BLACK-TAILED PRAIRIE DOG MANAGEMENT PLAN
Fort Niobrara National Wildlife Refuge
October 2007

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Fort Niobrara National Wildlife Refuge
Valentine, Nebraska

INTRODUCTION / BACKGROUND

In July 1998, the National Wildlife Federation petitioned the U.S. Fish and Wildlife Service (USFWS) to list the black-tailed prairie dog as threatened under the Endangered Species Act. In March of 1999, a moratorium of all black-tailed prairie dog control on U.S. Fish and Wildlife Service lands was issued by the Director. In May 2000, the USFWS concluded that this species warranted listing, but was precluded from being listed due to other higher priority species concerns and resource constraints. In August of 2004, an updated evaluation of the best available scientific information led the U.S. Fish and Wildlife Service to determine that the black-tailed prairie dog should be removed as a candidate for listing.

From 2002-2006, a severe drought hit western and north central Nebraska. A cessation of all control activities beginning in 1999 combined with a severe drought precipitated a rapid increase in total acres occupied by black-tailed prairie dogs on Fort Niobrara National Wildlife Refuge (NWR). The number of occupied acres on Fort Niobrara increased from an estimated 23 acres in 1999 to 175 acres in 2006 and the number of individual prairie dog towns increased from 1 to 5 during the same time period. Grid surveys conducted on the refuge in June 2004 estimated the prairie dog population at ~ 4000 animals (refuge files).

Fort Niobrara completed a Comprehensive Conservation Plan (CCP) in September 1999. Management objectives for native prairie grasslands, exotic/invading plant species, and wildlife have raised some interesting dilemmas with regards to prairie dog towns on Fort Niobrara NWR. During the CCP public involvement process, prairie dog management on the Refuge was one of the major issues for adjacent landowners and residents of Cherry County. Furthermore, human health and safety issues raised by the Nebraska Department of Health and Human Services in 2004 necessitated control of prairie dogs; and now burrowing activities of expanding prairie dogs threaten employee safety (i.e. corrals) and the integrity of management facilities (i.e. water control structures/dikes). These facts have led us to believe a management plan is needed to guide management of black-tailed prairie dogs on Fort Niobrara NWR.

Establishing and Acquisition Authorities for Fort Niobrara NWR:

- *Executive Order1461, January 11, 1912* **"...**as a preserve and breeding ground for native birds."
- *Executive Order 1642, November 14, 1912* set aside additional lands as the Fort Niobrara Game Preserve for the preservation of bison and elk herds representative of those that once roamed the Great Plains.
- *Executive Order 3256, March 31, 1920 and Executive Order 7301, February 21, 1936* were land acquisitions for various purposes including roost sites for sharp-tailed

grouse and prairie chickens, migratory bird food sites, and pronghorn antelope management.

- *Wilderness Act of 1964* and *Public Law 94-557* established the 4,635 acre Fort Niobrara Wilderness Area on October 19, 1976.

Historical Occurrence and Management of Black-Tailed Prairie Dogs on Fort Niobrara NWR

Records indicate that black-tailed prairie dogs were likely present at the time of establishment of the Refuge in 1912. References to prairie dog town size and location on the refuge are vague, but "small colonies" of prairie dogs were referenced in different years in the "north pasture" (habitat unit 1), "east buffalo pasture" (habitat unit 16), "corrals and adjoining unit" (habitat unit 9 & 23), headquarters area, "horse pasture" (habitat unit 13), "longhorn yearling pasture" (habitat unit 19/21?), "exhibition pasture" (habitat unit 27), and/or the "southwest boundary" (habitat unit 37?). Control efforts were discussed for the first time in the 1916 narrative report where prairie dogs are referred to as a "menace and safety hazard". Control actions over the years included poisoning, shooting, and/or donation of live prairie dogs to various entities (i.e. State of Nebraska, zoos, ranches).

For the first time in the 1958 narrative, specific reference is made to "maintaining a prairie dog town…for the enjoyment of the public". A desired boundary of the town was defined, approximately 40-50 acres in size, and any management actions taken would be to "thin not exterminate" the town. However, control efforts were "too severe" in late 1964 necessitating reintroduction of approximately 35 prairie dogs from the Clem Hahn Ranch in 1965. Rattlesnake problems in association with the prairie dog town are mentioned in the 1970 narrative and approval is sought to do "some control work" on the prairie dogs. Beginning sometime in the early 1970s and continuing until the early 1990s, the prairie dog town in the exhibition pasture (habitat unit 27) was maintained at approximately 20-30 acres by force account shooting. In 1994, the town expanded into the horse pasture (habitat unit 13) and was approximately 65 acres in size. Approval was received to thin the town using zinc phosphide oats. From 1995 through 1999, the prairie dog town was again maintained at 20-30 acres.

All control efforts were halted in 1999, and in combination with severe drought conditions, the black-tailed prairie dog population grew to over 4,000 animals occupying a total of approximatley175 acres in 5 locations within 5 years. In August 2004, Nebraska Health and Human Services formally contacted the refuge regarding violation of Title 179 NAC due to contamination of public water system/facilities from prairie dogs in the headquarters area. Non-lethal management actions including installation of a "prairie dog proof" fence and live trapping/relocation of animals were unsuccessful in keeping the area free of prairie dogs. In 2005, to ensure that prairie dogs do not present further safety and health hazards to refuge staff and visiting public in areas of concern, approval was received from the Regional Office to "opportunistically remove problem prairie dogs in a safe and discreet manner with the use of a firearm or air rifle."

Status of Black-Tailed Prairie Dogs in Nebraska

Historically, black-tailed prairie dogs were found through most of Nebraska with the Missouri River being the eastern edge of their distribution (Jones 1964). They were found in a variety of habitat types including the short-grass prairie of the Panhandle, widely available mixed-grass prairie, and portions of tall-grass prairie that were made suitable by grazing of vast herds of bison (Jones 1964). Prairie dog colonies in the Sandhills of north-central Nebraska were limited primarily to river valleys and other areas where soils would support the burrow system.

Black-tailed prairie dog numbers declined substantially from historic levels beginning in the early 1900s with the conversion of grasslands to croplands and with the implementation of major poisoning campaigns (Nebraska Game and Parks Commission 1999). Annual extermination of prairie dogs on private and state-owned lands in the state was required by statue from the early 1900s until 1995 when it was repealed. Currently, the black-tailed prairie dog is classified as an unprotected non-game species in Nebraska which means prairie dogs can be taken in any manner, without restrictions on shooting or control activities. Permits are not required for Nebraska residents to take prairie dogs, however nonresidents must have a small-game hunting permit.

