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BLACK-TAILED PRAIRIE DOG MANAGEMENT ON THE NORTHERN GREAT PLAINS NEW CHALLENGES AND OPPORTUNITIES

Greg L. Schenbeck
U.S. Forest Service, Chadron, NE

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Greg L Schenbeck, U.S. Forest Service, 270 Pine Street, Chadron, NE 69337

Abstract: Implications of new information and several recent developments to the management of black-tailed prairie dogs (cynomys ludovicianusl on the northern plains are discussed. Of primary importance is the need to conduct management programs that are as cost--effective as possible and responsive to the concerns of private land interests. Research findings indicate that cost-effectiveness can be improved by combining rodenticide use with changes in livestock grazing practices to reduce habitat suitability for prairie dogs. Other research suggests that reduced concentrations of Compound 1080 for prairie dog control warrants continued scientific evaluation. If reduced concentrations of 1080 could be used effectively and safely, the need to prebait would be eliminated and cost-effectiveness improved. New information is available that will assist in managing black-tailed prairie dog colonies on public lands for the positive social and environmental values associated with the species.

Introduction

The amount of information on the control and management of black-tailed prairie dogs on the northern Great Plains has grown considerably in recent years. There have been opportunities to learn from several ongoing prairie dog management programs and researchers have answered many previously unanswered questions. In addition to the new information that has been acquired, several recent developments also need to be considered in the design of future management programs for black-tailed prairie dogs. This paper identifies and discusses management implications associated with the new information and recent developments.

Effectiveness of Ongoing Management Programs

Management programs directed at controlling black-tailed prairie dog populations have been implemented across the northern plains, and strategies for the various programs range from treating all prairie dog colonies in an area with rodenticides to treating only those colonies that are creating some type of management problem(s), such as proximity to neighboring lands or unacceptably high expansion rates. Changes in livestock grazing practices are also being used concurrently with rodenticides in some areas to help control prairie dog populations.

The prairie dog management programs that I am familiar with in Nebraska and South Dakota generally report reasonable control with grain baits, primarily zinc phosphide formulations. Complaints about the need for prebaiting with untreated grain are common, but the most serious problem in the various programs is the rapid recovery of prairie dog populations following poisoning and the subsequent costs of frequent retreatments. For example, during the first few years of a prairie dog management program in Conata Basin, South Dakota, most colonies needed retreatment at least once every 3 years (Schenbeck 1982). Now, 8 years into the program, the frequency of retreatment is about the same but

progressively smaller areas within the poisoned colonies need retreatment

The effects of prairie dog control in Conata Basin on plant production has not been encouraging. Research results indicate that more than 4 years of reduced prairie dog densities may be needed for a corresponding increase in forage production (Uresk 1985). Utilization of available forage is obviously reduced by prairie dog control, but to gain 1 animal unit month of livestock forage annually for the life of a control treatment, approximately 17 acres had to be poisoned (Collins et al. 1984).

The cost-effectiveness of the various management programs is frequently questioned. Evaluating the Conata Basin program, Collins et al. (1984) found that, based strictly on livestock forage response to rodenticide treatments, the program was not economically feasible. At an annual population recovery rate of 1096 or greater, annual retreatment costs exceeded the annual value of grazing increases. Their analyses did not include the value of forage protected from further prairie dog population increases.

New Research Information

Habitat Relationships

The importance of black-tailed prairie dogs and their colonies to other wildlife species has been reaffirmed by several recent studies. Agnew (1983) found that colonies added heterogeneity to the fauna of the mixed-grass prairie in South Dakota by supporting greater avian densities and species richness and greater small rodent densities than adjacent uncoIonized sites. Prairie dogs were also a major component of swift fox *(Vuipes velox)* diets in southwestern South Dakota (Uresk and Sharps, in press). In a new publication on blackfooted ferret *(Mustela nigripes/* habitat near Meeteetse, Wyoming, Forrest et al. (1985) list Cynomys spp. as the principal associate of black-footed ferrets, and the authors also call to our attention the fact that all of the known breeding populations of ferrets exist near prairie dog colonies. The publication also includes projections on the size and distribution of prairie dog colonies needed to support viable ferret populations.

