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Rarely Observed Behaviors and Occurrences of Black-footed Ferrets Preconditioning for Wild Release 2014–2017

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Abstract

Black-footed ferrets Mustela nigripes became extinct in the wild in 1987 when the last known wild animals were removed from a remnant population in an attempt to save the species by beginning a captive breeding program. Breeding efforts were successful, and since 1991 wildlife managers have annually released ferrets back into the wild at sites within the ferrets’ historic range. Before their release into the wild, ferrets undergo a preconditioning stage in a quasi-natural habitat which better prepares them for life in the wild after a captive upbringing. Due to their nocturnal, fossorial, and largely solitary lifestyle, combined with their expansive habitat and endangered status, there are undoubtedly a multitude of behaviors ferrets exhibit that are not commonly observed. Here I detail multiple aspects of rarely described black-footed ferret ecology including black-tailed prairie dog Cynomys ludovicianus hunting stratagems, interactions with prairie rattlesnakes Crotalus viridis viridis, predation on birds, and sudden unexplained deaths of entire ferret family groups. The preconditioning setting that serves as an intermediate step between a captive and wild life for captive-reared ferrets allows for wildlife managers to witness ferret behaviors, though similar situations conceivably occur somewhat regularly in the wild.

Keywords: black-footed ferret; behavior; endangered; rare

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Introduction

The recovery plan (USFWS 2013) for the black-footed ferret Mustela nigripes (Figure 1), classified as endangered under the Endangered Species Act (ESA 1973, as amended), currently relies on captive breeding and reintroductions to build and maintain wild populations. The U.S. Fish and Wildlife Service’s National Black-footed Ferret Conservation Center (NBFCC) near Carr, Colorado, houses approximately two-thirds of the world’s captive population of black-footed ferrets, which wildlife managers utilize to sustain the essential captive population and provide animals for reintroduction efforts. Ferrets are bred, born, raised, and conditioned for wild release at this location, which provides many observation opportunities not available in the wild. Preconditioning is a vital step in the reintroduction process for captive-reared ferrets as researchers have shown that it increases their wild survival rates (Biggins et al. 1998, 1999). Preconditioning entails wildlife managers placing ferrets outdoors in a quasi-natural prairie dog burrow system within a predator-resistant pen measuring approximately \(12 \times 12\) m (Figure 2). Staff members typically place ferrets into a preconditioning pen at 60–120 d old, and ferrets remain in the pen for approximately 30 d before staff removes them and transports them to a designated release site within the ferrets’ historic range (Figure 3). Ideally a ferret...
dam and her kits are placed in a pen when kits are approximately 60 d old and kits remain with their dam until they are at least 90 d of age. Adult ferrets aged past their prime breeding years, 4 y old for males (Wolf et al. 2000) and 3 y old for females (Williams et al. 1991), also undergo preconditioning in these pens and are then eligible for release.

Black-footed ferrets are rare, solitary, nocturnal, fossorial, and secretive—a difficult combination for anyone who attempts to observe them. The pens at NBFFCC provide a unique opportunity to observe ferret behaviors that are otherwise nearly impossible to observe in the wild. Here I describe ferret behaviors and activities observed during 2014–2017 that have either not been, or rarely been, described previously. I have included never-before-described black-tailed prairie dog Cynomys ludovicianus hunting stratagems, interactions with prairie rattlesnakes Crotalus viridis viridis, apparent successful bird hunting incidents, and the rapid deaths of entire ferret litters by unknown causes. Because preconditioning is an attempt at mimicking wild conditions for ferrets, these forthcoming comments should be considered possible or even likely occurrences that wild ferrets experience.

**Prairie-Dog Hunting**

A key component of preconditioning is providing ferrets with the opportunity to hunt, kill, and consume prairie dogs Cynomys spp., their primary prey (Hillman 1968; Sheets et al. 1972; Campbell et al. 1987; Brickner et al. 2014), in a quasi-natural habitat. Researchers believe that, on average, wild ferrets kill approximately one prairie dog every 3.3 d (Biggins et al. 1993), and preconditioning allows for ferrets to practice the vital skills that will be needed postrelease. The live prairie dogs used at NBFFCC for this purpose are wild-caught black-tailed prairie dogs that have never had an interaction with a black-footed ferret as wildlife manag-

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**Figure 1.** A trio of black-footed ferret *Mustela nigripes* kits emerging from an artificial burrow while preconditioning for wild release (2015).

