
Understanding the Controversy Surrounding Black-Tailed Prairie Dog Restoration Efforts

Richard P. Reading^{1,2,3,*}, Lauren A. McCain^{3,4}, Tim W. Clark^{2,5},
& Brian J. Miller⁶

¹ Denver Zoological Foundation
2900 East 23rd Ave., Denver, CO 80205, USA

² Northern Rockies Conservation Cooperative
P.O. Box 2705, Jackson, WY 83001, USA

³ Southern Plains Land Trust
P.O. Box 66, Pritchett, CO 81064, USA

⁴ Forest Guardians
1452 Hudson St., Denver, CO 80220, USA

⁵ Yale School of Forestry & Environmental Studies
205 Prospect St., New Haven, CT 06511, USA

⁶ Wind River Foundation
P.O. Box 27, Watrous, NM, USA

* Corresponding Author: rreading@denverzoo.org

Introduction

In 1999 the U.S. Fish and Wildlife Service (USFWS) designated the black-tailed prairie dog (*Cynomys ludovicianus*) as warranted for listing as threatened under the Endangered Species Act (ESA), but precluded from such listing by other, higher priority species (USFWS 1999). This "warranted, but precluded" designation flamed a management controversy that had been brewing for years and instigated a flurry of activity by agricultural interests, government land and wildlife management agencies, non-governmental conservation organizations, scientists and others. This controversy is one of the latest in string of high profile conflicts between industries reliant upon natural resources and those interested in endangered species conservation in the United States.

As we shall see, prairie dogs alter grasslands they inhabit to such an extent that most ecologists consider them to be "keystone species" (Kotliar 2000; Miller et al. 2000). Ranchers and farmers, however, perceive the alterations as undesirable and consider the animals "pests" that compete with livestock, damage crops, and pose a threat to their livelihood (Reading et al. 1999; McCain et al. 2002). These agricultural interests elicited governmental support in their efforts to eliminate prairie dogs from western grasslands (Dunlap 1988). Yet, as recently as 10–15 years ago, the status of prairie dogs and their management was largely neglected and therefore not controversial (Jones 1999). How did this issue move to the forefront of conservation controversies in the USA? In this paper we describe and analyze the controversy surrounding prairie dog restoration efforts by examining the context of the issue, the key stakeholders, and the processes being used to understand and address the problem. We finish with recommendations to improve the prospects for black-tailed prairie dog conservation.

We write from the standpoint of conservationists concerned about the plight of the prairie dog and interested in developing less conflict-laden approaches to the conservation. We are also professionals who recognize the limitations of conservation approaches that focus narrowly on biology. Instead, we promote the policy sciences as a tool for contextual, interdisciplinary approaches (see Lasswell 1971; Lasswell and McDougal 1992; Clark 2002; and Wallace et al. 2002). We suggest a variety of complementary methods to achieve prairie dog restoration and argue for frequent evaluation and programmatic adjustment (i. e., adaptive management).

The Prairie Dog Restoration Context

Fully understanding the challenge of black-tailed prairie dog restoration requires comprehensive assessment of the context. Some people perceive prairie dogs as a threat to their livelihoods and lifestyles, whereas others view them as ecologically vital. These differences in perceptions stem from different ideologies, value systems, and situa-

tions of the people involved. But, the resulting social processes are based, to some extent, on prairie dog ecology and historical prairie dog management. We briefly summarize some of this here.

Biology and Ecology of Prairie Dogs

Black-tailed prairie dogs are one-kilogram ground squirrels that live in colonies of strongly defended family groups, known as coteries (Hoogland 1995). One of 5 species of prairie dogs, the black-tailed prairie dog is the only species that inhabits the Great Plains of North America (Hoogland 1995; Miller et al. 1996). Ranchers look at prairie dog colonies, note the lack of grass, and assume that prairie dogs are responsible for decreasing the livestock carrying capacity of rangeland. These perceptions are understandable; however, research suggests that prairie dogs reduce livestock production capacity by only about 1% (Crocker-Bedford 1976; Hansen and Gold 1977; O'Meilia et al. 1982; Uresk and Paulson 1988). It appears that although prairie dogs reduce forage biomass, their activities serve to greatly improve forage quality in the form of better digestibility, growth rates, and nutrient content (Bonham and Lerwick 1976; Coppock et al. 1983b; Detling 1998). This improved forage quality may result partly from increases in plant diversity, soil productivity, and water capacity on prairie dog colonies relative to surrounding prairie (Krueger 1986; Munn 1993; Outwater 1996; Weltzin et al. 1997b; Detling 1998).



