Reintroducing the Black-footed Ferret *Mustela nigripes* to the Great Plains of North America

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Abstract

Once extinct in the wild, great progress has been made over the past 18 years at reintroducing Black-footed Ferrets *Mustela nigripes* within historical habitats of North America. Since 1987, more than 6,000 Ferrets have been produced in captive breeding centres, facilitating the release of 3,094 captive-born Ferrets at 18 reintroduction sites across the western United States and northern Mexico. In addition, 147 wild Ferrets have been translocated from existing reintroduction sites to start or supplement other reintroduced Ferret populations. Allocations of Ferrets to reintroduction sites are determined by the U.S. Fish and Wildlife Service in consultation with the Black-footed Ferret Recovery Implementation Team, an advisory group comprised of 72 members representing 48 government agencies, Indian tribes, universities and conservation organisations. Allocation decisions are made using a ranking matrix consisting of biological, primary, factors (e.g. habitat and survival) and non-biological, secondary and tertiary, factors (e.g. planning, funding, and other project capabilities). Currently, there is an estimated minimum wild population of at least 824 individuals. However, only approximately 300 of those individuals are adult animals and contribute to the 'down-listing' goal of 1,500 breeding adults. In addition, only four sites have documented the ability to maintain at least 30 breeding adults over multiple years and thus contribute to the second 'down-listing' goal of maintaining at least 10 separate populations. Despite considerable progress, the programme faces obstacles such as disease and public acceptance of the Ferret's principal prey, prairie dogs *Cynomys*. Full recovery of the species will require continued vigilance of many involved partners, and greater support by the public, state and federal agencies, tribes, and non-governmental organisations to maintain and increase habitat for prairie dogs and Ferrets across the former ranges of these species.

Keywords: allocation, endangered species, ranking criteria, recovery

Reintroduciendo el Hurón de Patas Negras en las Grandes Planicies de Norte América

Resumen

Luego de haberse extinguido en estado silvestre, desde hace 18 años se ha logrado un gran avance en la reintroducción del Hurón de Patas Negras *Mustela nigripes* en su antiguo hábitat en Norteamérica. Desde 1987, más de 6.000 hurones han sido producidos en centros de reproducción, facilitando la liberación de 3.005 individuos nacidos en cautiverio en 18 localidades de reintroducción a lo largo del oeste de los Estados Unidos y norte de México. Adicionalmente, 147 hurones silvestres han sido trasladados desde localidades de reintroducción existentes para comenzar o como suplemento para otras poblaciones de hurones reintroducidas. La ubicación de los hurones en las localidades de reintroducción lo decide el Servicio de Pesca y Vida Silvestre de los Estados Unidos (USFWS) con el apoyo del Equipo de Implementación para la Recuperación del Hurón de Patas Negras (BFRIT), un grupo asesor conformado por 72 miembros que representan 48 agencias gubernamentales, tribus indígenas, universidades y organizaciones de conservación. La decisión de la ubicación se realiza usando una matriz de categorías que considera factores biológicos primarios (ej. hábitat y supervivencia) y factores secundarios y terciarios no-biológicos (ej. planes, fondos y capacidad de los proyectos). Actualmente, se estima una población silvestre mínima de 823 individuos. Sin embargo, solo aproximadamente 300 de estos individuos son adultos y contribuyen a la meta de bajar de categoría a la especie con 1.500 adultos reproductivos. Además, solo en 3 localidades se ha documentado la capacidad de mantener por lo menos 30 adultos reproductivos a lo largo de los años, con lo que se contribuye a la segunda meta de bajar de categoría a la especies manteniendo por lo menos 10 poblaciones separadas. A pesar del considerable progreso, el programa enfrenta obstáculos como enfermedades y la aceptación por el público de su principal presa, el Perrito de la Pradera *Cynomys spp.* La recuperación total de la especie va a requerir de la vigilancia continua por parte de muchos asociados y un gran apoyo por parte del público, agencias Estatales y Federales, Tribus y organizaciones no-gubernamentales, para mantener e incrementar el hábitat de los perritos de la pradera y hurones a lo largo de su antigua distribución.

