

A Home on the Range



HOW ECONOMIC INCENTIVES CAN SAVE
THE THREATENED UTAH PRAIRIE DOG

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ENVIRONMENTAL DEFENSE

finding the ways that work

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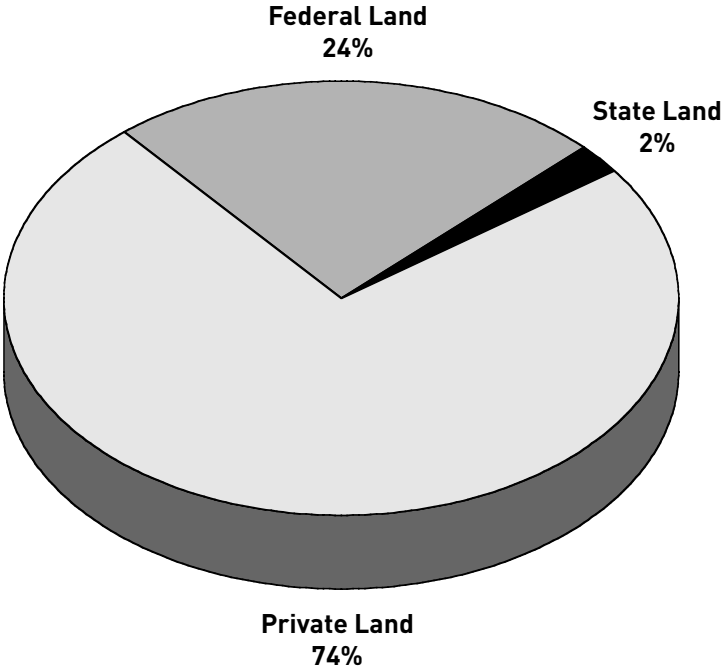
Executive summary

The four species of prairie dogs that inhabit the grasslands of the western United States are keystone species within their ecosystems. By creating a vast network of burrows and by continually clipping the grass around their colonies, prairie dogs create a diversity of habitats supporting many other species of plants and animals. Some animals find shelter in prairie dog burrows; others seek out the bare ground and short grass found on dog towns. Among the animals associated with prairie dog colonies are a variety of rare and declining species, including the black-footed ferret, swift fox, mountain plover, sage-grouse, and burrowing owl.

Many landowners, however, have an entirely different view of prairie dogs. To them, prairie dogs are pests that make it more difficult to earn a living from the land and, more importantly, to preserve cattle ranching as a way of life in the West. Holding them responsible for damage to crops and forage, and believing their burrows to be a menace to cattle and horses, landowners and state and federal agencies have sought to dramatically reduce populations of prairie dogs on much of the western range. This campaign, coupled with epidemics of sylvatic plague (an introduced disease that is fatal to prairie dogs), has caused a significant decline in prairie dogs across the nation. The rarest prairie dog in the United States—the Utah prairie dog—was placed on the federal endangered species list in 1973.

Approximately three-quarters of the remaining Utah prairie dogs live on private property (as opposed to federally-owned land). Lands occupied by Utah prairie

Where do Utah prairie dogs live?



The vast majority of Utah prairie dogs occurs on privately-owned land. A much smaller proportion occurs on federal and state-owned lands.



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Utah prairie dog populations have declined dramatically since 1920. This species was classified as endangered by the federal government in 1973.

dogs generally fall into three broad categories: (1) grazing lands (without irrigation); (2) alfalfa fields and irrigated pastures; and (3) open space along the fringes of rapidly growing towns such as Cedar City. The Utah prairie dog cannot be saved without the cooperation of these private landowners who control most of the remaining habitat, including many of the best sites for creating new prairie dog colonies. The essential challenge, consequently, is finding new approaches to prairie dog conservation that do not conflict with the landowners' needs and desires.

On grazing lands, the biggest complaint against prairie dogs is that they reduce the amount of forage available to livestock. This forage loss can be costly to ranchers, many of whom already have a difficult time making ends meet. Studies conducted elsewhere in the West, however, suggest that prairie dogs may also be beneficial to grazing lands. By continually clipping the vegetation around their colonies, they encourage the growth of younger, more nutritious shoots. They also prevent woody shrubs from encroaching on their colonies, thereby helping to preserve the open, grassy conditions favored by both prairie dogs and ranchers.

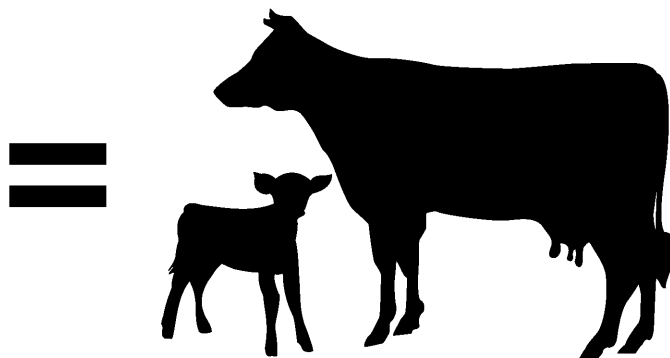
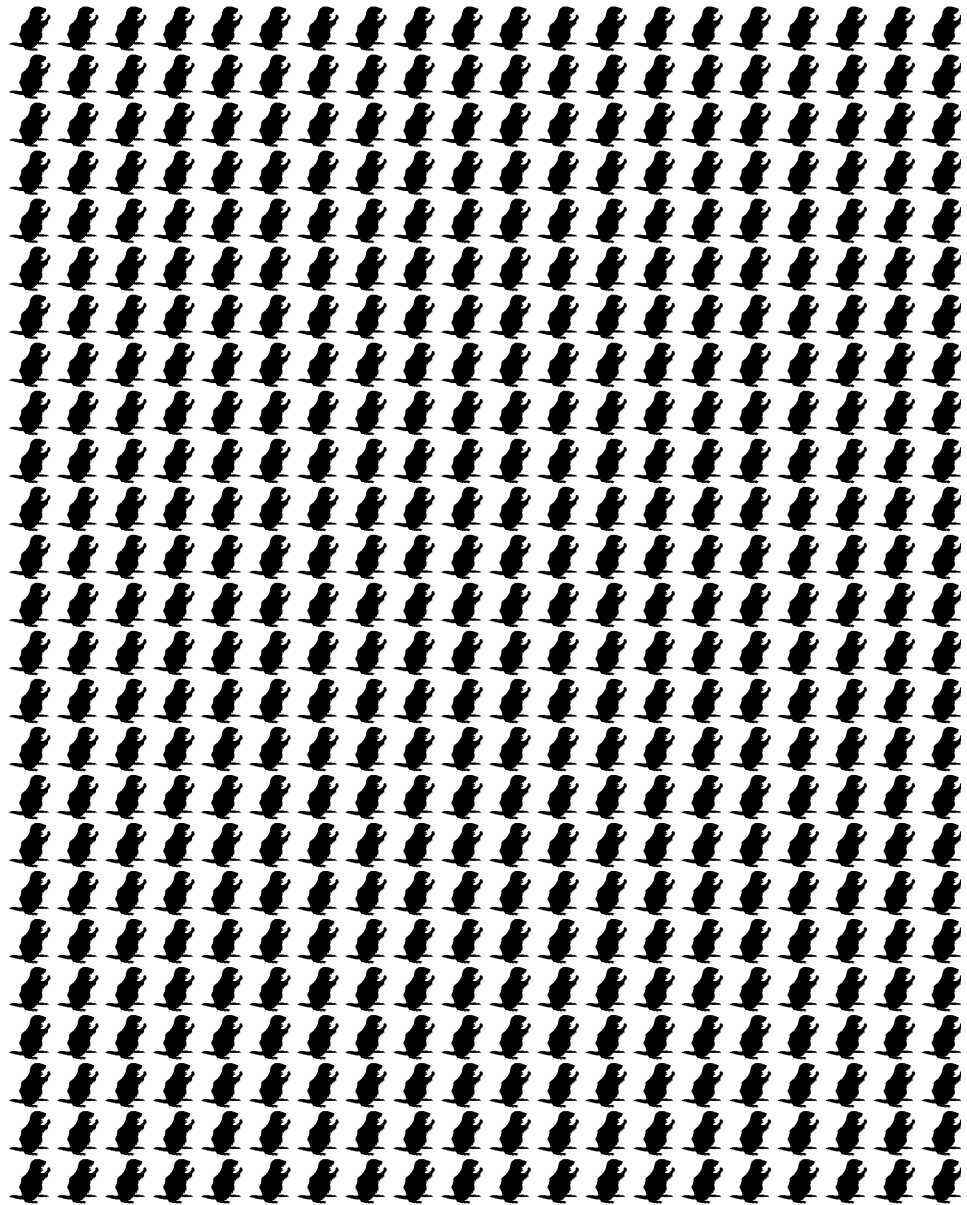
Thus, the annoyance over harm caused by prairie dogs on grazing lands must be tempered by an appreciation of the good they do. Most importantly, it should be possible for both Utah prairie dogs and livestock to co-exist on the same land.

