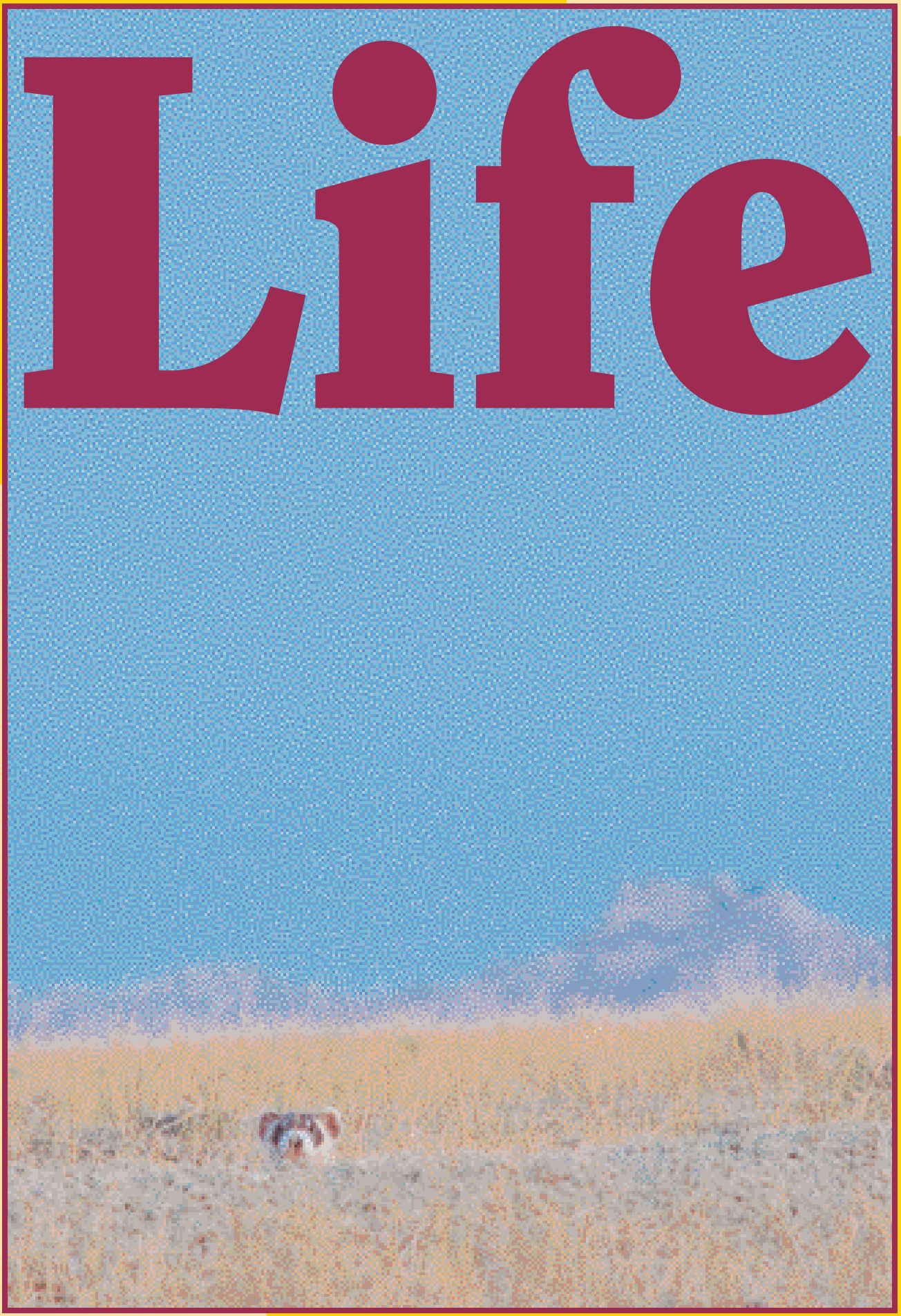
Life



On The Brink

Black-footed ferrets fight their way back from the edge of extinction with a little help from man.