The preference of black-tailed prairie dogs on the northern mixed-grass prairie for areas grazed by livestock and for areas impacted by other land uses was discussed in several recent reports. Cincotta (1985) reported that expansion of prairie dog colonies on the Badlands National Park in South ~ Dakota was favored in intensively grazed areas and in areas disturbed by homesteading activity. Uresk et al. (1982) found that prairie dog burrow densities in Conata Basin increased twice as fast on sites grazed by cattle than on sites ungrazed by cattle. In eastern Montana on the Charles M. Russell National Wildlife Refuge, the black-tailed prairie dog distribution was primarily influenced by intensive livestock gracing and/or other forms of human activity (Knowles 1982). Most colonies were on sites with heavy livestock grazing, stockwater developments, or past homesteading activity.

The impacts that prairie dogs have on their environment through grazing and digging activities have been described by several researchers. In Wind Cave National Park, Coppock et al. (1980) found that peak live graminoid biomass in areas colonized for 1-2 years, 3-8 years and more than 25 years was respectively 3996, 61% and 9790 lower than in adjacent uncolonized areas. Uresk (1984) reported that high densities of black-tailed prairie dogs can reduce production of some native perennial grasses but that several years of colonization might be necessary before a pronounced shift in species composition would occur.

Management Techniques

It is indicated in several recent reports that habitat suitability for black-tailed prairie dogs can be modified to promote either population expansion or reduction. Cincotta (1985) stated that, based on his observations, managers need to increase vegetative cover around colonies to help check expansion. Uresk et al. (I982) suggested that periodic rest or reduced stocking rates of livestock, in combination with rodenticides, would help regulate population increases and colony expansion. Deferring a pasture from cattle grazing for 4 consecutive growing season reduced a 110-acre colony in southern Kansas by approximately 90% (Snell and Hlavachik 1980). Summer grazing on the same colony was deferred again several years later when the colony began to expand, and after just 1 season of deferment, the colony had decreased approximately 70% in size (Snell 1985). Since the average annual precipitation in the general area of the Kansas colony was 25 inches, the response of colonies on the northern plains to summer deferment of livestock grazing would be less dramatic due to less rainfall. Studying black-tailed prairie dogs in eastern Montana, Knowles (1982) hypothesized that it would be possible to control the number and distribution of colonies by limiting cattle grating and the number and location of stockwater developments. He also stated that the establishment of new water developments and heavier livestock grazing would create additional areas suitable for colonization and colony expansion.

The comparative effectiveness of 2% zinc phosphide and 5% strychnine formulations was recently studied in South Dakota (Uresk et al. in press). Active prairie dog burrows were reduced 94% with zinc phosphide bait (prebaited), 77% with strychnine (prebaited), and 5690 with strychnine without prebait. Efficacy for zinc phosphide bait in this study was similar to a 96% reduction in prairie dog activity with the use of zinc phosphide bait on the Pine Ridge Indian Reservation in South Dakota (Tietjen and Matschke 1982).

The need for prebaiting for both zinc phosphide and strychnine baits was supported by the findings of Uresk et al. (in press). Although high levels of control can be expected with prebaited zinc phosphide and strychnine when applied in accordance with label instruction, the prebaiting operation doubles the costs and time requirements of a control program. Since prebaating appears to be unnecessary with sodium monofluoroacetate (Compound 1080) formulations, laboratory and field studies were recently conducted to determine if 1080 concentrations less than the standard 0.112% concentration could be used effectively and without significant nontarget hazards (Matschke and Hegdal 1985, Matschke and Savarie 1985). Results of these studies using the standard concentration and 2 reduced concentrations indicated that additional research should be conducted with 0.022% and 0.035% 1080 formulations on larger acreages under operational control procedures to further evaluate efficacy.and nontarget risks.

The management needed for a colony depends on its expansion potential, proximity to other colonies and other land ownerships, and the management goals for the unit of land where the colony is located (Cincotta 1985). Knowles (1982) experimented with zinc phosphide bait by applying partial treatments, where only part of a colony was treated, and total treatments, where an entire colony was treated. Although efficacy was estimated to be 88% based on visual counts, recolonization of the partially treated colonies was rapid with population recovery occurring within 2 years. Population recovery in the colonies receiving total treatment took an additional 2 years. Knowles (1982) stated, that from an economic standpoint, total treatments were the most cost-effective in controlling prairie dogs.