Black-tailed prairie dog. Photo by Richard P. Reading.

Even if levels of prairie dog-livestock competition were as high as ranchers suggest, an economic analysis by Collins et al. (1984) found that prairie dog control was not cost effective. And these economic studies did not consider the benefits of prairie dog activities to local ecosystems and even livestock producers. For example, prairie dogs promote plants more resistant to grazing and stem the spread of plants considered undesirable to livestock producers (Bonham and Lerwick 1976; Coppock et al. 1983a; Weltzin et al. 1997a).

Evidence that prairie dogs function as keystone species in the grasslands continues to grow. Prairie dogs act as ecosystem engineers, influencing the abundance and distribution of other species and a number of ecosystem processes (Uresk and Bjugstad 1983; Kotliar et al. 1999; Miller et al. 2000). By burrowing, grazing, and clipping of tall vegetation, prairie dogs significantly alter the grasslands they inhabit, creating a mosaic of on- and off-colony habitats that shift as new colonies form and established colonies expand, contract, and disappear. Prairie dog activities change the composition and structure of plant communities, increasing diversity, bare ground, and the prevalence of forbs, while decreasing the prevalence of tall grasses and shrubs (Uresk and Bjugstad 1983; Uresk 1985, 1987; Krueger 1986; Weltzin et al. 1997a; Winter et al. 2002). Prairie dogs also affect several ecosystem processes, e. g., water and soil movement, soil chemistry, and nutrient cycling (Coppock et al. 1983a; Munn 1993; Outwater 1996; Detling 1998). These changes create habitat features that are exploited by other species for foraging, nesting, shelter, and refuge (Kotliar et al. 1999; Miller et al. 2000). Finally, prairie dogs and their associates serve as prey for a large number of predators (Kotliar et al. 1999; Miller et al. 2000). The overall result is a significant increase in species diversity across landscapes inhabited by prairie dogs (Kotliar et al. in press).

Prairie Dog Decline

The trajectory of human/prairie dog interaction over the past century is a particularly illuminating example of the influence of human attitudes on the management of a native species:

Prairie dogs... were managed according to their perceived usefulness to humans. The case of prairie dogs differs from that of other animals in part because the rodents were largely overlooked by the early-twentieth-century conservation movement. Instead, alliances of scientists, local landowners, and government officials formed around the perceived need to control prairie dog populations. These alliances, cemented together by the perception of prairie dogs as destructive pests, worked throughout the twentieth century to exterminate prairie dogs in their plains habitat (Jones 1999).

When Europeans first arrived in the Great Plains, they encountered prairies teeming with life, including millions of bison (*Bison bison*) and billions of prairie dogs (Hoogland 1996). Biologists estimate that prairie dogs inhabited 41 million hectares in the U. S. in 1900, but by 1998 that number had declined to about 300,000–450,000 ha; the exact extent remains hotly disputed (Marsh 1984; Biodiversity Legal Foundation 1998; Luce 2001).

Prairie dog decline began with the arrival of farmers and livestock producers in the Great Plains in the late 1800s. Farmers converted prairie dog habitat into cropland and ranchers initiated massive poisoning programs (Miller and Reading 2002). Government-sponsored control programs, which continue at reduced levels today, were



«Managing» prairie dog populations in this way has been prevalent in the United States for over a century.

undoubtedly the largest factor responsible for prairie dog declines (Dunlap 1988; Miller et al. 1996). In addition, around 1900 plague (*Yersinia pestis*) was introduced to the United States from Asia and rapidly spread (Cully et al. 2000). Prairie dogs exhibit no resistance to this introduced pathogen and die quickly, often exhibiting over 99% mortality rates (Cully and Williams 2001). Many conservationists believe that effective management of plague represents the greatest biological challenge to maintaining and restoring large populations of prairie dogs today. Other locally important causes of prairie dog decline include urban development and recreational shooting.