ARTICLE AND PHOTOS BY TRAVIS LIVIERI

On a moonlit October night, wildlife biologist Randy Matchett maneuvers his pickup truck along a dirt trail in a remote area of north-central Montana. As he drives, he scans a flat, broad prairie dog town with a high-powered spotlight. It is 2:47 a.m. Matchett suddenly stops his truck and focuses his spotlight and vision on two small, brilliant green eyes 600 feet away. "There's one!" he exclaims. He's spotted one of North America's most endangered species, the black-footed ferret.

WHY THEY'RE ENDANGERED

Thousands of years ago black-footed ferrets (*Mustela nigripes*) crossed the Bering Land Bridge, between what is now Russia and Alaska. They left behind close relatives, the steppe polecat of Asia and the possible forerunner of domestic ferrets, European polecats. Similar in size and shape to the domestic ferret (*Mustela furo*), black-footed ferrets possess shorter fur, about 1 centimeter long, and distinct coloration, a black facemask, feet and tail tip with a creamy tan-colored body.

Black-footed ferrets are North America's only native ferret species and rely exclusively upon prairie dogs for food and shelter (they usurp prairie dog burrows). Prairie dogs are not dogs but actually a burrowing rodent species that lives in large groups called towns or colonies. The Great Plains once abounded with prairie dogs as well as many associated species such as burrowing owls, swift fox, mountain plovers, ferruginous hawks and black-footed ferrets. Prairie dogs thrived along with the great herds of bison, which liked to graze on vegitation above prairie dog towns.

But this pristine picture soon deteriorated when human settlements arrived on the plains. In the early 20th century, government-sponsored prairie dog eradication programs reduced prairie dog populations to nearly 2 percent of their historic numbers. Ranchers despise prairie dogs because they compete with cattle for grass. At the same time, land conversion for agriculture plowed over many prairie dog towns.

Highly toxic poisons were used to kill prairie dogs and many other species considered injurious to agriculture, such as wolves and coyotes. As the prairie dog declined, so did the black-footed ferret. By 1980, many people feared that the black-footed ferret was extinct.

But the story of these ferrets did not end there, thanks to a pet dog. In September 1981, near the small town of Meeteetse, Wyo., a ranch dog named Shep killed a small animal. It was a black-footed ferret. This event led to the

discovery of a small population of 129 black-footed ferrets in the area.

Biologists quickly began studying the Meeteetse black-footed ferrets, and soon learned that the population was suffering a decline from two diseases – canine distemper and sylvatic plague. Both distemper and plague are fatal to black-footed ferrets, and plague also kills prairie dogs. The black-footed ferret population dwindled to 18 individuals. In 1987, biologists decided to bring the last ferrets into captivity.

The 18 rescued black-footed ferrets formed the basis of a successful captive-breeding program. The goal was to produce enough black-footed ferrets for a return into the wild. "We produce about 300 black-footed ferret kits [babies] annually and 200 of them are released into the wild," said Paul Marinari, wildlife biologist at the U.S. Fish & Wildlife Service's National Black-Footed Ferret Conservation Center.

But captive-born kits aren't always ready to deal with the rigors of surviving in the wild – finding food and shelter and avoiding larger predators. To solve this problem, captive-born kits are sent to school.

According to Marinari, captive-born kits spend up to 45 days "in semi-natural outdoor pens where they hone their skills by experiencing live prairie dogs and dirt burrows." This process is known as pre-conditioning, and it has tripled the survival of captive-born kits released into the wild.

Beginning with such a small number of animals has been a genetic concern, particularly because only seven of the original 18 animals bred. Captive breeding facilities try to maintain the genetic diversity of the original black-footed ferret founders, but black-footed ferrets are not always easy to breed. For unknown reasons, the most genetically valuable black-footed ferrets are often the most difficult ones to breed. Problem breeders become prime candidates for artificial insemination, pioneered by Dr. JoGayle Howard, DVM, reproductive specialist at the Smithsonian's National Zoo.

The emerald green eyeshine of a black-footed ferret helps biologists locate them for population counts.

