alternative. Prairie dog control did take place in the Long Coulee allotment.

In 1982, BLM personnel of the Malta office produced a county-wide management plan for black-tailed prairie dogs at the request of FWP (BLM, 1982). The Black-tailed Prairie Dog Control/ Management in Phillips Resource Area, Programmatic Environmental Assessment (1982) included an analysis of four alternatives that ranged from no prairie dog control to total elimination. Although this plan went through public review and was approved in June 1982, it was never fully implemented due to the discovery of black-footed ferrets in Meeteetsee, Wyoming, in the fall of 1982 (J. Grensten, 1998, BLM, personal communication).

The Black-tailed Prairie Dog Control/Management in Phillips Resource Area, Programmatic Environmental Assessment (1982) was supplanted by the Judith-Valley-Phillips Resource Management Plan/Environmental Impact Statement (JVPRMP)(USDI:BLM 1992) which addressed prairie dog acreage by resource area. The plan provided for maintenance of "existing prairie dog habitat and distribution" (based on a 1988 survey) through cooperative management agreements. The BLM committed to management of 12,346 acres for black-footed ferrets and associated species within the 7km complex and 874 acres outside the 7km complex for a total of 13,220 acres in Phillips County. Under this plan, the BLM also supports maintenance of prairie dog towns on the CMR (5,800 ac), DNRC lands (2,012 acres) and 5,821 acres on private lands, through cooperative management agreements. The JVPRMP outlines a management goal of 21,646 acres of prairie dogs. The plan provides for BLM to allow expansion of prairie dog colonies on federal lands should prairie dogs be reduced on private or state lands, so long as the existing AUM level within each allotment on BLM lands is maintained.

The West HiLine Resource Management Plan/EIS (USDI:BLM 1988) briefly addressed prairie dogs and set a cap on prairie dog acreage at 100 acres in the Havre Resource Area (RA). It also provided for management of 800 acres of prairie dogs in the Valley RA and 71 acres in the

Judith RA.

The Miles City BLM District did not set target prairie dog acreage or maximum acreage for any of its resource areas (Big Dry, Powder River and Billings RAs). Instead, a Miles City District Black-tailed Prairie Dog Management Plan (USDI:BLM 1986) covering those areas was developed that allowed for natural expansion of prairie dogs provided there is no documented resource damage to soils and vegetation. The plan permits prairie dog control if resource damage is documented on a prairie dog colony.

The Great Falls BLM Resource Area does not contain any prairie dog colonies on lands under its jurisdiction, and none of its planning documents reference prairie dogs (T. Day 1998, BLM, personal communication).

The Butte BLM Resource Area only contains a single prairie dog colony on BLM lands but management of this colony is not addressed by any planning documents (S. Sovey 1998, BLM, personal communication).

Bureau of Reclamation (BOR) lands in Montana contain some prairie dog colonies. Colonies on BOR lands in Phillips County are managed by the BLM while others are managed by the Malta Irrigation District. There is no BOR document that addresses these colonies. The National Park Service has a portion of a prairie dog colony on the right-of-way at the entrance to the Little Bighorn Battlefield, but this property is allotted Tribal land.

The Ashland Ranger District of the Custer National Forest contains about 20 black-tailed prairie dog colonies comprising 776 acres, of which 539 acres occur on Forest Service Lands. The 1986 Custer Forest Plan established a maximum prairie dog acreage of 300 acres on primary rangelands with no limit on secondary rangelands. The plan provides for poisoning in the event of resource damage, a private landowner complaint, or a human health hazard. The goal of 300 prairie dog occupied acres for the Ashland Ranger District was believed to be sufficient to sustain a viable population as required by the Forest Practices Management Act (USDA:FS 1986). However, sensitive species status provides new direction when dealing with prairie dog management.

The Beartooth Ranger District of the Custer National Forest contains a single white-tailed prairie dog colony (approximately 90 acres). The Regional Forester is directed to identify a list of sensitive species occurring within National Forest boundaries and develop management strategies that avoid actions that may cause those species to become threatened or endangered (FSM 260.22). The sensitive species list maintained by the Northern Region of the USFS includes both the black-tailed and white-tailed prairie dog.

