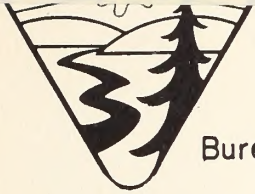


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HABITAT MANAGEMENT SERIES FOR ENDANGERED SPECIES

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Report No. 2

Black-footed Ferret
Mustela nigripes



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FORWARD

This Technical Note series on wildlife is designed to provide a literature review and summary of current knowledge pertaining to endangered and other wildlife species occurring on public lands. We in the Bureau of Land Management have recognized the need for basic wildlife information in order to do an effective job in land-use planning. Sound planning must identify the negative aspects as well as the positive benefits of any proposed land management decision or program. It is our hope, too, that this series will also prove useful to others--be they land managers, students, researchers or interested citizens.

Burt L. Lock

Director
Bureau of Land Management
Department of the Interior

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Introduction

The objective of this report is to provide BLM personnel with the latest and most up-to-date information on rare or endangered species occurring on the public domain. This will provide a tool for improved understanding of the interrelationships between the species and its environment and encourage an end product of enlightened land management which will fully consider the species' welfare in all management decisions.

1. Species Description

Mustela nigripes is a member of the weasel family and was first described by Audubon and Bachman in 1851. The most obvious distinguishing feature is the black eye mask across the face. The feet, legs to the shoulders and terminal fourth of the tail are also black. The remaining pelage is a pale yellow-buff, becoming lighter on the underparts of the body and nearly white on the forehead, muzzle and throat. The top of the head and the middle of the back are brown. The fur is about two-fifths of an inch in length on the back.

Many males have a black to black-brown longitudinal stripe in the pubic region, a trait that is faint or lacking in females. Since male ferrets do not always have this longitudinal stripe, the reliability of this characteristic for sex identification is questionable. The male is slightly lighter than the female, and young ferrets are lighter in color than adults. Winter pelage is slightly longer. Ferrets are similar in size and weight to wild mink. Adult males are 21-23 inches in total length, of which the tail is about one-fourth. Female adults average about 10% less in linear measurements.

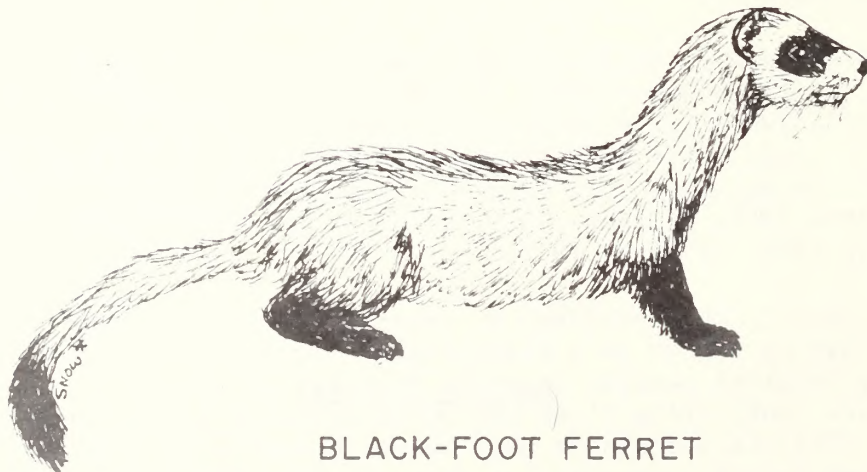
Ferrets weigh between 1½-3½ pounds. They are short-legged, have long, well-developed claws on the front paws, large ears and relatively large eyes. After dark the ferret's eyes show a green reflection from artificial light (Homalka, 1964, 1967; Henderson, n.d., 1966, 1968; Henderson et al, 1969; Corder, 1968; McClung, 1969; Milne et al, 1971; IUCN, 1968; USDI, 1968; Hillman, 1972).

In the Southwest, the "bridled" or "masked" weasel is often misidentified by laymen as a black-footed ferret (Ames, 1972). Apparently longtail weasels (Mustela frenata) in this area tend to have contrasting black and white markings on the face, and it is this characteristic that leads to confusion with the black-footed ferret. However, it does not have the black feet characteristic of the ferret (see Fig. 1).