In much of southern Utah, historic overgrazing by livestock has resulted in the loss of much of the original grass cover as well as increases in the amount of woody vegetation (i.e., brush encroachment). Coincidentally, many actions that ranchers would take to improve their grazing lands, such as clearing away the brush and reseeding sites with native grasses, are precisely the steps one would take to restore habitat for the Utah prairie dog. Ranchers, however, often lack the money to undertake such range improvements. In light of this, we propose an incentives program that would pay ranchers to improve privately-owned grazing lands in exchange for protecting existing prairie dog towns and, where necessary, allowing federal and state wildlife officials to re-introduce prairie dogs there. Such agreements would most likely take the form of fixed-term contracts with options to renew. Cooperating ranchers could be covered by a "safe harbor" permit from the US Fish and Wildlife Service, which ensures that the ranchers do not incur any added regulatory burdens as a result of welcoming an endangered species onto their property.

Utah prairie dogs can cause considerable damage to irrigated croplands and pastures both by consuming crops and by digging holes that intercept water and otherwise interfere with the irrigation equipment. Given the cash value of crops such as alfalfa and the expense of installing and maintaining irrigation systems, we foresee relatively few opportunities to restore prairie dogs in such places. The cost to the farmer is simply too high.

Similarly, along the fringes of southern Utah's rapidly growing cities, where land values are driven by development pressure, a straightforward incentives program is unlikely to offer enough money to attract many takers. However, it may

Utah prairie dogs and cattle



500 Utah prairie dogs consume approximately the same amount of forage as a cow and a calf, based on studies in high elevation rangeland habitat.

be possible to take advantage of the disparity in land prices across the range of the Utah prairie dog to encourage entrepreneurial landowners to engage in conservation efforts. This can be done via the creation of habitat conservation banks for Utah prairie dogs.

In such a bank, a landowner in a part of the Utah prairie dog's range where land prices are low, could restore habitat for the animals, thereby accruing prairie dog "credits." These could then be sold to developers wishing to alter prairie dog habitat in an area where land prices are high (e.g., near Cedar City). The developer would pay the rural landowner a certain amount of money as mitigation for the loss of prairie dog habitat near the city; the rural landowner, in turn, would agree to protect the habitat s/he has restored. If the US Fish and Wildlife Service insists that the mitigation ratio of acres restored to acres destroyed be greater than one-to-one, the result will be a net increase in the amount of prairie dog habitat. Habitat conservation banks for endangered species already have been created in several parts of the country. We believe the concept could work in Utah as well.

Finally, if financial incentives prove useful in aiding the recovery of the Utah prairie dog, they should be considered for the black-tailed, white-tailed, and Gunnison's prairie dogs as well. Although none of these species is on the endangered species list (yet), all three have suffered major population declines and could use a helping hand. In particular, Congress should approve a prairie dog incentive program through the "Farm Bill" (legislation that governs price support, crop insurance, and conservation programs for the nation's farmers) to reward landowners who agree to protect and restore habitat for all four US species of prairie dogs.

Through the judicious use of economic incentives, it should be possible for ranchers and prairie dogs to get along with each other—perhaps not everywhere, but at least in enough places to ensure the long-term survival of the prairie dogs and the other animals that depend upon them.

Varmints or vanishing species?



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Male greater sage-grouse often use the land around prairie dog colonies as a display ground. In fact, many wildlife species live in or near prairie dog colonies.

To many Americans, the prairie dog is a loveable, gregarious denizen of America's wide open spaces on the western range. For farmers and ranchers in the West, however, the prairie dog is a pest that damages crops and forage and interferes with their ability to eke out a modest living. As a result, for more than a century and a half, ranchers, farmers, and the federal government have waged a campaign against North America's prairie dogs. The consequences have been predictably deadly for the prairie dogs, which have been poisoned and shot in vast numbers, but also highly damaging to the grassland ecosystems that provide a home to the dogs.

Simply stated, the four species of prairie dogs that inhabit the grasslands of the western United States are keystone species within their ecosystems: their well-

being determines the fate of numerous other species. By digging a vast network of burrows and by continually clipping the grass around their colonies, prairie dogs create a diversity of habitats that support many other species of plants and animals. Some animals find shelter in prairie dog burrows; others seek out the bare ground and short grass found on dog towns. Among the animals associated with prairie dog colonies are a number of rare and declining species, including the black-footed ferret, swift fox, mountain plover, sage-grouse, and burrowing owl.

Persecution by humans, coupled with epidemics of sylvatic plague (an introduced disease that is fatal to prairie dogs) is wiping out colonies of prairie dogs across the nation. Of the four US species, the Utah prairie dog was added to the endangered species list in 1973. The black-tailed prairie dog, which once numbered in the hundreds of millions, if not billions, has suffered a 98% reduction in range and now survives only in scattered locations. It is a candidate for listing as a threatened species. The remaining two species, the white-tailed and Gunnison's prairie dogs, have also declined sharply. Ranchers and farmers continue to exterminate prairie dogs throughout the West, because these animals compete with livestock for forage and destroy valuable crops.

In irrigated pastures and croplands, prairie dogs can do considerable damage by reducing yields and interfering with irrigation systems, while on non-irrigated grazing lands, they can reduce the amount of forage available for livestock. Yet, prairie dogs have also been shown to increase the nutritional quality of forage by continually clipping vegetation and aerating the soil (O'Meilia *et al.* 1982). In addition, biologists have discovered that prairie dogs prevent woody plants such as mesquite from taking over grasslands. The animals do so by removing mesquite seeds and seed pods, and clipping, felling, or de-barking mesquite seedlings encroaching on their colonies.¹ In many places where prairie dogs have been elim-

¹These studies involved black-tailed prairie dogs. Given the ecological similarities between black-tailed prairie dogs and the other three prairie dog species, it is reasonable to conclude that all four species prevent shrub encroachment in grassland ecosystems.

inated, ranchers now spend millions of dollars to save their ranchlands from brush encroachment using herbicides, bulldozers, and prescribed fire. In essence, they are paying workers for a service that prairie dogs once performed for free (Weltzin *et al.* 1997).

