

CANDIDATE AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Vulpes velox*

COMMON NAME: Swift Fox

LEAD REGION: Region 6

INFORMATION CURRENT AS OF: September 22, 2000

STATUS/ACTION:

New candidate

Continuing candidate

Non-petitioned

Petitioned - Date petition received: March 3, 1992

90-day positive - FR date: June 1, 1994

12-month warranted but precluded - FR date: June 16, 1995

Is the petition requesting a reclassification of a listed species?

Listing priority change

Former LP:

New LP:

Candidate removal: Former LP: 9 (Check only one reason)

A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

F - Range is no longer a U.S. territory.

M - Taxon mistakenly included in past notice of review.

N - Taxon may not meet the Act's definition of "species."

X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Mammal, Canidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Canada, Colorado, Iowa, Kansas, Minnesota, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Wyoming

CURRENT STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Canada, Colorado, Kansas, Montana, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, Wyoming

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LEAD FIELD OFFICE CONTACT: Pierre, South Dakota, Pete Gober, (605) 224-8693, extension 24

BIOLOGICAL INFORMATION:

The swift fox is a member of the Order Carnivora and Family Canidae. It is included in the genus *Vulpes* with red fox (*V. vulpes*) and kit fox (*V. macrotis*) (Hall 1981). The swift fox is characterized by a black-tipped tail and black patches on either side of the nose. The pelage is buff gray across the back extending into a yellow-tan coloration across the sides, legs, and ventral surface of the tail. The throat and belly are pale yellow to white. Kilgore (1969) reported an average weight of 2.44 kg for 19 adult males and 2.25 kg for 14 adult females collected from Oklahoma, Kansas, New Mexico and Texas. Adults are 30-32 cm tall at the shoulders and are 77-79 cm in length (Egoscue 1979). The swift fox and its close relative, the kit fox, are the smallest North American canids (Egoscue 1979).

The taxonomic status of the swift fox is not clear. The swift fox was first described by Say in James (1823). Hall and Kelson (1959) suggested that swift fox and kit fox were conspecifics, being subspecifically distinct. Similar conclusions were reported by Dragoo et al. (1990). However, more recent research has distinguished the swift and kit fox (Rohwer and Kilgore 1973, Thorton and Creel 1975, Egoscue 1979, McGrew 1979, Stromberg and Boyce 1986). The most recent evaluation of taxonomic status, using mitochondrial DNA analyses concluded that the kit fox and the swift fox should be recognized as separate species (Mercure et al. 1993).

Merriam (1902) classified two subspecies of the swift fox: the northern swift fox (*Vulpes velox hebes*) and the southern swift fox (*V. v. velox*). Merriam's classification was still in use when the northern subspecies was listed as endangered in 1970 (35 FR 8495). The endangered listing was removed in the United States in 1980 (45 FR 49844); however, it remains in Canada (50 CFR 17.11). Stromberg and Boyce (1986) concluded that subspecific classification of the southern swift fox and northern swift fox was probably not justified, although significant geographic variation was present.

For the purposes of this evaluation, based upon currently available information, we treat the swift fox as a separate species from the kit fox. Because limited information concerning swift fox subspecies designation exists, we are unable to address the appropriateness of these designations; however, we will review and consider the appropriateness of subspecific designations for the swift fox if new information becomes available.

Swift fox tend to be monogamous and often pair for life (Kilgore 1969). They are monestrous (Asa and Valdespino 1998), with breeding occurring in late December or early January in the southern portion of the range to early March in the northern portion of the range (Egoscue 1979). Gestation is estimated to be 52-53 days. Average litter sizes of 3.4-5.7 pups have been reported based on counts at natal dens (Carbyn et al. 1994, Covell 1992, Hillman and Sharps 1978, Kilgore 1969, Rongstad et al. 1989). Young fox remain with the adults for 4-6 months (Covell 1992, Rongstad et al. 1989), which is longer than other North American canids. Covell (1992) reported that male pups had a higher frequency of dispersal (23 percent versus 10 percent) and dispersed significantly further than female pups (9.4 km versus 2.1 km). Reported annual

mortality rates range from 47-57 percent (Covell 1992, Rongstad et al. 1989, Sovada et al. 1998), similar to rates for other North American fox species (Cypher and Scrivner 1992, Disney and Spiegel 1992, Lord 1961, Ralls and White 1995, Storm et al. 1976). Available information identifies the coyote (*Canis latrans*) as the principal predator of swift fox (Carbyn et al. 1994, Covell 1992, Laurion 1988, Sovada et al. 1998). Human activities also present threats to swift fox (Hillman and Sharps 1978). Swift fox are easily trapped, shot, or poisoned, and are vulnerable to predator and rodent control efforts. Collisions with automobiles are a significant mortality factor for young animals in some landscapes (Sovada et al. 1998).

Swift fox are primarily nocturnal; however, limited daytime activity may occur near den sites (Egoscue 1979, Hillman and Sharps 1978, Laurion 1988, Rongstad et al. 1989). They probably are the most fossorial member of the North American canid family. Unlike other canids, dens are used throughout the year (Cutter 1958a, Egoscue 1979, Hines 1980, Kilgore 1969). Swift fox either excavate their own dens or enlarge the burrows of other animals (Egoscue 1979, Hines and Case 1991, Rongstad et al. 1989). Dens provide escape cover from predators, protection from extreme climate conditions in summer and winter, and shelter for raising young (Fox 1991, Rongstad et al. 1989). Dens are largely located in short and mid-grass prairie, but also have been found in cultivated fields or other habitats (Cutter 1958a, Egoscue 1979, Jackson 1997, Kilgore 1969, Uresk and Sharps 1986).