Prairie Dog Conservation and Management

Most substantial conservation activities for black-tailed prairie dogs arose from efforts to recover the critically endangered black-footed ferret (*Mustela nigripes*) (Clark 1989; Miller et al. 1996). Ferrets are obligate associates of prairie dogs, feeding almost exclusively on these rodents and using their vacated burrows as dens and refugia (Forrest et al. 1988). Ferrets likely went extinct in the wild in 1987 following the dramatic decline and fragmentation of prairie dog colonies



Black-footed ferret. Photo by Richard P. Reading.



Burrowing owl.

Photo by Richard P. Reading.

(Miller et al. 1996; Clark 1997). Today, ferret recovery is frustrated by a lack of prairie dog populations sufficiently large to support a ferret population. Similarly, other species associated with prairie dogs also declined dramatically, including especially swift foxes (*Vulpes velox*), mountain plovers (*Charadrius montanus*), ferruginous hawks (*Buteo regalis*), and burrowing owls (*Athene cunicularia*).

Despite these trends, agencies at all levels focused primarily on controlling prairie dogs until quite recently, and they initiated conservation actions reluctantly. Only after prairie dogs were petitioned for listing under the ESA did state wildlife agencies respond by quickly mobilizing to create an 11-state Black-tailed Prairie Dog Conservation Team. The USFWS supported the states' initiative and basically turned prairie dog management over to them, although the USFWS retains oversight (USFWS 2001, 2002).

Since the prairie dogs were petitioned for listing, some progress in their conservation has been made, but it has been slow in coming. The states produced a draft conservation plan and subsequent draft addendums (Van Pelt 1999; Luce 2001, 2002). One of their main goals is to prevent listing of the species under the ESA, as that would lead to loss of control over management (Miller and Cully 2001; Luce 2002). That goal arguably takes precedence over recovery of the species—a classic case of goal substitution.

Furthermore, the draft plan sets a goal of increasing prairie dog acreage to over 1% of historic levels by 2011; however, it also states that present levels are just under 1% of historic (Luce 2002). Thus, the plan is striving for a vague goal that is just marginally better than the status quo. The draft also permits unrestricted shooting and calls for providing money to cooperating landowners for poisoning prairie

dogs, even if a state remains below its target objectives for prairie dog acreage.

After over five years, the interstate plan remains in draft form, but all states are developing conservation plans and some agencies have begun taking action. For example, a few states have removed or are trying to remove "pest" species designations from prairie dogs and several agencies are also starting to regulate prairie dog poisoning and shooting. Prairie dog conservation incentives for landowners, advocated as early as 1990 (Miller et al. 1990), are finally receiving more attention (Bonnie et al. 2001; Luce 2001). Other initiatives include developing education programs and exploring the use of regulatory amendments to the ESA to encourage participation by landowners, tribes, and state agencies. Finally, private interests have developed successful ecological and technical methods of prairie dog translocation (Truett et al. 2001).

These actions notwithstanding, significant challenges to prairie dog restoration remain. We argue that the most important barriers include: agency inertia; a narrow focus on biology to the exclusion of socio-political factors; powerful political forces lobbying against conservation; and negative human values and attitudes toward prairie dogs. Thus, better addressing social and decision processes may offer the most efficient method of improving chances for success.

Understanding the Stakeholders: Social Process Analysis

Understanding the social process, that is how people interact, basically comes down to understanding the key participants, or stakeholders, and how they interact. Although each group is diverse, some generalizations are possible.

Ranchers

The agricultural industry, and especially ranchers, view prairie dogs as pests that require eradication or at least control (Reading et al.

