Global Re-introduction Perspectives: 2013

Further case-studies from around the globe

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Restoration of black-tailed prairie dogs to Vermejo Park Ranch, New Mexico, USA

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introduction

The black-tailed prairie dog (*Cynomys ludovicianus;* hereafter "prairie dog") is a fossorial, colonial, ground squirrel native to the western grasslands of the United States, southern Canada and northern Mexico. Recent estimates indicate prairie dogs occupy about 810,000 ha range-wide, representing a ~97% decline from historical occupation levels. This decline is primarily due to sylvatic plague (an exotic disease), loss of habitat and poisoning. Prairie dogs are a keystone species and numerous other grassland species, including the black-footed ferret (*Mustela nigripes*; Federally Endangered; IUCN: Endangered), burrowing owl (*Athene cunicularia*), ferruginous hawk (*Buteo regalis*), swift fox (*Vulpes velox*) and mountain plover (*Charadrius montanus*; IUCN: Near Threatened), are dependent on or are strongly associated with prairie dog colonies. Mid-19th century accounts of travelers on the Santa Fe Trail in northern New Mexico describe numerous prairie dogs on the shortgrass prairie in and around Vermejo Park Ranch (VPR). When VPR was purchased by Ted Turner in 1996, prairie dogs occupied <200 ha in a 24,280 ha shortgrass prairie landscape. Restoration of prairie dogs on VPR began in 1997 and translocation efforts began in 1999. From 1999-2006, 45 translocations were completed increasing colony acreage from 202 ha in 1997 to 3,950 ha in 2012.

Black-tailed prairie dog

Goals

- Goal 1: To restore the estimated early historic abundance of prairie dogs on VPR.
- Goal 2: To use prairie dog restoration to enhance biodiversity and improve the

status of existing imperiled species. A benchmark for the project is the establishment of a self-sustaining population (i.e., >30 breeding adults) of black-footed ferrets that meets federal recovery objectives for the species.
- Goal 3: To develop, refine and publish prairie dog translocation methods and the lessons learned during the project.
- Goal 4: To establish a large, ecologically intact and stable prairie dog complex on the shortgrass prairie that provides the opportunity for scientific research from single organism interactions to landscape level functions.

Success Indicators

- Indicator 1: A minimum of 50% of translocated prairie dogs should survive the first year post-release.
- Indicator 2: Newly established prairie dog colonies should persist and colony expansion should progress at ≥25% annually. As prairie dog colonies become established and the population increases dispersing prairie dogs should establish new colonies abrogating the need for future translocations.
- Indicator 3: Prairie dog associated species (i.e., burrowing owl, swift fox, ferruginous hawk and mountain plover) should utilize newly established colonies and populations should increase as prairie dog colonies expand.

Project Summary

Feasibility: No other North American grassland species evokes such strong emotions as does the black-tailed prairie dog. Conservationists and ecologist view prairie dogs as a native keystone species whose presence is necessary to maintain healthy grasslands with all the attendant species, assemblages and processes. Ranchers and farmers often view prairie dogs as competitors for a limited grass resource whose presence can leave the land absent palatable forage for livestock and in an early seral stage rendering it unsuitable for many agricultural purposes. In addition, the threat of listing under the Endangered Species Act has further hardened opinions. Recent efforts by several Federal agencies to compensate landowners for lands occupied by prairie dogs may help mitigate the concerns of both parties.

Prairie dogs alter the landscape upon which they live in several ways but two are most obvious. First, prairie dogs are soil engineers. They excavate deep (5 m) and extensive burrows (33 m in length), and create large mounds of soil at burrow entrances (Hoogland, 1995). Numerous mammals, birds, reptiles, amphibians and insects use prairie dog burrows as refugia. Second, prairie dogs consume and clip (non-consumptive) the vegetation around burrows. Without an unobstructed viewshed prairie dogs quickly fall prey to a host of predators. Moving east from the Rocky Mountains onto the Great Plains the climate becomes increasingly mesic and vegetation shifts from one short in stature (shortgrass prairie) to a landscape dominated by taller grasses (mixed grass prairie). Prairie dogs in the shortgrass prairie require minimal vegetative height reduction (normally via light ungulate grazing) in order to maintain a suitable viewshed, however, as grasses shift to taller representatives typical of the mixed-grass prairie, intense early season grazing by large ungulates or other treatments

(i.e., burning, mowing) to reduce grass height become necessary for prairie dog colony persistence and growth.

