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Denise E. Casey
Biota Research and Consulting, Inc., Box 2705, Jackson, Wyoming 83001

John DuWaldt
Yale University, School of Forestry and Environmental Studies, New Haven, Connecticut 06511

Tim W. Clark
Idaho State University, Department of Biological Sciences, Pocatello, Idaho 83209

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ANOTATED BIBLIOGRAPHY OF THE BLACK-FOOTED FERRET

Denise E. Casey¹, John DuWalt², and Tim W. Clark³

ABSTRACT.—An annotated bibliography of 351 references on the black-footed ferret (Mustela nigripes) shows 19 articles, mostly species descriptions, published from 1851 through 1899; 69 papers, mostly describing the range of the species, from 1900 through 1964; 156 papers dealing largely with the Mellette County, South Dakota, ferret research published from 1965 through 1980; and 107 publications since 1981 dealing primarily with the Meeteetse, Wyoming, ferrets.

This bibliography represents the first relatively complete annotated listing of the primary literature on the black-footed ferret. It builds on previous species summaries by Snow (1972), Harvey (1972), and Hillman and Clark (1980). This literature assemblage can serve as a statement of current information on the species and as background for future ferret conservation and recovery efforts.

METHODS

We attempted to limit the references to those containing original data or new information in published books or scientific journals. A few secondary sources and popular articles provide good overviews and were included. No newspaper articles are cited. We used the existing literature in our libraries as well as the Yale University libraries. The literature cited in each article or book was sought for additional references. We feel that the historical literature, prior to 1960, is well represented. The scientific literature on the 1964–1974 South Dakota ferret research is also well covered, but less widely available popular works from these studies are not as well represented. We included some contract consulting reports to governmental agencies that contain valuable information, but some of these were also not readily available. We annotated all publications we saw.

BLACK-FOOTED FERRET LITERATURE

This bibliography contains 351 references, nearly all of which are annotated. Nineteen (5%) were published between 1851 (when the species was first described) and 1899. These articles include the first descriptions of the animal and its range, a decades-long controversy over the existence of the species, calls for more information, and confirmation of the validity and range of the species late in the century. Between 1900 and 1964, 69 (20%) articles were found. These articles focus largely on the distribution of the species along with a few accounts of its ecology and status and the first known photographs of both wild (1929) and captive (1906) animals. Between 1965 and 1980, 156 articles appeared. These largely comprise the Mellette County, South Dakota, studies from 1964 through 1974. These constitute a solid body of scientific data on the life history of wild ferrets, captive rearing attempts, and the status of the species as well as surveys for ferrets. Most of the 107 (30%) publications from 1981 to 1985 deal with the Meeteetse, Wyoming, ferrets—discovered in late 1981, as well as renewed interest in finding or transplanting ferrets in other states. Less than one publication appeared every two and one-half years for the first 50 years of our knowledge of ferrets. About one paper was published per year from 1900 through 1964. This rate jumped to 10 papers per year from 1965 to 1980 and then to 27 per year after 1981.

We realize that new publications will be forthcoming. We welcome additions to this bibliography, and we apologize for any citations that were inadvertently overlooked.

¹Biota Research and Consulting, Inc., Box 2705, Jackson, Wyoming 83001.
²Yale University, School of Forestry and Environmental Studies, New Haven, Connecticut 06511. Present address: Ecology and Environment, Inc., 195 Sugg Road, Post Office Box D, Buffalo, New York 14225.
³Idaho State University, Department of Biological Sciences, Pocatello, Idaho 83209.
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REFERENCES


One BFF was kept in captivity for 5 months in 1929. Captured at 2400 meters in New Mexico in a Cynomys gunnisoni town, it ate many food items, “enjoyed” playing, and allowed nose and belly rubbing. It became “vicious” at maturity and was killed and made a study skin.


This general account, accompanied by a photo, locates the range of the BFF, its dependence on prairie dogs, and its probable extirpation as a result of prairie dog poisoning. Suggests that BFFs and their prey could be maintained “unmolested in colonies on national reserves.”


The apparent low number of BFFs is an adaptation to the prey base.


Popular account of C. N. Hillman’s research and predator control impacts on nontarget species.


Lists P. nigripes in the fauna of the state.


A late Pleistocene deposit in Wyoming yielded remains of 15 BFFs, designated a distinct population on the basis of teeth characteristics. Only two other Pleistocene records are known, both in New Mexico.


Pleistocene BFF remain from the Fairbanks District, Alaska, collected between 1938 and 1947, is identified as Mustela (Putorius) eversmanni michnoi. Gradation of cranial characters between M. nigripes and M. eversmanni is noted; additional analysis may find that there is only one Holarctic species.


Mustelid remains from near Fairbanks, Alaska, include the steppe polecat (Mustela (Putorius) eversmanni) and the Beringian ferret (Mustela eversmanni beringiae ssp. nov.). This is the first record of M. eversmanni in North America.


A comprehensive look at the BFF’s morphometry, distribution, and paleobiology.


News report on research activities on BFF population found in Wyoming in 1981. Photo.


Brief discussion of BFF, map of collection locations. Pertinent concept of “salvage zoology” mentioned in pref.


Rediscovery of University of Oklahoma BFF museum specimen collected in 1928 near Norman, Oklahoma. Extends state range eastward.


The original technical description of the BFF, made from a single specimen from the Platte River. Detailed, qualitative descriptions of dentition, body characteristics, pelage, color, dimensions, habits, and geographic distribution. Notes that BFF’s inhabit “wooded parts” and does not mention any association with prairie dogs. “It is with great pleasure that we introduce this handsome new species.” The authors claim that they are not surprised that many species were overlooked in the rapid exploration of the West.

Notes several occurrences of BFFs in Texas and cites Cary (1902) for reports from Stanton, Texas.


Early scientific description of North Dakota mammals, including Mustela nigripes.


Very brief account concluding with the thought that “high living on easily obtained fat prairie dogs seems to be the only explanation of their scarcity.”