Extensive discussions with biologists, range scientists, and ranchers, coupled with a review of the literature, have convinced us that the war on prairie dogs is, to a large degree, unnecessary and counter-productive. There is room for both livestock and prairie dogs in the American West. Moreover, by rewarding landowners who agree to protect and restore prairie dog habitat, ranchers will begin to view prairie dogs not as a pest, but as an asset. This report analyzes the use of economic incentives to engage landowners in conservation efforts on behalf of the Utah prairie dog, the most endangered of the four prairie dog species occurring in the United States. We begin with a brief overview of the status and ecology of the Utah prairie dog. We then discuss the economics of maintaining prairie dogs in rangelands, irrigated croplands, and the rural-urban interface. We focus on two approaches to restoring prairie dog colonies on private and state-owned lands: the use of safe harbor agreements and the creation of conservation banks.

Private lands are essential for saving the Utah prairie dog

The Utah prairie dog is restricted to a small portion of southwestern Utah. Historical data indicate that it was once far more numerous and widespread than it now is. According to one estimate, the total population of Utah prairie dogs was approximately 95,000 in 1920, dropping to 3,300 by 1972 (US Fish and Wildlife Service 1991). The primary reasons for this decline were poisoning, trapping, and shooting (carried out as part of a government-sponsored “control” effort), habitat destruction, and the spread of plague, a disease to which prairie dogs are highly vulnerable. The Utah prairie dog was added to the federal list of endangered species in 1973. In recent decades, probably in response to protection, Utah prairie dogs have rebounded slightly, increasing to upwards of 10,000 individuals by the late 1990s.²

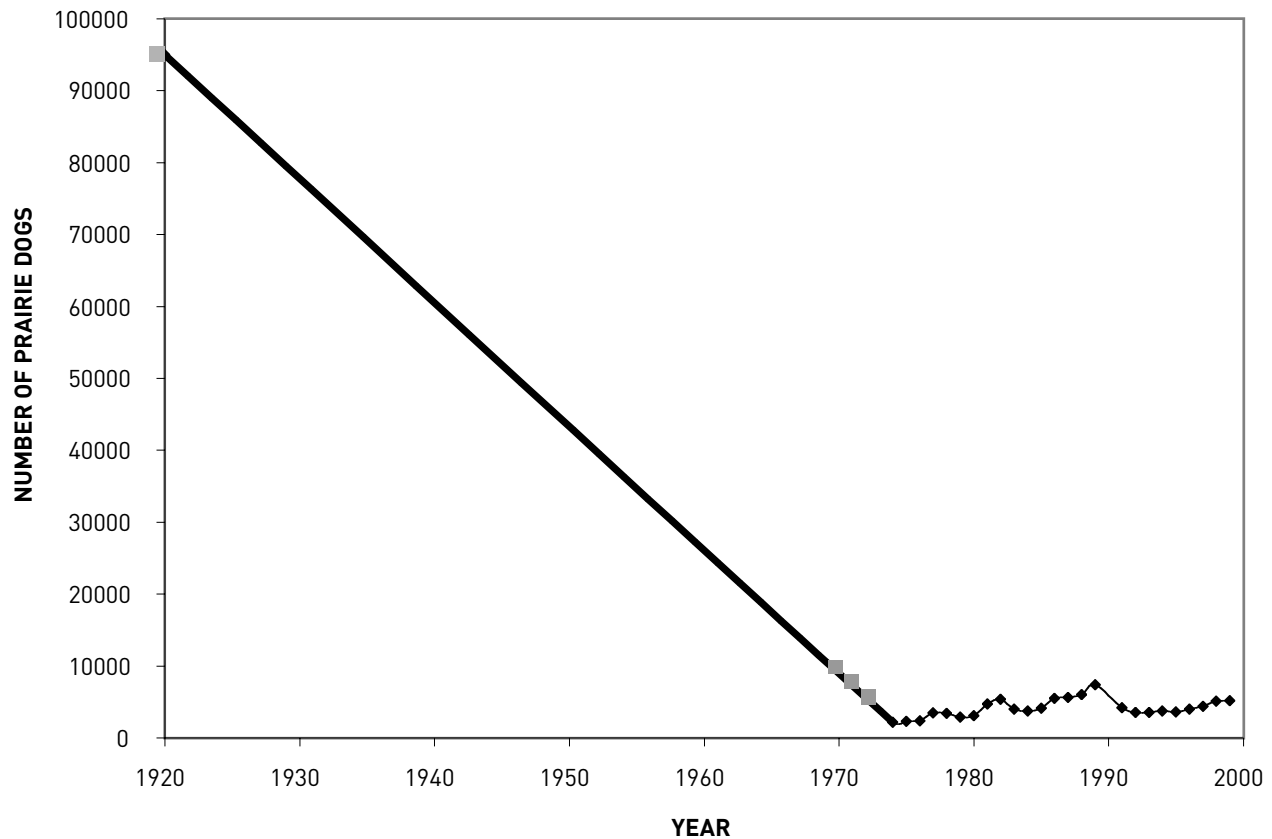
Despite protection under the Endangered Species Act, the Utah prairie dog remains a rare and vulnerable species. Plague epidemics continue to devastate existing colonies; sprawl in southwestern Utah is leading to the destruction and fragmentation of prairie dog habitat; and agricultural interests still object to the presence of Utah prairie dogs in rangeland and farmland.

In its 1991 recovery plan for the Utah prairie dog, the US Fish and Wildlife Service identifies three main populations, separated geographically and differing with respect to elevation and vegetation: the West Desert, primarily within Iron County; the Paunsaugunt region, most of which falls within western Garfield county; and the Awapa Plateau, which stretches across portions of Garfield, Wayne, Sevier, and Piute counties. Each of these main populations, in turn, can be subdivided into multiple, smaller populations. The vast majority of Utah prairie dogs—74% of the total population in 1999—live on privately-owned land. Federal lands, primarily those controlled by the Bureau of Land Management and the Forest Service, harbor most of the remaining prairie dogs. Finally, lands managed by the State of Utah School and Institutional Trust Lands Administration (SITLA) contain an additional 1–2% of the population. Although a small percentage of the total, these state-owned lands include most of the remaining habitat on the Awapa Plateau.

There are many acres of currently unoccupied land in all three population centers that are or could be made habitable for Utah prairie dogs. In some cases, the prairie dogs have recently vanished as a result of a plague epidemic, leaving behind apparently suitable habitat and a reasonably intact network of burrows. In other cases, the open, grassy expanses needed by the prairie dogs have given way to extensive stands of sagebrush and other woody vegetation. This phenomenon of “brush invasion” is typically associated with chronic overgrazing by livestock and the suppression of wildfires. Under these circumstances, restoring habitat for the prairie dogs might entail some or all of the following steps: clearing of the

² Populations of Utah prairie dogs fluctuate greatly from year to year, making counts from any one year of limited value. In 1975, the Utah Division of Wildlife Resources initiated regular counts of Utah prairie dogs, primarily during the spring. During the period 1996–1999, the spring count of adult Utah prairie dogs ranged from 3,961 to 5,120 individuals. Since these spring counts are believed to capture only 40–60% of the total population, one can double the spring tallies to obtain a crude estimate of the total adult population. That is what we have done to derive our population estimate of “upwards of 10,000 individuals” by the late 1990s.

Population size of Utah prairie dogs 1920–1999



The 1920 and 1970–1972 values are estimates for the entire population; values from 1974 to 1999 are annual spring counts, which record approximately 40–60% of the total population. Source: Utah Division of Wildlife Resources and US Fish and Wildlife Service

brush by bulldozer or other mechanical means; use of prescribed fire to replicate the natural fire cycle; seeding the site with native forbs³ and grasses; and restricting cattle grazing, at least until the new vegetation has taken hold. If prairie dogs do not re-colonize the site on their own, they can be transferred from other populations.