Implementation: Standardized procedures for establishing black-tailed prairie dog colonies in unoccupied habitat (sites without pre-existing burrows) through translocation were developed and published during this project (Truett & Savage, 1998; Long *et al.*, 2006). Briefly, prairie dogs were captured in late spring through late summer using either live traps or were flushed from burrows using a water/soap mixture. Immediately after capture, prairie dogs were transferred to an onsite indoor quarantine center and held for 1 - 2 weeks to ensure they were disease free. After the initial quarantine period, prairie dogs were moved to a prepared soft-release site and held on-site for an additional 3 - 5 days before release. Soft-releases sites were selected and prepared for occupation by prairie dogs based on the following criteria: soil type, vegetation type, proximity to project area boundaries and to other colonies, and for the potential for small colonies to expand and merge forming a single large colony. Once a site was selected 15 - 30 artificial burrows, each with a below-ground nest box buried to a depth of 1 m, were installed. Prairie dogs were then transported to the site and placed into an above-ground cage fitted over the artificial burrow, effectively preventing escape from the soft-release apparatus. Portable electric netting was installed around the site to discourage access by mesopredators (primarily badgers) and bison that often trampled above ground cages resulting in the premature release of prairie dogs. After a 3 - 5 day acclimation period, above-ground cages were removed and prairie dogs were released. Prairie dogs continued to use the artificial burrows several years after they had established natural burrows.

Post-release monitoring: Short-term post-release monitoring of translocated prairie dogs involved inspecting release sites daily until prairie dogs became accustomed to the site and began to excavate natural burrows. On most sites prairie dogs began to establish natural burrows within a day of release, however, it often took several weeks for prairie dogs to dig burrows of sufficient size, depth and complexity for them to safely occupy. At ~2 weeks post-release, we conducted visual counts to determine the number of surviving prairie dogs. For most translocations, the 2-week post release monitoring indicated a >50% retention rate. Long-term monitoring of established translocations consisted of annual areal mapping and density counts (prairie dogs/ha). Data collected from these measurements provides a reliable index to the number of prairie dogs living on VPR during a given period. Colony areal growth from 1997 - 2012 varied from 5% - 50% with an average annual increase of 22%. Prairie dog densities during this period averaged 25 prairie dogs/ha. Both areal growth and prairie dog density were strongly correlated with spring/summer precipitation. Lower than average precipitation resulted in less vegetative growth which resulted in lower prairie dog densities yet higher areal growth (prairie dog colonies expanded in search of forage). High precipitation years resulted in higher densities (higher pup production) and lower areal growth. Black-tailed prairie dog coverage on VPR has increased from 202 ha in 1997 to 3,950 ha in 2012 with a notable increase in biodiversity and abundance of associated species including black-footed ferrets.

Major difficulties faced

Post-release monitoring in typical habitat

- Establishing colonies during dry years proved to be very difficult. Excavating burrows requires substantial effort on the part of prairie dogs and during dry years the vegetation was neither sufficient nor nutritious enough to meet the energy requirements of prairie dogs. In addition, the soil tended to be “harder” in dry years further limiting the ability of prairie dogs to establish burrows.
- Badger predation during and immediately following soft-releases. Badgers would occasionally dig up below-ground soft release cages and predate the prairie dogs living in them. Badgers would also exploit the relative shallowness and simplicity of newly established burrows in the weeks immediately following release. In cases of severe predation by badgers a supplemental prairie dog release was required. Predation on recently released prairie dogs by other predators (e.g., coyotes, raptors) was more frequent but generally less damaging than that of badgers.
- Limiting prairie dog colony growth in specific areas so that colonies do not expand onto adjacent properties. Currently, neighboring landowners are supportive of our efforts to restore prairie dogs and associated species but that goodwill would undoubtedly diminish if VPR prairie dog colonies were to expand onto and colonize neighboring properties.

Major lessons learned

- Develop an open, constructive and civil relationship with all stakeholders including adjacent landowners and government agencies. To the extent possible these relationships should be developed prior to project initiation.
- Take a long-term view of the project envisioning complete success. What does the project look like in the future and what are the challenges to maintaining the program? An example from this particular project would be our rather quick and unexpected shift from managing for prairie dog colony growth to one of restricting colony growth.
- Understand and prepare for those challenges and setbacks (e.g., disease) which can reasonably be expected to occur during the different stages of the project.

Success of project

Highly Successful	**Successful**	Partially Successful	Failure
	√		

Reason(s) for success/failure:

- We reviewed the successes and failures of similar projects, routinely visited and communicated with other individuals and organizations involved in similar projects, and were open to new ideas. A thorough review of previous prairie dog translocation efforts, including Gunnison's (*C. Gunnisoni*) and Utah prairie dogs (*C.parvidens*), and black-tailed prairie dog habitat requirements coupled with a willingness to experiment and good record keeping allowed us to make informed decisions, detect trends and respond quickly to setbacks.
- We have fostered a good working relationship amongst all stakeholders and developed broad-based support, which is meaningful in the success of any large-scale restoration effort involving a controversial species.
- Severe prolonged drought has affected our efforts establish a self-sustaining population of black-footed ferrets on the prairie dogs at VPR. Black-footed ferret populations have fluctuated since first released in 2008 in apparent response to spring/summer precipitation levels. In 2010, >20 black-footed ferrets were identified living on VPR prairie dog colonies. Severe drought in 2011 reduced black-footed ferret populations to ~5 individuals.

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