Palabras clave: Ubicación, especies amenazadas, criterios de categorización, recuperación

Introduction

Once considered Extinct in the Wild, the Black-footed Ferret *Mustela nigripes* has made progress towards recovery through captive breeding and reintroduction projects. Dozens of popular articles, journal articles, book chapters, and four books have been written about the rediscovery and subsequent capture of the last 18 wild Black-footed Ferrets (Ferret), and the natural history and management of Ferrets in the wild (Seal *et al*. 1989, Miller *et al*. 1996, Clark 1997). However, little has been written about progress to reintroduce this species to the wild over the past 18 years.

Management of Ferrets has been a source of controversy and criticism since their rediscovery in 1981 near Meeteetse, Wyoming (Clark 1997). The Ferret was one of the first species to receive protection in the U.S. under the Endangered Species Preservation Act of 1967, the Endangered Species Conservation Act

of 1970, and the Endangered Species Act of 1973. Early efforts to develop a Ferret recovery programme were critically scrutinised and became emblematic of "the dynamic and complex nature of endangered species recovery programs" (Clark 1997). At its beginning, the recovery programme had to overcome significant obstacles, including controversial removal of surviving wild Ferrets to a captive breeding centre, low initial captive breeding success, and conflicts between partners (Miller *et al*. 1996). Many of these problems were resolved and the original 1979 recovery plan, revised in 1988, identified goals, objectives, management options, proposed courses of action, and a timetable for implementation (U.S. Fish and Wildlife Service 1988). The 1988 recovery plan also assigned responsibilities for actions to appropriate agencies, groups and individuals (Clark 1997). Many of the early programme recovery efforts, especially initial captive breeding attempts, were accomplished through efforts by the Wyoming Game and Fish Department (WGFD). Overall programme progress achieved to date is a result of involvement of numerous partners in all phases of programme planning and implementation.

In 1996, the U.S. Fish and Wildlife Service (USFWS) established the Black-footed Ferret Recovery Implementation Team (BFFRIT), then comprised of 27 entities including state and federal agencies and conservation organisations across the U.S.A., Canada, and Mexico. The BFFRIT provides recommendations to the USFWS on all matters related to Ferret recovery and is organised into an Executive Committee (EC) and three technical subcommittees: the Conservation Subcommittee (CS), the Species Survival Plan Subcommittee (SSP), and the Education and Outreach Subcommittee (EOS). Functions of the EC include addressing broad-based policy issues, political problem-solving, development and approval of annual and long-term management plans, review of overall organisational structural efficiency, funding issues, and recommendations to USFWS regarding recovery direction. The CS provides a forum for discussion and recommendations regarding the reintroduction and management of Ferrets in the wild. The SSP provides a management forum for ongoing captive breeding efforts. The EOS plans and coordinates public relations and education efforts for the programme.

The overall goal of the USFWS and the BFFRIT is Ferret recovery. The USFWS has defined goals for down-listing from 'endangered' to 'threatened' status (as defined by United States legislation) within the Recovery Plan as the establishment of 1,500 free-ranging, breeding adult Ferrets distributed in ≥10 populations over the historical range of the species, with no less than 30 breeding adults in each population (U. S. Fish and Wildlife Service 1988). The USFWS and BFFRIT work toward Ferret recovery by: (1) maintaining a captive Ferret population of optimal size and structure to support genetic management and reintroduction projects; (2) establishing free-ranging populations of Ferrets to meet the defined down-listing goals and delisting goals (as proposed in a pending recovery plan revision); (3) reducing disease-related threats to wild Ferret populations and associated species; (4) promoting the management of sufficient habitat to support a wide distribution of self-sustaining Ferret populations, and (5) expanding partner involvement and adaptive management through regular programmatic reviews and outreach.

In this paper we review how reintroduction sites are identified and prioritised, and the process used to allocate Ferrets among those sites. We also summarise reintroduction attempts over the past 18 years (1991–2008) and review the current status of Ferrets. Finally, we discuss obstacles to species recovery that must be addressed to achieve recovery goals and objectives.

