

FORUM

A Proposal to Conserve Black-Footed Ferrets and the Prairie Dog Ecosystem

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ABSTRACT / Prairie dogs (*Cynomys* spp.) have been poisoned throughout this century because of grazing competition with livestock. Recent evidence showed these early claims were exaggerated, but animal control was already entrenched in government policy. As a result, ongoing gov-

ernment subsidized poisoning has reduced prairie dogs to about 2% of their former distribution. The reduction of prairie dogs diminished species diversity in the arid grasslands of North America, including the potential extinction of the black-footed ferret (*Mustela nigripes*). Cost-benefit analysis revealed that poisoning costs more than any grazing benefits accrued. This analysis did not consider the long-term costs of reversing ecosystem degradation, the intangible value of biological diversity as a public benefit, or the depletion of biotic resources as a loss of actual or potential wealth. The government presently finances the poisoning policy and the preservation of endangered species like the black-footed ferret, two apparently conflicting programs. We, therefore, propose an integrated management plan that considers both interests. We propose that federal monies allocated to the poisoning program be converted into a rebate for ranchers who manage livestock while preserving the prairie dog community. This would redirect funds and personnel already allocated to prairie dog eradication to an incentive for ranchers who manage for livestock and wildlife. Livestock interests and grassland biotic diversity would both benefit.

We are presently witnessing a worldwide decline of biotic diversity unmatched since the Cretaceous, and that rate of biological depreciation is accelerating (Wilson 1988). The opening of the American West to rangeland and agricultural development is one North American example of this phenomena. It is a story of exterminated endemic species and their partial replacement with exotic substitutes. It is also the story of government policies and programs financially sustaining opposing interest groups. In this paper we discuss the ongoing degradation of the prairie dog ecosystem, a system that is vital to the biological integrity of the arid western grasslands, and propose an integrated management plan as an alternative.

The Problem: Prairie Dog Control Policy

Prairie dog (*Cynomys* spp.) eradication began around the turn of this century, and poison was the method of choice (Merriam 1902). Overall, prairie dog distribution was reduced from 40,000,000 historical hectares to 600,000 hectares by 1960 (Marsh

1984). Although these figures are estimates, they represent a 98% decline in the original geographic distribution of the four species of prairie dogs.

The program to exterminate prairie dogs began because ranchers wanted potential competitors with livestock eliminated. Livestock and prairie dogs eat grass, and so prairie dogs must go. In 1902, the director of the Biological Survey, C. H. Merriam, suggested that prairie dogs decreased the productive capacity of the land by 50%–75% (Merriam 1902). This estimate was readily accepted and used to justify poisoning well into the 20th century, but recent research has shown these figures exaggerated and misleading (Koford 1958, O'Meilia and others 1982, Collins and others 1984, Krueger 1988).

Early 1900s prairie dog research priorities and policy seemed coupled with poisoning policy directing the science. Research did not address ecological consequences or relationships but instead examined efficient and cost-effective toxicants and techniques (Lantz 1909, 1917, Bell 1918, 1921).

Initially, prairie dog poisoning activities were cooperative arrangements between states, county agricultural agents, and local interests (Bell 1921, McNulty 1971). Federal involvement was largely advisory until

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less of the obvious biological effects of poisoning policy, it will be necessary to institute new conservation incentives to counter the negative impact of the old incentives to poison. For long-term effectiveness, this plan will probably require legislative action. The Endangered Species Act addressed the need for incentives. "Encouraging the states and other interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs which meet national and international standards is a key to meeting the Nation's international commitments and to better safeguarding, for the benefit of all citizens, the Nation's heritage in fish, wildlife, and plants" (Endangered Species Act; Sec. 2, subsec. [a], [5]). "The purposes of this Act are to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes and conventions set forth in subsection [a] of this section" (Endangered Species Act; Sec. 2, subsec. [b]).

Because this is an integrated plan for management of a system and is outside the traditional agricultural paradigm, it will require a comprehensive education program (following that of the golden lion tamarin project; Dietz and Nagagata 1986). To augment the education program, the administering agency needs an economic model to demonstrate the financial feasibility of environmentally sound livestock practices. The model must also consider public cost and benefit.

Both O'Meilia and others (1982) and Hansen and Gold (1977) found no significant difference in market weight of cattle grazed on or off prairie dog towns, but at high densities of prairie dogs (e.g., 44/ha), a 4%–7% loss of forage to livestock can be expected (Uresk and Paulson 1989). White-tailed prairie dogs (*Cynomys leucurus*) live at much lower densities and would probably compete even less with livestock. Because 300 prairie dogs consume as much forage as one cow/calf unit (Uresk and Paulson 1989), this figure could be the basis for defining a financial rebate.