In 2003, the Nebraska Game and Parks Commission (NGPC) conducted aerial surveys within the current range of black-tailed prairie dogs which encompassed more than 22 million acres in the western two thirds of the state, excluding most of the Sandhills region. Survey acres were identified as suitable or marginally suitable for prairie dogs based on various characteristics including soils, hydrology, slope, and land cover. While 42.4% of the survey region was classified as suitable to highly suitable, only 0.6% was occupied by prairie dogs (Bischof *et al.* 2004).

Importance of Black-Tailed Prairie Dogs

The Refuge Manual addresses our requirements as refuge managers to "focus on native species and natural communities..." and to "strive to maintain populations of breeding individuals that are genetically viable and functional." under 601 FW 3, Biological Integrity, Diversity, and Environmental Health. This policy outlines that refuges currently supporting black-tailed prairie dogs should strive to maintain viable populations.

Black-tailed prairie dogs are an integral part of the wildlife community and it is appropriate to maintain a viable population on Fort Niobrara NWR. Many wildlife species associate with or depend upon prairie dogs during some portion of their life cycle. Over 167 vertebrate species have been documented using prairie dog towns (Campbell and Clark 1981, Clark *et al.* 1982, Knowles 1994, Reading *et al.* 1989, Sharps and Uresk 1991). Some species feed on prairie dogs, while others utilize the burrow systems or the unique habitat to fulfill their needs. Vacant burrows are used by cottontail rabbits, several species of small rodents, tiger salamanders (Kolbe *et al.* 2002), prairie rattlesnakes (Knowles 1994), bull snakes, and by burrowing owls (refuge files). At least 6 pair of burrowing owls successfully nested in the prairie dog town surrounding the headquarters in 2006. Two of the smaller towns also had burrowing owls. Many other passerine species, such as western meadowlarks, grasshopper sparrows, and horned larks prefer

the sparsely vegetated habitat created on dog towns due to the greater visibility of seeds and insects (Agnew *et al.* 1986). In the early stages of prairie dog occupation when plant composition is still predominately native grasses, bison and elk forage in prairie dog towns. However, the repeated grazing by large ungulates and prairie dogs eventually result in a change in plant composition to less desirable species and large ungulates then primarily use the prairie dog towns for loafing and wallowing (refuge observations). In addition to their importance to other wildlife species, prairie dogs are also important to refuge visitors for environmental education, wildlife observation, and photography.

REFUGE DESCRIPTION

Refuge Location and Resources

Fort Niobrara NWR is 19,131 acres in size and located along the Niobrara River in north-central Nebraska. The Refuge has a unique blend of topography, soils, and rock formations, along with differing exposures to sun, wind, and moisture. This mixture creates a wide variety of habitats that support an incredible diversity of plants and wildlife. Six major plant communities converge along the Niobrara River and are situated according to their habitat needs and tolerances (Churchill *et al.* 1988, Kaul 1990). Sandhill prairie grows atop sand dunes south of the river and mixed-grass prairie is found on hard tablelands to the north. Rocky mountain coniferous forest occurs on dry, rocky soil and steep eroding cliffs. Plants from the eastern deciduous forest, northern boreal forest, and tallgrass prairie plant communities inhabit water-rich areas along the river floodplain and canyon walls. Acreage totals by habitat type are approximately 14,323 acres grasslands; 4,318 acres woodlands; 375 acres river, stream and associated wetlands; and 115 acres administrative lands. In addition to herds of bison and elk, the refuge supports a diversity of wildlife including over 230 species of birds, 48 mammal species, 24 reptile and amphibian species, and several kinds of fish.

Surrounding Land Uses

The Refuge is located in Cherry County approximately three miles east of the city of Valentine, the county seat and biggest city in the county with a population of approximately 2,800. Cherry County is the largest county in Nebraska with a total area of approximately 6,013 square miles. Predominate land-use in the county is native prairie grazing and haying with less than 10 percent of the acreage cropped or irrigated (Miller 1990). Family-owned ranching is the primary source of income in Cherry County, although income generated from tourism is significant.

Public Uses

Approximately 100,000 public use visits are recorded annually on the Refuge with the greatest amount of visitation occurring from mid-May to mid-October. Activities include wildlife/wildland observation, photography, interpretation/education, fishing, hiking, horseback riding, floating the Niobrara River, and periodic special events.

Suitable Refuge Habitat for Black-Tailed Prairie Dogs

Fort Niobrara NWR grassland habitats were evaluated for potential occupation by black-tailed

prairie dogs using habitat variables described by Clippinger (1989) and Bischof *et al.* (2004). Soil type is a significant factor in determining where prairie dog towns could exist on Fort Niobrara NWR. Prairie dogs avoid sandy soils because they will not support a burrow system (Koford 1958). The twenty seven different soil series found on Fort Niobrara NWR are mapped and described in detail in the 1998 Soil Survey of Cherry County (USDA Natural Resources Conservation Service). Soil series of relevance to the prairie dog management plan are:

Anselmo – Loamy fine sand (AmB, AoB 0-3% slopes; AmC, AoC 3-6% slopes); Fine sandy loam (An 0-2% slopes; AnC 2-6% slopes; AnD, AuD 6-11% slopes).

Duda-Fishberry – Loamy fine sand (DtB, DtC, DxB, TgC 0-3% slopes).

Dunday – Loamy fine sand (DuD, DcD 3-9% slopes).

Fishberry – Fine sandy loam (FbC, TaC 0-6% slopes).

Hennings – Fine sandy loam (He 0-2% slopes).

Holt-Longpine – Fine sandy loam (HuC, RfC 2-6% slopes).

McKelvie – Loamy fine sand (McB, MpB 0-3% slopes; McD, MpD 3-9% slopes; McF, MpF 9-30% slopes).

McKelvie-Fishberry – Loamy fine sand (MdF, MsF, MtF, VdF 9-30% slopes).

Sandose – Loamy fine sand (SfB, BfB 0-3% slopes).

Sandose-Hennings – Loamy fine sand (ShB, BhB 0-3% slopes).