The Fort Belknap Reservation developed a black-tailed prairie dog management plan in 1991 (FaunaWest 1991). This plan set a minimum prairie dog acreage on the Reservation at 11,500 acres, and permitted prairie dog control through shooting or poisoning should the acreage remain above this level. This plan was not approved by the Tribal Council and therefore serves only as

guidelines for prairie dog management.

The Northern Cheyenne Reservation developed a similar black-tailed prairie dog management plan that established a minimum prairie dog acreage of 11,500 acres (FaunaWest 1994). The plan acknowledged that plague might reduce prairie dogs below this acreage and that natural recolonization would be permitted to reestablish formerly occupied prairie dog colonies. This plan only addressed the black-tailed prairie dog colony complex along the Tongue River and tributary drainages within the Reservation. Prairie dog colonies located in other drainage basins within the Reservation were not addressed.

The Crow Tribe does not have any documents addressing prairie dog management on the Crow Reservation.

The Montana Department of Military Affairs produced an Environmental Assessment for management of black-tailed prairie dogs on Fort Harrison, near Helena (Montana Army National Guard 1997). This document provided for translocation of black-tailed prairie dogs from an existing, 16-acre colony to a new, 2-acre site on the Fort. This translocation was successful and the new site is reaching capacity (Knowles and Weggenman 1998).

Montana Fish Wildlife and Parks (FWP) manages two state parks (Prairie Dog State Monument, Ulm Pishkun State Park) that contain prairie dog colonies. These prairie dog populations are not controlled and there are no plans or objectives that specifically address their management. FWP also holds conservation easements on six ranches that contain prairie dog colonies: the Brewer Ranch near Broadus; Page-Whittam Ranch near Glasgow; Fluss Ranch south of Terry; Hirsch Ranch near Miles City; Keogh Ranch near Whitehall and Cowell Ranch north of Fort Peck. The latter four contain language in the conservation easement that provides protection for prairie dogs (H. Youmans 1999, FWP, personal communication). In those cases, the base acreage of prairie dog colonies that existed at the time that the conservation easement was implemented cannot be reduced. In the case of all six easements, easement terms indirectly protect prairie dog colonies from plowing and subdivision but not from recreational shooting.

In 1988, an interagency black-footed ferret working group developed the "Montana Prairie Dog Management Guidelines" (Montana Black-footed Ferret Working Group 1988). This document was signed by FWP, FWS, MDA, USFS, BLM, BIA, and APHIS:ADC. The guidelines were developed to provide managers with reasonable and uniform guidance for prairie dog management and protection of natural resources essential to the maintenance of black-tailed prairie dog ecosystems in Montana. It was recognized that recovery of black-footed ferrets was dependent upon long-term management of prairie dog communities and that other species associated with prairie dogs would also benefit. The prairie dog management guidelines were intended to serve as a supplement to existing planning documents and did not supersede existing agreements or modify any agency responsibilities. Nor were they legally binding. The 1988 Montana Prairie Dog Management Guidelines were incorporated into BLM's 1996 range management EIS (1996 USDI:BLM) and in that format, are legally binding for the BLM (D. Hinckley 1998, BLM, personal communication). This document addresses the needs of grassland

species requiring short vegetation and bare ground and requires that management of grazing allotments consider maintenance of prairie dogs and prairie dog-associated species.

Goals of the 1988 Montana Guidelines included: 1) Inform public and private land managers in Montana of the role of the prairie dog ecosystem; 2) Assist land managers in developing long-term management objectives for prairie dog ecosystems, including those for associated species that may be threatened, endangered or of special concern; 3) Help managers identify potential problems for prairie dog populations in Montana and offer recommendations to avoid or resolve conflicts; 4) Ensure that managers consider the biology and needs of associated species in developing prairie dog management plans; and 5) Establish a framework for a reliable prairie dog ecosystem and associated species management protocol for land management agencies, wildlife agencies, and private landowners.