Figure 1
Black-Footed Ferret and "Bridled Weasel"



"MASKED" or "BRIDLED" WEASEL
MUSTELA FRENATA



BLACK-FOOT FERRET
MUSTELA NIGRIPES

2. Distribution, Present and Former

Both the former and the present distribution of the black-footed ferret are essentially the same, except that evidence is pointing to the existence of very limited numbers over most of the former range: Montana, Wyoming, Colorado, New Mexico, Arizona, Texas, Oklahoma, Kansas, Nebraska, South Dakota and North Dakota. Most ferret sightings to date have been in South Dakota (Cahalane, 1954; Arvey et al, 1950; Cockrum, 1960; Crabb et al, 1950; Fichter et al, 1953; Fortenbery, 1970; Henderson, 1968; Hershkovitz, 1966; Hoffman et al, 1969; IUCN, 1968; Jones, 1964; Lechleitner, 1969; USDI, 1968).

The Executive Committee of The American Committee For International Wild Life Protection sponsored a survey in 1952-53 of ferret sightings. Cahalane (1954) compiled a list of forty-two reports as being timely and reliable, and he determined that these reports were of 50-70 individual ferrets.

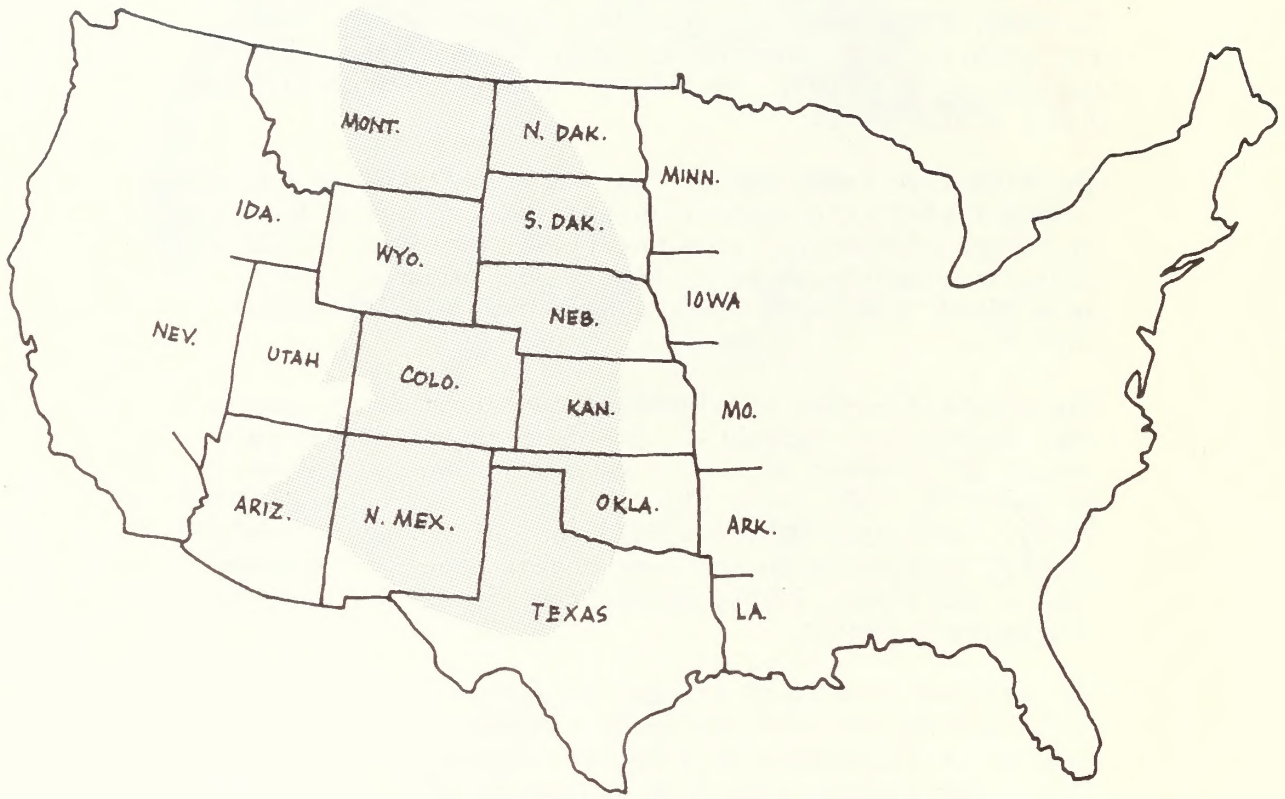
The greatest number of sightings came from South Dakota, then Montana and Nebraska. The most recent documented record of a ferret in Kansas came when one was captured December 31, 1957, near Studley in Sheridan County (Henderson, 1968). July 25, 1928, one mile east of Norman, Cleveland County, appears to be the most recent date for Oklahoma (Avery and Glass, 1950), except for a possible 1968 sighting (Fortenbery, 1970).