The reintroduction process

Success in captive breeding has enabled development of a large-scale reintroduction programme. From a 'founder' population of only seven animals, >6,000 Ferrets have been produced in captivity since 1987 (Fig. 1). Primary goals of the Ferret captive breeding programme have been to maintain genetic diversity and to provide Ferrets for release to the wild (Ballou & Oakleaf 1989). Reintroduction sites are initially identified by various entities, ranging from private landowners to tribes, and state and federal agencies. In exercising oversight of the reintroduction process, the USFWS solicits reintroduction proposals each January from entities interested in obtaining an allocation of Ferrets for release. Proposals provide specific information about the biological suitability and management conditions of sites that is used in an adaptive ranking matrix to make preliminary Ferret allocation decisions by the USFWS.

The development of an adaptive allocation matrix for distributing captive-born Ferrets among reintroduction sites has been important given the need: (1) for a transparent process in allocating and distributing Ferrets to partners; 2) to maintain partner involvement and input in decision making; 3) to be able to modify matrix categories and values based on new findings; and 4) to reintroduce Ferrets in new areas to achieve distributional and population recovery objectives, as well as to increase partner involvement and support. The factors included in the ranking matrix are developed and weighted by the BFFRIT to evaluate best the site-specific project attributes that are known to be critical to successful reintroduction. These attributes include biological, management and research elements, which are ranked on a scale of 0–5 (Table 1). The total number of points received establishes the level of priority for a site to receive captive-born Ferrets.

Primary factors for assessing the suitability of a site to receive Ferrets are habitat quality, occurrence and current status of sylvatic plague outbreaks, documented kit production and adult survivorship. Biological attributes are deemed most important for reintroduction success and are multiplied by a factor of four to weight their overall importance within the matrix. The Ferret is an extremely specialised carnivore relying on prairie dogs *Cynomys* for food and shelter and occurring exclusively in prairie dog colonies (Biggins *et al*. 2006). Habitat characteristics of prairie dog species, such as colony size and average burrow density, are

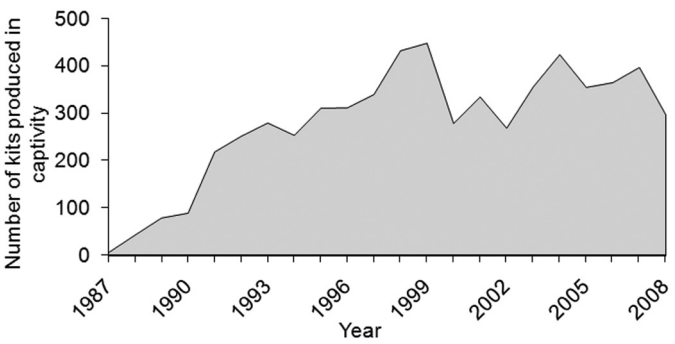

Fig. 1. Annual production of Ferret kits at captive breeding facilities from 1987 to 2008.

Table 1. Factors incorporated into matrix for prioritising the allocation of Ferrets to reintroduction sites. Each site is evaluated in each category and ranked on a scale of 1–5. Primary factors are weighted by 4, secondary factors are weighted by 2, and tertiary factors are not weighted.

Primary Factors*	Secondary Factors	Tertiary Factors
Habitat suitability	Long-range site conservation	Pre-conditioning capabilities
Plague status	Ferret monitoring	Contingency planning
Documented kit production	Habitat monitoring	Veterinary and husbandry support
Ferret survivorship	Disease monitoring/ management	Reintroduction proposal quality
	Research benefits	Project resource availability

*Alternative primary factors used in place of documented kit production and Ferret survivorship when considering new sites are (1) proposed project benefits and (2) management/legal status.