Recent Developments

Discovery of Black-footed Ferrets in Wyoming

The discovery of black-footed ferrets near Meeteetse, Wyoming, in 1981 has provided an opportunity for acquiring a better understanding of prairie dog-ferret relationships. The discovery also rekindled public awareness and interest in the species and its recovery.

Guidelines for Conducting Ferret Surveys

A set of guidelines for conducting black-footed ferret surveys is being developed by the U.S. Fish and Wildlife Service and will be used by the Service as the standard for ferret survey procedures in Section 7 consultations (Endangered Species Act) on federal projects. In addition to the guidelines, the Bureau of Land Management recently published a handbook on ferret survey methods (Clark et al. 1984). The survey methods described in the handbook and by the U.S. Fish and Wildlife Service are more intensive and costly than many past surveys.

New South Dakota Law

A new weed and pest law for South Dakota became effective in January, 1984. The new law brings control of black-tailed prairie dogs and other species considered as agricultural pests under the administration of county weed and pest boards. The old law dealt only with weed control. Under the new law, county boards have the authority to declare lands with prairie dogs a public nuisance and to require or conduct prairie dog control in response to complaints from neighboring lands.

Recent EPA Actions

The recent registration of aluminum phosphide as a burrow fumigant provides another tool for controlling prairie dog populations. The fumigant appears to be most effective when used as a follow-up to bait application and many users report better success with the new fumigant than with the old gas cartridges.

EPA's final decision on 1tPAR (rebuttable presumption against registration) for Compound 1080 was issued in July, 1985. The agency concluded that a variety of regulatory measures can be imposed that will allow the continued use of 1080 as a rodenticide. A major condition for continued use is that all data necessary to fully support federal registration be submitted to EPA. One of several other requirements is that use of 1080 to control prairie dogs be at a maximum concentration of 0.02% beginning in 1986 and continuing until data are submitted on the lowest effective bait concentration. Bait concentrations exceeding 0.02% will have to be assessed to evaluate risks to black-footed ferrets.

Litigation

A civil lawsuit listing the American Farm Bureau Federation, South Dakota Farm Bureau Federation and several individuals as plaintiffs and the Forest Service, National Park Service, and Bureau of Indian Affairs and numerous officials of those agencies as defendants was filed in United States District Court in 1980. The primary contention in the suit was that the defendants failed to conduct an effective prairie dog control program on lands

administered by them and that adjacent private lands were damaged by prairie dogs originating on the defendants' lands. The suit was finally settled in December 1984, with the primary agreement being to better coordinate control programs on private, public and tribal lands.

Management Implications

Information presented and discussed in this paper has implications that need to be considered when evaluating the effectiveness of an ongoing prairie dog management program or when designing and implementing a new program. Being responsive to these management implications will present both challenges and opportunities to private, tribal, and public land managers. The major management implications are:

1. Control of black-tailed prairie dogs on the northern plains generally requires a long-term commitment of funding and manpower because of rapid population recovery after poisoning and slow vegetation recovery due to limited rainfall.
2. The most cost-effective control programs will combine the use of rodenticides with livestock grazing practices that reduce habitat suitability for prairie dogs. Current poor economic conditions accent the need for the most cost-effective programs possible, consistent with appropriate environmental and social considerations.
3. Further research into the efficacy and risks of reduced 1080 concentrations needs to be supported. The primary benefit of using 1080 would be the elimination of prebaiting and improved cost-effectiveness.
4. The new "state-of-the-art" black-footed ferret survey methods are more intensive and probably more reliable than many past surveys, but funding the more expensive surveys will be a tough challenge for public land managers faced with substantial budget reductions.
5. The best opportunities for managing black-tailed prairie dogs for their positive values probably exist on public lands remote from adjacent private lands, since private landowner attitudes towards black-tailed prairie dogs on the northern plains are generally not favorable. The new South Dakota weed and pest law and the litigation discussed in this paper are indicative of general landowner attitudes in areas where prairie dog populations have been allowed to increase beyond the tolerance limits of the local landowners and residents.
6. A concerted effort is needed to identify public lands on the northern plains where prairie dog colonies could be managed to meet the black-footed ferret habitat criteria presented in the recent publication on ferret habitat near Meeteetse, 'Wyoming (Forrest et al. 1985).

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