**Figure 2.** A black-footed ferret *Mustela nigripes* preconditioning pen located at the U.S. Fish and Wildlife National Black-Footed Ferret Conservation Center near Carr, Colorado (2018).

**Figure 3.** The historic range of the black-footed ferret *Mustela nigripes* at the time of European settlement onto North America.

ers trap them from locations where ferrets are not present. Because the bulk of ferret activity is at night (Hillman 1968; Henderson et al. 1974), live prairie dog feeding at NBFFCC also occurs at night. Vargas and Anderson (1998) trialed ferrets’ prairie dog hunting abilities and tactics in a captive setting and noted when a ferret dam is present with young kits she is almost always the most aggressive prairie dog killer and kits are hesitant to participate, especially during the first live feeding. Vargas and Anderson’s (1998) trials also revealed that the confidence and ability of ferrets to hunt prairie dogs seems to improve after their first prairie dog
encounter. Ferret behavior in preconditioning pens reinforces both of these findings, further exemplified by dams that have preconditioned litters in previous years usually killing prairie dogs more readily and efficiently than adult ferrets of the same age or older that have never been exposed to a prairie dog. Ferrets seem to have the greatest advantage over prairie dogs in a burrow and most attacks and kills occur within burrow systems. Occasionally though, preconditioning ferrets will chase a prairie dog above ground until it is caught, which Hillman (1968) also observed in the wild. Once a ferret catches a prairie dog, the ferret will usually attempt to bite the prairie dog on the neck and carry or drag the prairie dog into a burrow where it will kill and consume it underground.

Kits will sometimes participate with a dam in prairie dog kills, especially as they gain experience, but I have never witnessed anything resembling cooperative hunting. Occasionally multiple ferrets will attack a prairie dog at the same time but they will often attempt to pull the prairie dog in different directions or even grapple with each other over a prairie dog, which can allow the prairie dog to escape. The typical kill bite on a prairie dog is at the throat (Hillman 1968; Henderson et al. 1974; Clark et al. 1986; Vargas and Anderson 1998) and ferrets appear to always kill a prairie dog before they begin to consume it. I have observed several subsurface prairie dog kills near burrow entrances which allowed me to witness multiple ferrets in a family unit consume a prairie dog at the same time. There does not seem to be a hierarchy in social structure between family members, at least during feeding time, as I have watched all ferrets in a litter consume a prairie dog at the same time without conflict on multiple occasions.

I witnessed an interesting hunting behavior on September 6, 2016, when I observed a 3-year-old female ferret, identification studbook number (SB) 7692, rapidly dig soil out of a burrow as she chased a prairie dog underground. This ferret had preconditioned kits in previous years and therefore had experience hunting prairie dogs, although she did not have kits with her on this occasion. I presented the prairie dog to SB 7692 while she was in a burrow, but after her initial attack, the prairie dog escaped and fled to a different, partially collapsed burrow, where it proceeded to bury itself by backfilling soil on top of itself as it retreated headfirst into the burrow. The ferret followed and aggressively dug soil out with her forelegs at a pace that matched the rate the prairie dog was burying itself. Ferrets do not dig their own burrows nor do researchers believe they are able to remove compacted burrow plugs as rapidly as prairie dogs (Biggins et al. 2012), but the loose soil created by the prairie dog in this situation did not appear to be a difficult obstacle for the ferret to remove quickly. The prairie dog’s back was toward the surface so SB 7692 was unable to secure a throat-bite while she pursued the prairie dog. The ferret would occasionally surface from the burrow to observe her surroundings and then return to the burrow to continue digging until both animals reached a depth in the burrow (about 1 m) where I could no longer see them. I placed a motion-triggered Reconyx HC500 Hyperfire Semi-Covert IR trail camera in the pen to capture any further activity, but the prairie dog was never seen again, which indicates SB 7692 eventually caught and killed the prairie dog underground.