thought to be critical components for predicting site success and maintaining viable Ferret populations (Biggins *et al*. 1993). Risk to Ferret populations due to current, historic, or nearby presence of sylvatic plague *Yersinia pestis* at Ferret reintroduction sites also strongly influences reintroduction success (Godbey *et al*. 2006). Epizootic outbreaks of sylvatic plague devastate prairie dog populations (Ubico *et al*. 1988, Pauli *et al*. 2006) and Ferrets are particularly vulnerable to plague exposure (Williams *et al*. 1994). Allocation criteria place a priority on areas with no history of plague, which are located primarily in the eastern portion of the historical range of Ferrets and Black-tailed Prairie Dogs *Cynomys ludovicianus* (Gage & Kosoy 2006). Characterising existing kit production and Ferret survivorship at a site also is important in assessing how further reintroductions could assist in permanently establishing Ferret populations.

Non-biological secondary and tertiary factors are ranked similarly to biological primary factors. Secondary factors include long-term site conservation potential, monitoring of habitat and disease, and expected research benefits; they are multiplied by a factor of two to give them additional weight within the matrix. These factors reflect the importance of on-the-ground monitoring, management, and conservation of reintroduction sites. Tertiary factors relate to availability of logistical resources and the extent of planning before reintroduction. Scores for these factors are not given additional weight, and their original values are used within the matrix.

Although the recovery programme seeks new reintroduction sites, in the original design of the matrix new sites typically ranked low compared to established projects, primarily due to the inability of new sites to report litter production and Ferret survivorship. In 2007, the USFWS and BFFRIT adopted alternatives to those factors for evaluating new reintroduction sites: expected benefits of the proposed site to the overall recovery programme, and status of any pending permits or agreements that must be in place before implementing a reintroduction project. These factors were evaluated and weighted as a primary factor (i.e. multiplied by four) similar to the biological factors (Ferret survivorship and litter production) that they replaced. The USFWS distributes annual allocation proposals to BFFRIT members for review and their comments are summarised, analysed, and considered in the allocation process. The USFWS circulates paraphrased or quoted comments by reviewers without identifying individuals and provides detailed responses to comments. Final allocation decisions in late summer are based on the number of kits produced and available for release, partner comments, allocation matrix scores, and resolution of outstanding concerns regarding reintroduction projects. Although the allocation matrix is used to assess many project attributes, the USFWS also considers the role of projects in enhancing the distribution of recovery sites across the historical range of Ferrets and in increasing the number of recovery partners when it determines final annual allocations of Ferrets.

Before the annual fall release of captive-born Ferrets, they are held in semi-natural conditions in outdoor pens to give them experience with prairie dog burrow systems and live prey (Fig. 2). Preconditioning pens have been developed and used in least eight locations in six states over the past 18 years, with designs varying between sites over time but always containing burrow systems and fencing or barriers both above and below ground to prevent Ferret escapes and depredation. Currently, nearly all preconditioning occurs at the Ferret Conservation Center operated by the USFWS in Wellington, Colorado. Post-release monitoring has shown that Ferrets receiving preconditioning treatment have at least a three-fold increase in survival relative to Ferrets that have not received such treatment (Biggins *et al*. 1998).

Fig. 2. A captive-born Ferret emerging from a prairie dog burrow in a preconditioning pen at Malta, Montana, U.S.A. (Photo: David Jachowski)

Progress towards recovery

Ferret releases occur annually at a growing number of reintroduction sites within their historical range. From 1991 to 2008, approximately 3,094 captive-born Ferrets were released and 147 wild Ferrets were translocated to initiate or bolster Ferret populations at 18 sites in eight states in the United States and 1 site in Mexico, under various land ownerships (Table 2; Fig 3). Sites have been established on federal public lands managed by the U.S. National Park Service, USFWS, U.S. Bureau of Land Management, and U.S. Forest Service. Tribal lands are well represented, with Ferrets being reintroduced on five Indian reservations. Three reintroduction sites are composed mainly of private lands, and several projects occur in areas with a mix of state, private and federally

Table 2. Reintroduction sites of Ferrets, including year reintroduction was initiated, land management status, number of Ferrets released and estimated current population size as of December 2008.