Objectives designed to attain goals of the 1988 Montana Guidelines included: 1) Develop understanding, interest, and support for management of prairie dog ecosystems in Montana; 2) Maintain prairie dog ecosystems to ensure adequate habitats for the continued existence of threatened, endangered and associated species; 3) Identify standards and techniques for managing prairie dog populations in Montana; 4) Monitor prairie dog ecosystems to determine the status and trend of populations of prairie dogs, threatened and endangered species and species of special concern; and 5) Design research to find solutions to short and long-term biological and social problems related to prairie dog ecosystem management.

The 1988 Montana Guidelines featured a model prairie dog management plan as an appendix. Items identified as critical to a prairie dog management plan included a site description, history of prairie dog use, potential conflicts, management areas, situation analysis, management direction, and future action items. The appendix also outlined 16 recommended steps for developing a site-specific management plan and a list of 30 management concerns.

CURRENT MANAGEMENT STRATEGIES

Bureau of Land Management (BLM)

The BLM administers federal lands under the authority of the Federal Land Policy and Management Act of 1976, which promotes sustained yield and multiple use principles. Under this Act, the BLM must consider all uses of the land including mining, grazing, timber harvest, and wildlife resources. Recreational shooting is considered a legitimate use of federal lands administered by the BLM. The BLM must balance often-competing resource uses and has done so in each of its Montana Field Offices with an Environmental Impact Statement/Resource Management Plan (EIS/RMP). The BLM can give special consideration to wildlife resources (or other natural systems) by designating a specific area within their jurisdiction as an "Area of Critical Environmental Concern" (ACEC).

U.S. Forest Service (USFS)

The U.S. Forest Service manages federal lands under the authority of the Multiple Use Sustained Yield Act of 1960 and the National Forest Management Act, which address timber production, grazing, recreation, watershed protection, and fish and wildlife habitat. The Forest Service must manage its lands in a manner that maintains viable populations of all native wildlife species. Black-tailed and white-tailed prairie dogs are included on the sensitive species list maintained by Region 1 of the USFS.

State Lands

The Montana Department of Natural Resources and Conservation (DNRC) manages state school trust lands with the specific objective of generating funds for the state's school system. Although maximizing income is a management objective, the state must also consider long-term environmental consequences of its management actions. State school trust lands are inspected at least once during the lease term, which generally spans a 5 or 10 year period. The presence of prairie dog colonies is noted and current colony size is compared to the size recorded during the previous inspection. The DNRC is generally concerned about large expansions of prairie dog colonies and under its lease agreement can mandate control of pests. Since the mid-1990s however, DNRC has virtually ceased mandating control of prairie dogs by leasees of state school trust lands.

FWP manages two state parks that feature black-tailed prairie dog colonies but has no written prairie dog management objectives for these parks other than maintenance of the prairie dog populations. The four ranches under conservation easements that specifically address prairie dogs require that existing prairie dog colonies must not be reduced below the acreage occupied at the time the easement was implemented. (H. Youmans 1999, FWP, personal communication).

Private Lands

Private landowners do tolerate a level of prairie dog acreage, as evidenced by the fact that at least 37% of black-tailed prairie dog acreage documented during the 1996-98 survey is located on private lands (Figure 3). Private landowners can manage prairie dogs on their lands according to their individual management objectives. Only toxicants registered by the Environmental Protection Agency (EPA) may be legally used to control prairie dogs. Currently, zinc phosphide-treated grain bait, aluminum phosphide tablets, and sodium nitrate gas cartridges are registered for prairie dog control. Various “home remedies” and use of strychnine obtained in Canada may occur, but has not been documented.

Private landowner concerns about black-tailed prairie dogs include: forage competition between prairie dogs and domestic livestock, the potential for livestock to be injured as a result of stepping into prairie dog burrows, damage to agricultural crops, and dispersal of prairie dogs from public lands to private lands. Ecological research indicates that forage competition

between prairie dogs and livestock is less than commonly believed (O'Meilia and Knopf 1982, Collins et al. 1984, Whicker and Detling 1988).