Interestingly, the steps one might take to restore habitat for Utah prairie dogs are likely to benefit livestock as well. Removing overmature sagebrush and reseeding with grasses and forbs yield more forage for cows and prairie dogs alike. It may be necessary to restrict livestock grazing for the first couple of years following reseeding in order to give the plants a chance to establish themselves, but over time, the net result should be better range conditions for livestock and Utah prairie dogs. The fact that both species can benefit from range restoration sets the stage for an unusual partnership between ranchers and those concerned about endangered species, as discussed later in this report.

In response to the protestations of farmers, ranchers, and developers, however, the US Fish and Wildlife Service has largely ignored the possibility of restoring Utah prairie dogs on state and private lands. Instead, the 1991 recovery plan

³ A forb is a non-woody (herbaceous) plant other than a grass.

(US Fish and Wildlife Service 1991), interim conservation strategy (Utah Prairie Dog Recovery Implementation Team 1997), and the Iron County Habitat Conservation Plan (Iron County Commission and Utah Division of Wildlife Resources 1998) all focus on creating new populations on federal (Bureau of Land Management and Forest Service) lands by translocating Utah prairie dogs from private lands. The sole reliance on public lands is troubling for several reasons. First, as noted previously, private lands harbor the vast majority of Utah prairie dogs. Therefore, at least for the foreseeable future, conserving the Utah prairie dog means conserving privately-owned and state-owned habitat. In addition, establishing occupied habitat on federal lands through translocation requires a source of prairie dogs. At present, only private lands can produce enough prairie dogs to repopulate habitat on federal lands. Private lands are also important to recovery efforts because conflicts between private landowners and prairie dogs are causing federal agencies to limit their habitat restoration and translocation activities to areas on federal lands that are far away from private lands. Given the “checkerboard” pattern of land ownership in this part of Utah, such a restriction severely constrains recovery efforts.

Finally, there is a scientific argument to be made for restoring prairie dogs on private lands. A team of biologists from Princeton University recently prepared a population viability analysis of the Utah prairie dog. The biologists concluded that “. . . this species’ survival in all three recovery areas is far from assured given its current abundance, geographic distribution, and the threats facing its habitat” (Roberts *et al.* 2000). Of particular concern was the density of prairie dog colonies: As colonies become fewer in number and more dispersed, the ability of the animals to re-colonize areas in the wake of plague outbreaks, droughts, and other catastrophes declines. Thus, a policy that ignores the protection and restoration of prairie dog colonies on private lands could jeopardize the survival of the species.

The economic impact of prairie dogs varies with land use

Developing conservation strategies for the protection of endangered species on private lands requires an understanding of the economic and social forces that drive land use and land management decisions on private lands.

This chapter discusses the nature of the conflict between private landowners and Utah prairie dogs, and in particular, explores the costs of prairie dog conservation on private lands. Not surprisingly, the costs of protecting occupied prairie dog habitat vary depending upon land use.

Conflicts between federally listed threatened and endangered species and private landowners are driven in large part by the costs, both perceived and real, of land use restrictions brought about by the Endangered Species Act (ESA). With respect to private lands, the ESA often results in restrictions on the use and/or conversion of lands where species are present. Thus, the largest cost associated with endangered species is typically an “opportunity cost” whereby the presence of a listed species prevents the landowner from deriving income from the land that would otherwise be realized were that species absent. In the case of the Utah prairie dog, occupied habitat restricts development of the land and theoretically could restrict agricultural uses such as grazing and crop production. The US Fish and Wildlife Service and the State of Utah have typically not placed restrictions on grazing lands, as cattle ranching and prairie dog conservation can be quite compatible, and they have regularly issued depredation permits to private landowners who suffer crop losses due to prairie dogs.

Unlike most other threatened and endangered species, however, Utah prairie dog conflicts on private lands go beyond the restrictions imposed by the ESA (i.e., opportunity costs). Given the species’ penchant to consume forage and crops and to interfere with irrigation systems, prairie dogs are considered to be a pest in their own right. In this sense, the Utah prairie dog is not unlike the endangered gray wolf, whose re-introduction to portions of the West has been so controversial in the agricultural community because of the wolf’s potential to prey upon livestock (E. Owens, pers. comm). Like the wolf, the Utah prairie dog is disliked for reasons beyond its listing under the ESA. As a result, crafting prairie dog conservation strategies for agricultural lands requires addressing not only ESA-induced

Grassland restoration can benefit both Utah prairie dogs and livestock.



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conflict but also landowner concern about the direct costs of maintaining populations of prairie dogs on their lands.

Prairie dogs and cattle can co-exist in rangelands

Agriculture is the primary land use within the range of the Utah prairie dog, and cattle ranching is by far the most prevalent agricultural use. Cattle ranches in southern Utah are typically cow-calf operations. An average ranch maintains about 200 brood cows which are bred for calving in the late winter and spring (Workman and Evans 1996). A few bulls are maintained for breeding purposes. Calves are typically weaned in the fall, and most are then sold to feeder lots where they will be fattened and sent to market. Remaining weanlings may be sold as yearlings or used as replacement stock for the breeding herd.

Providing forage for cattle is a primary focus of ranching. Cows can be grazed on rangeland, irrigated pasture, or a combination of the two. Most Utah ranchers graze their livestock on both private and public (federal and state) lands. Federal and state grazing permits are often sold in conjunction with ranch properties and can significantly boost the price of ranches since the grazing permits specify a price per AUM (animal unit month) on federal lands which is often below the private rate.

Rangeland is typically managed to reduce invasive weeds, shrubs, and juniper, and to promote grasses beneficial to cattle. Pasture is irrigated and thus significantly more productive than typical rangeland. In winter when grazing is limited, cows are often fed hay, which is either grown in irrigated fields on the ranch or purchased. Significant acreage in southern Utah is devoted to alfalfa production using center pivot irrigation systems. Alfalfa is grown for local use as well as for sale to other regions and states.

Cattle ranching is typically not a highly profitable business. An economic study of Utah ranches suggests that many Utah ranches operate close to the margin (Workman and Evans 1996; Godfrey 1992). In fact, using data from 1990, Workman and Evans (1996) determined that the average Utah ranch operated at a loss at that time. The study concludes that “lagging cattle prices, increased operating costs, and declining land values combined to make the 1990 picture for Utah ranches especially bleak.” Since 1990, cattle prices adjusted for inflation have fallen. While we could find no economic studies of ranches specific to the range of the Utah prairie dog, ranches in southern Utah are likely to fare even worse than elsewhere in the state, given low rainfall, less productive rangeland, and reduced access to markets. As noted by Godfrey (1992), “many ranchers in Utah are willing to forgo higher returns to remain on the ranch. For many operators, ranching is as much a ‘way of life’ as it is a business.”

The profitability of Utah ranches is important to prairie dog conservation for several reasons. First, ranchers who operate marginal businesses are less likely to tolerate increased costs from forage depredation by Utah prairie dogs. Second, such ranchers are less likely to make investments in range improvements that produce better forage for cattle and simultaneously improve conditions for Utah prairie dogs. Third, economically marginal ranches are more likely to be sold for development in areas where such markets exist, such as on the outskirts of rapidly expanding Cedar City.

On the other hand, the fact that ranching is often a difficult business also creates opportunities for prairie dog conservation, because it may take a relatively small incentive payment in order to persuade ranchers to protect and restore prairie dog colonies. Thus, some ranchers might look favorably on expanding their ranching business to produce both beef and prairie dogs.

Prairie dogs consume grass but also improve range conditions

Several studies have examined forage loss in rangeland habitats due to prairie dogs, though fewer studies have specifically examined the impacts of Utah prairie dogs on cattle grazing. The amount of forage consumed by prairie dogs will vary considerably among sites, depending upon the density of prairie dogs and the characteristics of the site.