1999; McCain et al. 2002). Ranchers perceive prairie dogs as severely restricting forage for livestock, despite scientific evidence to the contrary. They also fear losing their traditional lifestyles and control over public grazing lands (Reading and Kellert 1993; Reading et al. 1999). Both are occurring, but the extent to which prairie dogs are responsible is likely not high. McCain et al. (2002) suggest that ranchers' attitudes toward prairie dogs are an outgrowth of a worldview, or myth,¹ that promotes domination over nature, libertarianism, and the use of nature for economic gain. Ranchers use powerful symbols associated with cowboys and other Western myths, coupled with their traditional influence over local politicians to get what they want.

Conservationists

In almost direct opposition to ranchers, conservationists view prairie dogs as a native, keystone species that deserves protection (Reading and Kellert 1993; Reading et al. 1999). Conservationists are influenced by ideologies and myths associated with game management principles and wildlife biology, and envision huge expanses of open space sparsely populated by people, but supporting vast numbers of prairie dogs, bison, and other species (Popper and Popper 1987; Callenbach 1996). They are growing in number and often resort to lawsuits, media publicity, and appeals to popular pressure to achieve their goals. Conservationists use symbols associated with vast wilderness, wildlife, and endangered species, including imagery like the "American Serengeti" to promote their views (McCain et al. 2002).

Animal Rights Activists

Animal rights activists want decreased human impacts on nature and desire an end to pain and suffering to prairie dogs by poisoning and other extermination methods. They support extending legal

¹ We follow Lasswell and Kaplan (1950) in defining a myth as a pattern of beliefs based on underlying assumptions that are accepted without question by a community, whether these assumptions are true or not. Myths, or worldviews, are supported by powerful symbols and help people simplify and comprehend a world too complicated to fully understand.

rights to animals (Wise 2000), including prairie dogs. They use tactics and strategies similar to wildlife conservationists, often working with them on prairie dog issues. Their worldview is an outgrowth of myths associated with human rights, animal welfare, and conservation.

Agency Personnel

Agency personnel hold personal views that vary greatly, but can be quite similar within a single agency or profession. They face a volatile issue in managing prairie dogs. Despite multiple use mandates, most agencies are strongly influenced by special interests. There are also struggles for power among the agencies (Fischer 2000). Historically, many agencies were recruited into prairie dog poisoning campaigns (Barko 1997; Jones 1999), and an anti-prairie dog attitude remains strong in some. These attitudes are changing, especially among wildlife biologists. The myths and ideologies of agency professionals hold that control of nature for human purposes is both possible and desirable, and because of their training, agency personnel should be entrusted with doing so. They primarily use laws, regulations, and traditional authority to maintain control over wildlife and habitat.

Recreational Shooters

Recreational shooters form a small but vocal group that values prairie dogs as live targets to shoot (Vosburgh and Irby 1998). They identify with the agricultural community and believe that many species are "varmints" that must be actively controlled (Hawes-Davis 1998). Shooters espouse ideologies that promote extremely limited government regulation and open access to public lands. They tout their skill and the money they spend in local communities to influence prairie dog management.

Developers

Developers are mostly involved along Colorado's Front Range. They want cheap solutions to prairie dog management that permit continued developing (e.g., exterminate or move animals in the way of

development). These stakeholders are influenced by myths of capitalism, economic growth, and the importance of home ownership to Americans. Developers use their wealth and the media to influence politicians and the public to promote their agenda.

General Public

The American public is diverse, and most citizens are unaware of the prairie dog problem. However, public support for conserving wildlife is strong. For example, a survey by Czech and Krausman (1997) found that 84% of the public support the current ESA or would like it strengthened. Several subgroups view prairie dogs positively, such as Native Americans with traditional cultural beliefs, who consider them to be a species with which they are intimately interconnected.

Prairie Dogs

Finally, black-tailed prairie dogs are participants in this issue too, as are a myriad of other associated species. Their interest, to the extent we can know it, appears to be for continued existence and individual well-being. Right or wrong, humans will decide prairie dogs' fate.