Another fascinating hunting behavior occurred on September 6, 2016, as I watched adult male ferret SB 7240 attack a juvenile prairie dog above ground and kill it in a way I have never seen described elsewhere. After I released the prairie dog into a burrow occupied by the ferret, the prairie dog quickly fled the burrow in an attempt to escape. The ferret followed the prairie dog out of the burrow and quickly subdued it with a bite to the back of the neck. Rather than take the prairie dog underground, the ferret began violently shaking the prairie dog while maintaining the bite grip on the back of the neck. The ferret would shake the prairie dog aggressively for a few seconds, then stop for second or two, conceivably to take a breath, and then violently shake again. This continued for approximately 30 s until the ferret effectively decapitated the prairie dog. Once the prairie dog was deceased, the ferret moved the carcass underground to consume it.

**Rattlesnake Interactions**

Prairie rattlesnakes (hereafter, rattlesnakes) are fairly common at NBFFCC and throughout much of the black-footed ferrets’ range as well. Researchers do not know if rattlesnakes hunt or even kill ferrets (Eads 2012) and it may even be possible that ferrets hunt and eat rattlesnakes or other snakes (Audubon and Bachman 1851; Eads 2012). In order to survive potentially deadly encounters, especially if a predator–prey relationship exists, it is conceivable that ferrets, rattlesnakes, or both may have developed survival strategies to avoid interactions with each other. It is also possible that ferrets developed rattlesnake venom resistance similar to what researchers have observed in other species. The California ground squirrel Otospermophilus beecheyi lives among rattlesnakes and has shown rattlesnake venom resistance (Poran et al. 1987) and the honey badger Mellivora capensis, a distant ferret relative, exhibits resistance to other pit vipers (Drabeck et al. 2015). Biggins et al. (2011) recovered carcasses of ferrets and neutered Siberian polecats Mustela eversmanni that had been released onto prairie dog colonies to inspect causes of mortality. Of the animals that had been preyed upon, most were by coyotes Canis latrans, although American badgers Taxidea taxus, great-horned owls Bubo virginianus, and diurnal raptors were causes of mortality as well. Researchers did not attribute any fatalities to rattlesnakes, although two deaths were due to unknown causes. Still, due to the danger to NBFFCC staff and the possible threat to ferrets, when staff members find rattlesnakes on the premises of NBFFCC they safely remove the snakes with snake tongs and transfer them to another location.

Staff members at NBFFCC find rattlesnakes within preconditioning pens every year, but have not observed ferrets interacting with them, nor have they observed rattlesnakes interacting with ferrets. In one unusual
instance I observed multiple members of a ferret family group leaping over a rattlesnake in excited anticipation as I approached their pen with food. It was not obvious if the ferrets realized they were leaping over a snake because they treated it as if it were an inanimate obstacle and were essentially ignoring it. The snake did not appear to feel threatened by the ferrets as it remained still and coiled flat on the ground and never flinched as the ferrets were moving around it. I fed the ferrets and they retreated underground with their food at which time I removed the snake from the pen with snake tongs and moved it to another location.

Despite a lack of proof, NBFFCC staff have attributed occasional preconditioning ferret deaths to rattlesnakes in the past, usually based on circumstantial evidence. A typical example occurred on August 14, 2014, when 3-y-old female ferret SB 7090 suddenly went missing after 34 d in a pen. Staff members found a rattlesnake in a burrow within the pen the day after the ferret’s disappearance. Staff never saw the ferret again and she is presumed to have died underground. The rattlesnake was approximately 0.5 m long and therefore could not have consumed the ferret, so if the snake was indeed the reason for the ferret’s death, it was most likely a result of the snake defending itself from the perceived or real threat of the ferret, and not because it was hunting the ferret.

A more convincing rattlesnake-caused ferret death occurred on September 7, 2016. I observed preconditioning adult male ferret SB 7260 drinking water from an above ground dish at 0740 hours. The ferret appeared in poor health but he was able to elude capture and retreated into a burrow. The ferret was observed aboveground again at 1230 hours and was in such poor health that I was able to pick him up with a gloved hand, at which time I brought him immediately to an on-site veterinary room. The ferret's temperature was normal at 38.3°C (101°F) on presentation and remained normal throughout his treatment. While the ferret was under anesthesia I subcutaneously injected him with 40 mL 0.9% NaCl fluids and a veterinarian injected another 6 mL 0.9% NaCl fluids as an intraosseous infusion. The ferret was experiencing irregular cardiac auscultation and labored mouth breathing until the veterinarian provided oxygen and although the larynx was inflamed, it did not appear to be swollen. Antibiotics and Clotriodinium antitoxin were administered prophylactically as Clotriodinium perfringens is somewhat common (see “Sudden Deaths of Litters,” below) and can kill ferrets quickly if left untreated. While anesthetized, the veterinarian and I observed two puncture wounds on the muzzle of the ferret as well as facial swelling, severe bruising, and hemorrhagic palate leading to a rattlesnake bite diagnosis. After medical treatment the ferret was alert and by 1630 hours he began eating. The ferret was placed in an Animal Intensive Care Unit with supplemental oxygen overnight but staff found him dead at 0715 hours on September 8, 2016. Though the death of this ferret is unfortunate, this case did provide strong evidence that rattlesnakes can indeed kill black-footed ferrets.