To address the spread of black-tailed prairie dogs from public lands onto private lands, National Grasslands in North and South Dakota, and Badlands National Park previously poisoned prairie dogs up to 1 mile from exterior boundaries. This practice substantially reduces the effective size of blocks of federal land for prairie dogs. This practice has not been implemented on federal lands in Montana, but there have been cases where prairie dogs were poisoned to address concerns of neighboring landowners (B. Haglan 1998, CMR, personal communication).

Tribal Land

Tribes are autonomous governments. The federal government has a trust responsibility to assist in management of Tribal lands under authority of the Indian Reorganization Act of 1934 (Roemer and Forrest 1996). Families on Reservations have been allotted land, which is the equivalent of deeded land, but allotted lands may or may not be managed by the Tribal governments. Similar to the case of state lands, Tribes have a management objective of generating income from lands they manage. The black-tailed prairie dog shooting program at Fort Belknap meets this objective by generating income from Tribally managed lands totaling approximately $90,000 of income this decade (T. Vosburgh 1998, Fort Belknap, personal communication).

THREATS TO LONG-TERM PRAIRIE DOG PERSISTENCE

AGRICULTURAL LAND CONVERSIONS

An estimated 18 to 20 million acres of land in Montana have been converted from native shrub/grasslands and grasslands to agricultural croplands during the past century (Lesica 1995, Stringer and Lund 1997). Most of this conversion has taken place east of the Continental Divide and is now approaching approximately half of the prairie landscape. Almost without exception, prairie dogs are not tolerated on agricultural croplands. In addition, the physical disturbance of annual cultivation exceeds the ability of prairie dogs to cope with modification of their habitat.

PLAGUE

The Center for Disease Control (CDC) has records of plague in Montana from as early as the 1930s. Sites where plague was documented include Glasgow, Jordan, and Yellowstone National Park (R. Stoneberg 1998, FWP, personal communication). Documentation of plague at Jordan included a confirmed case of plague in a prairie dog. During the 1930s, prairie dogs were extensively poisoned (USDI:BLM 1982) and effects of plague during that period may have been attributed to poisoning and therefore overlooked. Based on the unexplained disappearance of some prairie dog colonies on the CMR, isolated plague epizootics may have occurred during the 1970s. (Knowles 1982).

Plague was confirmed in a Montana black-tailed prairie dog from Carter County in 1986 (A. Dood 1998, FWP, personal communication). Plague apparently spread throughout this area of the state during the late 1980s and early 1990s. Documented prairie dog colonies in Powder and Custer Counties declined from 183 in the mid-1980s to 47 in 1996-98. The 1996-98 statewide prairie dog survey found that about 5% of previously recorded prairie dog colonies had disappeared as a result of plague.

It is assumed that plague spread to the Big Dry Arm area of the CMR and adjacent BLM lands by 1991 (D. Tribby 1998, BLM, personal communication). However, the decline of black-tailed prairie dogs in this area may have been compounded by poisoning or directly attributable to poisoning. The number of surveyed prairie dog colonies in the eastern half of Garfield County declined from 102 in the mid 1980s to 51 by 1996-98. Plague was not noted in three adjacent prairie dog complexes in Rosebud (Ingomar complex), Petroleum, and Valley Counties.

Black-tailed prairie dog acreage on the Northern Cheyenne Reservation declined from 10,758 acres to approximately 650 acres between 1992 and 1994 (Figure 2). Plague worked its way through colonies along the Tongue River in a very orderly manner, starting in the north and spanning the length of the Reservation over a period of two years. Of 63 prairie dog colonies examined in this area during September 1994, only two colonies showed no sign of plague activity; 29 had between 1 and 10 prairie dogs remaining; and 32 appeared vacant. The 2 colonies that apparently escaped the impacts of plague were located in tributary drainages, more than a mile away from prairie dog complexes. A few isolated upland colonies on the Reservation are known to have escaped plague but were not surveyed in 1994. Plague was noted elsewhere along tributaries of the Tongue River. On the Ashland Ranger District, prairie dog acreage dropped from 514 acres (26 colonies) in 1992 to 323 acres (11 colonies) in 1997. By 1999, GPS mapping indicated that prairie dog acreage had increased to 539 acres (D. Sasse, USFS 2000, personal communication).