On private land, cooperating ranchers could be given a cash rebate for preserving the prairie dog ecosystem. Tax breaks, product marketing help, and free publicity may also be appropriate incentives for ranchers that declare and manage their lands for livestock and black-footed ferrets/prairie dogs (e.g., "this beef produced on a privately owned and managed black-footed ferret preserve").

In addition, some livestock operators lease public land. They are charged a federal grazing fee ac-

ording to the amount of forage they will use. Forage is measured in animal unit months (AUMs), and 1 AUM is the amount of forage required to sustain a cow, a horse, or five sheep for one month (US General Accounting Office 1988). Because the federal government owns public land and manages it in the interests of the entire nation, we recommend that public land not be poisoned. The environmental and fiscal costs of poisoning are simply too great, and the percentage of US beef weight produced on western public land is too small. Lessees using public land could receive compensation for the policy change in the form of grazing fee credits (a certain number of free AUMs based on 300 prairie dogs equaling one cow/calf unit; Uresk and Paulson 1989).

The conservation incentive will work only when stocking rates are within the carrying capacity of the land. Overgrazing occurs when forage consumption exceeds the regenerative capacity of natural vegetation. A balance between grazing impact and forage capacity is an elusive but essential goal, and even today, livestock overgrazing persists on public lands (Vale 1975, US Government Accounting Office 1988). Carrying capacity and stocking rate assessments should consider interannual climatic variation (United Nations 1978).

Carrying capacity depends on quality of forage as well as quantity of forage, so the number of cattle and/or bison will be related to that trade-off; if too many cattle are grazed in a confined area, reduced quantities of forage from severe livestock grazing will not offset any gain in forage quality (Detling and Whicker 1988, Whicker and Detling 1988), but, in proper balance, cattle and prairie dogs may coexist (Krueger 1988).

Henderson (1980, p. 103) stated "Over-abundance of prairie dogs, in many cases, is a sign of poor range management. We perpetuate poor rangeland management by advocating killing prairie dogs only." Because there is higher total production on pastures supporting prairie dogs only (and even on prairie dog-cattle pastures) than on pastures supporting only cattle, cattle limit total production more than prairie dogs do (Uresk and Bjugstad 1983). In addition, unstable livestock densities coupled with prairie dogs may just amplify a preexisting livestock problem: if prairie dogs are controlled when livestock are the offenders, it may increase rather than decrease the economic and ecological burden (Krueger 1988).

One part of a present strategy to make ferret reintroduction more palatable to ranchers is "prairie dog block clearance," where ferret reintroduction sites would not be poisoned but poisoning elsewhere would be easier. That plan does not address antiquated mis-

conceptions about the prairie dog ecosystem. Unless myths are dispelled, conservation of the prairie dog ecosystem will be difficult. We propose that an integrated management plan, including conservation of the prairie dog community, may be a cheaper and wiser alternative to the conflicting directives of animal control and the Endangered Species Act.

Black-footed ferret recovery must be based on the conservation of the ecosystem upon which it depends. If we fail to recognize the endangered black-footed ferret as a symptom of an imperiled ecosystem, the drain on species diversity and the federal budget will continue. Unless we counter the eradication of the prairie dog, we will be saddled with an expensive ferret program in perpetuity. With limited habitat available, any wild populations of ferrets would probably require intensive management and continued restocking from populations of ferrets maintained in captivity. Moreover, if present trends continue, the US Fish and Wildlife Service eventually will need to add other species to the list of endangered and threatened organisms. For example, the burrowing owl (*Athene cunicularia*) (Marti 1974, Knowles and others 1982) and mountain plover (*Charadrius montanus*) (Knowles and others 1982, Olson-Edge and Edge 1987) also depend on prairie dogs, and they too soon may require government welfare for survival.

Inflexible exploitation that is not influenced by ecological considerations is unlikely to make the best use of resources; in fact, the resulting ecological damage is likely to cause economic and social damage as well (International Union for the Conservation of Nature 1980). In this paper we have outlined an ecologically and fiscally sensible program that educates the public and rewards environmentally sensitive members of the livestock industry. That integrated program is an alternative to the present conflicting directives of poisoning policy and endangered species management. It is designed to restore ecological integrity to the arid western grasslands without harming the interests of the livestock industry.

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