Eads (2012) noted that if ferrets did evolve some resistance to rattlesnake venom, that ability may be lost or diluted due to the severe genetic bottleneck that resulted from the ferrets’ near extinction. The efficacy of California ground squirrel resistance to Pacific rattlesnake Crotalus viridis oreganus venom correlates with rattlesnake presence or absence across its population (Poran et al. 1987) and rattlesnakes are relatively uncommon or absent from the immediate area in which the founding ferrets utilized for the captive breeding effort were captured (J. Boulerice, Wyoming Game and Fish, personal communication; D. Biggins, USGS, personal communication). It is therefore conceivable that these ferrets never had the evolutionary pressure to develop venom resistance compared to historic ferret populations from areas with dense rattlesnake populations; though ferrets moving to and from nearby populations may contradict this notion. Perhaps if researchers undeniably confirm that rattlesnakes do kill modern-day ferrets, genetic research on preserved ferret specimens from extinct historic populations could investigate the possibility of a lost survival trait in the ability to resist rattlesnake venom.

In addition to rattlesnake defensive strikes causing ferret mortality, the immobility and small size of ferret kits (Hillman and Carpenter 1983; Vargas and Anderson 1996) makes it likely that rattlesnakes could prey upon young ferrets rather easily. It would be difficult to know how often ferret kits are preyed upon by rattlesnakes as kits typically stay underground until they are at least 40–50 d old (Hillman 1968; Paunovich and Forrest 1987; Vargas and Anderson 1996) and therefore wild litter sizes are rarely known by researchers until kits have reached an age at which snake depredation seems less likely. More investigations into ferret interactions with not only rattlesnakes but other snakes that frequent ferret habitat such as bullsnakes Pituophis catenifer sayi or even garter snakes Thamnophis spp., which can be mildly toxic (Jansen 1987), seems warranted to further understand how these species cohabitate and if snakes pose a realistic threat to the recovery of ferrets.

**Bird Predation**

Preconditioning pens at NBFFCC are bordered by 2.4-m-high walls composed of a wooden frame and 2.5-cm-gap wire mesh. To keep raptors out of the pens, 5-cm-gap netting covers the top of each pen. While this design is capable of excluding medium- and large-sized animals from the pens, other smaller species can enter and exit the pen and staff members often see them in pens while ferrets are present. Researchers have occasionally described instances of ferrets unsuccessfully pursuing songbirds (Henderson et al. 1974; Eads 2012) and Hillman (1968) described live-tethering small mammals and birds, which nearby wild ferrets would readily attack and consume. Others (Sheets et al. 1972; Campbell et al. 1987) have described wild ferret scat makeup as consisting of only mammalian (Cynomys, Peromyscus, Lagurus, Microtus, Sylvilagus, Lepus) remains while Brickner et al. (2014) described ferret diets on white-
tailed prairie dog *Cynomys leucurus* colonies traced through stable isotopic values, but looked only for mammalian prey species.

Witnessing a ferret successfully hunt a bird would be extremely fortuitous and while this has not yet happened, I have found strong evidence that successful hunts have occurred. On August 28, 2016, I discovered western meadowlark *Sturnella neglecta* remains in the nest chamber of adult male ferret SB 7329. The body, head, and legs of the bird were all missing and I assume the ferret had consumed these parts. All that remained of the bird were both wings and a multitude of feathers. On November 29, 2017, I again found a deceased western meadowlark in the nest chamber of a preconditioning pen. Three ferret kits aged 97–125 d that were preconditioned without a dam had occupied this pen. While ferrets occasionally preying upon songbirds has always been presumed (Audubon and Bachman 1851), the most intriguing presumed bird predation I have encountered occurred on July 11, 2016, when I found the remains of an American kestrel *Falco sparverius* at a burrow entrance in a pen with ferret dam SB 7913 and her litter of five kits. I discovered dozens of kestrel feathers that had been moved out of the burrow in an apparent burrow excavation performed by the ferrets (Henderson et al. 1974; Clark et al. 1984, 1986; Eads et al. 2012; Figure 4). I presume that a kestrel entered the pen through a gap in the top netting and then roosted on the ground that night. A ferret then likely found and killed the kestrel, then took it underground and consumed it. The feather remains were cleaned out of the burrow shortly thereafter. I never found the carcass of the kestrel.