Brief description of BFF based entirely on Audubon and Bachman’s description. Notes that “it is a little remarkable that so conspicuous and well marked a species should have eluded the notice of the recent explorers in the Platte region.”


Describes BFF as predator of prairie dogs and as “nowhere numerous.”


Currently managed for livestock grazing and big game range, BFF habitat near Meeteeete is protected from major impact by suspension of proposed oil field development until other management strategies can be implemented.


Bureau of Sport Fisheries and Wildlife lobbied for rational management of prairie dog colonies. Points out the USDI policy conflict of energy production vs. resource protection. Emphasizes need for compromise policies. Includes 1965 USDI BFF policy statement and 1972 USDI rodent poison guidelines.


Results of radio tagging studies of Wyoming BFFs are described.


Movements of four radio-tagged BFFs were monitored during the falls of 1981 and 1982. Lengths of movements are described and areas of activity characterized.


Dissection of muscles of the pelvic limb of BFF. Musculature found to be very similar to other mustelids.


Inventory of prairie dog colonies in 3 southwestern North Dakota counties.


1981 Wyoming BFF find reported. Photo.


A three-line note claims BFFs are very rare or extirpated in the Mesquite Plains district.


Fleas, ticks, nematodes, and mites were identified.

Two objectives are suggested: reconstitution of an advisory board to oversee BFF research and management, including more research representation, and important research topics, including basic ecology of M. nevadensis, mortality factors, survey techniques, captive breeding and translocation, and prairie dogs.


The skull and left mandible of a subadult male BFF were found in Gove County, Kansas, in November 1978, representing the first of the species found in the state in over 20 years.


Calls for implementation of six strategies: (1) conserve existing population, (2) continue research and monitoring, (3) initiate captive propagation for future release, (4) continue search for other populations, (5) evaluate and identify future reintroduction sites, and (6) develop complete management plans for reintroduction sites and subject them to public review.


Audubon Society representative suggests “prairie dog bank” or colony leasing program to preserve faunal community. Example of pro- and anticaaptive breeding polarization.


Resume of BFF with weights of two adults.


Montana Department of Fish, Wildlife and Parks initiated a program with the ultimate goal of recovering BFFs in the state. Discussion includes agency cooperation and future plans. Appendices provide observation report form and follow-up procedures.


Reviews status of BFF and reports 50–70 animals from 42 sightings from a canvass of federal employees from 1948 to 1953. Range map based on reports included. States that complacency regarding BFF is unjustified.


The use of spotlighting as a search and research method, historically and in present day, is discussed. Results of a pilot study to assess BFF responses to this technique are presented.


Brief popular account of characteristics and life history with tips for finding and observing BFFs, "surely . . . the last one you kick off on your lifetime checklist."


An introduction to the research and propagation techniques of the Endangered Wildlife Research Program. Electro-ejaculation and artificial insemination used on surrogate species of ferrets are potential methods for use with BFFs.


A captive breeding program was conducted at the Patuxent Wildlife Research Center from 1968 to 1979. Results of this effort are reviewed and prognosis for successful future programs discussed along with role of captive breeding as adjunct to habitat preservation, field studies, law enforcement, and public education.


Four wild-captured BFFs held at Patuxent Wildlife Research Center died within 21 days after vaccination with modified canine distemper virus.
Maps BFFs in plains of Colorado. States that they are most beneficial because they prey on prairie dogs.


Different perceptions of the role of prairie dogs in ecosystems affects the survival of both Cynomys and M. nigripes. Basic review of BFF life history, behavior, and habitat loss dilemma.


The BFF was probably common in certain areas of Kansas west of the Flint Hills. Twenty-eight of 38 museum specimens from the state were collected before 1900, and most were males. Agriculture and prairie dog control blamed for demise of the BFF.


Attempt to inventory prairie dogs and BFFs. Author reports on a mail survey for BFFs and prairie dogs in Wyoming. Lists and maps of black- and white-tailed prairie dog colonies and BFF locations in 1971 and historical times.


A one-page introduction to the BFF’s appearance and habits, history of search efforts in Wyoming, and a plea for information.


A quick introduction to the BFF and its sign with a request for information.


Outlines history of BFFs in Wyoming leading up to 1974d campaign to record recent sightings.


Yet another introduction to the BFF, part of the author’s early 1970’s campaign to publicize BFFs and gather information.
Another introduction to the species, this time focusing on sightings and remains that were turned up by the author’s “Ferret Search.”

Fifteen BFF remains found at one Paleo-Indian site in Wyoming. BFFs used as religious objects and head-dress pendants.

Popular account of historical and ecological details of BFFs.

Review of BFF reports in Wyoming, hypotheses about BFF decline, and methods of searching for populations. Recommends prairie dog management techniques for BFF preservation, including termination of control on all colonies suspected of supporting BFFs.


Discussion of conflicting agency responsibilities toward BFFs. Lack of information on prairie dog control makes it hard to assess status of BFF. New location techniques are necessary.


Lists and evaluates 148 Wyoming BFF reports. The increasing number of reports in recent years is the result of increased concern for the BFF, not an indication of increased abundance.


45 valid BFF sightings in Wyoming were collected during a search effort in 1973–1975 resulting from a publicity campaign throughout the state. Evaluation criteria are given; a map shows locations of reports. Concludes that the existence of BFFs is verified.


A short popular account of some highlights of the first year’s research on Wyoming BFFs. Many excellent photos.


Outlines problems on several fronts that must be overcome to set up successful conservation programs.


As a step toward developing a case history, the role of the private research arm of the Wyoming BFF program is presented. The historic role of the conservation community in wildlife protection, management, and study is reviewed, and some ideas for achieving model conservation programs are brought together.


Reports progress in a study “directed toward those parameters of ferret-prairie dog relationships which are significant for the conservation of the ferret.”


Search efforts in Wyoming in 1979 are reported, the environments around 10 reported BFF sightings are described, and BFF habitat is discussed.