No verified records of ferrets in Montana were obtained after 1953 (Hoffman, Wright and Newby, 1969). However, a report came in to Fortenbery of a ferret sighting in Montana in 1970. Two reports came from Kansas and also one each from Utah, Nebraska and New Mexico in that year (Fortenbery, 1970).

There have been unverified sightings in Prowers County, Colorado in the past five years, and sightings from previous years have been statewide (Tully, pers. comm.). The most recent sighting in Wyoming was June 29, 1965, U.S. Highway 87, six miles east of Casper (Hershkovitz, 1966).

A recent communication (June, 1972) from the New Mexico Department of Game and Fish indicates that the black-footed ferret may be extinct in New Mexico. Although there are still reports of sightings, either they cannot be authenticated or they turn out to be bridled weasels (Ames, pers. comm.).

Ferret Distribution Map



Verified observations of the black-footed ferret have been made in eight Nebraska counties in the last five years (Lock, pers. comm.). There have been no verified sightings of ferrets in Kansas in the past four years (Henderson, pers. comm.).

3. Status and Population Trend

The black-footed ferret is endangered. Because very little population data is available, it is difficult to determine whether or not the total population is declining. The ferret apparently has never been common and has always been difficult to observe. Most ferrets have been observed in association with prairie dogs, and the reduction in prairie dog numbers is probably an indication of reduction in numbers of ferrets (Cahalane, 1954; Henderson et al, 1969; Henderson, n.d.; Corder, 1968; Fichter and Jones, 1953; Hershkovitz, 1966; Hoffman et al, 1969; Caras, 1966; Homolka, 1967).

4. Life History

Intensive studies of the black-footed ferret to obtain information on life history were not started until 1964 when a family of ferrets was discovered in Mellette County, South Dakota. Up to that time there is very little in the literature on this subject. The remaining known concentration of ferrets occurs in South Dakota; and the South Dakota Cooperative Wildlife Research Unit, in conjunction with the Northern Prairie Wildlife Research Center, has been coordinating the studies being conducted.

There are still very few publications dealing with the life history of ferrets; and most of them contain at least some of the information present in a publication called "The Black-footed Ferret in South Dakota" by Henderson, Springer and Adrian, which at the moment is probably the most comprehensive report on ferrets.

Observations to date have been made of single adults and families. The female alone cares for the young, although the male may stay in the same prairie dog town in some instances. Observers to date have been unable to study young ferrets until they appear above ground, which is generally when they are about half grown. The young ferrets rarely appear during the daylight in the summer, although the female at times may sunbathe.

Both the young and the adults are primarily nocturnal. The behavior patterns of the different families that have been observed are essentially the same.

In the evening, the female cautiously emerges from her burrow and spends quite a bit of time checking the area. After this procedure, she goes to the burrow that the young are in and coaxes them out. Sometimes they are very reluctant to leave and the female may grab them by the nape of the neck and drag them out. Once outside, they may dart back to that burrow several times, but finally will follow the female.

The family then travels from burrow to burrow, with the female carefully checking each one and eventually relocating her litter in one of them. She then selects a burrow for herself.

As they grow older, the young are less afraid to travel. From June to mid-July the young are observed above ground at night and the family extends its activities. By mid-July, the young are half grown and eating prey which the female kills. The female will drag a prairie dog that she has killed from one burrow to another, then bring the young ferrets to that burrow, or take the prairie dog to the burrow that her litter is in.

By early August the female puts the young ferrets into separate burrows. The young possibly begin hunting by themselves, although Hillman (1972) reports that he has never observed this activity himself. By mid-August they are out during the early morning, playing and following the female. By late August - early September the young are approaching adult size and dispersion starts.

Late summer - early fall is probably the principal time of dispersal. 43% of the dead ferrets found outside of prairie dog towns have been found between mid-August and mid-October. Ferrets may visit formerly used areas which are not currently inhabited. They are usually found singly during late fall, winter and spring. Ferrets do not hibernate.