Prairie dog colonies in west central Phillips County were noted to be in decline by 1992. In South Phillips County, approximately 26,000 acres of prairie dogs within a 1,000,000-acre area were reduced to 5,500 acres between 1992 and 1996. (John Grensten 1999 BLM pers. comm.). This decline was attributed to plague but the only confirmation of plague in this area came from blood samples collected from predators (coyotes and badgers) (R. Stoneberg 1998, FWP, personal communication). A collection of over 200 fleas from prairie dog burrows on the Fort Belknap Reservation (Knowles 1996) and the CMR (Knowles 1993, R. Matchett 1998, CMR, personal communication) all tested negative for plague. Plague appeared to spread north to the Milk River, south to the CMR, and possibly west to the Fort Belknap Reservation. The decline of prairie dogs in Phillips County, the CMR and Fort Belknap Reservation appears similar in degree (approximately 50% loss in acreage) and nearly synchronous in timing (Figure 5). The apparent plague epizootic remained active in this area until at least 1996. The decline of prairie dogs on the Fort Belknap Reservation may also have been the result of intensive recreational shooting. BLM also actively encouraged prairie dog shooting until 1993, but prairie dogs were protected on the CMR. The pattern of prairie dog decline in Phillips County, the CMR and the Fort Belknap Reservation was not consistent with the pattern observed on the Northern

Cheyenne Reservation.

Plague may have entered the Custer Creek area North of Terry as early as 1983 causing a decline in black-tailed prairie dogs similar to that documented in Phillips County. The Custer Creek area is now reported to have over 5,000 acres of black-tailed prairie dogs. Seventeen of 92 colonies mapped during a 1991 survey had totally disappeared by 1996, but 85 at least partially active colonies were found in this area in 1996, representing a net loss of only 7 colonies (Wittenhagen and Tribby 1997).