Specific management guidelines for monitoring and protecting the Wyoming BFF and its habitat are given. The BFFs current status and all the primary baseline data sources and methods are identified.


State-of-the-art description of field survey techniques. Recovery team reviewed these guidelines and declared them adequate. Introduces a method for comparing intensity of nocturnal searches.

A track station survey method has implications for BFF surveys.


Detailed methods for conducting BFF surveys. Discusses general life history and BFF sign. Photos of BFFs, diggings, tracks, scats. Appendices include reprints of Hillman and Clark 1980 and Fortenbery 1972, additional references, a key to mustelid skulls, and a postcranial comparison of the prairie dog and BFF.


Climate, soils, and vegetation of the BFF-occupied area are described along with a history of ranching, poisoning, and grazing. The area contains evidence of a historically larger prairie dog complex.


Configuration, rate of production, persistence, and seasonality of BFF diggings and prairie dog burrow plugging patterns on white-tailed prairie dog colonies are described based on a two-year sample. The results have implications for timing and "search images" of prescribed BFF and BFF-sign searches.


The BFF-occupied prairie dog complex totals about 3,000 ha in 33 colonies; the Big Horn Basin has 40,455 ha in 250 colonies, and the state has an estimated 6,000 colonies. Ferret/prairie dog computer models are reviewed and recommendations made for transplants and captive breeding.


Observations of BFFs between December 1981 and September 1984 included ferret maintenance behaviors (locomotion, alert, grooming and sunning, defecation and urination, digging, and predation) and social behaviors (reproduction, ontogeny, maternal, play, and agonistic).


Account of distinguishing characteristics, habitat, present and former distribution, reasons for decline, and legal status of BFF.


BFF distributed in western half of Kansas.


Prairie dogs occur in two of eight vegetation types in the BFF-occupied area (junegrass and sagebrush/junegrass), whereas four other prairie dog complexes with historic BFF occupancy occurred in six vegetation types. Similarities of the five complexes were plant heights < 66 cm, level to gently rolling topography, and severe human-caused disturbance. Conclusion that vegetation type alone should not be used to identify BFF habitat.


Mentions that M. eversmanni is considered conspecific with BFF.


BFF considered third rarest animal in America. Populations declined along with prairie dogs. General overview; asks for reports.


Calls for specimens of BFF to benefit science.


Contrary to other accounts, the BFF was not rare on the prairie. Created a new subgenus for BFF based on skull characteristics. The earliest "full account" of the species based on examination of several specimens, some in response to his advertisements for specimens. Describes distribution (expected to be enlarged) and detailed body characteristics. Notes that "its retiring habits, and the nature of its resorts, doubtless tend(ed) to screen it" despite extensive exploration of the West.


BFF captured near Abilene, Texas, in 1882 is placed on exhibition at Cincinnati Zoological Gardens. The specimen expands the known range in Texas. Called a "rare species."
Great Basin Naturalist Memoirs


Overview of BFF ecology and history. 1978 and 1979 Wyoming coal lease surveys yielded six BFF skulls but no live BFFs. Techniques included dogs and winter helicopter and snowmobile searches. Three more years of searches are planned for four likely areas based on historical and recent evidence.


Brief review of Mustela nigripes plight. Suggests protection of both prey and habitat. Photo of zoo-held animal.


Brief account listing single specimen for state; states that species was not expected to be found north of the Colorado River.


Lists the louse Neotrichodectes minutus as a BFF parasite.


Description of Patuxent Wildlife Research Center’s responsibility for “technical investigation and propagation of rare and endangered species.” BFF considered one of the priority species. Applications toward improved survey techniques, ensuring adequate precontrol surveys. Mentions disease as captive-breeding problem; for BFF, rabies, distemper, and tularemia are major concerns.


Discusses research needs: increasing animal reproductions, survival and population in historical range. Brief sections on BFF populations and distributions, mobility and spatial requirements, behavioral and biological characteristics, vertebrate associates, and development of management practices.


Popular description of BFF and prey relations. Links bison, cattle, prairie dogs, and BFF. Description of pest control vs. endangered species program politics.

Prairie dog surveys in the Meeteetse area are described along with recommended procedures for surveys in areas being assessed for BFF transplant sites.


The history of the development of marking and radio-tagging techniques by the Denver Wildlife Research Center is reviewed, and current techniques described.


Review of Swenk’s (1908) Nebraska BFF records, most from the southcentral loess plains. Range map.


Synopsis of BFF as an endangered species. Mentions agency efforts to manage species.


General history of ferrets and search techniques focusing on Montana. State Department of Fish, Wildlife, and Parks decision to search for ferrets in Montana and its implications for the agriculture and livestock industries.


Northern Pacific Railroad lands were surveyed 1908–1914 (just prior to widespread prairie dog poisoning). Of 6,661 sections in 22 counties in Montana, 1,662 (25%) contained some prairie dogs. Totaling a minimum of 47,568 ha in 1914, prairie dog colonies have been reduced in the area by 90+%. Implications for BFFs and their possible reintroduction are discussed.


Common attributes of 10 mustelids are high turnover rates, high juvenile mortality, and low average life spans (< 1 yr). BFFs bear 3.38 young/year, exhibit equal juvenile sex ratios, and females breed and bear young at one year of age. High annual declines have been observed.


Good semitechnical review of BFF characteristics and ecology. Good comparison with congeners. Illustrations of scats, trenches, and congeners.


Discusses policies for prairie dog management and control and BFF surveys and sightings on national forests and national grasslands.


Six BFFs located by government employees following prairie dog poisoning in Haakon County. Litter of 5 captured: 2 died, 3 released in Wind Cave National Park.


Popular account of the politics of the BFF leading to its "de-emphasis" by federal officials in 1980.


Lists species and mentions that it was not seen by S. Baird. The single question mark indicating the author’s doubting the existence of the species set off a decade-long controversy.


Nebraska Pawnees believed BFFs had supernatural power and were able to kill men.