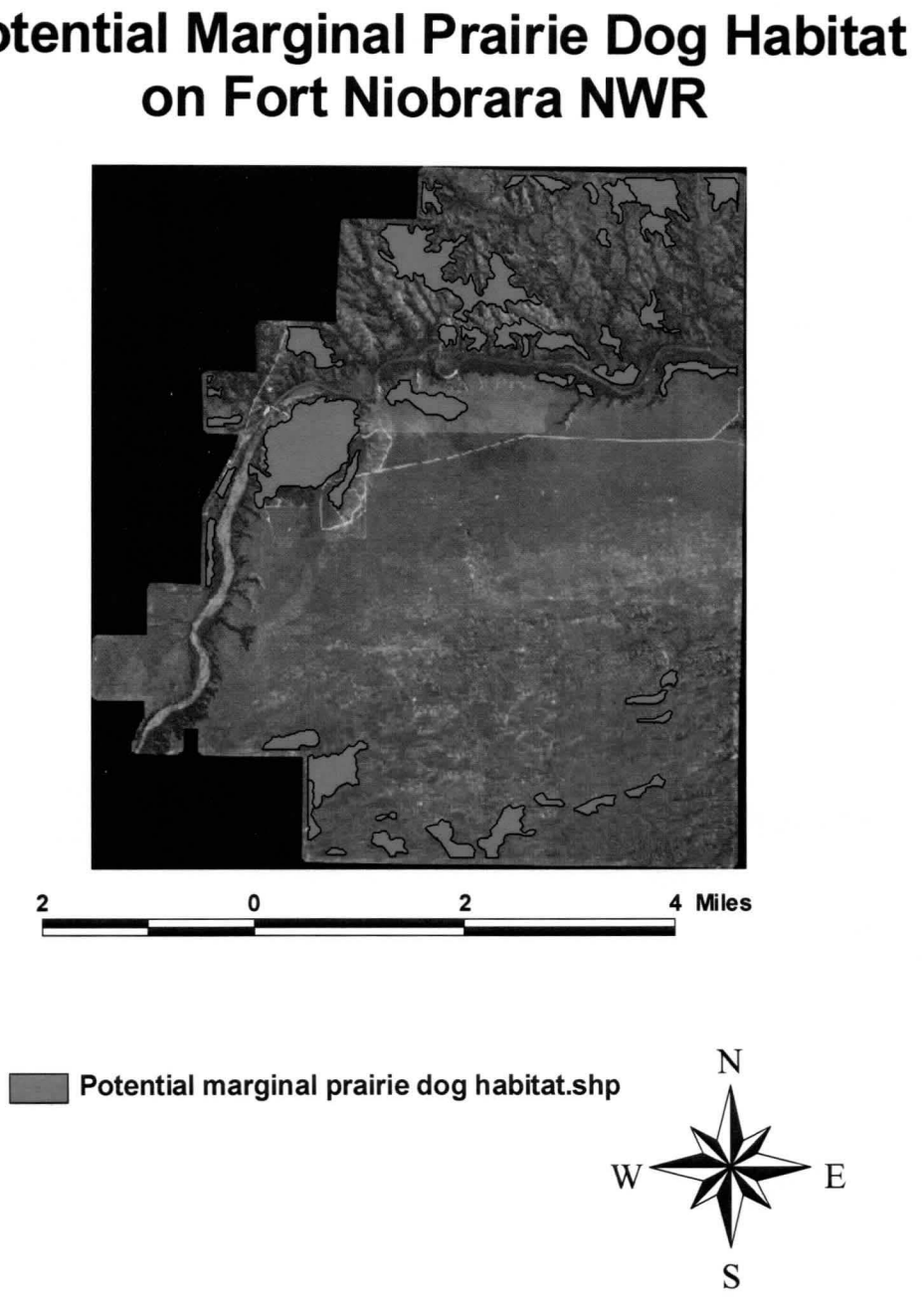
Valentine-Duda – Loamy fine sand (VnD, VfD, HxC 3-9% slopes; VnF, VfE, VsF 9-15% slopes).

Valentine-Sandose – Loamy fine sand (VsD 0-3% slopes).

Vetal – Fine sandy loam (Vz, Vx 0-2% slopes).

Refuge-specific information on vegetation, slope, soils, and hydrology were combined using a Geographic Information System (GIS) and potential suitable habitat delineated. Less than 10% of Fort Niobrara NWR, or approximately 1900 acres, is "marginally" suitable for prairie dogs while 90% of the Refuge is unsuitable due to soil type and plant community (Figure 1). Historical records concur with this assessment as much of the refuge never supported prairie dogs.

Figure 1.


