



Cheyenne Mountain Zoological Society

4250 Cheyenne Mountain Zoo Road | Colorado Springs, CO | 80906  
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## Cheyenne Mountain Zoo Black-Footed Ferret Recovery Program

### **Background**

The black-footed ferret was listed as endangered in 1967 by the U.S. Fish and Wildlife Service (FWS) under a precursor to the Endangered Species Act of 1973. The black-footed ferret is the only ferret native to North America and once ranged from Canada to Mexico. Adult ferrets measure from 15 to 22 inches from nose to tail tip and weigh about two pounds. They once flourished wherever prairie dogs existed, across the short grass prairies of the Great Plains states.

The black-footed ferret is one of the most endangered mammals in North America. Black-footed ferrets came to the very brink of extinction in the early 1980s (a total founding population of only seven animals), primarily due to human extermination of their main prey base-prairie dogs. The goal of the captive-breeding program is to restore this native carnivore to North America's prairies. The Cheyenne Mountain Zoo's ferrets are part of an aggressive captive-breeding and reintroduction program that is making progress toward recovering this native ferret population. We are one of only six breeding centers in the world to breed this endangered species.

Black-footed ferrets were thought to be extinct until 1981 when a small population was discovered in Wyoming. By 1987, biologists rescued the last few remaining ferrets in the world and placed them in captivity for breeding to prevent certain extinction. Captive breeding proved successful, and by 1991 enough black-footed ferret kits were produced that some could be released into the wild in six western states.

The recovery program is enjoying marked success. The Species Survival Plan (SSP)-directed captive-breeding program reliably provides adequate numbers of kits to supply several release sites each year. Certain release sites are experiencing remarkable success with more ferrets in the wild than documented ever before-



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and with one site's population now consisting of more than 98% wild-born ferrets from captive-reared ancestors.

### **Cheyenne Mountain Zoo Gets Involved**

In 1990, Cheyenne Mountain Zoo was one of the first zoos to join the efforts to recover the endangered black-footed ferret. A special facility was designed and built and a dedicated zookeeper position was created for black-footed ferret breeding. To date, we have produced more than 150 weaned kits and have contributed almost 139 black-footed ferrets to release programs in Arizona, Wyoming, South Dakota, Montana, Colorado, Utah and two Native American reservations.

The Zoo invests approximately \$60,000/year, including staff time, in the black-footed ferret recovery program. We receive small grants to defray costs.

### **Species Survival Plan and Field Work**

In 1996, Della Garelle, DVM, our Zoo Staff Veterinarian, was appointed as the Black-Footed Ferret Species Survival Plan Chair, a position she still holds. Extensively involved with black-footed ferret recovery, Dr. Garelle is the only zoo member on the Fish and Wildlife Service's black-footed ferret recovery implementation team's executive committee. She is also the Chair of the SSP sub-committee of the recovery team.

Cheyenne Mountain Zoo and Dr. Garelle have won numerous awards from both the FWS and Association of Zoos and Aquariums (AZA) for efforts to save the black-footed ferret. Dr. Garelle authored the veterinary chapter and conducted the final editing and distribution of the expanded Black-Footed Ferret Husbandry Manual that all SSP facilities use. She also writes an annual report on activities of the SSP to the AZA's Conservation and Science Department that is shared with all zoos. Dr. Garelle has traveled to field release sites several times to anesthetize black-footed ferrets in the field and to train FWS and National Park Service field biologists in safe field anesthesia and blood-sampling techniques for black-footed ferrets.



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**Recovery Program Description**

Black-footed ferrets reproduce in the spring for a maximum of four years. Potential mates are selected at an annual meeting of breeding facilities with the help of several computer programs designed to maximize the genetic diversity of the seven founder animals. Ferrets are then driven across North America to be housed near their new mates. Travel for several annual meetings and time for monthly conference calls are part of the essential communications with other breeding facilities to ensure best practices are followed in the adaptive management of black-footed ferret breeding and husbandry.