A letter in response to Merriam’s Synopsis of the weasels of North America extends the range north in Montana, to the foothills of the Rockies, and to the Continental Divide Basin in Wyoming. Includes personal observations, Indian accounts, and some life history information for BFFs.


Reviews historic records and Division of Wildlife processing of reports. Although there is no current BFF project, preliminary work in summer spotlighting, winter ground searches, and prairie dog mapping has begun. A BFF seat was positively identified in 1983.


BFF habitat restricted to southwestern North Dakota. Lists by county the number of towns and acreages of black-tailed prairie dogs and BFF sightings from 1910 to 1973. No recent “verified” reports.


Minimum viable population size is estimated by five methods: experiments, biogeographic patterns, theoretical models, simulation models, and genetic considerations. Genetic factors suggest a MVP of about 200 BFFs for short-term fitness. Implications for research, management, and recovery efforts.


General review of mustelid and BFF life history.


Standard reference to weasel life history.


Technical account of characteristics, distribution, and taxonomy. Includes drawings of animal and skull, and a range map.


Brief description with two reports from Navajoland from 1936 and 1940. The Navajo name is “dlo’ii liz-hinii,” meaning black weasel.


Historic records of BFFs in Wyoming are noted. Report handling consists of detailed interviews, possible site visits and searches, and departmental filing.


Sixteen scent attractants were evaluated as BFF lures in the lab, and six were subsequently evaluated in the field in known BFF-occupied areas. No BFF visitations were documented.


Aspects of fitch ferret life including diseases pertinent to BFFs.


The advisory team was created to oversee BFF work in an area of varied land and management jurisdiction. Representing management agencies and private concerns, it has reviewed research-management and information education plans, reviewed and approved research, sought funding for research, mediated BF development conflicts, and maintained control of all BFF-related activities in the state.
Research needs include additional data on movements, dispersal, and mortality, and evaluation of potential transplant sites, captive breeding techniques, and search techniques. Management needs include finding BFFs, enhancing habitat or mitigating its loss, dealing with BFF/mineral development conflicts and prairie dog control, and conducting public relations campaigns.


Bibliography of BFF literature organized to assist wildlife management personnel. Includes ecology, life history, history of man's interactions. Also includes geographic index and layman's reading list.


The Utah Division of Wildlife Resources has improved its network for receiving, investigating, and recording BFF sightings, plans intensive surveys of 2 areas, and seeks guidelines for dealing with the discovery and management of BFFs.


Mentions skin examined and described by Audubon and Bachman from Fort Laramie.


Overview of BFF ecology with distribution and abundance in Kansas. Good photographs of BFFs and winter trench.


Most BFF sightings of recent decades were in the western half of Kansas. Most recent specimen captured in 1957. In 1969-1970 state searched for BFFs through a media campaign and follow-up field investigations. BFF listed as extirpated by the Soil Conservation Service and Kansas Academy of Science in 1973.


Government document on all aspects of BFFs, resulting from study of the Mellette County, South Dakota, population. Study had three goals: (1) determination of distribution and status of South Dakota BFFs, (2) gathering of life history, behavioral and ecological data, and (3) development of location techniques.


Summary of BFF historical distribution, present status, and habitat relationships. Primarily a literature review. Includes extensive reference section by subject and a conceptual model of BFF habitat.


Close-range sighting of BFF crossing highway east of Casper, Wyoming.


Notes that BFF had not been seen in the state for many years but reports a road-killed specimen from 1930 was mounted and given to the university museum.


"Due to the destruction of most of the prairie-dog towns in Kansas the Black-footed Ferret is now on the verge of extinction in the State."


Zinc phosphide-poisoned rats were fed to 16 Siberian ferrets (Mustela eversmanni). Ferrets accepted rats and 3 individuals had an emetic response to the toxin. Authors conclude that emetic reflex protects carnivores against zinc phosphide poisoning but state the necessity of secondary "safe" prey items following poisoning of primary prey.

Results of 1966–1967 field study of BFF population in Mellette County, southwestern South Dakota. Data on diurnal activity, reproduction, and mother/young behavior; food habits and dispersal; behavioral response of Cynomys to BFFs. Description of BFF sign. Domestic ferret (Mustela putorius) 1080 feeding experiment.


Field observations revealed activity patterns, behavior, movements, food habits, and BFF/prairie dog relationships.


A solid review of the South Dakota research on BFF life history, past and present distribution, and current programs and problems. Noteworthy is the insight that “observational” efforts are not providing answers needed for effective management.


An early report of the South Dakota studies giving observations of basic BFF distribution and ecology.


Synopsis of South Dakota BFF population work. Describes distribution, behavior, sign, BFF effects on prairie dogs, and research and management needs.


Distribution of black-tailed prairie dog colonies in Mellette County, South Dakota, was examined to determine characteristics of BFF habitat. BFFs had been observed on 14 of 86 colonies in the study area. Management recommendations concerning size and distribution of colonies for BFFs are made.


A good popular article describing the plight of the BFF, its life history, and captive breeding attempts in the 1970s, with mention of current location techniques and management efforts.


The breeding biology and behavior of four wild-caught BFFs held at Patuxent Wildlife Research Center and studied 1975–1978 were similar to closely related mustelids. Reproductive disorders and other pathologic conditions were encountered.


Up-to-date technical synopsis of species.


Experiences with BFFs in South Dakota are applied to the Wyoming population. It is recommended that long-term funding be developed to maintain and enhance the species.


Authors estimate 30 million acres of federal land are suitable for prairie dogs. Managing for prairie dogs is managing for BFFs. Mentions progress in search methods and inventorying of prairie dog colonies.


Lists state records for the BFF, the last in 1953.


Overview of rarest mammal and man’s failure to refrain from habitat destruction.

—. 1967. This masked bandit is definitely on the nation’s wanted list—wanted alive. Experts claim only 20 are left. Nebraskaland 45(8):53.

A six-year study indicated that reduced predation may be the most important benefit of prairie dog coloniality. Discusses the possible effect of nocturnal, burrow-entering BFF on prairie dogs compared to diurnal predators.