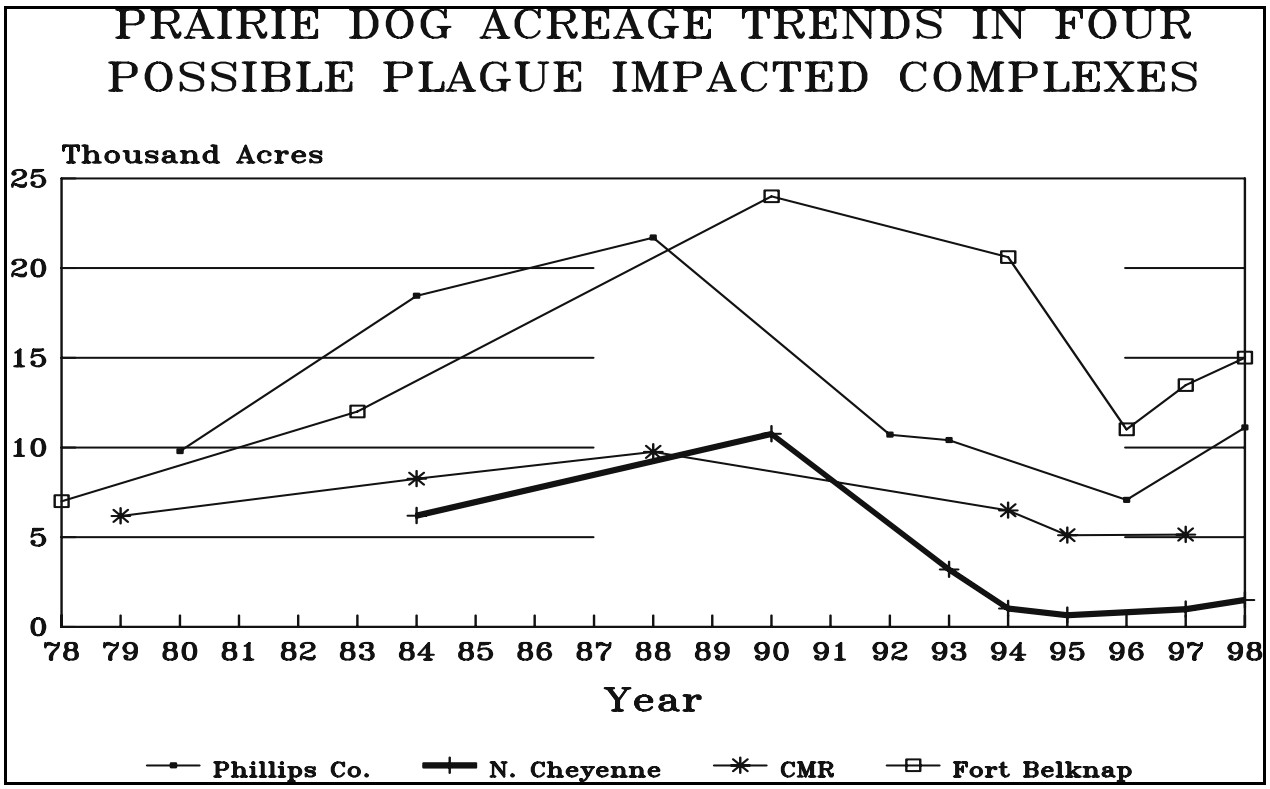

Figure 5. A comparison of 4 frequently mapped prairie dog complexes that were possibly impacted by plague.

POISONING

In Montana, poisoning of prairie dogs is conducted primarily by private individuals and is geared toward containment rather than landscape-scale eradication. The Montana Department of Agriculture (MDA) only provides technical assistance to private landowners with regard to prairie dog control. Roemer and Forest (1996) provide a review of the use of toxicants to control prairie dogs on the Northern Great Plains. Poisoning has been reduced during the past decade, in the wake of plague working its way through many of Montana's prairie dog complexes.

However, the petition to list the black-tailed prairie dog has prompted increased interest in eliminating prairie dogs from private lands (M. Sullins 1999, MDA, personal communication).

RECREATIONAL SHOOTING

It has only been since the mid-1980s that black-tailed prairie dog shooting has become a popular vacation activity. Many prairie dog shooters travel considerable distances specifically for the purpose of shooting prairie dogs. Recreational shooting was promoted by the BLM in Phillips County during the mid-1980s as an alternative to chemical control. The Fort Belknap Indian Reservation developed a fee-based recreational shooting program for non-members in 1989 (Figure 2). By the mid-1990s, 500-600 shooters were purchasing licenses to shoot prairie dogs on Tribal lands. Black-tailed prairie dog acreage on the Reservation began to decline about the time shooter numbers reached this level. This decline may have been the result of recreational shooting, or of plague moving northwest from Phillips County, or a combination of both. As prairie dog acreage declined, the Reservation raised its license fee with the result that shooter numbers declined to about half of their peak number. At least three private ranches in Montana promote prairie dog shooting, two of which charge a fee for shooting and guiding.

Knowles (1987) reported that shooting is an effective technique to regulate the growth of small prairie dog colonies. The impacts of recreational shooting on prairie dog-associated species, including the disturbance factor of the presence of shooting activity, have not been investigated.

SUBDIVISION

Loss of black-tailed prairie dog colonies to residential development and other forms of urbanization is a significant threat only in southwestern Montana. The black-tailed prairie dog was once common in the Helena Valley but is now restricted to six small colonies, most of which are confined by residential development.

ADDITIONAL PRAIRIE DOG CONSERVATION CONSIDERATIONS

POPULATION FRAGMENTATION

The pattern and process of black-tailed prairie dog colony fragmentation in Montana began with government-sponsored poisoning campaigns initiated in 1914 (D. Flath 1999, FWP, personal communication) and peaked in the 1930s in association with the CCC program (Anderson et al. 1986). The goal of these efforts was total eradication and the primary poison used was strychnine. Although the goal of eradication was not attained, the program effectively broke up very large black-tailed prairie dog colonies into small isolated colonies (Murie 1937). These smaller colonies were then managed at low levels through the 1950s and 1960s with the use of compound 1080 with the result that prairie dogs were extirpated in some areas. There can be little question that unlimited use of poison for half a century greatly fragmented the distribution of black-tailed prairie dogs in Montana.