There are many hurdles to jump to produce enough black-footed ferrets to maintain the core breeding group and also have some to release to the wild. One hurdle is the annual pre-breeding physical exam, making sure all ferrets are healthy. Then the males and females need to come into breeding condition at the same time. We manage this by having a natural light cycle that changes length by a few minutes every day, just like in nature. The lights need to be bright so we use a foot-candle light meter to measure the light intensity. Usually there will be a couple females that do not cycle fully. We verify this by checking repeated female vaginal cell samples and male samples as well.

The next hurdle is breeding. If females are choosy or if some primary males are not ready we may have to go to the next potential mate, even if the genetic match isn't the most perfect. We monitor the pair with infra-red surveillance cameras to document a good mating, check vaginal samples again for sperm, and then, if positive, wait 42 days for the next hurdle, whelping. Whelping is also monitored remotely on infrared cameras since we can't disturb the female for this critical event. Whelping usually happens without our help. The next hurdle is the biggest. Neonatal kit survival in the first 5 days of life is the most tenuous. When they are born they weigh 5-10 grams (the weight of a nickel) are blind, bald and very fragile. We can only watch and hope that the dam will be attentive and that the kits are nursing and healthy. We have started a program of medicating the



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expectant dams with a safe antibiotic that may help the kits survive the first few days. Ferret kits cannot be hand-raised from this young age, so it's completely up to the dams. There is normally a percentage that doesn't make it through this critical time.

Kits' eyes open at about 35 days and then the next hurdle is weaning. We weigh the kits often and watch for any weight loss, especially during weaning. All kits are offered processed prairie dog meat provided by the FWS. This gets the kits accustomed to the taste of their primary prey in the wild. When they go 'hunting' for the first time it is with hamsters before moving on to real-life experience with a prairie dog out in the pre-conditioning pens.

After all the facilities that breed black-footed ferrets are done with their annual breeding season, decisions are made about which black-footed ferrets are release candidates, and which have valuable genes that need to stay in the SSP to breed next year. Black-footed ferrets that are release candidates then go to pre-conditioning pens, which are built on prairie dog towns, for at least 30 days to get used to living in prairie dog burrows and hunting prairie dogs. Prairie dogs are often larger than ferrets. When deemed ready for the ultimate hurdle, making it in the wild, the kits are released. They are closely monitored by radio-telemetry or by night spotlighting.

### **Cheyenne Mountain Zoo's Outreach Efforts**

Cheyenne Mountain Zoo has a black-footed ferret exhibit in the Rocky Mountain Wild exhibit. Dr. Garelle has authored or co-authored several publications on black-footed ferrets and has served as a professional reviewer for several other publications. The Zoo's efforts are acknowledged on at least two Web sites featuring the black-footed ferret ([www.blackfootedferret.org](http://www.blackfootedferret.org) and [www.prairiewildlife.org](http://www.prairiewildlife.org)) and in a large brochure and videos produced on black-footed ferret recovery.



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**Cheyenne Mountain Zoo's Project Goals**

1. Ensure a healthy population of black-footed ferrets at the Zoo.
2. Produce as many black-footed ferret kits as possible every year.
3. Conduct press releases and media events several times a year.
4. Continue to be involved with black-footed ferret recovery on a national and international level.
5. Improve the current black-footed ferret exhibit by making our exhibit boxes look more natural and enhancing our interpretive graphics.
6. Secure additional funding for the black-footed ferret program at the Zoo.
7. Increase lighting intensity in the breeding facility and evaluate effects.
8. Pursue field work as needed.
9. Increase outside funding for the black-footed ferret program.
10. Increase educational outreach regarding black-footed ferret recovery and the Zoo's role.
11. Promote the new venture of "Ferret Safaris" to South Dakota.