It is likely that early observations of prairie dog impacts on forage vastly overstated the amount lost. Merriam (1902) stated that “the annual loss from prairie dogs is said to range from 50 to 75 per cent of the productive capacity of the land and to aggregate to millions of dollars.” In a paper titled “Death to the Rodents,” Bell (1921) estimated an annual loss of forage due to prairie dogs of at least \$300 million. He noted that prairie dogs “select the most productive valleys and bench lands for their devastating activities.” Neither Bell (1921) nor Merriam (1902) provide any sort of rigorous analysis in support of their conclusions, and more recent analyses of the losses caused by prairie dogs have been more temperate.

In the early 1970s, the South Dakota Department of Agriculture reported that black-tailed prairie dogs occupied 730,000 acres of rangeland in the state, resulting in losses of \$10,000,000 or about \$13.7/acre (Clarke 1987). At that time, prairie

Comparison of forage impacts from prairie dogs and cattle

Citation	Ratio of forage consumed	Comments
Merriam 1902	256 prairie dogs = 1 cow + calf	Black-tailed prairie dogs; no methodology offered. Probably not reliable.
Koford 1958	355 prairie dogs = 1 cow + calf	Black-tailed prairie dogs; says Merriam (1902) neglected to compensate for fact that about 25% of forage consumed by prairie dogs is not livestock forage. Says even his own 355 figure is “misleading.”
Crocker-Bedford 1976	(1) lower elevation site w/alfalfa 410 prairie dogs = 1 cow + calf (2) higher elevation site w/o alfalfa 500 prairie dogs = 1 cow + calf	Utah prairie dogs. For cow without calf, 320 and 390 respectively. Numbers vary seasonally, e.g., at site (1), 300 in early spring, 525 in late spring, 506 early summer, and 368 late summer. Since black-tails weigh less than Utahs, numbers should be higher for black-tails. Merriam’s number too low.
extrapolated from Uresk and Paulson 1988 and Hansen and Cavender 1973	390 prairie dogs = 1 cow + calf	Black-tailed prairie dogs; Hansen and Cavender value based on lab studies

dogs occupied about 3% of the state's hay, range, and pasture lands (Clarke 1987). In his analysis of prairie dog impacts in South Dakota, Sharps (1987) suggests the costs of forage loss due to prairie dogs are quite low. According to this study, eliminating all prairie dogs from an occupied grazing area would yield only a 4.4–8% gain in forage for livestock, and thus, prairie dog control was not economic.

In Oklahoma, O'Meilie *et al.* (1982) compared an enclosure with cattle and black-tailed prairie dogs to one with cattle only. For all types of vegetation except forbs, pastures with black-tailed prairie dogs contained less herbage than those without. Still, the authors note that under heavy utilization, herbage was sufficient to meet demands of both steers and prairie dogs. However, the enclosure with black-tailed prairie dogs did have steers with lower weights, costing \$14–\$24/steer though these differences were not statistically significant. The authors did find that black-tailed prairie dogs improve forage quality by selecting for short grasses, forbs, and other plants, by reducing the preponderance of medium and tall grasses, by maintaining grasses in early phenological stages, and perhaps by enhancing soil fertility. O'Meilie *et al.* (1982) theorize that these beneficial impacts from black-tailed prairie dogs partially compensate for reductions in quantity of forage.

Hansen and Gold (1977) examined the interaction among cattle, black-tailed prairie dogs, and desert cottontails in Colorado and found significant overlap between forage consumed by black-tailed prairie dogs and cattle. The amount of aboveground herbage eaten by black-tailed prairie dogs and cottontails was about 24% of potential annual production, suggesting that forage consumed by black-tailed prairie dogs could be significant. The authors concluded that the three herbivores combined removed 405/kg/ha of dry herbage. The authors estimate that black-tailed prairie dogs accounted for 53 kg/ha, cottontails for 39 kg/ha, and cattle for 313 kg/ha.

Turning to Utah prairie dogs, Crocker-Bedford (1979) concluded that colonies below 7,200 feet in elevation consume about 8% of the grass and forb production on rangelands. Above 7,200 feet, Utah prairie dogs consumed 1–2%. (These elevational differences in prairie dog impacts are due to differences in Utah prairie dog density at the observed sites. At low elevations, Crocker-Bedford (1976) suggests a longer growing season results in higher densities of Utah prairie dogs.) Crocker-Bedford (1976) calculated that the average number of Utah prairie dogs consuming the intake of one cow and calf unit at two different sites was 410 and 500, respectively. The author notes that the ratio might actually be higher since cattle trample much of what would otherwise be available as forage. In addition, it is important to note that Utah prairie dogs are only active during part of the year, meaning that this ratio might be higher still.

Comparisons of forage consumption by cattle and prairie dogs, including those of Crocker-Bedford (1976) referenced above, are contained in the table on page 8. This table provides some insight into the trade-offs involved in managing rangelands for both prairie dogs and cattle. Given the high ratios of prairie dogs to cattle (even in the case of Merriam's [1902] figure, which likely overstates the impacts of prairie dogs), this table suggests that even small changes in grazing intensity could yield significant conservation benefits for prairie dogs.

One important question is whether the economic benefits of prairie dog control outweigh the costs. A study by Collins *et al.* (1984) suggests they do not. The authors analyzed lethal control of black-tailed prairie dogs in South Dakota

through an initial treatment and subsequent maintenance treatments. Under realistic re-colonization rates, prairie dog control was uneconomic. Even under low colonization rates, investments in prairie dog control were recovered only after two decades. On the other hand, prairie dog control has been subsidized by both federal and state governments, making it economically feasible for ranchers. Sharps (1987) also argued that the benefits to ranchers from prairie dog control in South Dakota were outweighed by the costs.

While prairie dogs in general and Utah prairie dogs in particular reduce available forage for cattle, it is also clear that prairie dogs significantly benefit grazing lands, improving forage quality, increasing plant diversity, boosting soil productivity and water-holding capacity, and maintaining grassland conditions (e.g., Crocker-Bedford 1979; Detling and Whicker 1988; Whicker and Detling 1993). Where cattle are not kept at high densities, the improved nutritional quality of forage may make up for any losses due to prairie dogs. Prairie dogs also limit encroachment of shrubs into grasslands by removing tall vegetation around colony sites. Landowners spend considerable sums for brush control. Yet, we are unaware of any studies that have tried to quantify the economic benefits of brush control by prairie dogs. Bonham and Lerwick (1976) determined that prairie dogs actually encouraged spread of plants that are more tolerant to grazing. Crocker-Bedford and Spillet (1981) theorized that prairie dogs may benefit rangeland productivity by eating cicadas. The economic benefits from all of these prairie dog impacts are difficult to measure but meaningful nonetheless.

Economic losses in alfalfa fields and irrigated pastures can be costly

While the costs of maintaining Utah prairie dogs on rangeland are likely to be relatively low, such may not be the case in irrigated alfalfa fields. Production of alfalfa in Utah is growing. In 1992, Utah produced 1.8 million tons of alfalfa on about 500,000 acres, making the state 17th nationwide in alfalfa production. In 1997, Utah produced 2.1 million tons on 542,000 acres—improving its rank to 11th. Iron County ranks 25th among all US counties in alfalfa production, with 225,000 tons produced on 43,000 acres. Besides being fed to cows and horses in Utah, alfalfa is also exported to other states—primarily California, which purchased \$28 million of Utah alfalfa in 1995.

In 1984, a US Fish and Wildlife Service notice reclassifying the Utah prairie dog from “endangered” to “threatened” contained an estimate of \$1.5 million in annual crop losses and equipment damage caused by Utah prairie dogs (US Fish and Wildlife Service 1984). There appears to be no rigorous analysis underlying this estimate. Without control measures, prairie dog colonies in alfalfa expand rapidly, eventually consuming or stunting up to 90% of the potential productivity of the crop (Crocker-Bedford 1979). While calculating average costs to individual alfalfa producers is difficult given differences in acreage under production and acreage occupied by Utah prairie dogs, it is possible to estimate the opportunity costs for an acre of lost forage due to Utah prairie dog depredation.