The large ears of the ferret suggest that hearing is well developed. Adrian (Henderson, et al 1969) tested this by scraping his foot across the floor of a truck from which he was watching some ferrets from five feet away. The young immediately ran down the burrow. On another occasion when a female and her litter were being observed, they suddenly ran down a burrow which was seven feet away. Several seconds later, a great horned owl swooped over the burrow entrance.

Smell also seems to be important, as ferrets apparently sniff the air frequently. Sight is relied on at close range, but does not seem to be as important at distances over 300 feet.

Wild ferrets have never been seen drinking water, but captive animals have been observed to drink. Only a few scats have ever been found above ground, and it is believed that they are deposited underground for the most part. Ferrets will urinate above ground at least some of the time. They also tunnel under the snow as do weasels.

The usual hardness of the soil in prairie dog towns makes it difficult to find tracks. Most ferret tracks are observed when there is some snow cover. Twelve to sixteen inches is the average distance between tracks in a normal bounding gait. Mink and ferret tracks are very similar, and mink have been observed in prairie dog towns. Mink and ferret scats are also similar, so there is no guarantee that such sign observed belongs to ferrets.

When a ferret is digging out a prairie dog burrow, or one of its own making, it backs out with the dirt held against its chest, dragging the dirt farther from the burrow entrance each time. A trench 3-5 inches wide and up to 11 feet long is formed on the surface. These trenches are formed mostly at night and are diagnostic of ferrets because no other species in a dog town leaves this type of structure.

The prairie dog is the ferret's main source of food. The effect of ferrets on prairie dog populations depends on the size of the town and the number of ferrets present. Parts of towns frequented by ferrets are thinly populated while densities are higher where ferrets are occasional.

When a ferret is active during the day, the prairie dogs stay above ground. In the locality of the ferret they may appear very agitated. The prairie dogs frequently cover up the burrows in which ferrets are present or apparently where there is an odor of recent ferret presence. The ferrets seem to have no difficulty digging out of these situations.

Prairie dogs may be aggressive towards ferrets when the young are threatened, while the ferrets may not be particularly aggressive in turn. Some prairie dogs will fight with teeth and feet if a ferret grabs them, and they may escape. Sometimes prairie dogs may run in front of the ferret as

though trying to divert it. Prairie dogs usually give way if a ferret is insistent. Captive ferrets kill prairie dogs by attacking the throat or the back of the neck. The internal organs and the throat are usually eaten first. Ferrets will eat prairie dogs that they haven't killed themselves.

Ferrets have been seen chasing birds and have been observed catching moths. They possibly eat snakes and ground squirrels and in captivity have also eaten commercial mink food, fish, liver, hamburger, pork, milk, rabbit and bread.

Sheets and Linder (1969) studied the food habits of a female and four young in Mellette County, South Dakota, during the summer of 1968. Six prairie dog burrows were excavated to recover ferret scats. Prairie dog remains found in the burrows consisted of skulls, feet and skins.

Fifty-six ferret scats were recovered. Forty-one percent of the contents by weight consisted of animal material, and the remainder was fragments of soil and plant material, much of which resulted from contact with the burrow. Of the animal material present, 18% was mouse remains and 82% was prairie dog remains. Prairie dog remnants occurred in 51 of the scats, and mouse remnants were in 19 scats.

Although ferret scats were found scattered throughout older burrows, two accumulations were found in a burrow recently vacated. The scats had not been covered by the ferrets.

One aid in finding ferret scats was noting a considerable amount of white mold attached. All scats were black with exposed hair on their surface and were one to four inches long and about one-fourth of an inch thick.

Ferrets are basically unafraid of human beings, and observers have been able to approach to within a few feet of them at night. While caring for her young, a female appears to be less wary than at other times of the year. When alarmed or disturbed, ferrets chatter or bark and may hiss defiantly.

Aldous (1940) captured a young female ferret in July, 1929 and maintained her in captivity for several months. While young, she was playful and could be handled without difficulty. She escaped for several days five months later and after she was caught became vicious. A male that Progulske (1969) acquired in 1963 had already been in captivity for several months and was vicious until it died. It would dig as much as fifteen feet of burrows at night.

This ferret's food consumption for seven months was between 60-364 g/day. Both captive ferrets usually fed at night. Hillman (1972) reports that two black-footed ferrets presently in captivity are most active at night, but also feed during the day.