Researchers have documented over 80 species of native birds utilizing at least one aspect of active prairie dog colonies (Kotliar et al. 1999) including five that appear to depend heavily on prairie dogs or the habitat they create (Kotliar et al. 1999). But, due to a lack of wild observations, absence of evidence in ferret scat studies (Sheets et al. 1972; Campbell et al. 1987), and the probable difficulty in catching birds, ferrets most assuredly do not rely on birds as a primary food source as was originally reported by Audubon and Bachman (1851). It seems reasonable to believe, though, that ferrets are opportunistic hunters and will take birds if they happen upon them, but it is likely they do not actively search them out. One possible outlier to this could be the burrowing owl *Athene cunicularia*. Griebel (2000) documented five assumed ferret depredations upon burrowing owls and their nests, and the apparent willingness and ability of ferrets to catch and consume a similarly sized bird of prey in the American kestrel would enforce this possibility. Due to ferrets and burrowing owls both exploiting prairie dog burrows as shelter, it is

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**Figure 4.** American kestrel *Falco sparverius* feathers excavated from an artificial burrow occupied by black-footed ferrets *Mustela nigripes* (2016).
conceivable that the burrowing owl may be an occasionally targeted prey source. Others (Eads 2012; Dinsmore 2013) have also postulated that ground-nesting birds, especially those that frequent prairie dog colonies, such as mountain plovers _Charadrius montanus_, could be at risk from nest depredation from ferrets and future research is needed to determine if this is a viable threat to these birds.

**Sudden Deaths of Litters**

Every year there is occasional ferret death (loss) in the preconditioning pens. Wildlife managers should realistically expect some loss due to the naïveté of captive-raised animals entering a seminatural environment combined with the occasional undetected biological defect that can be fatal. The occasional loss of entire litters over relatively short amounts of time, however, when litters in adjacent pens receiving identical treatments remain healthy, has continued to puzzle everyone involved in the ferret preconditioning process.

An example of what managers could consider a typical mysterious litter loss occurred in 2016 with dam SB 7824 and her litter of five kits. Staff placed the litter in a pen on June 22, 2016, and animals appeared healthy whenever they were observed. On July 14, observers noted four seemingly healthy animals but on July 15, only one animal was seen and on July 16, staff found no animals. On July 17, all of the previous day’s food was still above ground and staff found SB 7824 dead at a burrow entrance with no obvious signs of external trauma. Black-tailed prairie dog burrows, which exist in most pens, can reach a depth of up to 5 m (Hoogland 1995) so living ferrets are not regularly accessible and carcasses are not always recovered. Staff saw no live ferrets in the pen again despite trail cameras and food being left for another 12 d, and managers assumed the entire litter of kits all died underground in the burrow system. NBFFCC submitted the ferret carcass to Colorado State University Veterinary Diagnostic Laboratories for necropsy on July 18, 2016. Gross necropsy showed mildly inflamed intestines but no other abnormalities. Laboratory results revealed lesions of shock in the lungs and intestines but the consulting pathologists could identify no cause for this. Researchers have identified gastrointestinal distresses such as _Clostridium perfringens_, coccidiosis, and _Salmonella enterica_ as common fatal illnesses in captive black-footed ferrets (Bronson et al. 2007) and the consulting pathologists searched for all three during necropsy. They did not detect coccidiosis or _Salmonella_. They did culture _Clostridium_, a naturally occurring bacterium in the gastrointestinal microbiota of ferrets, from the stomach, but not from the intestines, and overgrowth of bacterial rods was not present. Due to a lack of _Clostridium_ in the intestines and a lack of sporulating bacterial rods, corresponding pathologists and veterinarians did not attribute the cause of this ferret’s death to _Clostridium_. They observed no further signs of trauma or distress in the carcass and as a conclusion, identified no cause of death for this ferret or her litter.