In 1998, Iron County farmers produced an average of 4.4 tons of alfalfa per acre annually (Utah Department of Agriculture 1999). Depending upon the quality of the hay, prices for alfalfa range from \$35/ton to \$100/ton with a central price esti-

mate of approximately \$79/ton (Utah Department of Agriculture 1999). Thus, loss of one acre of alfalfa production costs a farmer on average \$350 annually.

Prairie dog burrows may cause damage to irrigation equipment. The presence of burrows also results in some irrigation water being diverted down the burrow system and away from the field. The cost of this lost water depends upon the value of the water to the farmer. Given the very low rainfall in parts of south-central Utah, this cost may be substantial for some farmers. In any event, equipment damage and water loss only increase the costs of Utah prairie dogs in irrigated alfalfa.

In irrigated pastures, costs associated with forage loss are likely to be smaller than the costs associated with alfalfa production, though larger than the costs of Utah prairie dogs in rangeland. The figure will depend on the productivity of the pasture (tons of forage produced per acre annually) and the size of the prairie dog population in and around the pasture. Costs of forage loss will be reflected in one of two ways: (1) reduced weight gain on cattle and thus reduced market price per head; or, (2) cost associated with intensifying grazing on owned lands, purchasing grazing rights from some other source, or purchasing hay from other farmers.

Saving prairie dogs on the urban interface is costly

Where land values are driven upward by development pressure, the costs of maintaining Utah prairie dog habitat are high as compared to the costs on agricultural lands. Our research indicates that unimproved rangeland in south-central Utah typically sells for \$200-\$500 per acre. Water rights weigh heavily on price. One real estate agent claimed that water rights south of Cedar City have been sold for \$1,500 to \$15,000 per acre-foot.

Proximity to Cedar City, Utah, also has a significant effect on land prices. No other city or town within the range of the Utah prairie dog is experiencing such significant growth. The population of Iron City is growing at a rate of about 6% annually (Iron County Commission and Utah Division of Wildlife Resources 1998). According to one real estate agent, one-quarter to one-half acre, undeveloped lots can sell for as much as \$20,000. More typically, our research indicates that undeveloped land around Cedar City has a price range of \$2,000 to \$7,500 per acre.

Despite encroaching development in and around Cedar City, Utah prairie dogs still exist within the confines of the town and can be found in such places as a cemetery, a golf course, a baseball field, and even within the clover leaf formed by the on- and off-ramps of Interstate 15. Nonetheless, the probability of prairie dogs persisting over the long-term within or adjacent to urbanizing areas is probably quite low due to habitat fragmentation and increased mor-

The rapid growth of some towns in southern Utah has led to conflicts between development and prairie dog conservation. There are Utah prairie dogs living next to this hotel near Bryce Canyon National Park.



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tality from cars and pets. Even if prairie dogs were able to eke out a living in urban or suburban areas, it is unlikely that other grassland species, such as ferruginous hawks, could do likewise.

High land prices in the Cedar City area, combined with conflicts between development and Utah prairie dogs, led to the enactment of the Iron County Habitat Conservation Plan (HCP) in 1998. The plan was developed by the Iron County Commission and the Utah Division of Wildlife Resources in close coordination with the US Fish and Wildlife Service. The HCP allows for the destruction, or “take,” of prairie dog habitat on private lands in exchange for establishment of prairie dogs on public lands through translocation and habitat management. The amount of take is limited annually to a prescribed number of Utah prairie dogs or acreage of occupied habitat, both of which are allowed to vary as populations on public lands increase or decrease.

Environmental Defense’s criticism of the Iron County HCP was based on several grounds (Environmental Defense 1998). Most important, the plan dismissed opportunities for conserving Utah prairie dogs on private lands in Iron County and instead focused restoration activities solely on federal lands. Yet Iron County contains 65% of the known Utah prairie dogs, and 86% of those are on private lands. Though federal land ownership in the County is significant, as noted previously in this report, private lands have an important role to play in the recovery of the species. In approving the plan, the Service missed a significant opportunity to improve the status of the prairie dog on private lands by not seeking to direct restoration activities and the financial resources created by the plan to willing private landowners outside of urbanizing Cedar City. These are landowners who might agree to conserve prairie dog habitat if given financial incentives to do so. Instead, the plan focuses solely on directing resources to federal lands—lands already required by the Endangered Species Act to be managed for the benefit of endangered species.

Getting along with little doggies: solutions for conserving Utah prairie dogs on private lands

Economic incentives are essential

Given longstanding efforts to eliminate prairie dogs from much of the West, one might conclude that overcoming ingrained landowner attitudes towards the Utah prairie dog and the Endangered Species Act would be extremely difficult. After all, many ranchers view prairie dogs as a pest. Even so, we are optimistic that prairie dogs can be conserved and even restored on private lands by providing private landowners with the right incentives.

By regulating the direct take of Utah prairie dogs on private lands, the Endangered Species Act strongly discourages (albeit not always successfully) landowners from shooting or poisoning them. More important, the Act provides a strong foundation to ensure that the permanent loss of habitat to development is mitigated for through the Act's permitting processes.

The most obvious shortcoming of the Endangered Species Act with respect to conservation on private lands is that it does not encourage and, in fact, often discourages private landowners from undertaking habitat enhancement and restoration activities. No provision of the Act requires any landowner to undertake proactive management for the benefit of any endangered species. Yet conservation of many listed species, including the Utah prairie dog, requires landowners to undertake habitat management activities, such as range restoration. By itself, the Act is not sufficient to encourage prairie dog conservation on private lands.

The future of Utah prairie dog populations on private lands will hinge upon the development of incentive-based approaches that reward landowners whose actions contribute to the conservation and recovery of the species. Incentives for prairie dog conservation can change landowner attitudes towards prairie dogs by making landowners view them not as a liability, but as an asset.

Incentive-based approaches must be flexible enough to adapt to different landowner types. While financial incentives for prairie dog restoration may work well for ranchers, providing developers with incentive payments to maintain prairie dog habitat in urbanizing areas won't work. Not only would the incentive payments be very expensive, but the survival prospects for both prairie dogs and their grassland ecosystem will be low given the likelihood of surrounding habitat fragmentation. Consequently, we recommend different approaches for grazing lands, croplands, and urbanizing lands.

Grazing lands: with the right incentives, ranchers will help

To be successful, an incentive program to conserve Utah prairie dog habitat on private rangeland must provide (1) economic benefits to ranchers through range improvements, lease payments, or other means; (2) assurances that ranchers won't be penalized as a result of stewardship activities on their lands; and (3) a mechanism to control the number of prairie dogs in case populations grow beyond expectations.

1. PROVIDING ECONOMIC BENEFITS TO RANCHERS

As noted previously, cattle ranching and prairie dog conservation can be quite compatible. Nonetheless, given the potential impacts of Utah prairie dogs on forage, in most cases ranchers will require some sort of economic incentive to restore and manage prairie dog habitat on their lands. One alternative, conservation leasing, is simply to pay ranchers to undertake measures to protect, enhance, and/or restore Utah prairie dogs on their lands (Environmental Defense 2000). For example, the US Fish and Wildlife Service might enter into a 20-year lease with ranchers in return for an agreement on the ranchers' part to undertake conservation activities to benefit Utah prairie dogs.

Where range conditions are poor, an incentive payment might fund re-seeding of native vegetation, control of shrubs, fencing to protect restoration areas, and other improvements. Technical assistance from range management experts might also be part of an agreement, since a landowner would otherwise have to purchase such services from a private rangeland consultant.