Relations among Stakeholders

Relationships among stakeholders have become increasingly conflict-laden. Conflicts developed during recovery efforts for black-footed ferrets, and intensified as other species associated with prairie dogs, and then the prairie dogs themselves, were petitioned for listing under the ESA. Today, relationships among stakeholders are strained. For example, state and federal agencies often focus on control of species management programs, rather than on cooperating to restore prairie dogs and their associates. Conservationists and animals rights activists are suing agencies to conserve and restore prairie dogs, while ranchers are eliciting the support of local elected officials to restrict prairie dog conservation activities. Despite these strained relations, the interstate prairie dog plan does not address these issues (Van Pelt 1999; Luce 2001).

Understanding Decision-making: Decision Process Analysis

Any conservation program involves decision-making. The first step toward improving the decision process consists in analyzing and understanding the current mode of decision-making.

Organizational Arrangements

Decision-making occurs within organizations that dictate how information is or is not shared, how resources are distributed, who is involved, how participants interact, and ultimately how decisions are made. Understanding these factors helps identify the best opportunities for influencing and improving decision-making.

Bureaucratic organizational arrangements are coming to dominate prairie dog restoration and management. This is not surprising given the increasingly prominent role that government agencies play. Historically, however, informal decision-making was common, for example, among private landowners managing prairie dogs on their land (Barko 1997; Jones 1999). Much of the conflict today results from landowner concerns that they are losing control over their ability to manage prairie dogs as they see fit (Reading et al. 1999).

Following the 1998 petition to list the black-tailed prairie dog as threatened, the states organized an interstate team (Van Pelt 1999). This team largely continues using past patterns of interaction, power arrangements, bureaucratic designs, and modes of participation, despite the very limited success of such approaches in restoring threatened and endangered species. The resultant organizational structure leaves power and authority fragmented among several agencies, hampering progress. Despite great effort on the part of the team coordinator, there are already signs that the interstate approach will prove inadequate. For example, most states face hostile local governments and legislatures. In fact, 4 states have already withdrawn from the official interstate effort, calling into question the new organization's ability to coordinate effective regional conservation.

Finally, there has been little attempt to organize all stakeholders into the process. Key stakeholders largely excluded from the process include agricultural interests, powerful local politicians, recreational shooters, and a multitude of smaller conservation organizations. This limited involvement has begun to strain relations, increase conflict, and hinder restoration.

The Decision-making Process

Prairie dog conservation has entered into just the first few phases of the decision-making process. Currently, each major stakeholder is working to influence the way in which the prairie dog problem is defined by promoting its own problem definition, while trying to discredit other definitions. Thus far, it appears that the agencies, especially state agencies, are dominating conservation planning, with little input from other important stakeholders.

Power and authority are highly fragmented among several groups. Black-tailed prairie dogs are distributed across 11 U.S. states, 1 Canadian province, 1 Mexican state, and several Native American reservations. They occur on private, state, federal, and tribal lands managed by several federal, state, and tribal agencies, local governments, private ranchers, and non-governmental organizations. This fragmentation is creating problems of coordination and effective management, and often results in unproductive conflict, such as states' rights vs. federalism. This complex political environment calls for innovative decision-making, something the interstate coordinator has been trying to achieve. Despite this need, traditional state wildlife management approaches dominate and the plan fails to define how the states will manage their contentious socio-political environment characterized by powerful conservative governments, agricultural lobbies, urban developers, and vocal conservation and animal rights interest-groups.

Finally, the interstate plan never clarifies how success or failure will be appraised. Efforts thus far have been largely evaluated by the agencies themselves (Luce 2001b; USFWS 2001, 2002). As such,

"success" is almost guaranteed, and indeed 5 states already claim that they exceed their target figures. From our perspective, the agencies' actions thus far are necessary for prairie dog restoration, but are far from sufficient.