Potential Marginal Prairie Dog Habitat
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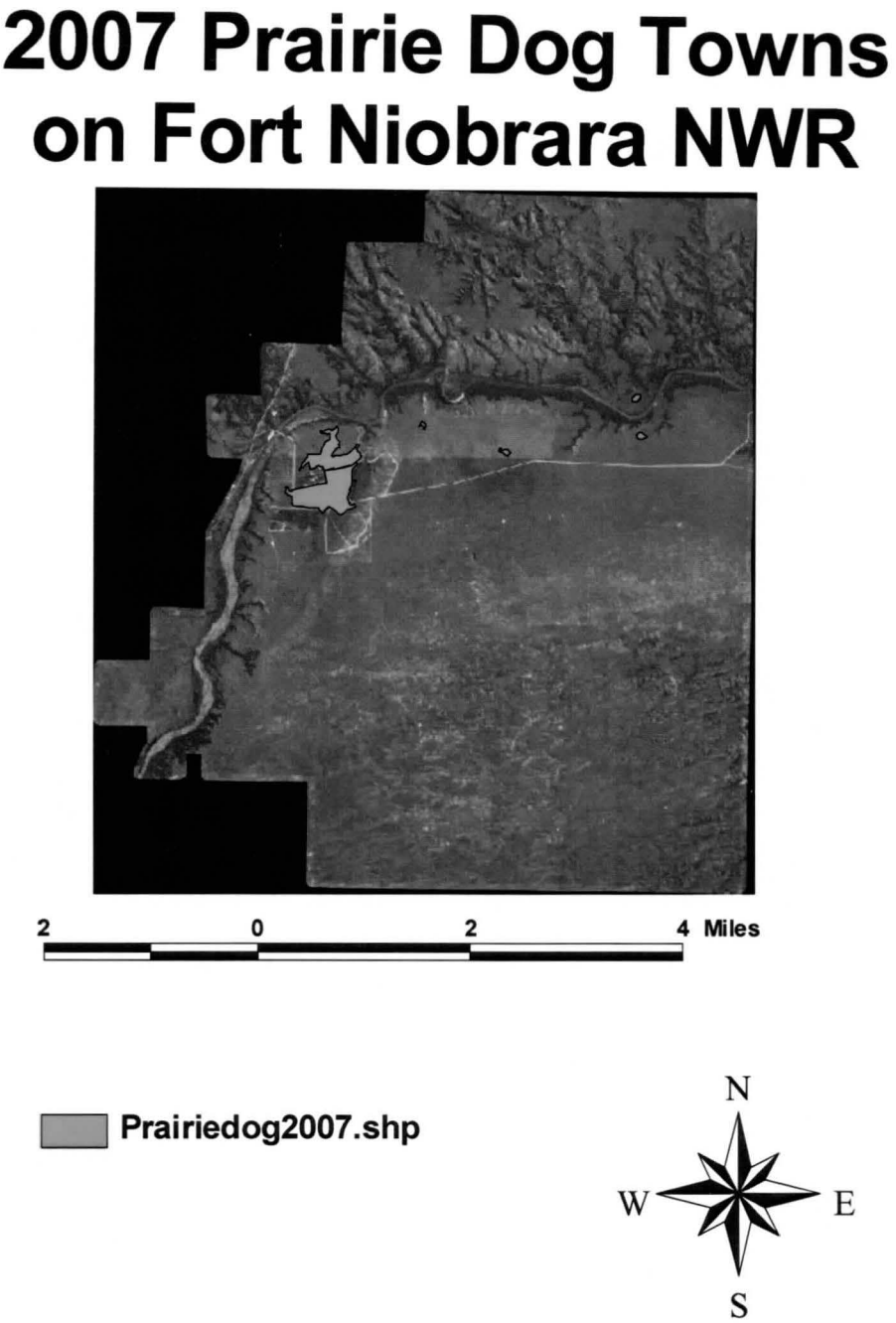
Current Distribution of Black-Tailed Prairie Dogs on Fort Niobrara NWR

A survey completed by refuge staff in May 2007 indicated there were five active or recently active prairie dog towns occupying approximately 173 acres on the Refuge. The main prairie dog town surrounds the headquarters area and is ~164 acres in size. The prairie dog town in the wilderness area (habitat unit 1) is less than 3 acres and is being limited somewhat by predators and surrounding topography. Prairie dogs are attempting to establish a town east of the corrals in habitat unit 23 and the 1 acre area was already a safety concern during bison handling operations in 2006. Two prairie dog towns in habitat unit 16, occupying ~5 acres of grasslands combined, are not currently active due to predators and being located in unsuitable habitat (sandy soils).

Figure 2.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ISSUES / CONCERNS

Issues and concerns regarding prairie dog management on Fort Niobrara NWR were identified and explored during the public involvement process of Comprehensive Conservation Plan (CCP) in the late 1990s. Following implementation of the plan, and expansion of refuge acreage occupied by prairie dogs, additional issues were raised by concerned citizens, State government, and on-site managers. These issues are discussed below.

Potential Conflict between Various CCP Management Objectives

In the CCP, the prairie dog objective is to "allow the expansion of the existing black-tailed prairie dog town in the Refuge to a manageable size to enhance Refuge biological diversity and attain stated goals and objectives for native and migratory avian species." In the general discussion of wildlife goals, the CCP states that "prairie dogs will be excluded from areas where their presence creates a safety hazard or conflicts with management objectives." Prairie dogs, if allowed to expand and occupy potential habitat without direct management, could result in CCP objectives for native prairie grasslands, exotic/invading plant species, bison, and native birds not being met.

The grassland objective for the refuge is to "maintain the approximate 14,264 acres of Sandhill Prairie and Mixed Prairie vegetation communities in early through late successional stages to meet nesting, brooding, feeding, and/or protective cover requirements of various grassland dependent birds, fenced animals and other wildlife. Species composition on a minimum of 90 percent of the grasslands will be middle-to-late successional stage and consist of 75-85 percent grasses, 5-10 percent grass-like plants, 5-10 percent forbs, and 5 percent shrubs." Areas occupied by prairie dogs eventually become a low successional stage vegetation community dominated by forbs. Furthermore, in some areas of the refuge where prairie dogs are located, invasive and exotic plant species have become established and are spreading with the prairie dogs. The CCP objective for exotic and invading species is to "prevent additional exotic plant species from becoming established and reduce the occurrence, frequency and stand density of existing invading and exotic vegetation. Target level of combined total of invading and exotic plant species is less than 5 percent of species composition."

If prairie dogs do not follow model predictions and become established in Sandhill prairie grasslands, accomplishment of bison, prairie grouse, and native bird objectives could be in jeopardy. CCP objectives for these different wildlife groups are as follows:

> "Maintain a five-year average density of one prairie grouse lek per 1.4 sq. mile with an annual target of 100 sharp-tailed grouse and 65 greater prairie chicken breeding males in the grasslands south and east of the Niobrara River."
>
> "Maintain or increase breeding and migration use on Fort Niobrara by Species of Management Concern, U.S. Fish and Wildlife Service, Region 6, including northern harrier, ferruginous hawk, upland sandpiper, long-billed curlew, burrowing owl, short-eared owl, red-headed woodpecker, loggerhead shrike, dickcissel, lark bunting, grasshopper sparrow, chestnut-collared longspur, eastern meadowlark, and other habitat sensitive birds such as western meadowlark, bobolink, clay-colored sparrow, belted

kingfisher, willow flycatcher, and yellow-breasted chat."
"Preserve and maintain breeding populations of bison and elk with age and sex composition approximating historic herds. Implement management actions that maintain or increase levels of genetic variability to assure viable, sustainable populations according to accepted standards of conservation biology."

A diverse and healthy grassland plant community will support a variety of wildlife populations. Plant species composition, height/structure, and residual cover are important vegetative factors to consider for many species of grassland birds (Table 1.) (Skinner 1975, Ryan 1986, Renken and Dinsmore 1987, Kantrud and Higgins 1992, Volkert 1992, and Bakker 2003). Providing a mix of short, medium, and tall grassland through grazing, prescribed burning, and rest will result in a mix of habitats for the suite of grassland birds and other wildlife inhabiting the refuge.