Losses from man include trapping, highway mortality, sport shooting for prairie dogs and poisoning of the prairie dog. When strychnine and 1080 were used in experiments, domestic ferrets died when fed poisoned prairie dogs. Since it is unlikely that domestic ferret and black-footed ferret physiology differ to any great degree, some black-footed ferrets have probably also died when prairie dogs have been poisoned.

Possible predators of the ferret are the badger, domestic dog, coyote, domestic cat, owls, bobcats, prairie rattlesnakes, hawks and eagles, although it seems that man probably causes the most mortality. Parasites of ferrets include ticks, fleas, lice, nematodes and mites. The relationship of parasites and diseases of the ferret are unknown (Aldous, 1940; Henderson, n.d., 1968; Hillman, 1968a, 1968b, 1972; Progulské, 1969; Henderson et al, 1969; Sheets et al, 1969; Boddicker, 1968).

5. Reproduction

At this point nothing is known about how a male and a female ferret find each other. Mating is believed to occur in April or May, but this is based on the assumption that gestation is similar to that of the domestic fitch ferret: 42 days.

Additional evidence has been obtained from killed females. One killed on May 16, 1967, appeared to be in heat. A female trapped May 3, 1920, was said to be carrying unborn young. A nursing female was collected June 20, 1913. A litter of one-third grown ferrets observed July 6, 1967, had their eyes only partly open (Henderson et al, 1969).

6. Habitat Requirements

There no longer is any question that the ferret is associated primarily with prairie dogs and prairie dog towns. Although ferrets have been seen under haystacks, in alfalfa fields and buildings, most of these sightings occur during the time of dispersal and in most cases are probably temporary. There is no evidence to indicate whether or not wild ferrets

can live indefinitely on food sources other than prairie dogs. Historically, the range of the ferret has closely coincided with that of the prairie dog, and this relationship continues.

Studies at the South Dakota Cooperative Wildlife Research Unit of ferret scats found in a prairie dog town indicated that mice and prairie dogs were the prey consumed. In a town with four young ferrets, 68 scats were collected and mouse hair amounted to 32% in the scats; the remainder was prairie dog.

Prairie dog burrows provide a more moderate environment than hot, cold or inclement weather outside. Ferrets live in the burrows and rear their young in them. Burrows probably provide protection for ferrets from their predators that other situations don't.

The general conclusion by now is that ferrets have never been abundant, and this close association with prairie dogs may be involved in an adaptation to prevent the ferret's overexploitation of its food supply.

Twenty-one ferrets were observed on six prairie dog towns from April 1966 - December 1967 by Hillman (1968a, 1968b). Five towns were on rolling grassland and one was on low terraces adjacent to a creek. The soil type was mainly solodized-solonetz with a thin friable surface layer underlain by a dense, dispersed clay layer. A study in Nebraska by Fichter and Jones (1953) showed a preponderance of ferret records in loess plains, but they admitted that the lack of sightings in the sandhills may be related to the lack of coverage of this area by man.

Areas that are good prairie dog habitat and have prairie dogs living in them evidently are also good ferret habitat (Sheets et al, 1971; Hillman, 1968; Fichter and Jones, 1953; Henderson et al 1969).

7. Protective Measures Instituted

a. Legal or Regulatory

1. The black-footed ferret is on the IUCN (International Union for the Conservation of Nature and Natural Resources) and the USDI endangered species lists.

2. The black-footed ferret is protected in South Dakota; no one except authorized personnel may hunt, take, trap or kill a ferret, and then only under severe restrictions.
3. No control of prairie dogs may be undertaken on national wildlife refuges of the BSW in Region 3 without permission of the Regional Director.
4. A policy issued June 22, 1965, states that USDI personnel may not undertake prairie dog control until surveys are conducted and the area is certified free of ferrets. The USDA and the Defense Department are cooperating by generally requiring pre-control surveys on lands under their jurisdiction (Henderson et al, 1969).
5. A policy has been agreed upon whereby pre-control surveys will be carried out at two levels of intensity on principal and secondary ferret areas. The principal ferret areas are where most ferret sightings have occurred. The secondary areas are where all other sightings have been. On the principal area an intensive survey will be made on each town before any control is initiated and control will not be undertaken before September 1 of any given year. In the secondary area, a sample consisting of at least 25% of the burrows in each town will be inspected before control. In neither area will control by use of toxicants be undertaken where the presence of ferrets has been confirmed or suspected within the preceding two calendar years (Fortenbery, 1970).