Alternatives to agency efforts have received less attention, but may offer opportunities for improvement. Non-profit organizations have put out plans (e.g., Predator Conservation Alliance 2001) or begun implementing actions for prairie dog restoration that are more proactive and innovative, but also mostly focus on the biological aspects of the challenge and do little to address values and attitudes, organizational arrangements, or the power and authority structures that underlie the more immediate biological threats.

Working to Improve Prairie Dog Restoration Efforts

Addressing conflict in conservation is difficult, as competing interests are usually firmly entrenched. There is no silver bullet. Instead, we suggest focusing on processes that will help us better manage conflict and move toward more successful conservation. We stress that this will not be easy nor quick, but will depend on building new cooperative relationships and expanding on successful practices to date. This requires employing a "practice-based" approach that seeks continuous improvements.

From an organizational perspective, we suggest broadening participation in prairie dog restoration efforts to include all stakeholders who wish to participate. We recommend creating a national working group to serve as a forum for conveying values, opinions, and demands; exchanging ideas and information; expressing legal and other obligations; managing conflict; and identifying opportunities to improve conservation. Additional structures are necessary at local levels. Most states have, or are in the process of creating, working groups for prairie dog conservation. Broad participation is even more crucial at this level. Two types of working groups might be required. A formal, decision-making body would include representatives of all

organizations legally required to be involved. A second, less formal group would include representatives of all stakeholders. Group members must be willing to work cooperatively with diverse participants, some of whom may embrace very different values. Managing such a group well is crucial to keep conflict from becoming unproductive.² Finally, we recommend forming special, high-performance teams (Gordon 1983; Clark and Westrum 1989) to address pressing problems, such as (i) the plague challenge, (ii) the prevalence of negative attitudes toward prairie dogs, (iii) government policies that promote eradication rather than conservation, and (iv) empowering people that support prairie dog restoration.

Holding workshops and decision seminars helps develop problem solving, decision-making, and leadership skills (Clark et al. 2002; Wallace and Clark 2002). They can also assist in building trust, increasing cooperation and collaboration, and decreasing conflict. Finally, special teams can use workshops to focus on some of the more specific aspects of the prairie dog restoration challenge, such as those listed above.

Practice-based conservation is adaptive management (Holling 1978) at its best. Practice-based conservation involves three steps (Collingridge 1992; Clark and Brunner 1997). First, participants identify the "best practices" being used. Second, these practices are adapted and applied to similar circumstances elsewhere. Finally, the most effective practices are diffused as widely as possible, where professionals continue to adapt, refine, and upgrade them. Outside evaluations are essential (Kleiman et al. 2000). An important part of evaluation includes explaining the factors responsible for each success or failure. We have chosen to highlight just a few candidate "best practices," each of which could be improved through evaluation and refinement. Other actions for other species offer additional possible models.

² Note, not all conflict is bad. Well-managed conflict can result in productive discourse and lead to greater innovation and creativity.

The Montana Prairie Dog Working Group

Montana was the first state to set up a prairie dog working group. Their management plan strives to ensure the long-term viability of prairie dogs and associated species using a number of strategies and annual review (Montana Prairie Dog Working Group 1999). Although lacking in some areas, the plan is the product of a cooperative effort among diverse interests over several years and is arguably the best state plan currently addressing prairie dog management. More importantly, it provides a basis for upgrading conservation planning and implementation in the future.

Private Land Initiatives

Several non-profit and for-profit organizations have initiated conservation projects for prairie dogs recently, including 2 new land trusts, the Nature Conservancy, and Turner Enterprises, Inc. These organizations work to capitalize on favorable demographic trends that have led to relatively low land prices in areas inhabited by prairie dogs and located close to large blocks of public land. They and their collaborators have taken an experimental approach to restoring the prairie dog ecosystem that promises to benefit similar restoration efforts elsewhere (Truett et al. 2001).

Web-based Information Dispersal

John Sidle of the U. S. Forest Service provides an invaluable service by distributing information about prairie dog conservation and management via the Internet to all interested people. In addition, The Prairie Dog Coalition offers a list-serve for people interested in news or discussions about prairie dog issues. Both efforts rapidly disseminate information and ideas. They both also could likely be improved using insight gleaned from similar efforts for other species or issues.