Debate over costs and benefits of coloniality in prairie dog species. Powell suggested that white-tails are less dense because their range overlaps less with BFF than black-tails. Hoogland answers cogently that the BFF range overlap with black-tails should be interpreted as an effect of greater colony density, not a cause.


An HSI model following the U.S. Fish and Wildlife Service model series assumes that BFFs can meet year-round habitat requirements within prairie dog colonies providing colonies are large enough, burrows are numerous enough, and adequate numbers of prairie dogs and alternate prey are available. Literature is reviewed and model assumptions and structure are discussed.

HUBBARD, J. P., and C. G. SCHMITT. 1984. The black-footed ferret in New Mexico. Final report to BLM Santa Fe, New Mexico, under BLM Contract No. NM-910-CTI-7 to Dept. Game Fish, Santa Fe, and under New Mexico Dept. Game Fish Proj. FW-17-R.

A comprehensive summary of background information on BFFs and the status of both prairie dogs and BFFs in the state, with special emphasis on historic records and recent efforts to locate BFFs.


Excellent summary of BFF including brief discussion of ecology, threats to survival, conservation measures taken and proposed.


A literature review of laws that affect BFF research and management revealed that the major law is the 1973 Endangered Species Act, although other laws have key significance when particular recovery actions are taken.


Pelts of 86 BFFs were shipped in the fur trade during these years.


Fecal bile acids in scats of 20 BFFs, 7 other small carnivores, and 72 of unknown origin were analyzed to see if the method could be used to verify BFF presence. Substantial overlap among confidence intervals with other species led to the conclusion that the method is not useful. Gas-liquid chromatography is suggested instead.


Provides locations of BFFs collected in Nebraska, and states that BFFs are capable of decimating prairie dog populations.


Gives measurements of an unsexed adult BFF from 1944 and states that a few individuals may still inhabit the western part of Kansas.


Field studies in Cheyenne County, Kansas, 1975–1977 yielded no live BFFs although one had been observed in 1975. A decline in BFF habitat was noted. Report suggests that, if captive breeding provides animals for recruitment, the hurdles of poisoning, harassment, shooting, and habitat stability must still be overcome for populations to become re-established.


No genetic variation was observed for three proteins examined from saliva samples from 22 BFFs. No conclusions can be drawn, however, and suggestions are made for additional approaches.

Classic discussion of Cynomys prairie communities based on fieldwork in Colorado. Details the ecology and trophic relations between prairie dogs and other members of the prairie, including BFF, and man and his domestics. Reference to BFF as obligate predator.


Nongame amenities are new in the public mind and have political and governmental support. North Dakota created one position in 1975 to manage nongame with emphasis on the BFF and prairie dog communities.


Twelve BFF remains from Jaguar Cave, Idaho, fall outside the historic species range and date from 10,370 + 350 B.P. Suggested that the BFF, an Old World invader, is not as successful as M. eversmanni in Eurasia and now exists only as a relic population.


Popular account of BFF within context of all endangered species.


The history of the BFF in the state is reviewed. Fifteen probable and one confirmed sighting were recorded between 1/1/80 and 1/1/84. The state goal has been to implement effective information and education programs.


An early survey for BFFs revealed only three reports (one of value). Three-quarters of respondents felt that BFFs should be protected, although few were familiar with the animal.


Overview article for public education but contains some misinformation. Illustrates BFF sign and requests sighting information.


Three specimens noted: one undated, one from 1927, and a recent private mount donated to Oklahoma State University.


Sixty-three BFF reports may be authentic on the state’s estimated 15,000 acres of prairie dogs. Despite intensive surveys 1971–1973, no BFFs were found in the Panhandle study area.


Concludes that BFFs are extinct or rare in the state—despite recent reports—because of lack of evidence during recent intensive surveys.


Popular discussion of status of BFF and different research approaches; also looks at Atlantic green turtle, sandhill crane, Bahaman swallowtail, and Apache trout.


Summarizes main workshop points, with a reminder that all activities should be conducted for the benefit of "the resource," namely the BFF and the prairie dog.


Approved in June 1978, the Recovery Plan was based on available scientific data and presented broad flexible guidelines.

Government plan outlining the objective of “maintaining at least one wild self-sustaining population of BFFs in each state within its former range.” State-by-state implementation plan listing lead agencies, cooperators, activity priorities, and budgets. Includes letters of comment by plan reviewers.


South Dakota BFF population and habitat needed to sustain BFF. Purchase or easement of prairie dog colonies suggested as management practice. Results of landowner interviews on attitudes toward prairie dogs included.


Record of the first BFF-specific symposium (All articles are listed in this bibliography.) Excellent compilation of status of management, ecology, and politics of the rarest North America mustelid.


Brief description of BFF and its historic range. Includes a list of recent confirmed and probable sightings from 10 western states and two provinces provided by the U.S. Fish and Wildlife Service.


History of Nebraska prairie dog control reviewed: the state has legislated annual control of colonies since 1903. Number of towns and acres estimated from unsuccessful 1971 media blitz to locate BFFs.


Brief technical synopsis with records of occurrence in Wyoming up to 1965; includes state range map.


No BFFs are known to exist on National Park Service lands, although past sightings are noted. No intensive surveys have been conducted. However, several parks have prairie dog populations that are controlled to curb emigration and expansion. Some prairie dog community research is being conducted; more is proposed.


Reports a “new enemy” — minklike — decimating prairie dog towns in the Nebraska sandhills. Editor’s note suggests it is the BFF.


Brief synopsis of our knowledge of BFF: life history, search efforts, and poisoning controversy.


The BFF is used as a case study in a detailed popular article on the politics and history of wildlife killing by federal agencies.


The controversial study of prairie dog control and BFF preservation in South Dakota 1964–1970. Skillful description of people and events resulting from USDI’s dual poison and protect mandate.


Overview article from a journalist who won acclaim for digging out the story about the plight of the BFF.


Critical review of dual role of Bureau of Sport Fisheries and Wildlife and the USDI in managing rodent control and endangered predator the BFF.