Table 1. Nesting and foraging habitat requirements for selected grassland birds.

Species	Vegetation height	litter	Patch size	Distance from trees
Bobolink	25 to 45 cm	3.4 to 9.1 cm	40 ha	45 m
Burrowing owl	<13 cm	minimal	4 ha	>100 m
Dickcissel	21 to 100 cm	1.6 cm	10 ha	Prevent woody encroachment
Long-billed Curlew	<30 cm	minimal	42 ha	Avoids areas with high density trees and shrubs
Grasshopper sparrow	20 to 60 cm	Not available	8 ha	50 m
Sharp-tailed grouse	15 to 40 cm	Use areas that are idle for several years	60 ha	>50 m
Short-eared owl	30 to 60 cm	2-8 yrs. of residual cover	74 ha	Not available
Upland sandpiper	3 to 60 cm	2.3 cm	100 ha	100 m

Prairie dog towns typically lack medium and tall grassland vegetation and have little residual cover due to the foraging and burrowing activities of the prairie dogs (Sid *et al.* 1991). One study determined that over 80% of the forage (standing and residual vegetation) was removed by prairie dogs by August (Knowles 1986). Prairie dog occupation of large expanses of grassland on the Refuge would result in a reduced carrying capacity for bison and cause prairie grouse populations and other wildlife to decline due to lack of high quality grassland habitat. Bison and

prairie grouse, especially greater prairie chicken, are species of management importance and Fort Niobrara is the only refuge that has viable/sustainable populations of both. Careful and balanced management of the potentially conflicting wildlife populations is a necessity.

Grazing / Burning

A document titled Management of Black-tailed Prairie Dogs on Fish and Wildlife Service Lands (November 24, 2003) issued by the Regional Office, recommends that burning, grazing, and mowing not be completed on or adjacent to prairie dog towns. The bare ground/low vegetation created encourages prairie dog expansion. If this were incorporated into management as a hard and fast rule, management for grassland health and large ungulate grazing would be very difficult on Fort Niobrara.

When prescribed fire is used as a management tool, typically units are burned with the safest boundaries, utilizing roads, habitat unit boundaries/fence, open water, etc. to safely conduct a burn. A three acre prairie dog town in the middle of a burn unit plus a buffer around the town would require the unit to be split into many units to burn separately. The firebreaks utilized would no longer be determined by safety considerations. Also, no matter how large a buffer, there is no guarantee that prairie dogs will not move and establish new towns which is what has occurred on Fort Niobrara.

Most of the grasslands on the refuge are included in the Fort Niobrara and Sullys Hill bison herd grazing programs. Bison grazing in the vicinity of prairie dog towns encourages expansion of the town. And in years of drought, the potential for expansion is even greater. Bison herds are managed at levels that maintain and/or improve native prairie plant health and create a shifting mosaic of grazed and ungrazed patches. A careful balance of "grazers", which includes prairie dogs, is necessary so that native prairie grasslands don't become a homogenous sea of short vegetation.

Human Health and Safety

Several human health and safety concerns associated with the occurrence of prairie dogs have been documented on Fort Niobrara and include water contamination, injury to government horses that have stepped in holes, and injury to staff moving bison via horseback. Other potential health and safety concerns associated with prairie dogs include rattlesnake encounters, plague, and monkey pox.

Water Contamination

In August 2004, Nebraska Health and Human Services formally contacted the refuge regarding violation of Title 179 NAC due to contamination of public water system/facilities from prairie dogs in the headquarters area. In 2005, to ensure that prairie dogs do not present further safety and health hazards to refuge staff and visiting public in areas of concern, approval was received from the Regional Office to "opportunistically remove problem prairie dogs in a safe and discreet manner with the use of a firearm or air rifle." In conjunction with active prairie dog management, wells in the headquarters area were abandoned/replaced in 2006. No violations

have occurred since.

Prairie Dog Burrows and Mounds

Prairie dog burrows and mounds are a safety concern on the refuge due to bison handling activities via horseback. Bison can be unpredictable and dangerous and special skill and concentration is required when moving the bison by horseback. When moving bison through areas occupied by prairie dogs, horseback riders have to be even more vigilant due to additional danger the burrows present. Horses can stumble due to the mounds and holes created. Riders may be thrown from the horse as it stumbles. Also, several instances of government horses sustaining leg injuries from stepping in prairie dog holes have been documented on Fort Niobrara. Most of the time, the horses eventually recovered; however, some of the horses have had to be surplussed due to the injury.

Rattlesnakes

Prairie rattlesnakes have been observed on or near black-tailed prairie dog towns on Fort Niobrara NWR and colonies to the north of the refuge. Although incidences of human bites are rare, domestic livestock and dogs being bitten by rattlesnakes in and near prairie dog colonies north of the refuge happen almost annually. Prairie rattlesnakes use prairie dog burrows as winter hibernaculum, especially where no quality denning sites in rock outcrops are available (Knowles 1994). This phenomenon is observed on and adjacent to Fort Niobrara NWR, as concentrations of rattlesnakes are observed in September and October on several towns used as hibernaculum. The abundance of small mammals on prairie dog towns may also attract rattlesnakes (Agnew *et al.* 1987). These factors may lead to an increase in human and rattlesnake encounters, especially during the fall denning period.

Prairie rattlesnakes are a native species found throughout the mixed and short grass prairies. Allowing rattlesnakes to exist in suitable habitat on Fort Niobrara NWR is supported by current policy and management. We do believe, however, that increased human-rattlesnake encounters are likely to occur when prairie dog towns lie adjacent to the visitor center and occupied residences. The U.S. Forest Service also recognizes this in its management of prairie dog towns on National Grasslands adjacent to occupied residences, and actively controls prairie dogs in these areas (Greg Schenbeck, personal communication).

Plague

The possibility of humans contracting sylvalatic plaque due to the presence of prairie dogs has been cited as a concern by some local residents. People usually get plague from being bitten by a rodent flea that is carrying the plague bacterium or by handling an infected animal. Black-tailed prairie dogs are known to be flea carriers. In the United States, the last urban plague epidemic occurred in Los Angeles in 1924-25. Since then, human plague in the United States has occurred as mostly scattered cases in rural areas (an average of 10 to 15 persons each year) (Center For Disease Control Website: www.cdc.gov/) and is now treatable. According to the Nebraska Game and Parks Commission, plague has not been found in prairie dogs in Nebraska. It appears that the possibility of a human contracting plaque from fleas associated with prairie dogs is extremely remote. For some individuals, however, the concern still exists.