WHY WE SHOULD SAVE THEM

But why go to all this effort to save an endangered species like the black-footed ferret? It is true that the prairie dog ecosystem would not collapse without black-footed ferrets, but Matchett said black-footed ferrets are considered a "flagship species."

"They are charismatic representatives of the prairie dog ecosystem and the other associated species," Matchett said. "If we can restore healthy ferret populations that means we have healthy numbers of prairie dogs and other animals."

Prairie dogs are a "keystone species," the vital component of an ecosystem that has great effects upon other species. Without prairie dogs there would be no black-footed ferrets. Thus restoring black-footed ferrets will be a giant step in conserving an entire ecosystem.

WHAT'S BEING DONE

Restoring black-footed ferrets has not been a simple task because of many unknown or uncontrollable factors such as disease, predators and the ferrets themselves. Part of Matchett's duties as an employee of the U.S. Fish & Wildlife Service, the federal agency in charge of endangered species recovery, are restoring ferrets to the Charles M. Russell National Wildlife Refuge in Montana. "We've had limited success here because we still understand very little about black-footed ferrets and even less about sylvatic plague" Matchett said. "Every year we learn a little bit more."

There are 10 black-footed ferret reintroduction sites in six U.S. states – Wyoming, Montana (three sites), South Dakota (three sites), Arizona, Colorado, Utah – mostly on federal, state and tribal

Volunteer Opportunities

- Cheyenne Mountain Zoo
  (719) 633-9925
  www.cmzoo.org/volinfo.html
- Louisville Zoological Gardens
  (502) 459-2181 ext. 350
  www.louisvillezoo.org/info/jobs/volunteer%20info.htm
- The Phoenix Zoo
  (602) 914-4394
  www.phoenixzoo.org/zoo/who/Volunteers/volunteers.asp
- Smithsonian National Zoological Park
  (202) 673-4956
  http://nationalzoo.si.edu/Support/Volunteer/
- Toronto Zoo
  (416) 392-5942
  www.torontozoo.com/get_involved/volunteers.asp?nav=4

The most successful ferret reintroduction site is the Conata Basin in southwestern South Dakota.

lands where large prairie dog towns still exist. Mexico also has a reintroduction site.

While large blocks of public land are the primary target for black-footed ferret reintroduction, biologists still work with private landowners to reduce conflicts. At the Shirley Basin, Wyo., ferret reintroduction site, a majority of the ferrets survive on private lands. "The landowners have been very cooperative and supportive of the program," said Martin Grenier, nongame mammal biologist for the Wyoming Game & Fish Department. "Landowners have graciously allowed us access and in 2003 we found more than 50 ferrets." Local support for black-footed ferret reintroduction is often rare because black-footed ferrets need prairie dog towns to survive, and ranchers fear they may lose control of their private lands.

To alleviate the fears of private landowners, black-footed ferrets are reintroduced as "non-essential, experimental," a special designation of the Endangered Species Act. Such a designation relaxes the regulations that may affect habitat and allows for accidental deaths of black-footed ferrets without any repercussions for the landowner. Also, if a black-footed ferret moves onto private lands the landowner may request it be relocated. While some biologists were not happy with the special designation, without it many politicians would not have allowed black-footed ferret reintroductions.

Shirley Basin became the first black-footed ferret reintroduction site in 1991. Black-footed ferrets were released there into white-tailed prairie dog (*Cynomys leucurus*) towns.

There are five species of prairie dogs, black-tailed (*C. ludovicianus*), white-tailed, Gunnison's (*C. gunnisoni*), Utah (*C. parvidens*) and Mexican (*C. mexicanus*). Both Utah and Mexican prairie dogs are listed as threatened and endangered, so these species are not used in black-footed ferret reintroductions. Since 1991, nearly 2,000 black-footed ferrets have been released into black-tailed (seven sites), white-tailed (three sites) and Gunnison's (one site) prairie dog towns.