Site number	Reintroduction site	Year reintroduction began	Land management status	Total number of Ferrets released[a]	Estimated current population[b]
1	Shirley Basin, Wyoming	1991	Private and Bureau of Land Management	518	239[c]
2	Badlands National Park, South Dakota	1994	National Park Service	244	22
3	UL Bend National Wildlife Refuge, Montana	1994	US Fish and Wildlife Service	229	10
4	Conata Basin, South Dakota	1996	US Forest Service	167	239
5	Aubrey Valley, Arizona	1996	Private	306	66[d]
6	Fort Belknap Indian Reservation, Montana	1997	Tribal	167	0
7	Coyote Basin/Snake John, Utah	1999	Bureau of Land Management	332	11
8	Cheyenne River Indian Reservation, South Dakota	2000	Tribal	185	75[e]
9	Wolf Creek, Colorado	2001	Bureau of Land Management	239	13
10	40-Complex, Montana	2001	Bureau of Land Management	95	0
11	Janos, Chihuahua, Mexico	2001	Private	257	17
12	Rosebud Indian Reservation, South Dakota	2004	Tribal	139	28[d]
13	Lower Brule Indian Reservation, South Dakota	2006	Tribal	62	26
14	Wind Cave National Park, South Dakota	2007	National Park Service	49	18
15	Espee Ranch, Arizona	2007	Private	51	20[d]
16	Logan County, Kansas	2007	Private	74	15
17	Northern Cheyenne Indian Reservation, Montana	2007	Tribal	38	8[d]
18	Vermejo Ranch, New Mexico	2008	Private	89[f]	17

[a] Combination of captive-born releases and wild-born translocations
[b] Minimum number known alive through annual surveys as of December 2008 (unless otherwise noted)
[c] Based on monitoring only 15% of habitat.
[d] Based on 2007 estimate because 2008 monitoring was not performed
[e] Based on monitoring only 45% of habitat
[f] Total number of Ferrets released that were not removed for translocation to other sites during the same year

managed lands.

The recovery programme is currently about one-quarter of the way toward the goal defined by the 1988 Recovery Plan of 1,500 breeding adult Ferrets distributed in ≥10 populations over the historical range of the species, with no less than 30 breeding adults in each population. With the aid of new reintroductions and continued augmentation, Ferret populations have continued to increase since reintroductions began, resulting in a total minimum population of 824 individuals as of December 2008 (Fig. 4). However, only about 300 of those animals are adults. It is difficult to determine if individual Ferret reintroduction sites have succeeded in terms of establishing self-sustaining populations because of a lack of background information on wild populations and a limited understanding of the stability of current, reintroduced Ferret populations. While official down-listing goals require ≥30 adults at each site (or population), experience has shown that defining a self-sustaining population of Ferrets is extremely difficult. From a biological perspective, a population of 40 adult individuals has a 57% chance of extinction whereas a population of at least 100 adult individuals has less than 10% chance of extinction over 100 years (Conservation Breeding Specialist Group 2004). From a management perspective, sites are considered successful when they have relatively large populations of ferrets over multiple years without augmentation of their populations, or when they can be used as a donor site for translocation of wild-born kits to other sites (Lockhart *et al*. 2006). Using these criteria, four reintroduction sites (Shirley Basin, Conata Basin, Cheyenne River Indian Reservation, and Aubrey Valley) currently are self-sustaining.

Ferret populations at some reintroduction sites have increased dramatically to become large in recent years, despite poor initial survival. Grenier *et al*. (2007) documented a dramatic rise in Ferret numbers at Shirley Basin, Wyoming, after 11 years of reintroduction efforts. Similarly, Ferret reintroductions at Aubrey Valley in Arizona continued for 8–10 years with little documented success before a dramatic rise in 2006 (Lockhart *et al*. 2006). These examples suggest that reintroduction success might rely on multiple sustained releases that either meet a minimum population size threshold, or take advantage of annual variations in site suitability. These results also suggest that we have a poor understanding of what specific attributes contribute to recovery and that more accurate assessments of reintroduction sites could forewarn us if the likelihood of reintroduction success is low.