Monkey Pox

Monkey pox was recently a high profile news story with regards to prairie dogs. The origin of the outbreak was traced to a shipment of prairie dogs in the pet trade. These prairie dogs then infected humans which handled them. USDA-APHIS immediately placed restrictions on the trade and handling of prairie dogs. It does not appear that this disease is established in wild populations of prairie dogs.

Management Facilities

Burrowing activities of prairie dogs have resulted in water control structure/dikes being breached, public use roads being degraded, and bison handling facilities/areas being compromised on Fort Niobrara NWR. These impacts indirectly are a health and safety concern, but also result in refuge funds and manpower being taken away from higher priority projects to remedy them.

Local Perceptions and Attitudes

The general local perception and attitude towards prairie dogs appears to be consistent with recent research conducted on the subject (Lamb and Cline 2003). People with little direct contact with prairie dogs tend to place more value on prairie dogs and their role in the ecosystem. Those having more direct experience with prairie dogs tend to focus on the adverse effects of and need to control prairie dogs. The most common negative opinions emphasized the competition with livestock for grazing, changes in plant communities (grass to annual forbs) due to burrowing (Coppock 1981), and soil erosion caused by bare ground and burrowing activities.

There have been numerous studies concerning the competition for grazing between livestock and prairie dogs. Research findings suggest the competition is minimal (O'Meilia *et al.* 1982) but is dependent upon prairie dog and livestock densities. Compensatory factors such as increased forage quality and nutrient cycling offset the above ground grazing and forage clipping done by prairie dogs (Whicker and Detling 1988). The fact that prairie dogs burrow and create bare ground and that they clip vegetation to the ground either to eat, store as hay, or to reduce visual obstruction is readily apparent to the casual observer. This has also been confirmed in many studies (Agnew *et al.* 1987, Cid *et al.* 1991, Knowles 1994). It is an illogical argument to most private landowners that there is little to no competition between prairie dogs and cattle for grazing given that prairie dogs remove up to 80% of the forage.

Private rangeland adjacent to the refuge is primarily used for livestock grazing and hay production. The burrowing, clipping, and grazing activities of prairie dogs are primary factors given for need to control prairie dogs on private lands. Mounds created make haying difficult to nearly impossible and the standing hay crop is nearly eliminated where prairie dogs are established. The level of control varies from landowner to landowner, but in general, tolerance is low for any newly establishing towns or for towns that have expanded across ownership boundaries.

Drought

Ability to adapt management is especially critical in years of drought. Climatologic data indicates that Cherry County was in an extended drought 2002-2006. During above average precipitation years in mixed grass prairies, increased vegetative growth may limit expansion of existing towns and the establishment of new towns. During periods of below average precipitation, expansion rates may increase dramatically. This is the pattern that appears to have occurred in Nebraska and South Dakota the past few years. During extended droughts, increases in prairie dog control may be needed. During periods of average to above average precipitation, less management may be required.

BLACK-TAILED PRAIRIE DOG MANAGEMENT

Management proposed below includes essential elements needed to conserve black-tailed prairie dogs and their associated ecosystem on Fort Niobrara NWR. The plan also recognizes that circumstances exist where population control is appropriate and necessary due to human health and safety concerns; management for other prairie plant and wildlife species; and minimizing the potential for prairie dogs to colonize onto adjacent private rangelands. Flexible and adaptive management is critical for the long-term survival of black-tailed prairie dogs on Fort Niobrara.

Goal, Objective and Strategies

In the Fort Niobrara CCP, the prairie dog goal/objective is to "allow expansion of the existing black-tailed prairie dog town on the refuge to a manageable size to enhance biological diversity and attain stated goals and objectives for native and migratory avian species." In 1999, at the time the CCP was completed, the "existing" prairie dog town was 30 acres in size and located southeast of the visitor center in the wildlife viewing pasture. Within 5 years, that town grew to over 165 acres in size with prairie dogs residing within a few feet of the visitor center, residences, and maintenance shops of the headquarters area. Also, colonizing prairie dogs from that town established 4 new towns occupying a total of 9 acres. Due to health and safety concerns and other potential issues identified in this plan, the prairie dog objective is stepped-down to the following:

> *Allow for the expansion and/or existence of up to ~190 acres (10% of suitable habitat) of black-tailed prairie dog towns within the prairie dog compatible zone on Fort Niobrara NWR. Prairie dogs will not be allowed to occupy areas where they pose a health and safety risk, conflict with other wildlife/habitat management objectives, and/or threaten private land.*

It is unknown how many acres of occupied prairie dog towns may have historically existed on the refuge prior to its establishment. Some speculation has been made in the literature that from 3% to 10% of suitable habitat on the Great Plains was occupied by prairie dogs (Flath and Clark 1986, Clark 1989). The proposed management level of ~190 acres is 10% of total refuge acres containing potential suitable habitat based on plant community, soil texture, slope, and distance from water table. Furthermore, based on refuge historical records and staff observations/surveys conducted in recent years, this objective level is realistic and will likely support a sustainable

population of black-tailed prairie dogs as well as other prairie wildlife species. Also, this management level will enable refuge CCP objectives for bison, elk and native birds to be met. Management strategies that will be implemented in conjunction with this plan are:

1. Identify/establish management zones within the refuge that specify areas where prairie dog colonies will be allowed and areas where they will be excluded from.

2. Adjust/adapt bison grazing and prescribed fire programs as needed to support management zone priorities.

3. Monitor prairie dog colonies for disease, occupied acreage, and use by other wildlife.

4. Maintain a manageable level of prairie dogs at a specified location and/or exclude prairie dogs from specified management zones utilizing lethal and non-lethal actions.

5. Consider allowing prairie dogs to occupy prairie renovation areas if invasive/noxious plant management actions (herbicide, interseeding, burning, grazing) are not successful within 5 years.

6. If black tailed prairie dogs are extirpated within the boundaries of Fort Niobrara NWR and do not re-establish passively within 3 years, planning for translocating will be initiated.