b. Captive Rearing

In 1966 the Endangered Species Act was passed and the laboratories at Patuxent, Maryland, received an appropriation to establish a stock of captured ferrets. The Director of the South Dakota Game and Fish Commission at that time refused to allow the capture of a resident species until 1969. Breeding pens were built, and two ferrets have been obtained (Hillman, 1972).

c. Habitat Protection and Improvement

The only habitat protection being practiced at present seems to be the policy of not poisoning prairie dog towns where ferrets are definitely known to be present. Also, the BSFW has been paying \$600 per year to a rancher who owns land on which prairie dog towns with ferrets are known to exist, for grass lost through sparing the prairie dog towns (McNulty, 1971).

d. Reintroduction

Some transplanting of ferrets has occurred. Three ferrets from the five that were captured for a Walt Disney film were released in Wind Cave National Park, South Dakota, but were very rarely seen after their release, and it is not known whether or not they survived or reproduced (Garst, 1954; Homolka, 1964).

8. Identification of Limiting Factors

The control and, in many instances, the extermination of entire prairie dog populations is quite probably the major limiting factor for ferrets. Although actual population changes in ferrets cannot be calculated, most present-day sightings, as well as past sightings, have been in active prairie dog towns.

Although the Division of Wildlife Services seemed to require positive proof that their poisons were killing black-footed ferrets, and felt that the failure to find such ferrets was an indication that they were not being poisoned, it is probable that some ferrets have died from secondary poisoning that never would have been found, since it is most likely that they died in burrows where they would normally eat. Domestic ferrets have died when test-fed prairie dogs poisoned with the poisons that the Division of Wildlife Services has used (Henderson, et al 1969; Etter, 1965; McNulty, 1971; Hillman, 1968a, 1968b).

9. Recommended Species and Habitat Management Techniques

1. Intensify studies into the status, life history and ecological relationships of ferrets, prairie dogs and other ferret prey, including the development of methods to live-trap and mark ferrets with investigations of marked ferrets to learn their movements and longevity.

2. Develop better methods for determining the presence of ferrets.
3. Urge increased reporting by the public of live and dead ferrets and ferret sign. (Color postcards and pictures have been very helpful in the South Dakota studies.)
4. Promote greater public awareness of the dependency of ferrets upon prairie dogs.
5. Determine the direct and indirect effect of prairie dog control on ferrets.
6. Develop materials for prairie dog and other animal control that will not poison ferrets.
7. Explore all feasible means of retaining adequate numbers of prairie dogs and ferrets on both public and private lands.
8. Experiment with transplanting and releasing ferrets into areas where prairie dogs are protected.
9. Test methods for maintaining ferrets in areas not occupied by prairie dogs.
10. States in which ferrets are known to exist should hire non-game biologists to study ferrets and other non-game species (Henderson et al, 1969).
11. Train Division of Wildlife Services men in ferret detection (Fortenbery, 1970).
12. Train state game and fish biologists from ferret states in ferret detection (Tully, 1972).
13. Use airplane surveys to plot prairie dog towns and to check for ferret sign such as trenches (Fortenbery, 1970; Henderson et al, 1969).
14. Ferret Ground Surveys: Winter is one of the best times to observe signs of ferret activity when tracks and digging are most evident in the fresh snow and prairie dogs are less active, and therefore less likely to erase ferret signs. Since snow cover is highly variable, the usefulness of this method is restricted.

In conducting diurnal surveys, the observer should approach to within one hundred yards of the area, inspecting the town with a spotting scope or binoculars. The activity of prairie dogs may indicate the presence of a ferret if they are looking in its direction instead of eating; if the ferret is above ground, the prairie dogs may be very excited; if the ferret is below ground, the prairie dogs may try to cover up the burrow that it's in.

If the first inspection is without results, move to the edge of the town and look again, then drive or walk and look for ferret sign, checking through the binoculars occasionally. In the winter, look for tracks in the snow, trenches, snow tunnels and scats. In the summer, check to see if many burrows are plugged up.

Notice if there are as many young prairie dogs as there should be in a ferret-free town. Night surveys should be made since the ferret is mainly nocturnal. The mother and her young are seen above ground in early July through early September. They are most active from twilight to midnight and 4 a.m. until an hour or so after sunrise.

Unless ferrets are actually seen, there is no way to be certain that a ferret is living in a prairie dog town at a particular time. Helpful information includes knowledge of how long the town has been at its present location, whether or not the town is increasing or decreasing, whether or not people shoot at the prairie dogs, if poisoning has been attempted, and whether any one has seen a ferret or its sign in the town.