Captive BFF lifespan reported to be five years.


Prairie dogs considered infestations on North and South Dakota Indian land, covering 70 thousand acres on seven reservations. Surveys conducted for BFF prior to control.

Positive circumstantial BFF evidence was found on 4 of 20 prairie dog towns surveyed in Montana in 1978, and one possible sighting was made. Recommendations for easements on critical habitat and future study are made.


A single skull with teeth and mandible and some other bones were found in a survey of coal areas in Wyoming.


Five BFF skulls were found in surveys of coal areas in Wyoming.


Reviews conflict of prairie dogs being on the "pest list" and BFFs on the endangered list. Mentions the 1080 ban and Patuxent Wildlife Research Center's capability to breed BFFs in captivity.


Author relates observation of BFF in prairie dog colony while bison hunting north of Saline River in 1860.


Reviews recent literature on ecology and population biology of prairie dogs and describes research on effect of seismic activity on white-tailed prairie dogs.


Review of two subgenera Putorius (BFF) and Ictis (all other Mustela). Notes the similarity of BFF to Putorius eversmanni and P. putorius.


Accuses agencies of mismanaging predator/rodent control programs. Lists a series of immediate research/management goals including captive breeding and transplanting of populations.


BFF nomenclature determined as Mustela nigripes.


MOORS, P. J. 1950. Sexual dimorphism in the body size of mustelids (Carnivora): The roles of food habits and breeding systems. Oikos 34:147-158.

Sexual dimorphism in the mustelids is discussed.


News item on early research efforts on BFF population found in 1981. Photo.


Drawings of right front and hind tracks as well as scats from Garst's captive BFFs in Douglas, Wyoming.


This early popular account calls BFF's parasites in prairie dog colonies preying on the "hapless colonists." They are certain to disappear with the "inevitable extinction" of prairie dogs. Includes a color print of Louis Agassiz Fuertes' painting of the BFF.


Description of events following location of Meeteetse, Wyoming, BFF population in the fall of 1981.


A popular account of the primary actors in the second year of the Wyoming BFF program.

Seven three-week old Siberian polecats died from dual infections. Encephalitozoonosis and hepatozoonosis may have ecological implications for the BFF.


Four Crow BFF relics located in Pryor, Montana. Skulls retained in skins.


Determining the level of genetic heterogeneity in BFFs should have high priority in recovery planning, since it is unknown whether they are subject to inbreeding depression, and critical management decisions rest on this information.


Suggests that range overlap of BFF with that of the highly colonial black-tailed prairie dog caused the prairie dog adaptation for denser colonies. See response by Hoogland 1982.


An additive model to estimate BFF energy expenditure (for running, digging, investigating burrows, and thermoregulation) was based on field data from the Wyoming population and lab data from Siberian polecats. A BFF should eat 20 prairie dogs during the four winter months. More are needed by lactating females in summer. Implications for conservation are discussed.

PRAIRIE DOGS POISONED WITH "1080" ON PUBLIC LANDS IN SOUTH DAKOTA: the endangered species, black-footed ferret, also found there. 1965. Defenders Wildl. News 40(3):47.

News article on government use of 1080 on 500,000 acres of Bureau of Land Management and Bureau of Indian Affairs lands in response to stockmen's requests.


Male BFF captured in South Dakota was held in an outdoor cage at a mink ranch for seven months. Activity patterns, behavior, condition, size, and feeding and killing behaviors were noted.


Review of Clark's Wyoming BFF search efforts and the state and federal policy problems associated with managing predators.


The first popular account of the Meeteeese BFF find, describing some initial conservation studies.


Popular account of the many interests affected by the discovery of BFFs in Meeteeese, Wyoming—ranchers, management agencies, biologists.


Snowtracking is used on the Wyoming population to census BFFs and study winter ecology, specifically movements, activity area sizes, hunting behavior, intra- and interspecific interactions, and markings.


A framework for recovery planning is presented since current numbers are insufficient to maintain long-term viability. Three options to increase BFF numbers include increasing habitat at their present location, finding more wild ferrets elsewhere, and directly manipulating the population through translocation and/or captive rearing—this last is strongly recommended, and accompanying considerations are presented.

Prairie dog control on Forest Service units is accompanied by precontrol BFF surveys. The most serious management problem is determining presence of BFFs.


Derisive but colorful report of the BFF "as blood-thirsty as the mink itself."


Points out the role of federal lands as reservoirs for rodent pests. Rate of control is proportional to the health of the cattle market and drought.


The BLM receives and checks out BFF reports, participates in management meetings, and funds and sponsors research and publications, as well as conducting related activities such as prairie dog inventories and prairie dog habitat management plans.


In 1983, the Committee on the Status of Endangered Wildlife in Canada formally designated the BFF as extirpated; the last specimen was collected in Saskatchewan in 1937. Recent possible sightings, however, led wildlife agencies to institute surveys in 1985.


In a brief survey in 1980, the lack of other evidence of BFF presence to corroborate 26 "trenches" led the authors to suggest that "trenches" may not be diagnostic of BFF presence on white-tailed prairie dog colonies.


A BFF in the collection of an early woman naturalist in Colorado is verified by E. Cones.


Overview of BFF's plight with reference to New Mexico. Lists seven counties where BFFs have been collected and an eighth credible sighting. Requests public input in a publicity campaign to locate BFFs.


Overview of history, identification, life history, behavior, and population status in Montana.


A summary of the standardized "Black-footed ferret guidelines for compliance with the Endangered Species Act." Reviews the purpose of the guidelines, areas to be surveyed, methods and timing, kinds of data and training needed, coordination of survey methods, and procedures if BFFs are found.


Popular description of location of BFF population near Meeteetse, Wyoming, in the fall of 1981 and the subsequent telemetry of a male BFF.