Perhaps the most concerning issue with these or other mysterious pen deaths is that a pattern between cases has yet to fully reveal itself. Managers can exclude experience of the dam in the pens because SB 7824 had successfully preconditioned kits in both 2014 and 2015. Possible genetic factors are unlikely as ferrets were born to this same dam and sire (SB 7814) in 2015, preconditioned in the same method, and released, and survived for over a year in the wild. It is also curious that ferret litters in pens directly adjacent to this pen received identical care and treatment and remained healthy throughout their preconditioning period. It is possible that the pen contains an unidentified contaminant but this is also somewhat questionable as SB 7824 and her litter lived in the pen for 23 d before anything appeared to be wrong and the pen had successfully preconditioned four ferrets in 2015 with no loss.

Although staff did not witness it in this case, possibly because they recovered only one of six ferret carcasses, evidence of cannibalism by ferrets has occurred as staff have recovered ferret carcasses from the pens that have been partially consumed. Wildlife managers have always presumed that cannibalistic behavior of the ferrets has been on littermates that were already deceased as a ferret has never come out of the pens with wounds that would indicate an attack from another ferret. Campbell et al. (1987) found that 9 of 86 collected wild ferret scats contained ferret hair including four that contained no other species besides ferret hair. They attributed these findings to ferret grooming but it is possible that these may have been the result of similar cannibalistic behavior. Observers have noted cannibalism in pens in which every ferret died and it is possible that this is how an unidentified pathogen has been passed between animals. Observers have also noted cannibalism in situations where only one ferret died and the remaining members of the litter remained healthy. Other managers investigating complete litter loss have retrieved every ferret carcass and none of the animals had been cannibalized.

Wild black-footed ferrets have relatively high 1-y mortality at 53–86% (Forrest et al. 1988), though researchers attribute most mortalities to depredation, emigration, and diseases for which the preconditioning ferrets at NBFFCC have been vaccinated. To the best of my knowledge, researchers have not documented entire litters dying rapidly from other causes in the wild. Perhaps a natural diet that wild animals consume prevents these litter die-offs or maybe the ability to select a burrow from a number many thousand times more than what exists in a preconditioning pen allows for ferrets to move away from a stress-inducing or contaminated environment. Though wildlife managers cannot confirm that aspects of captivity did not contribute to the deaths of these ferrets, they should not ignore rapid deaths of entire family units that cannot be explained, even with professional necropsy. Future research could explore the frequency of litter loss in the wild as it is possible that there is yet another factor limiting the recovery of the species that is unknown at this time.
Discussion

Wildlife biologists thought the black-footed ferret was lost to extinction before the species was rediscovered near Meeteetse, Wyoming, in 1981. The final 18 individuals from this remnant population saved the species from extinction through intensive captive-breeding efforts, and the subsequent decades have seen the production of over 10,000 captive- and wild-born descendants. From this standpoint, we could consider the black-footed ferret one of the great conservation stories of our time. Tremendous strides in recovery efforts ranging from captive breeding and rearing, to habitat preservation, have allowed for animals to be released back into the wild annually for nearly 30 y. That being said, the species has justifiably remained listed as endangered on the Endangered Species Act (ESA 1973) since its inception. The difficult-to-study life habits of wild ferrets paired with over 40 y of endangered status demonstrates that there is still much to learn that could feasibly be beneficial to the long-term survival of this species and the ecosystem it inhabits. This document touches on some of what I have witnessed at NBFFCC but there are countless other occurrences that observers continue to miss due to timing, underground activity, or simple bad luck. Diverse and rarely witnessed hunting stratagems as well as rapid deaths of ferrets due to various causes could all foreseeably impact management decisions in the future for both ferrets and other species that share their environment. When making decisions that determine whether a species survives into the future, it is essential to be informed with the widest base of knowledge possible; understanding life habits of a species provides much of this necessary foundation. Moving forward with this base of knowledge, we can better understand how to proceed in order to provide the greatest chances for future success.

Supplemental Material

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The ferrets that enter preconditioning are captive bred from six facilities: U.S. Fish and Wildlife Service’s National Black-Footed Ferret Conservation Center, Cheyenne Mountain Zoo, Louisville Zoo, Phoenix Zoo, Toronto...
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