Denver Zoo Prairie Dog Workshop

In 1999 the Denver Zoological Foundation and the Northern Rockies Conservation Cooperative held a daylong workshop at the Denver

Zoo on prairie dog conservation. Participants included representatives from ranchers', governor's, animal rights, and conservation organizations, and from tribal, city, county, state, and federal agencies. Many participants had never met in such a setting before. Although only a small beginning, the workshop brought together diverse interests; shared values, concerns, and strategies for addressing prairie dog management; and opened a dialogue for future communication. This is a model that could be duplicated and expanded in the future.

* * *

Several other best practices should be identified, adapted, and spread. Particularly important areas for analysis include federal agricultural policies and subsidies, tribal land initiatives, city and county level actions, public land management, and applied research, especially on managing plague.

Effectively managing and reducing conflict represents perhaps the greatest challenge facing prairie dog conservation. Prairie dogs elicit strong emotional responses from several stakeholder groups, reflecting the strength of the underlying values and issues that these animals symbolize. If society hopes to conserve prairie dogs, an effective public relations program is necessary. Reading et al. (1999) outline a strategy for addressing values and attitudes in prairie dog conservation. It involves increasing awareness, sensitivity, and understanding of the conservation challenge while simultaneously developing a sense of ownership in the program by all stakeholder groups (Hungerford and Volk 1990).

Changing the values, attitudes, and behaviors of many key stakeholders toward prairie dogs will likely be challenging, if not impossible, because these people already possess values and attitudes that are central to their belief systems (Tessler and Shaffer 1990). However, for some people change is possible, and requires providing alternative choices for reaching the same or similar goals (Tessler and Shaffer 1990; Petty et al. 1997). For example, a financial incentive may provide ranchers with an attractive alternative to poisoning, especially if the

conservation program explicitly links how poisoning conflicts with other core ranching values (e.g., love for wildlife, a desire to live in a "clean," rural environment). Unfortunately, the simplistic financial incentives advocated by the agencies do not seem to be working. In 2002, for example, Colorado initiated a \$600,000 pilot program to provide incentives to landowners who conserve prairie dogs. However, few landowners joined the program and county governments developed legislation to discourage involvement, probably because both dislike prairie dogs for far more than financial reasons (see above; Reading and Kellert 1993, Reading et al. 1999). While potentially helpful, incentives must be linked to broader programs that work to address underlying attitudes toward prairie dogs (Reading et al. 1999, Lamb et al. 2001).

Conclusions

We cannot solve the problem we have created
with the same thinking that created the problem.

ALBERT EINSTEIN

The issues surrounding black-tailed prairie dog management and restoration are extremely conflict-laden and polemic. As with many, if not most ecological problems, successful restoration requires far more than a biological approach, because the problem stems primarily from the underlying socio-economic and political aspects of the challenge. The key stakeholders involved in prairie dog restoration efforts hold widely diverging values and attitudes toward the species and how to manage it. As a result, each promotes contrasting definitions of the problem and methods for addressing it. For example, ranchers believe there are too many prairie dogs and call for additional control measures, while conservationists express concern over the dramatic decline in prairie dog numbers and demand active restoration.

Resolving the conflict surrounding prairie dogs requires addressing the reasons for these differences, finding common ground, and, if

we want to recover prairie dogs, developing innovative approaches to build support for, or at least reduce opposition toward, restoration among antagonistic stakeholders. As Einstein suggested, this requires a more complicated mode of thinking than that which led to the problem. We recommend moving toward more complex thinking by using a practice-based approach that involves continual refinement and adaptation of activities which have already proven successful in prairie dog conservation.

Before European colonization of the Great Plains, black-tailed prairie dogs represented one of the most successful vertebrates in North America, numbering in the billions. Today, the future of that species, and of the many species that benefit from its activities, lies in our ability to successfully apply innovative approaches to restore prairie dogs to America's grasslands.

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