The most successful ferret reintroduction site is the Conata Basin in southwestern South Dakota, which harbors the majority of wild black-footed ferrets. With more than 250 ferrets documented in 2003, this site has provided wild black-footed ferrets for other reintroduction

Where To See Black-Footed Ferrets

- AZ, The Phoenix Zoo, Phoenix*
- CA, San Diego Wild Animal Park, Escondido
- CO, Cheyenne Mountain Zoo, Colorado Springs*
- D.C., Smithsonian National Zoological Park, Washington, D.C.*
- KS, Lee Richardson Zoo, Garden City
- KS, Hutchinson Zoo, Hutchinson
- KY, Louisville Zoological Gardens, Louisville*
- MI, Binder Park Zoo, Battle Creek
- MN, Lake Superior Zoo, Duluth
- MT, Zoo Montana, Billings
- NE, Henry Doorly Zoo, Omaha (call to verify first)
- ND, Dakota Zoo, Bismarck
- OH, Akron Zoo, Akron, (call to verify first)
- PA, Elmwood Park Zoo, Norristown
- SD, Bramble Park Zoo, Watertown
- TX, Fort Worth Zoo, Fort Worth (call to verify first)
- TX, San Antonio Zoological Gardens and Aquarium, San Antonio
- TX, Texas Zoo, Victoria
- UT, Hogle Zoo, Salt Lake City
- WI, North Eastern Wisconsin Zoo, Green Bay
- Canada, Toronto Zoo, Scarborough, Ontario*

*Black-footed ferret breeding facility

Prairie dogs are a "keystone species" whose presence is vital to the prairie ecosystem. Black-footed ferrets can't survive without them.

Solitary animals, black-footed ferrets only socialize during the breeding season in April.

sites in South Dakota and Colorado. The reasons for such great success in establishing ferrets at Conata Basin are "large, closely spaced prairie dog towns as well as the absence of sylvatic plague" according to Bill Perry, district ranger for the U.S. Forest Service. The Forest Service manages the Buffalo Gap National Grasslands, which contains Conata Basin.

South Dakota is the only state within the Great Plains that does not have a history of plague. Other ferret reintroduction sites have to contend with the destructive forces of plague and thus have not been as successful as Conata Basin at restoring ferret populations.

But that does not make those other sites a failure because very often knowledge is gained that improves future success. "There is no textbook on how to reintroduce black-footed ferrets," Perry said, "so we must use our best knowledge and continue to learn and adapt." One tool that may soon become available is a plague vaccine for both ferrets and prairie dogs. Plague remains the primary threat to black-footed ferret reintroduction because so little is understood about it.

Before being released into the wild, captive-born black-footed ferrets first go to "school" to learn how to hunt and survive in the wild.

For More Info

Internet

- Prairie Wildlife Research
  www.prairiewildlife.org
- Black-Footed Ferret Recovery Implementation Team
  www.blackfootedferret.org
- Live Black-Footed Ferret Cam
  www.nationalzoo.si.edu/animals/smallmammals/
- U.S. Forest Service
  www.fs.fed.us/r2/nebraska/gpng/black_footed_ferret.html
- Arizona Game & Fish Department
  www.gf.state.az.us/w_c/blackfooted_ferret.shtml
- Colorado and Utah Ferret Project
  www.co.blm.gov/lsra/bffwebpage.htm
- The Phoenix Zoo
  www.phoenixzoo.org/zoo/animals/ferret.asp
- Cheyenne Mountain Zoo
  www.cmzoo.org/bff.html

Book

Prairie Night: Black-Footed Ferrets And The Recovery Of Endangered Species by B.J. Miller, R.P. Reading and S.C. Forrest. [Smithsonian Institution Press, 1996, ISBN: 1560986034]

CIRCLE OF LIFE

Almost 500 black-footed ferrets were recorded in the wild in 2003. At least 1,500 black-footed ferrets need to be established and surviving in healthy populations across the Great Plains before they can be removed from the endangered species list.

The task of counting surviving black-footed ferrets in the wild can be difficult because of their elusive nature.

Black-footed ferrets are nocturnal. The best way to locate them is by using a high-powered spotlight to detect their emerald green eyeshine, much like a deer in the headlights of your car.