7. Work cooperatively with the Nebraska Game and Parks Commission on management of black-tailed prairie dogs on the refuge.

Management Zones

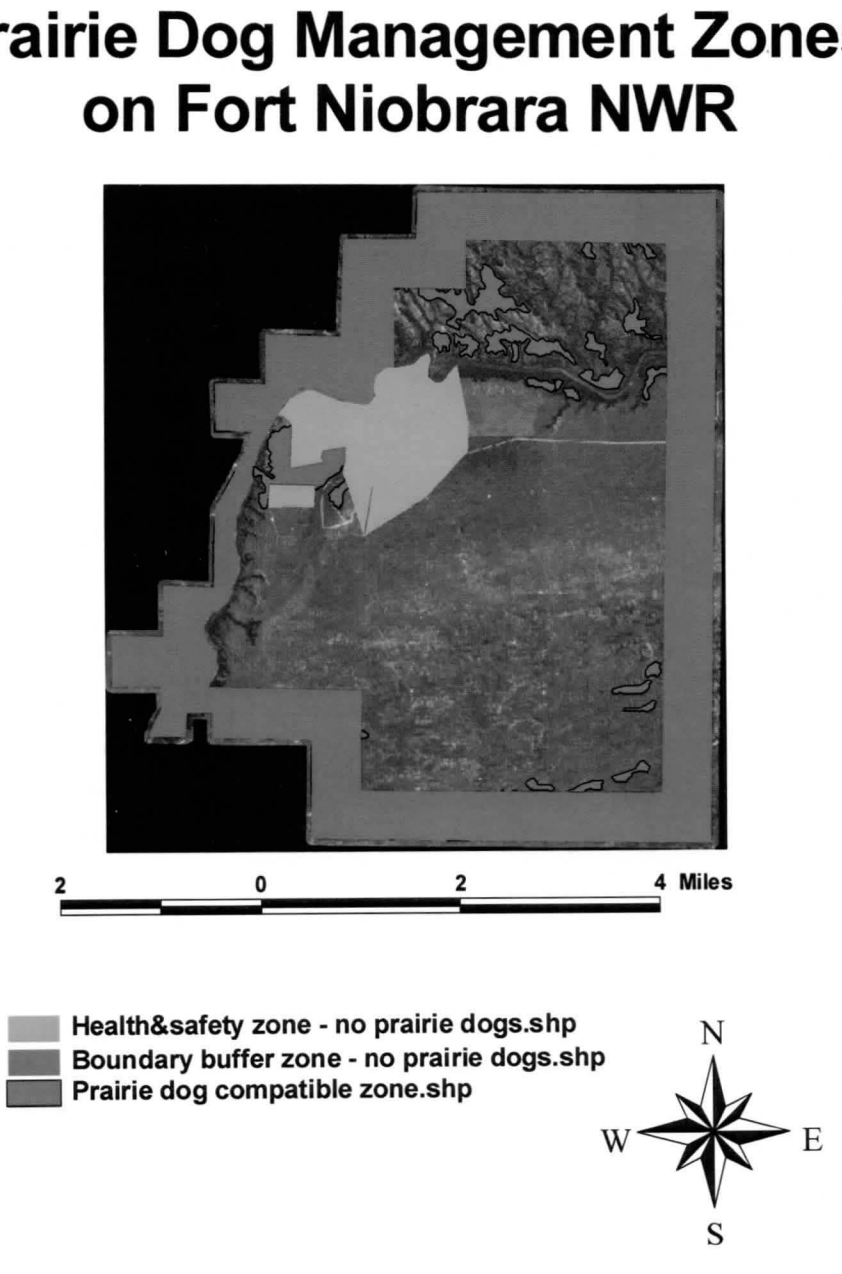
The map below (Figure 3) illustrates proposed management zones on Fort Niobrara NWR. Potential "marginally" suitable habitat within the refuge that, if occupied by prairie dogs, would not pose a health and safety risk, conflict with other wildlife/habitat management objectives, and/or threaten private land is delineated as a "prairie dog compatible" management zone. Acres managed for prairie dogs would approximate 70-80 acres south of the Niobrara River and 110-120 acres in the wilderness area north of the river for a refuge total of ~ 190 acres (10% of suitable habitat). Prairie dog "incompatible" management zones are those areas where prairie dogs will not be allowed and include the headquarters area (visitor center, residences, shops, well), bison corrals and adjoining handling units, government horse grazing units, public use roads and parking areas, water control structures/dikes, and ½ mile buffer adjacent to private lands.

Existing and newly established towns in "prairie dog incompatible zones" will have active control methods using one or more of the actions described in the next section of this plan. Specific techniques and frequency of control for these areas are not given due to the dynamic nature of the grassland/ bison grazing/ fire management programs, experience to be gained with control methods, and the dynamic establishment of towns on the refuge. This will allow more flexibility where, when, and how control measures are taken and will allow us to adjust when conditions warrant. These details will be addressed in our Annual Habitat Work Plans.

Existing and newly established towns in prairie dog "compatible" zones will be evaluated for needed management actions. Generally, once desired acreages are achieved, prairie dog colonies

will be allowed to expand and contract with natural predators and vegetative growth defining occupied areas and population densities. Long term management of established towns may require periodic control to limit population size within a town to prevent expansion and/or minimize the spread of density dependent diseases.

Figure 3.



Description of Potential Management Actions

Many strategies and techniques were considered for the management of black-tailed prairie dogs. They were evaluated based on a review of available literature, staff experience and knowledge, available budget, and compliance with laws, regulations, and policies related to refuge management.

Population Monitoring

Fort Niobrara staff will continue to annually map prairie dog complex boundaries using GPS and identify any newly formed or re-colonized areas. Population density data will be obtained as needed for management decisions.

Density data will be collected using protocol outlined by Severson and Plumb (1998). Severson and Plumb determined that using visual counts in a defined area correlated more closely to the actual numbers then other methods (i.e. burrows counts along transects, aerial photography). The recommended technique consists of counting individuals three times in 4-hec plots for 3 consecutive days using the maximum number counted as the final estimate. Visual counts will be conducted from an elevated area e.g., a blind or hill, early morning using binoculars. Counts will be conducted from mid to late June after the young-of-the-year have emerged and yearlings are dispersing.