SETON, E. T. 1929. Lives of game animals; an account of those land animals in America north of the Mexican border, which are considered "game," either because they have held the attention of sportsmen, or received the protection of law. Doubleday, Doran Co., Garden City, New York. 4 vol.
The first detailed popular account of BFF size and color, history, numbers, range and "haunts," breeding, habits, food, disposition, and "amusements," closing with a lament for its probable extinction from prairie dog extermination. Quotes many earlier authors.


Eighteen excavated prairie dog burrows yielded 82 BFF scats, the contents of which were 86% prairie dog. A BFF-occupied prairie dog town had a significant decrease in prairie dog population. BFF diggings are compared to prairie dog diggings. BFF capture techniques are compared.


Photograph and description of successful use of tubular live-trap for capturing BFFs.


Food habits of a female BFF and four young were studied during summer 1968. Six prairie dog burrows were excavated and 56 BFF scats recovered. Prairie dog composed 82% of animal matter in the scats.


Eighty-two scats recovered from 17 excavated black-tailed prairie dog burrows occupied by two female BFFs and their young were analyzed. Contents were primarily prairie dogs and mice.


Plains rodent population expanded at the turn of the century, and this created competition with stock. Refers to Merriam, who stated the BFF alone could hold prairie dogs in check. Suggests setting aside undisturbed ecosystems to study the life history and interactions of prairie species.


States simply that Putorius nigripes, called the American or black-footed ferret, occurs in central regions east of the Rocky Mountains.


The first of a series of mustelid bibliographies, arranged by nine subject headings, covers literature 1900-1974.


Semitechnical account of BFF ecology, with short bibliography.


Records of BFF specimens from southwestern Saskatchewan and southern Alberta.


Lists BFF as rare in southwestern Saskatchewan and southern Alberta. Cites eight documented occurrences of BFF ca. 1907-1935, seven of these from Saskatchewan.


South Dakota Cooperative Wildlife Research Unit, Brookings. 1963-. Quarterly report, vol. 1--.

Quarterly reports include reports of continuing Unit project on BFF population located in Mellette County.


Ten-month study to train dogs (Canis familiaris) to search for and discriminate BFF odors.


Only one BFF reported (1952) in Utah. Prairie dog populations have declined; Cynomys parvidens is endangered.


Analysis of 8,339 coyote (Canis latrans) stomach contents yielded 3 BFF remains.


Note on a road-killed female BFF in South Dakota in 1952 and deposition of skin and skeleton.

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Account of Wyoming Game and Fish Department’s activities in relation to the Meeteetse BFF find. Emphasis on administration; gives some biological information.


This prey-use model estimates annual BFF energy needs for reproduction and determines ranges of prey numbers and BFF densities based on prey unit energy availability. Size of BFF preserve considered.


Despite recent sightings, the status of BFFs in New Mexico is unknown. BFFs are often confused with bridled weasels (Mustela frenata neomexicana). Prairie dog numbers are increasing. Nongame protection legislation for endangered species is being considered.


Proposes that best management for BFFs is management of prairie dogs by states through land acquisition and easements, with cost shared nationally.


Synopsis of the ecology of two subgenera Putorius and Mustela. Claims that the BFF was useful to settlers because it inhibited prairie dog colony expansion. Notes that, because captive breeding trial failed, it appears that habitat preservation is the only way to save the species. However, he cites Hillman et al. 1979 as evidence that increasing prairie dog abundance does not increase BFF numbers.


Gives state records for the BFF, noting that it is not abundant there and is nearly always found near prairie dog towns. Locates the range, “Great Plains from North Dakota to northern Texas and west into the Rocky Mountains up to 10,000 feet.”


Gives circumstances of collection and measurements of a male BFF caught by a “gloved hand” in Kansas in 1957.


Brief account of characteristics and Texas distribution. Notes that BFF, now nearly extinct, is among the least known of more than 200 Texas mammals. Its “undoing” is its close association with prairie dogs.


From August 1982 to September 1984, 59 BFFs were live-trapped and chemically immobilized without mortality or serious injury. Capture procedures, handling, and drugging techniques, along with precautions taken to prevent introduction of diseases are described.


Discusses history of BFF sightings (one high elevation), distribution of three prairie dog species in Colorado. Prairie dog inventory is planned with the goal of locating BFF habitat.


Introduces the BFF because “its rarity recommends it,” notes the few specimens available, includes a drawing.


BFF from Gainesville, Cooke County, Texas, was the second specimen recorded for the state. The first was from Abilene.


Thirty-eight “black-footed ferret” hearts were studied with physiologic, microdissection, vascular injection, and histological methods. We question the species identification here.
Western states survey prairie dog towns for BFFs. Discusses differences in colony characteristics of prairie dog species.


The BFF is an example of an endangered species whose habitat and prey base have been interrupted by human activities. Suggests preservation of dog towns.


USDI. Fish and Wildlife Service. Patuxent Wildlife Research Center, Laurel, Maryland. Several unpublished reports are cited:

USDI. 1976a. Protection of the black-footed ferret during animal control operations. 4 pp.

Summarizes development of BFF precontrol surveys and zinc phosphide application guidelines for control use in Montana. Describes 1975–1976 Pine Ridge Indian Reservation and Buffalo Gap National Grassland surveys, where BFF sign was observed. Habitat preservation and management implication of control programs stated.


Plan to develop BFF telemetry techniques. Also mentions trip to Soviet Union to procure 48 Siberian polecats.


Second consecutive year with no BFF sightings in South Dakota.


Work with captive BFFs and Siberian polecats, including birthing of five BFFs. None survived, apparently due to maternal neglect. Death of diabetic BFF.


Successful captive mating of one BFF pair. One live kit was produced but did not survive. Successful breeding of Siberian polecats and artificial ejaculation and insemination techniques.

USDI. 1977b. Geographic distribution of the black-footed ferret.

Two BFFs were seen in western South Dakota in 1969, for a total of 30 individuals seen 54 times from 1966 through 1969 by Bureau of Sport Fisheries and Wildlife personnel. Summary of scat analysis. Suggests that BFFs diminish populations of C. ludovicianus.