Living underground in prairie dog burrows, black-footed ferrets come up for only a few hours each night to hunt. While prairie dogs sleep, a black-footed ferret will creep down into one of their burrows and place a neck bite on unsuspecting prey, suffocating it. The ferret will then drag the kill back to its burrow for the night. But black-footed ferrets will not live in the same burrow each night – they often move throughout their territory, which can range from 75 to 200 acres in size.

Once a biologist has located a black-footed ferret using a spotlight and determined which prairie dog burrow the ferret occupies, he or she will attempt to identify the animal. All black-footed ferrets that are released have a small microchip implanted under the skin, a passive integrated transponder (PIT) tag, similar to the tags used for pets. The biologist will place a PIT-tag reader with a ring that fits over the prairie dog burrow. When the black-footed ferret emerges from the burrow, the reader will scan the unique 9-digit, PIT-tag number. If there is no reading then the black-footed ferret is wild-born and must be live-trapped for PIT-tag implantation. Keeping records of PIT-tag readings provides biologists with a database of knowledge concerning individual black-footed ferret survival and movements.

Solitary animals, black-footed ferrets

Biologists track individual black-footed ferrets by using scanners and chips implanted in the ferrets. A scanner ring is placed around a burrow they know a black-footed ferret is using. When a ferret enters or exits, the ring scans the chip. If a ferret doesn't have a chip, biologists must capture it to implant a chip for future scans.

only socialize during the breeding season in April. As with many wildlife species, the male will breed as many females as possible and leave the female with the responsibility of raising the kits.

Typically, a litter of three kits are born underground 44 days after breeding. Newborn kits are blind and helpless. After 60 days, usually in August, the kits will come above ground to frolic and play, as well as learn hunting skills from their mother. By late September the kits have attained adult size and the skills necessary to survive. At this time they explore areas farther away from their mother and eventually leave to establish their own territories.

Life on the prairie is not always easy for a black-footed ferret. In addition to finding and killing similar-sized prey, black-footed ferrets must avoid larger predators. The most common predators of ferrets are coyotes, an adaptable and numerous species on the Great Plains. Death for a black-footed ferret can also come on the silent wings of a great-horned owl or under the watchful eye of an early morning hawk or eagle. Black-footed ferrets are not safe even from their own cousin, the badger. With powerful limbs, a badger can dig down into a prairie dog burrow in a few short minutes.

Black-footed ferrets stay active throughout the year. Some reintroduction sites in the Northern states even track ferrets in the snow by finding the distinctive footprints left by their bounding movements. Compared to prairie dogs, black-footed ferrets are poor diggers although they will occasionally adjust a burrow and leave behind a trench of dirt. Biologists can also use these trenches, particularly on winter snow, to locate ferrets.

EYE ON THE FUTURE

No new populations have been found since the Meeteetse black-footed ferrets were discovered in 1981. Every year biologists receive reports of ferret sightings that are not associated with reintroduction sites, but the chances of finding a new population are very slim. Some reports are determined to be other animals such as badgers or weasels. At this point, the future of the black-footed ferret lies in captive breeding and reintroduction.

Research into many aspects of black-footed ferrets continues, including genetics, basic ecology, reintroduction techniques and disease vaccines. Little by little biologists piece together the complex puzzle that is black-footed ferret recovery and the overall prairie dog ecosystem.

Mike Lockhart, the black-footed ferret recovery coordinator for the U.S. Fish & Wildlife Service, has directed national recovery efforts since 1996. "Several years ago the prospect of fully recovering ferrets was pretty grim. With some of the successes we've had in recent years, many folks believe we have a good chance of taking ferrets off the endangered species list within 25 years," Lockhart said. "The key to recovering ferrets still rests upon healthy populations of prairie dogs." ■

Travis Livieri is founder and executive director of Prairie Wildlife Research, a nonprofit organization dedicated to conservation of prairie species and their habitats. He has worked with black-footed ferrets in the field since 1995 and conducted his master's degree research on ferrets in South Dakota. In 2004, Livieri was named the chairman of the Black-Footed Ferret Recovery Implementation Team Conservation Subcommittee.