If there is some evidence for further surveillance, the investigator should watch a town at least five consecutive days and nights from three hours before dusk to three hours after dawn (Henderson et al, 1969).

15. Sanctuaries for ferrets and prairie dogs may be an effective approach in habitat management if an adequate number of prairie dogs can be maintained as a food supply for the ferrets. However, important information is lacking, such as how many prairie dogs are necessary to maintain a ferret indefinitely. Neither is there adequate information on home range and movements of ferrets.

10. Ongoing Research Projects

The South Dakota Cooperative Wildlife Research Unit is still maintaining ongoing studies on the black-footed ferret and the prairie dog. Chemosterilant experiments are being conducted on prairie dogs in captivity and in towns. Surveys are continuing.

The feasibility of radiotelemetry studies was also being worked on. Several ferrets have been marked. The coordinator of these studies is Raymond L. Linder. Cooperators include Conrad N. Hillman, BSFW. Studies of prairie dogs are also being conducted in relation to the ferret projects.

11. Authorities

1. Conrad Hillman
Division of Wildlife Research
U. S. Bureau of Sport Fisheries and Wildlife
919 Main Street, Room 210E
Rapid City, South Dakota 57701
2. F. Robert Henderson, Extension Specialist
Wildlife Damage Control
Kansas State University
Manhattan, Kansas 66502
3. Dr. Paul F. Springer, Assistant Director
Northern Prairie Wildlife Research Center
Jamestown, North Dakota 58401
4. Raymond L. Linder
Supervisory Wildlife Biologist (Research)
South Dakota Cooperative Wildlife Research Unit
Brookings, South Dakota 57006

12. Governmental, Private and International Organizations Actively Involved With This Species' Welfare

- A. 1. Defenders of Wildlife
2000 N Street, N.W.
Washington, D.C. 20036
2. A national nonprofit educational organization, dedicated to the preservation of all forms of wildlife. Promotes, through education and research, protection and humane treatment of all mammals, birds, fish and other wildlife and the elimination of painful methods of trapping, capturing and killing wildlife.

3. Dr. Richard H. Pough, President
 4. Has been involved in consideration of the purchase of a large ranch in South Dakota as a ferret refuge.
- B. 1. U. S. Bureau of Sport Fisheries and Wildlife
Office of Endangered Species/International Activities
Washington, D.C. 20240
- Patuxent Wildlife Research Center
Laurel, Maryland 20810
2. Scientific study and propagation of threatened wildlife species. The objectives are to obtain needed information on the distributional, behavioral, ecological, physiological, genetic and pathological characteristics of threatened species in the wild so as to identify and evaluate limiting factors and find means of correcting them; and to maintain captive populations of these wildlife species for study and for the production of suitable stock needed to restore or bolster populations in the wild (Erickson, 1968).
 3. Conrad Hillman (Rapid City, South Dakota)
 4. Cooperation with the South Dakota Cooperative Wildlife Research Unit.
- C. 1. South Dakota Cooperative Wildlife Research Unit
Brookings, South Dakota
2. Life history and ecological studies of the black-footed ferret
 3. Raymond L. Linder, Project Leader
 4. Coordination with South Dakota State University and South Dakota Department of Game, Fish and Parks
- D. 1. South Dakota Department of Game, Fish and Parks
Rapid City, South Dakota
2. Protection, life history and ecology and management of the black-footed ferret.

3. Unknown
 4. Coordination with the South Dakota Cooperative Wildlife Research Unit
- E.
1. Nebraska Game and Parks Commission
2200 North 33rd Street
Post Office Box 30370
Lincoln, Nebraska 68503
 2. Study in progress to determine the status and distribution, protective measures needed, and management techniques.
 3. Ross Lock, non-game biologist
- F.
1. National Audubon Society
North Midwest Regional Office
R. R. 4
Red Wing, Minnesota 55066
 2. Supports and urges the protection of prairie dogs on all public lands in recognition of the interrelationships of the black-footed ferret and the prairie dog.
 3. Edward M. Brigham, III, North Midwest Representative
 4. Has funded census of prairie dogs and black-footed ferrets in Mellette County, South Dakota.