Disease Monitoring

Staff will be informed of the potential for plague and other infectious diseases associated with prairie dogs through periodic safety meetings, e-mails, and memos. If individual animals appear to be sick or if a significant, unexplained mortality event occurs, the Region 6 Chief of Wildlife Health and/or Regional Biologist will be contacted immediately. The Disease Contingency Plan for Fort Niobrara NWR will be consulted for appropriate response including animal collection and diagnosis, safety precautions, potential closure of area to public use, etc. If plague is confirmed on Fort Niobrara NWR, staff will work with Regional External Affairs in notifying the public.

Non-Lethal Control

Exclusion

Total exclusion is not often practical or economically feasible. Some success on smaller towns has been reported by burying small mesh wire fencing about two deep and leaving 3 feet above ground (Hyngstrom *et al.* 2005). Mesh wire fencing was installed on Fort Niobrara to prevent expansion of the prairie dog town into the headquarters area. Within a month of this effort; however, prairie dogs breached the barrier and were back in the headquarters area. Fences and objects (i.e. hay bales, trees/bushes, snow fence) that block a prairie dogs view have been used to make an area less suitable to prairie dogs. Reports in the literature, though, suggest they have

proven to be only mildly successful with prairie dogs reportedly digging under the fence or climbing over without problems. These methods are often very expensive and this control technique may only be effective on newly established towns containing a small number of animals.

Frightening
In general, frightening techniques do not work. On Fort Niobrara, constant disturbance by refuge visitors, lawn mowers, vehicles, etc. did not result in prairie dogs leaving the headquarters area.

Range Management
Moderate to heavy grazing of grasslands results in short grasses and forbs, which is desired habitat of prairie dogs. Bison stocking rates in combination with prairie dog forage consumption, ~8 pounds of forage/month, must be considered when managing grasslands for prairie dogs or other wildlife. Heavier stocking rates will favor prairie dogs while light to no grazing will result in taller, denser vegetation required by other prairie wildlife such as greater prairie chickens. Placement of salt and mineral blocks within a prairie dog town is a range management tool that can be used to encourage bison to graze and wallow in it or expand the boundary of the town.

Capture and Relocate
The cost of capturing and moving prairie dogs can be very expensive and time consuming. The use of cage traps for removal of individual animals has been shown to be inefficient. Other live capture methods include flushing with soapy water or sucking them out of their burrows with a vacuum truck. On Fort Niobrara NWR, prairie dogs have been captured by hand after flushing the burrow with soapy water and then relocated to an area on the refuge where they were desired. Live capture of prairie dogs to support recovery efforts for black-footed ferrets or establishment/augmentation of prairie dog colonies at other sites could also be an option for management.

Lethal Control

Toxicants
The use of toxicants has been shown to be one of the most effective methods of control for prairie dogs. Several toxicants are currently labeled for use on prairie dogs and have no secondary poisoning effects when label instructions are followed. Typically, toxicants provide up to 90% control with one treatment. One or more follow-up treatments may be needed for 100% control. Timing of the application is critical to reduce impacts to nontarget species.

Zinc-phosphide coated oats were developed and approved by the U.S. Fish and Wildlife Service as a control agent for prairie dogs (Tietjen 1976). They have been used successfully on Fort Niobrara prior to the moratorium. Proper pre-baiting and timing are critical to ensure that treated grain is consumed by prairie dogs and does not remain available to non-target animals. All label instructions will be followed by certified applicators. Prairie dogs eating zinc phosphide treated oats typically die slowly enough that they retreat into burrow systems and are not left on the surface. Zinc phosphide is extremely toxic to waterfowl and granivorous birds (Knowles 1994). It rapidly decomposes in the environment when exposed to moisture. The most likely non-target

species to be affected on Fort Niobrara NWR would be granivorous birds commonly observed on prairie dog towns such as western meadowlarks, red-winged blackbirds, and horned larks. Late fall and early winter are considered ideal times for control due to the fact that most granivorous birds, burrowing owls, and other sensitive species are not present. Also, prairie dogs more readily take the treated grain, as little to no green forage is available.

PhosFume is another toxicant labeled for use in prairie dog control. It is widely used to fumigate grain bins and is also labeled for use on burrowing rodents, including prairie dogs. It comes in a tablet form that is dispensed into holes and then the holes are covered. A chemical reaction is initiated by exposure to atmospheric moisture and phosphine gas is released throughout the burrow system. This phosphine gas is highly toxic to insects, birds, and mammals. Timing again is critical, as any non-target animals in the burrows would also be killed. The best time to treat with PhosFume is from fall to late winter, after all burrowing owls have departed. A certified contractor would need to be hired to make application of this toxicant. Current Refuge policy will be followed by completion of an approved Pesticide Use Proposal for both.

Shooting
Control through consistent, selective shooting by refuge staff has been very effective in the past for maintaining a prairie dog population within a designated area and preventing expansion. Recreational shooting of black-tailed prairie dogs is not allowed on the refuge, and we propose to leave this closure in place. This decision was made based upon the fact that Fort Niobrara is currently closed to hunting, acreage is small, and because a significant amount of opportunity for this activity occurs to the north in South Dakota on Tribal and private lands.

Leghold Traps and Snares
In small colonies, leghold traps and #120 Conibar traps placed and bedded at burrow entrances can be used successfully where other methods are not practical. In general, snares have been shown to be labor intensive, relatively ineffective, and expensive on a large scale. Upon removal of animals, the burrows are filled-in to discourage re-colonization.

Site Recovery
Leveling Holes
To prevent re-establishment, holes and mounds may be bladed, disked, or otherwise smoothed. Small towns may be smoothed with a small tractor mounted blade.

Seeding
Nearly all prairie dog towns on the refuge are dominated by low successional plants, both native and non-native. Recovery of these areas may include over-seeding with a variety of native plants including blue grama, hairy grama, buffalo grass, little bluestem, prairie sandreed, sand bluestem, needle-and-thread, prairie junegrass, annual sunflower, prairie coneflower, purple coneflower, and others.

Reintroduction
The only likely scenario to cause the long term loss of prairie dogs on Fort Niobrara NWR would

be an outbreak of plague. In the event that a total loss of prairie dogs occurs on the refuge, monitoring will continue for at least 3 years. If after this time period, prairie dogs have not begun to re-establish on their own, consideration will be given to reintroducing black-tailed prairie dogs into a historic town within the "prairie dog compatible" management zone.

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