Review of the work on the Mellette County, South Dakota, BFF population. Recommends development of improved detection methods, extensive surveys, and habitat research.


Experiments with telemetering Siberian polecats, with discussion of problems.

USDI. Fish and Wildlife Service. Endangered Species Technical Bulletin. Several issues reported news of the ferret:


Describes problems of two captive breeding pairs of BFFs, including age, health, and possible genetic problems. Researchers concerned about factors limiting reproduction in the wild, such as small litter sizes, lack of prey diversity, canine distemper virus, and subterranean life.


Approval of recovery plan of FWS. Notes that prairie dog management is crucial, describes original range, decline, and outlines recommendations.


Regional FWS personnel and recovery team cooperate to train ferret-finding dogs in South Dakota.


New Mexico contracted for the training of two dogs to search for BFFs in towns slated for poison control, with plans to relocate any BFFs found.


The Navajos enacted a tribal endangered species act that includes the BFF. Several potential BFF areas exist on the Navajo Reservation. Some sign and one sighting from 1973 to 1974 search efforts led to continued surveys and publicity. Dog towns are surveyed prior to control efforts.


Two FWS personnel and four dogs are trained to locate BFFs in Region 6.


FWS awards contract for BFF search of 4,000 ha of prairie dog colonies with Labrador retrievers. Most locations in South Dakota.


Highlights BFF survey activities in Wyoming, captive breeding and canine-distemper vaccine experiment at Patuxent Wildlife Research Center, and mammary tumor and death of captive BFF.


Review of Nebraska’s endangered species programs, including solicitation of BFF reports. No evidence has surfaced since 1949.


Several BFF sightings (one confirmed) reported in May and June 1981: Lyman and Putte counties, South Dakota; Uinta and Goshen counties, Wyoming; and Moffat County, Colorado.


Report on questionnaire to determine current range of BFFs revealed 228 sightings. All states reported sightings since 1970 except Arizona.


USDI. 1982b. Regional briefs, Region 6. ESTB 7(3).

T. Clark finds dead BFF on Meeteetse study area; another dead BFF found just north of Meeteetse.


Wyoming Game and Fish Department appointed lead agency for Wyoming BFF recovery effort. Advisory team made up of representatives from Wyoming Game and Fish, Bureau of Land Management, Forest Service, Fish and Wildlife Service, University of Wyoming, and private landowner.

USDI. 1982d. Regional briefs, Region 6. ESTB 7(5).
Report of a "test" in South Dakota and Kansas during summer 1981 to stimulate reports of BFFs through publicity; of 26 reports, about 1/4 were deemed "probable."


In addition to 9 BFFs reported by FWS biologists in November 1981, 11 more have been revealed by ISU/Biota snowtracking efforts. Fieldwork to continue.


Two South Dakota State University students logged 650 hours searching for BFF sign in Mellette County, South Dakota, where last BFF was seen in 1972. No evidence of BFFs was found.


D. Belitsky hired by Wyoming Game and Fish Department for BFF coordinator position.


BFF Advisory Team meeting in December 1982 discusses future research and management for Meeteece population; biologists continue winter surveys.


Report of research activities by FWS and ISU/Biota since discovery of BFF 1 1/2 years earlier; history of BFFs; development of BFF Advisory Team; threats; and plans for recovery.


Several documents being developed for management and recovery of BFF by Recovery Team, Region 6, BFF Advisory Team, and FWS Division of Research.


Intermediate Management Guidelines Committee of BFF Advisory Team began drafting guidelines and announced operational protocol for researchers, photographers, and others in the BFF-occupied areas. Presentations were made in a town meeting in Meeteece.


Report of Recovery Team meeting in Rapid City with plans for revision of Recovery Plan.


Report of BFF Advisory Team meeting agenda of increasing efforts to locate, capture, and mark BFFs while minimizing impact on the population; litter surveys ongoing.


Max Schroeder leads workshops in Utah, Colorado, South Dakota, and Montana to educate field personnel in recognizing BFF sign and conducting surveys.

USDI. 1983i. Regional briefs, Region 6.

M. Schroeder hired as regional BFF specialist to coordinate research and management with all involved agencies.


Male BFF found east of Cody, Wyoming, in June 1983 subsequently identified as a European polecat.


Five photos of BFFs with short article. Called a useful weasel because it lowers prairie dog populations and doesn’t disturb humans.


Author acquired mounted female BFF taken near Anselmo, Custer County, Nebraska, in 1938.


Poem about the BFF reprinted from Saturday Review.


Lists high elevation BFF collections from Teller and El Paso counties, Colorado.


This early technical description includes skull characteristics and the Colorado distribution, including specimens from 3,075 m elevation and from west of the Continental Divide. Notes its association with prairie dogs and its "curious history of having been lost to science for many years" after its description by Audubon and Bachman.


Synopsis of Wyoming records, habits, and habitat of BFFs. Map of locations.

The major challenges of captive animal management are to simulate ecological and demographic factors vital to preserving genetic variability and to minimize the risks of extinction to which small populations are prone.


BFF status is unknown. Two road kills occurred 1952–1972. Most sightings from this century have been from the southeastern part of the state. The population has been reduced by (1) prairie dog control, (2) 1080 poisoning, (3) loss of habitat, and (4) road kills and shooting.


Early popular article with photographs of a 1927 specimen from Montana. Interesting description of the controversy over the BFFs existence during the late 1800s, which culminated in Coues' successful location of specimens. Good description of natural history, although there are some technical errors.


Specimens from the most westerly portion of the species' range were collected in east central Arizona. One specimen collected in 1917 and a second in 1929.


Provides good history of the documentation and controversy of the "black boots of the prairies" as well as basic life history information and six excellent 1929 photos (presumed to be the earliest taken of wild BFFs).


A road kill in Perkins County, South Dakota, in October 1952 is recorded and deposition of the skin and skeleton is noted.


Specimens from the most westerly portion of the species' range were collected in east central Arizona. One specimen collected in 1917 and a second in 1929.
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