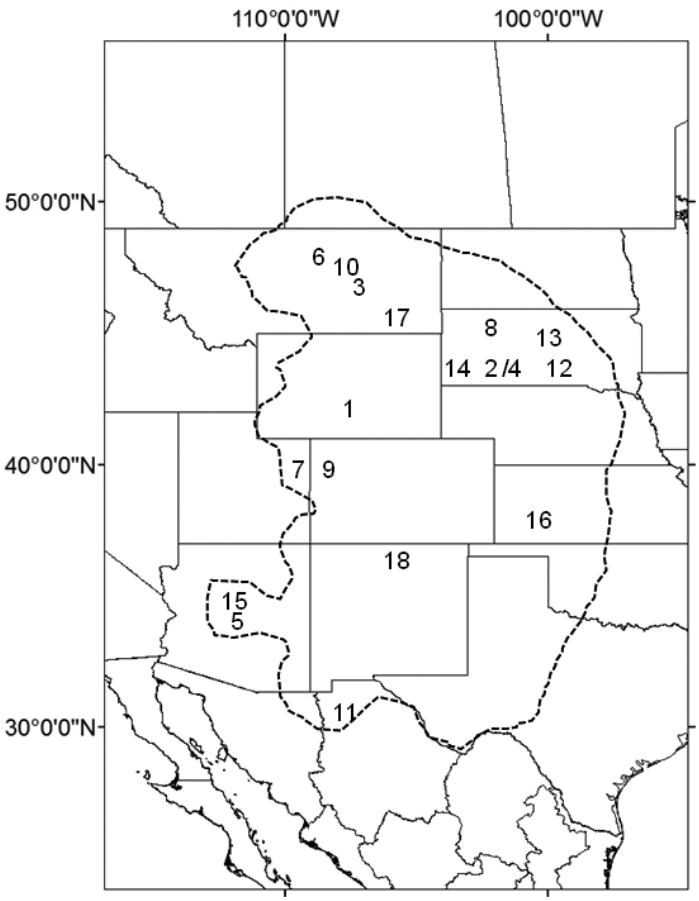

Fig. 3. Great Plains of North America, with state and international boundary lines, showing the historic range of prairie dogs (dashed line) and the 18 Ferret reintroduction sites numbered in chronological order (see Table 2).

Although not yet contributing directly to down-listing, some sites with small Ferret populations, such as UL Bend in north-central Montana, have benefited the recovery programme by advancing our understanding of Ferret behaviour (Biggins *et al*. 2006), resource selection (Jachowski 2007), and the influence of sylvatic plague on both Ferret (Matchett *et al*. in prep.) and prairie dog populations (Collinge *et al*. 2005, Augustine *et al*. 2008).

Increased attention in recent years has focused on identifying potential reintroduction sites in the eastern portion of the Ferret's historical range. In contrast to more westerly sites, eastern prairie dog complexes typically have higher densities and less susceptibility to sylvatic plague (Gage & Kosoy 2006). However, such sites usually are small, more fragmented in distribution, and privately owned. Emergence of several new potential recovery sites has necessitated development of innovative USFWS authorisation and permitting procedures to enable the programme to take advantage of time-sensitive recovery opportunities and to exercise greater flexibility in managing reintroduced Ferret populations without imposing adverse restrictions on cooperating and adjacent landowners. By releasing Ferrets under the status of 'experimental populations', the USFWS has been able to provide assurances to landowners and other parties that Ferrets can be removed from a reintroduction site after an experimental 5-year period. This approach has been valuable in getting Ferrets reintroduced relatively quickly onto sites where concerns exist regarding Ferrets and the ramifications of the Endangered Species Act. For example, this approach was particularly valuable at Logan County in Kansas,