Incentive payments might include a combination of range restoration activities, technical assistance, and a lease payment. If livestock must be kept off the areas undergoing restoration for a couple years while the new vegetation establishes itself, the ranchers will need to be provided with other sources of forage to sustain their herds during that period. The specific combination will vary for different landowners depending upon the needs of the individual landowner, range conditions, and other factors. In other words, one size may not fit all. While this is not an obstacle in trying to negotiate prairie dog conservation agreements with a small number of individual landowners in southern Utah, it may make a large-scale effort to encourage prairie dog conservation across the West more challenging.

Another type of incentive that could be offered would be "prairie dog insurance." Under such an approach, ranchers would undertake management activities to increase prairie dog numbers on their lands. Such activities might be wholly or partially covered through an incentive payment. However, in lieu of paying the landowner for the lost forage costs associated with prairie dog conservation, the landowner would instead be insured against such losses. Thus, if a rancher's profits were reduced as a result of prairie dog impacts, s/he would be paid the difference and made economically whole.

The challenge of such an approach would be for the rancher and the agency or organization offering the incentive to agree on a methodology to ascertain losses due to prairie dogs. Such a methodology might require forecasting beef production on a piece of property in the absence of prairie dog restoration efforts. Divergence from that forecast would result in a payment to the landowner based on the loss in weight of the cattle herd due to prairie dogs and the market price

The Utah prairie dog is the rarest species of prairie dog in the United States.



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of beef. Measuring forage loss from prairie dogs would entail monitoring of their numbers on each enrolled property and estimating their forage impacts. While deriving such a methodology might be complex, from the perspective of the provider of the incentive, such an approach might make sense if the risks of having to pay the insurance and the costs associated with monitoring prairie dog populations could be spread across many properties. By spreading risk and monitoring costs in this way, the cost of the incentive program could be driven down as incentive payments would cover only the real costs absorbed by the landowner who agrees to conserve Utah prairie dogs.

2. PROVIDING REGULATORY ASSURANCES TO RANCHERS THROUGH SAFE HARBOR

Managing lands for the benefit of endangered species under the watchful eye of regulatory agencies can be daunting for many private landowners. Landowners often fear that improving conditions for listed species on their lands could result in increased regulation through the ESA. Since any incentive program to protect endangered species is likely to have some significant measure of oversight from government agencies, landowners will require regulatory assurances that they will not be penalized for stewardship activities.

The US Fish and Wildlife Service's safe harbor program was established to provide just such assurances to private landowners. Under safe harbor agreements, landowners commit to undertake activities that will benefit endangered species on their lands—activities that are not required by law. In return, the US Fish and Wildlife Service provides private landowners with assurances that they will not be subject to additional regulatory restrictions under the ESA should they be successful in expanding endangered species populations on their lands. Safe harbor has been well received by landowners in North Carolina, South Carolina, and Texas with over 1.5 million acres enrolled. New programs are now operating in Arizona, Georgia, and Virginia. Listed species are benefiting as well (Environmental Defense 2000).

With respect to the Utah prairie dog, safe harbor agreements between landowners and the Service could implement a number of restoration and conservation activities, including range improvement, re-introduction, monitoring, and other measures, on private lands. Agreements would be tailored to the individual needs of ranchers and the species at each particular site. Financial incentives would underwrite the costs of such activities. Duration of agreements would vary but could be as long as 30 years. Historically, Utah prairie dog populations have been hit by plague outbreaks at roughly 20-year intervals (Roberts *et al.* 2000). This suggests that 20 years might be a reasonable duration for individual safe harbor agreements (although agreements of shorter duration should certainly be considered on a case-by-case basis).

3. CONTROLLING PRAIRIE DOG NUMBERS WHERE NECESSARY

Ranchers may be unwilling to allow for the expansion or introduction of Utah prairie dogs on their lands unless they can control prairie dog damage beyond reasonable limits. If, for example, a rancher implements restoration activities on 200 acres and prairie dogs expand onto other portions of the property or onto neighboring lands, there needs to be a mechanism for that rancher to control the number

of prairie dogs. In most cases, such control will likely be unnecessary because the financial incentives in the agreement will compensate that rancher for anticipated growth in prairie dog numbers on the property. However, should prairie dog population growth exceed expectations, ranchers will want assurances providing them some ability to control forage loss due to prairie dogs. Without such assurances, ranchers may be unwilling to enter into safe harbor incentive agreements in the first place.

In summary, we foresee a relatively simple, voluntary program offering ranchers economic incentives through lease payments, range improvements, technical assistance, or other mechanisms. In return, the rancher will agree to undertake conservation measures to assist in the recovery of Utah prairie dogs on the property, such as restoring some areas to native grasslands (or allowing them to be restored), excluding grazing from restoration areas for a prescribed period, allowing prairie dogs to be reintroduced, etc. The Service, the State, and the ranchers will put the terms of the agreement into a safe harbor agreement of fixed duration, which will provide the ranchers assurances as to their ongoing responsibilities under the ESA. In addition, the agreement will allow control of Utah prairie dogs if population expansion exceeds expectations.

Cropland: no easy solutions to conflicts with prairie dogs in irrigated farmland and pastures

For several reasons, it is unlikely that Utah prairie dogs have a long-term future in irrigated croplands. First, as our analysis shows, the likely costs of maintaining them in alfalfa are significant. An incentive program targeted at alfalfa farmers would be far more expensive than one targeted to rangelands. Second, farmers already have access to depredation permits for prairie dogs in alfalfa fields and so they have little need to seek alternative solutions to prairie dog problems in such fields.

While alfalfa fields could theoretically support vast numbers of Utah prairie dogs, the purpose of the ESA is to protect and recover both endangered species and their native habitats. If at all possible, conservation of Utah prairie dogs should result not just in the protection of the prairie dogs themselves, but also protection of the ecosystem they inhabit in southern Utah.

Irrigated pastures may provide limited opportunities for conservation of Utah prairie dogs. Forage loss associated with Utah prairie dogs in such pastures will likely still cause ranchers to want to rid themselves of the animals. However, one alternative to shooting the prairie dogs may be to manage a portion of the ranch that is in non-irrigated pasture for prairie dogs. In such areas, prairie dogs are less destructive and can be managed in conjunction with cattle. Such an approach is quite similar to conservation banking in that losses in one area are compensated for by conservation actions elsewhere. For such an agreement to work, transactions costs involved in crafting such an agreement would have to be low.

Urbanizing land: conservation banking can be used to generate money for habitat restoration

Development of rangeland around Cedar City and, to a lesser extent, other towns within the range of the Utah prairie dog, has placed increased pressure on

prairie dog habitat. At the same time, developers have demanded relief from the ESA's take prohibition. Given development pressure in urbanizing areas, the opportunity costs of Utah prairie dog conservation are high, as is the political pressure to allow development in these areas. Furthermore, even where Utah prairie dogs are protected in urban areas, it is unlikely they can survive for long in fragmented urban landscapes where they suffer from increased predation rates, habitat degradation, mortality from cars, and isolation from other prairie dog colonies.

In 1998, the Service approved the Iron County Habitat Conservation Plan, allowing take of Utah prairie dogs around Cedar City in exchange for mitigation activities on federal lands. As noted previously, Environmental Defense opposed the Iron County HCP in part because the plan did not provide a mechanism to protect prairie dog habitats on private lands, where most of them now exist. Even with approval of the Iron County HCP, demand for permits to take occupied Utah prairie dog habitat is still high, especially since the HCP strictly limits the amount of take that can occur annually. Thus, it appears that alternatives to the Iron County HCP might well be attractive to developers.