Following the 1972 executive order banning the interstate transportation of compound 1080, poisoning of black-tailed prairie dogs diminished to sporadic efforts conducted by private parties and counties that employed zinc phosphide poison. This effort appears to have had little effect, and increases in black-tailed prairie dog populations were noted until the late 1980s. With the advent of plague, however, prairie dog distribution in Montana was further fragmented, resulting in greater distances between black-tailed prairie dog colonies and smaller average size of active colonies.

Movement of black-tailed prairie dogs among colonies determines the amount of genetic exchange between colonies, the probability of an abandoned colony being reoccupied, and the rate that prairie dogs can find and occupy suitable habitat across the landscape. One migrant per generation is considered sufficient to maintain genetic diversity in small populations. Understanding prairie dog dispersal is important to devising a prairie dog conservation strategy for populations that currently exist in Montana. The greater the number of colonies and the greater the distributional area of the colonies, the lower the risk of extinction.

Black-tailed prairie dogs are known to be capable of dispersing 6 miles between colonies (Knowles 1985). The probability of gene flow among colonies 10 or more miles apart is considered to be low. The 1996-98 statewide prairie dog survey indicated that 5% of known colonies are located 5-10 miles from their nearest neighbor and an additional 2% are more than 10 miles from the nearest neighbor. Loss of colonies located near the edges of prairie dog distribution may result in contraction of prairie dog range within the state.

BARRIERS TO DISPERSAL

As black-tailed prairie dog populations become more fragmented, dispersal barriers become increasingly more numerous and more significant in preventing exchange of individuals between local populations. Under high population densities, even formidable barriers to dispersal (e.g. the Missouri River) can be breached as a result of thousands of crossing attempts on an annual basis. Fragmented, local populations become more vulnerable to extinction as a result of catastrophic events and the odds for natural recolonization decline as distance to a source population increases and the absolute number of prairie dogs in a source population declines. As a consequence, metapopulation function is reduced as prairie dog complexes are broken into smaller, isolated colonies.

LAND OWNERSHIP PATTERNS

Land ownership within the range of the black-tailed prairie dog tends to consist of small parcels of federal land embedded within larger blocks of privately owned land. Generally, federal ownership of these lands was retained because they were not suitable for homesteading and agriculture. Consequently, federal lands frequently contain areas that are topographically unsuitable for prairie dogs. Portions of Blaine, Phillips, Prairie and Valley Counties are notable exceptions to this general pattern. These counties contain several large blocks of federal land with topographic conditions suitable for black-tailed prairie dogs. The CMR and Ashland

Ranger District are examples of large blocks of federal land that encompass large areas not suitable for prairie dogs, based upon habitat and topography.

Figure 6 illustrates distribution of prairie dog colony acreage by land ownership, as documented during the 1996-98 statewide survey (Knowles, 1998). The 1996-98 survey indicated that approximately 37% of documented prairie dog acreage in Montana was in private ownership, but this was a minimal estimate because some black-tailed prairie dog colonies on private lands were not mapped due to lack of access. Any prairie dog conservation strategy that addresses prairie dogs on a statewide basis must address prairie dogs on private lands.