**The Zoo's Black-Footed Ferret Breeding Successes**

The Zoo has been actively involved with the Species Survival Plan (SSP) for black-footed ferrets since 1990, and is one of only five zoos in the world propagating this critically endangered species. Each year, together with the SSP, we fine-tune our program to try to increase kit production for release in the wild. In 2004 the Cheyenne Mountain Zoo was thrilled to announce the birth of 21 black-footed ferret kits in the spring of 2004.

In 2005 we increased the lighting intensity from 50 to 250 foot candles (much higher than any other facility). This, among other changes, may have been responsible for our record-breaking success: 32-34 kits born.

The 2006 season saw less remarkable, though still significant, success: 24 kits born. There were no problems with the breeding season, but several females that were expected to whelp, did not for unexplained



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reasons. This demonstrates that still more needs to be learned about the complexities of black-footed ferret reproduction.

Dr. Garelle, Cheyenne Mountain Zoo Director of Conservation and Animal Health, has been involved with the black-footed ferret recovery program for more than a decade and chairs the black-footed ferret Species Survival Plan, which oversees captive breeding of the ferret at all six facilities internationally.

**The Future**

According to Dr. Garelle, one of the biggest challenges to establishing viable populations of black-footed ferrets in the wild is the lack of enough large and healthy prairie dog colonies. The ferrets' diet consists almost entirely of prairie dogs. Plague, which humans introduced to North America at the turn of the century, has had a devastating effect on prairie dogs and black-footed ferrets. Currently there are not enough healthy habitats available to remove the black-footed ferret from the endangered species list.

**BLACK-FOOTED FERRET FACTS**

**Vernacular Name:** Black-footed ferret

**Scientific Name:** *Mustela nigripes*

**Class:** Mammalia

**Order:** Carnivora

**Family:** Mustelidae

**Geographic Range:** As of August 1990, wild black-footed ferrets have been extirpated in the wild; see "Conservation" below. Only reintroduced populations exist in the wild.

**Physical Characteristics:** Black-footed ferrets are from 15-22" long from head to tip of tail and weigh 1½-2 lbs. Females are about 10% shorter than males. The body is generally a yellow buff color, becoming



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pale underneath. The forehead, muzzle, and throat are nearly white. The top of the head and middle of the back are brown. The face mask, feet, and terminal fourth of the tail are black.

**Adaptations:** Black-footed ferrets are closely associated with prairie dogs. Their streamlined bodies allow them to use the prairie dog burrows for shelter and travel. Primarily nocturnal, they have keen senses of hearing, smell and sight.

**Ecological Niche:** The black-footed ferret is an obligate (predator) of prairie dogs. Studies indicate that they will only kill what they need to eat. The average prairie dog town size to support a single ferret is about 18 acres, while the range of a female raising a litter averages 80 acres. A viable population of black-footed ferrets requires 10,000 acres.

**Reproduction:** Ferrets are solitary except during breeding season (March and April). After a gestation of 42 days, a litter of 1-6 young is born. The young emerge from the burrow in 5-6 weeks and hunt with their dam. They will leave the mother in September or early October.

**Conservation:** The black-footed ferret may have been common on the Great Plains, with over a thousand reports of the species since 1851. During the 20th century, however, a dramatic decline in ferret population occurred, associated with prairie dog extermination. In Kansas alone, the area occupied by prairie dog towns has declined by 98.6% since 1905. The black-footed ferret has been listed as an endangered species since 1967. Thought to be extinct, a black-footed ferret was killed by a dog near Meeteetse, Wyoming, in 1981. A captive breeding program was then started from this new found population. Today, all black-footed ferrets are descended from this group. The world captive population is kept at approximately 300 animals. The re-introduced wild population is estimated to be at least 500.



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**Other Information:** In much the same way as Andean condors provide study animals to assist with California condor research, the Steppe polecat has been used as a surrogate for black-footed ferret study.

**Zoo Diet:** Prepared small carnivore diet; hamsters.

To learn more about our native black-footed ferret, log on to [www.blackfootedferret.org](http://www.blackfootedferret.org) or visit the black-footed ferret exhibit at Cheyenne Mountain Zoo.