Conservation banking of endangered species habitat is a relatively new concept that allows developers to purchase endangered species mitigation credits from other landowners (Environmental Defense 2000). In the case of the Utah prairie dog, private landowners would agree to restore, enhance, and permanently protect habitat in exchange for a mitigation payment from a developer who wishes to develop Utah prairie dog habitat in another location. Thus, private landowners would have a significant financial incentive to protect prairie dog habitat elsewhere. In exchange, the developer would receive a permit to take Utah prairie dog habitat. Mitigation ratios would be set so as to guarantee that conservation banking resulted in a net conservation benefit for the Utah prairie dog.

Conservation banking is beginning to take hold in other parts of the US. For example, California has an official state policy promoting the use of conservation banking for rare habitat types and endangered species. That policy has helped lead to the development of conservation banks for the threatened coastal California gnatcatcher, the endangered Quino checkerspot butterfly, and other species. A conservation bank for endangered red-cockaded woodpeckers has been created in Georgia (see box on page 18).

We believe conservation banking for the Utah prairie dog could achieve the same success. Trades would most likely take place between areas with high development values, such as near Cedar City, and rural areas where land prices are low. Given the narrow profit margins associated with ranching, ranchers might look quite favorably on entering into a conservation banking agreement that paid them to restore and enhance prairie dog habitat while allowing cattle to graze.

The Fish and Wildlife Service's Utah prairie dog recovery plan (US Fish and Wildlife Service 1991) currently divides the range of the species into three recovery areas. Conservation banking would be most successful if the Service and the State of Utah allowed mitigation to occur across recovery areas, thereby allowing mitigation to be targeted to areas, such as the Awapa Plateau, where conservation activities are most needed and land prices are relatively low.

A significant challenge for the Service will be to develop a currency of exchange for conservation banking. In other words, the Service will have to determine how to translate the take of a certain number of prairie dogs on the site slated for development into acres of prairie dog habitat that are required to be restored and/or protected in the conservation bank. Arriving at such a currency should guarantee that trades result in a net benefit for Utah prairie dogs.

Depositing woodpeckers in the bank

International Paper (IP) is a major forest products company with extensive landholdings in eight southeastern states. Much of its land consists of the intensively-managed, young pine plantations typically found throughout the Southeast. With rare exceptions, forests managed in this way are inhospitable to the endangered red-cockaded woodpecker, which requires much older trees for nesting and foraging. Thus, despite IP's extensive landholdings, few red-cockaded woodpeckers currently live there. Surveys a couple years ago turned up only 16 groups of woodpeckers on IP's industrial forestlands, and some of these "groups" consisted of single individuals. Two additional groups were located on IP's Southlands Experimental Forest in Georgia, where the company tests new silvicultural techniques for possible application on its industrial forestlands.

IP wanted to be able to harvest timber on the lands occupied by the 16 woodpecker groups, but it also wanted to contribute to the conservation of the species. Working with the US Fish and Wildlife Service, the Georgia Department of Natural Resources, and Environmental Defense, IP developed an innovative Habitat Conservation Plan for its lands. Under this plan, IP will restore woodpecker habitat on the Southlands Experimental Forest by drilling artificial cavities for the birds, rehabilitating old, abandoned woodpecker nest trees, controlling the vegetation in the understory, and moving young woodpeckers from other locations to the Southlands site. For each new group established on the Southlands site, IP will be allowed to harvest timber in the habitat of one of the 16 groups on its industrial forestlands. More important, if IP succeeds in establishing more than 16 groups of woodpeckers on the Southlands site, it can sell "credits" to other landowners who may wish to develop woodpecker habitat in the panhandle of Florida, the coastal plain of Alabama, or the coastal plain of Georgia.

For the woodpeckers, IP's plan amounts to a good deal. Instead of having 16 woodpecker groups scattered over millions of acres in marginal habitat, IP

will create a single, large population in better quality habitat, and it will commit to properly managing the habitat of those birds over the long term. For IP, it's a way to manage an endangered species on its property more efficiently and, perhaps, to make some money in the process. As a result of IP's restoration activities on the Southlands Experimental Forest, the population of red-cockaded woodpeckers there has already grown from two groups in 1996, comprised only of three male birds, to eight breeding groups today.



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International Paper has created a conservation bank for red-cockaded woodpeckers.

The Farm Bill: the key to helping prairie dogs nationwide

Every few years, the US Congress re-examines domestic agricultural policies through legislation commonly known as the Farm Bill. This law contains myriad agricultural programs including federal crop insurance, price support programs, and others. Last year, for example, the US government made \$32 billion in direct payments to farmers and export subsidies. Farm programs have an enormous and often unappreciated impact on water quality and wildlife habitat.

Increasingly, the Farm Bill has become a vehicle for conservation programs such as the Conservation Reserve Program, Wildlife Habitat Incentives Program, Environmental Quality Improvement Program, and others. Whereas such programs once dealt primarily with soil conservation, they now focus on a variety of activities with a wide range of environmental benefits such as improved water quality and habitat restoration.

To date, Farm Bill programs have concentrated almost entirely on cropland and offered little for livestock grazers. The legislation that will be before the 107th Congress should change that. The Congress will have an opportunity to recognize the increasing need to conserve grassland habitats on rangelands by offering incentives payments for ranchers to restore and protect these lands. The need for such a program is clearly demonstrated by the decline of prairie dogs in the West, where one species is listed as threatened and three others are increasingly acknowledged as likely to be listed in the future.

Specifically, Congress should authorize development of a Prairie Dog Habitat Reserve Program. Monies for this program could be made available under an expanded Wildlife Habitat Incentives Program or under a grasslands easement and enhancement initiative, both of which are now being considered by Congress. Under this program, ranchers would receive money to protect and restore habitat for all four species of prairie dogs on private lands. In addition, landowners would receive technical assistance in altering their grazing practices, if necessary to protect and expand existing colonies of prairie dogs. Landowners would also receive assurances that their stewardship activities would not subject them to additional regulation. For the Utah prairie dog, landowners would enter into safe harbor agreements; for the other species of prairie dogs, landowners would enter into "Candidate Conservation Agreements with Assurances." The Service has designed these agreements to provide landowners with assurances as to their regulatory requirements should the unlisted species be added to the endangered species list subsequent to the landowners agreeing to conserve habitat. Such assurances will no doubt be quite valuable to landowners contemplating whether to enter a portion of their lands into the Prairie Dog Habitat Reserve Program in order to benefit the increasingly uncommon black-tailed, white-tailed, and Gunnison's prairie dogs.

Many Farm Bill programs are administered through a bidding system whereby landowners compete against each other for Farm Bill payments. In the Conservation Reserve Program, for instance, landowners submit bids for certain practices on their lands that are then scored according to the environmental benefits expected to be produced through the contract. The bids are also compared according to the price per acre that the landowner agrees to accept for undertaking the

practice. Under the Prairie Dog Habitat Reserve Program, the federal agency implementing the program would develop an analogous scoring program that would rank landowners according to the presence or absence of prairie dogs, the quality of the habitat, potential for restoration, proximity to other prairie dog populations, and other factors.

We recommend that the Prairie Dog Habitat Reserve Program be administered by the US Department of Agriculture's Natural Resources Conservation Service, which has experience and expertise in rangeland restoration and management. In addition, NRCS would need to coordinate safe harbor and candidate conservation agreements with the US Fish and Wildlife Service. This could be done through a programmatic permit to the NRCS that would allow it to enter into safe harbor and candidate conservation agreements with ranchers.

The Prairie Dog Habitat Reserve Program would have significant benefits for the Utah prairie dog. In addition, such a program could also benefit other prairie dog species, and if very successful, perhaps reduce or even prevent the need to list those species under the Endangered Species Act.

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