13. Listing of Photographic Material Available for Duplication

The South Dakota Cooperative Wildlife Research Unit should be a good source of photographic material. The publication "The Black-Footed Ferret in South Dakota" is an excellent source of photos. Individuals who have studied the ferret in some detail might have photographic material available. South Dakota also has a movie on black-footed ferrets. The costs of most of this material should be nominal. Donald Fortenbery has prepared a slide series on the black-footed ferret.

14. Other

There are political and economic ramifications involved in any attempt to administer programs which will be beneficial to the black-footed ferret. Competitive uses for public lands have been economically oriented in the past and politics concerning management of these areas have sometimes been conflicting in nature.

Although the official policy at the Washington office of the BSWF has been the protection of the black-footed ferret, there apparently were some difficulties encountered in field level operations. Hall (1966), Madson (1968), McNulty (1971) and Etter (1965) give variously detailed accounts of the different obstacles that have been encountered in attempts to protect the black-footed ferret.

Since the Cain Report on predator control was published and the President's Executive Order banning the use of poisons on public lands was issued, the situation should be improved.

Henderson et al (1969) have pointed out the great lack of knowledge about many aspects of the ferret's life history and ecology, including just what effect prairie dog control does have on ferret populations.

There is some evidence that the pre-control surveys which the Division of Wildlife Services agents have been conducting are inadequate. These surveys have consisted of the agents walking or driving through a prairie dog town during the day. Usually the poison crews have been right behind them. Many of the people who have studied ferrets feel that this approach is highly unlikely to produce either ferret sign or sightings. In fact, after such a survey and while poisoning was in progress a ferret was seen in a dog town in one instance. The poisoning was halted, but the ferret was never seen again (McNulty, 1971).

Fortenbery (1970) reported that more extensive pre-control surveys are now being made, and he was training DWS men in the techniques of looking for ferrets.

However, there still seems to be a lack of basic knowledge about prairie dogs and ferrets. How will the ferret's ability to capture prairie dogs affect any attempts to establish sanctuaries? If there is only one dog town on a sanctuary, the resident ferret may be capable of reducing the population to the extent that it no longer has an adequate available food supply. If this is the case, then how large an area is necessary to be an effective sanctuary? And how many prairie dogs are necessary to support one ferret indefinitely? If the numbers of prairie dogs are reduced but not exterminated in a town through control efforts, can a ferret catch enough other prey species living in that town, such as mice, to survive?

The efforts to find means other than poisons to control prairie dogs are commendable. However, if the use of chemosterilants becomes an effective control method, how will this affect the ferret's food supply? Or will the chemosterilants be used only in areas where it is certain that there are no ferrets?

More basic information is also needed on prairie dog-livestock relationships. Carl B. Koford (1958) has one of the most extensive studies: "Prairie Dogs, Whitefaces, and Blue grama," Wildlife Monograph No. 3. Many complex factors are involved, but it is apparent that overgrazing is favorable to an increase in prairie dogs. It is not known with certainty just how much forage prairie dogs will consume that could also be utilized by livestock.

It is the supposed competition between prairie dogs and livestock for forage that stimulates ranchers to have prairie dogs eliminated, even on public lands where they have grazing permits. This economic fact of life tends to override any other considerations for management of the land and has probably cost some ferrets their lives and will continue to do so until a feasible management policy is established. It seems logical to investigate the merits of natural biological control of prairie dogs and to conduct more intensive studies to learn just what the ecological relationships are.

Research is needed to determine if ferrets are found in habitat types other than prairie dog towns. There have been incidental observations of ferrets in places such as alfalfa fields, but no studies to indicate whether or not they were surviving in these situations.

Some re-education of landowners who have grazing permits on public lands seems necessary. It is likely that most of them do not favor extermination of the prairie dogs, but control of numbers, which the black-footed ferret may be capable of doing.

Progulske, in a June 15, 1972, personal communication, mentions a M.S. thesis by Robert G. Sheets (1970. Ecology of the black-footed ferret and the black-tailed prairie dog. South Dakota State University. 42 pp.) The notice arrived too late to be able to obtain the thesis for this report, but it may contain additional information on ferret-prairie dog relationships that could have useful applications for habitat management.

The black-footed ferret bibliography prepared by Linda Harvey (see Selected References) lists over a hundred references on the black-footed ferret. Much of this information is repetitious, consisting of descriptions of the ferret and general known distribution. However, it is a very complete listing if it is felt that additional references should be consulted. Those articles listed in the Selected References for this report were chosen on the basis of being the most pertinent to the type of information that the Bureau of Land Management would find useful.

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