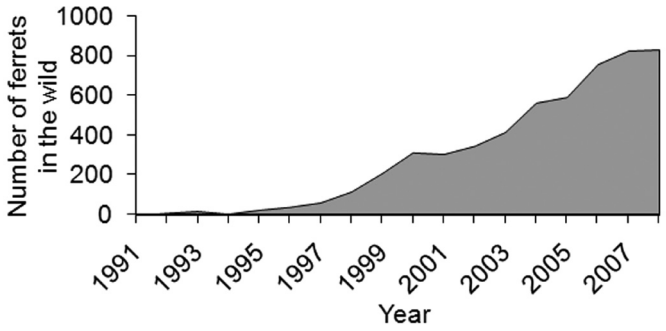

Fig. 4. Minimum number of Ferrets known to be alive in the wild each year since reintroductions began in 1991.

where Ferret reintroduction was envisioned and achieved through the determination of private landowners despite political hurdles at the county, state, and federal levels.

Ferret reintroduction efforts have led to advancements in prairie dog management and conservation. Few prairie dog populations of sufficient size to be Ferret reintroduction sites currently exist (Forrest 2005), thus management that focuses on conserving or enlarging those populations is of critical importance. The endangered status of Ferrets and the public interest they generate has led to significant progress in monitoring and conserving prairie dog populations where Ferrets have been reintroduced. At Conata Basin in southwestern South Dakota, the US Forest Service used a series of land exchanges subsequent to their first Ferret reintroduction in 1996 to consolidate public holdings for larger prairie dog habitats, resulting in an exceptional recovery area (Livieri 2006). At 40-Complex, on lands managed by the Bureau of Land Management in north-central Montana, Ferret reintroductions in 2001 led to increased prairie dog monitoring and temporary prairie dog poisoning and shooting prohibitions.

As new Ferret reintroduction sites were identified or explored, more partners became involved in the recovery programme. When the BFFRIT was created in 1996, its membership included representatives of 27 state and federal agencies and conservation organisations. Partner involvement has increased since that time. As of 2008 the BFFRIT included 72 members representing 48 different government agencies, conservation organisations, zoos, Indian tribes, and universities.

Problems ahead

The two greatest remaining obstacles to Ferret recovery are disease and limited suitable habitat. Sylvatic plague has spread across much of the historical range of Ferrets over the past century. An effective plague vaccine for Ferrets and prairie dogs has been developed and tested (Rocke *et al*. 2008), but there currently is no feasible method of applying it to protect large prairie dog complexes. Plague epizootic outbreaks have reduced entire Ferret reintroduction sites to a fraction of their former habitat extent in less than a year (Fig. 5). Epizootic outbreaks reduced the area occupied by prairie dogs at UL Bend by 40%, from 1,264 ha in 2006 to 763 ha in 2008. Similar reductions due to epizootic outbreaks were observed at 40-Complex (56%), Fort Belknap (53%), Shirley Basin (49%), and Conata Basin (31%) reintroduction sites. There is some indication that prairie dog and Ferret populations can recover from plague events if unaffected pockets of prairie dogs and Ferrets persist and repopulate vacated habitat (Grenier

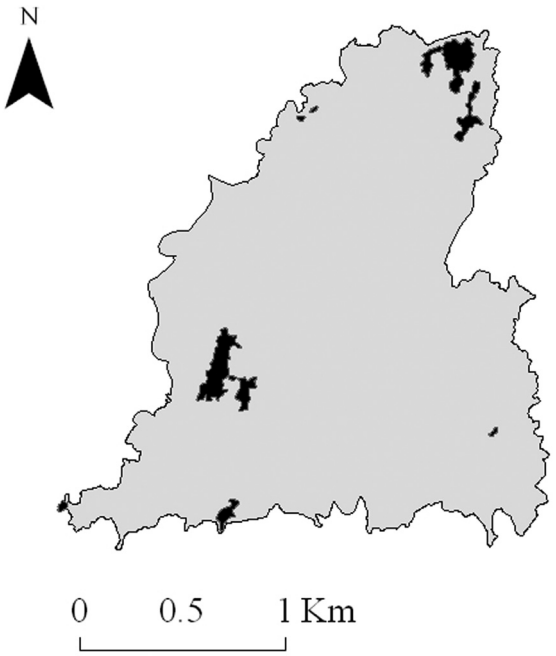

Fig. 5. Prairie dog colony perimeter boundary in 2006 (light grey) and after a plague epizootic in 2007 (black) for the Valentine colony on UL Bend National Wildlife Refuge, Montana. Prairie dog colony size decreased by 97%, from 353.6 ha in 2006 to 9.2 ha in 2007.