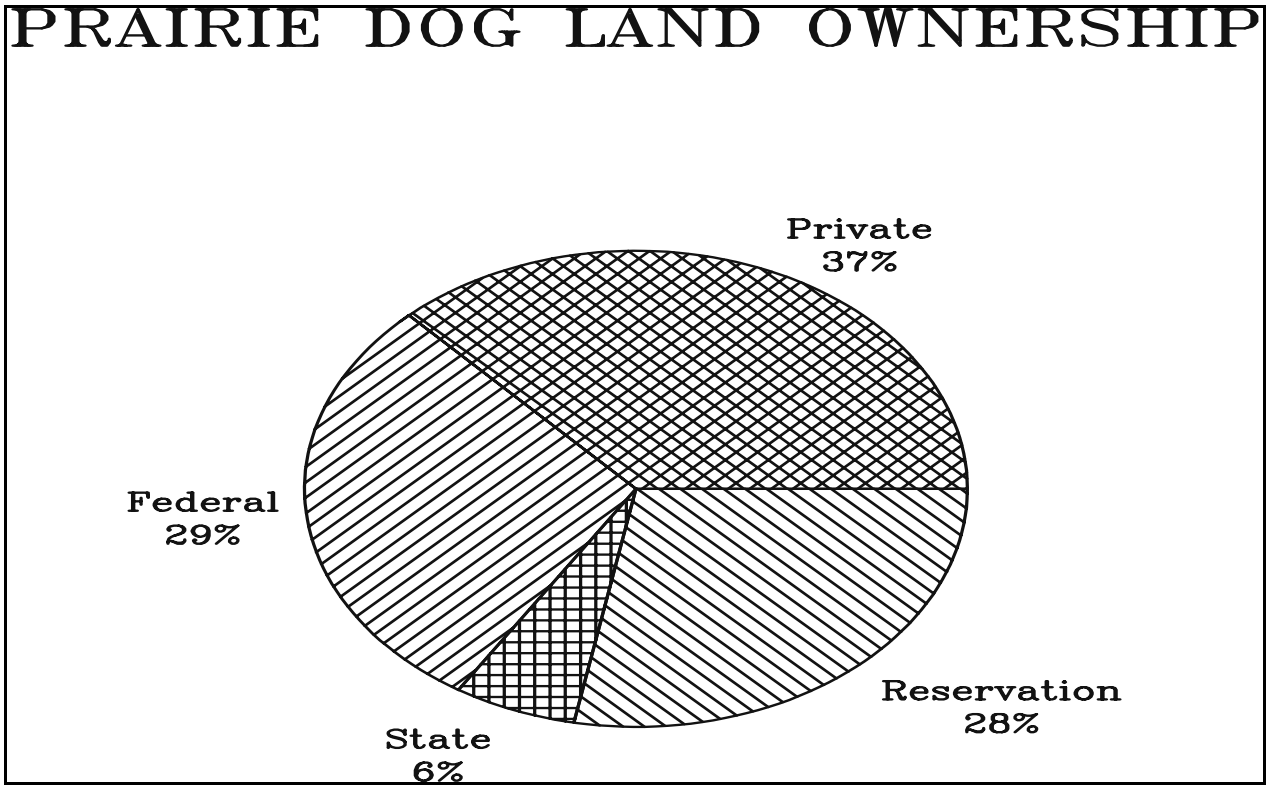

Figure 6. Percentage distribution of Montana prairie dog acreage by land ownership, as determined by the 1996-98 statewide prairie dog survey (Knowles 1998).

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GLOSSARY

APHIS:	ADC U.S. Department of Agriculture, Animal and Plant Health Inspection Service: Animal Damage Control {now APHIS:WS (Wildlife Services)
AUM	Animal-unit month
BIA	U.S. Department of Interior, Bureau of Indian Affairs
BLM	U.S. Department of Interior, Bureau of Land Management
BRD	U.S. Geological Service, Biological Resource Division
CCAA	Candidate Conservation Agreement with Assurances
CCC	Citizen Conservation Corps
CMR	Charles M. Russell National Wildlife Refuge
Complex	A cluster of several to many prairie dog colonies
Distribution	The geographic extent of the occurrence of a species.
DNRC	Montana Department of Natural Resources and Conservation
EA	Environmental Assessment
ESA	Endangered Species Act of 1973, as amended
FWP	Montana Department of Fish, Wildlife and Parks
FWS	U.S. Department of Interior, Fish and Wildlife Service
GPS	Global positioning system
HCP	Habitat Conservation Plan
K	Kilometer (.6214 mile)
MCA	Montana Codes Annotated
MDA	Montana Department of Agriculture
MHP	Montana Heritage Program
MPDWG	Montana Prairie Dog Working Group
MBFFWG	Montana Black-footed Ferret Working Group
NGO	Non-governmental organization
NHP	Natural Heritage Program
NRIS	Natural Resource Information System
RA	Resource Area (Bureau of Land Management)
Range	The outer limits of the distribution of a species, independent of population density.
RMP	Resource Management Plan
Take	To “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct” (Section 9, ESA)
USDA	U.S. Department of Agriculture
USFS	U.S. Department of Agriculture, Forest Service