et al. 2007). However, evidence from other studies suggests that if prairie dog populations rebound following plague epizootics, outbreaks are likely to recur every 4–5 years (Barnes 1993, Cully *et al*. 2007). Therefore, the development of tools to mitigate the occurrence and outbreak of sylvatic plague on prairie dog colonies will be critical for achieving Ferret recovery.

The second pressing issue for Ferret recovery is the need for broader public acceptance or tolerance of prairie dogs. Where large blocks of suitable habitat exist, Ferret reintroductions frequently are met with public and political opposition (Lockhart *et al*. 2006). At two reintroduction sites, where prairie dog shooting and poisoning were prohibited to benefit Ferrets, these measures were revoked following plague epizootics and the halting of Ferret reintroductions. Such action is counter to the long-term need to restore prairie dog habitats important for Ferret recovery and for many other sensitive and declining prairie wildlife species (Miller *et al*. 1994). Management of prairie dog complexes is needed because most, if not all, of the remaining large prairie dog complexes in North America have been identified and Ferret reintroductions have been attempted on most of them (Forrest 2005, Luce 2006). As most wild Ferrets occur only at four sites, there is a great need to expand Ferret populations at additional sites. Further conservation efforts will be required to protect existing prairie dog colonies, expand current populations, and create new colonies if the Ferret recovery programme is to succeed. These steps can be made only with strong public and political support for prairie dog conservation.

Conclusion

From early struggles to locate extant Ferrets, to successful captive breeding and subsequent reintroduction, the recovery programme has overcome many significant obstacles. Progress over the past 18 years in reintroducing Black-footed Ferrets to the wild and broader partner participation suggests that full recovery is possible. However, full recovery requires continued vigilance and support by the many partners (Reading & Kellert 1993), as well as increased support by the public, and federal, state, and tribal agencies to maintain and increase prairie dog and Ferret habitat across the former range of these species. Only through continued commitment from current recovery partners, expanded involvement of new partners, careful evaluation of programme progress and continued effective management and research can recovery be achieved.

Acknowledgments

We thank the many persons who contributed to the reintroduction of Ferrets across the western United States. While we cannot list here all those individuals involved in Ferret recovery efforts, we wish to acknowledge the agencies, organisations and tribes involved in recovery through the current BFFRIT and prospective new members including: US Fish and Wildlife Service, Bureau of Land Management, US Forest Service, National Park Service, US Army, US Geological Survey, US Department of Agriculture Wildlife Services, Arizona Game Fish and Parks, Colorado Division of Wildlife, Kansas Department of Wildlife and Parks, Montana Fish, Wildlife, and Parks, Nebraska Game and Parks Commission, North Dakota Game and Fish Department, New Mexico Department of Game and Fish, South Dakota Department of Game, Fish and Parks, Utah Department of Natural Resources, Wyoming Game and Fish Department, Grasslands National Park Canada, Instituto de Ecologia Mexico, Cheyenne River Sioux Tribe, Gros Ventre and Assiniboine Tribe, Lower Brule Sioux Tribe, Northern Cheyenne Tribe, Rosebud Sioux Tribe, Navajo Nation, Hualapai Tribe, Cheyenne Mountain Zoological Park, National Zoological Park, Phoenix Zoo, Calgary Zoo, Toronto Zoo, Henry Doorly Zoo, Louisville Zoo, Defenders of Wildlife, National Wildlife Federation, Prairie Wildlife Research, Turner Endangered Species Fund, The Nature Conservancy, World Wildlife Fund, and Association of Zoos and Aquariums. Finally, we thank the private landowners whose growing support is critical to the future success of reintroduction projects and eventual species recovery.

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