Swift fox, like other canids, are opportunistic foragers, feeding on small mammals, birds, insects, reptiles, fruits, berries, and carrion (Cutter 1958b, Hillman and Sharps 1978, Hines and Case 1991, Kilgore 1969, Kitchen 1999, Uresk and Sharps 1986, Zumbaugh et al. 1985). Lagomorphs (Cameron 1984, Cutter 1958b, Hines and Case 1991, Kilgore 1969) followed by rodents (Kitchen 1999, Uresk and Sharps 1986) are the most frequently represented mammal groups. Insects and birds become important food items in late summer and early fall (Kitchen 1999, Uresk and Sharps 1986) and several studies report use of carrion throughout the year (Hines and Case 1991, Kilgore 1969, Uresk and Sharps 1986, Zumbaugh et al. 1985).

The historic range of the swift fox includes all or portions of Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming, and the southern prairie region of Alberta, Manitoba, and Saskatchewan (Banfield 1974, Egoscue 1979, Hall and Kelson 1959). Some historical range descriptions include swift fox in Minnesota and Iowa; however, there are no verifiable records of swift fox occurrence in either State (Dinsmore 1994). The swift fox was considered common or abundant in much of its original range until the late 1800's to the early 1900's. Factors associated with the arrival of European settlers apparently led to a dramatic decline in swift fox numbers and distribution by the late 1800's (Zumbaugh and Choate 1985). Bailey (1905) noted that ranches described swift fox as scarce compared to their numbers in previous years. By the 1930's, there were no known records of swift fox in Oklahoma (Glass 1956). In Kansas, it was reported that the swift fox had become uncommon by 1869 (Zumbaugh and Choate 1985); other reports considered swift fox to be extinct in Kansas (Baker 1889, Cockrum 1952). Lechleitner (1969) suggested a significant contraction of swift fox distribution occurred in Colorado by 1900. Swift fox were last seen in

Canada in 1938 (Soper 1964). The last historical report of swift fox in Montana was in 1918 (Bailey and Bailey 1918), and Hoffmann et al. (1969) concluded that swift fox were probably extinct in Montana. There were no reports of swift fox in Wyoming between 1900 and 1958 (Long 1965), in South Dakota between 1914 and 1966 (Hillman and Sharps 1978), in North Dakota between 1915 and 1970 (Pfeifer and Hibbard 1970), and in Nebraska between 1901 and 1953 or 1954 (Jones 1964).

Beginning in the 1950's, swift fox numbers appeared to be recovering over much of their former range (Andersen and Fleharty 1964, Anderson and Nelson 1958, Glass 1956, Hines 1980, Kilgore 1969, Long 1965, Martin and Sternberg 1955, Sharps 1977). The return of the swift fox in areas of their historic distribution was attributed to restrictions in the use of toxicants for predator control, declines in fur value, and limitations on methods of fur harvest (Kilgore 1969).

In response to the 90-day Finding, in October of 1994 the 10 affected State wildlife agencies and interested cooperators (several Federal Agencies, including the Service) formed the Swift Fox Conservation Team (SFCT). The goal of the SFCT was to develop a species Conservation Assessment and Conservation Strategy (CACS) document. The CACS was intended to provide the framework to direct swift fox conservation as an alternative to a federally mandated recovery effort.

THREATS:

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

More viable swift fox populations occur across more of the species' historic range than previously determined by the Service.

The Service's 1995 12-month Finding concluded that most remaining swift fox populations occurred in marginally viable populations in scattered, isolated pockets of remnant short and mid-grass prairie habitat. Moreover, we concluded that most remaining grassland in the western Great Plains consisted of a mixed cropland/grassland mosaic which did not favor swift fox use. However, extensive rangelands still exist as predominately grassland environments in the swift fox's historic range and although some conversion to agriculture use is still occurring, it is at a much lower rate than in previous years. Additionally, recent studies indicate that the swift fox is more flexible than we previously determined in its habitat requirements and can utilize areas with mixed land uses (Allen et al. 1995, Giddings 1997, Luce and Lindzey 1996, Roy 1998, Schmitt 2000).

Although swift fox populations appear to have been extirpated in North Dakota, are declining in South Dakota, and are present in low numbers in only a few counties in western Nebraska, populations in a significant portion of the species' historic range are stable or increasing (Allen et al. 1995, Giddings 1997, Luce and Lindzey 1996, Roy 1998, Schmitt 2000). The SFCT concluded that the swift fox currently occurs in approximately 40 percent of its historic

range and that the continuity of this distribution infers an adequate degree of viability for the persistence of the species overall (Schmitt 2000). Moreover with regard to population trends, some reoccupation of its former range by the swift fox has occurred in this area, especially in Wyoming, eastern Colorado, and several counties in the western-most one-third of Kansas.

Additionally, studies in New Mexico (Giddings 1997) and Oklahoma (Allen et al. 1995 Roy 1998) indicate the swift fox is present throughout most of its historic range in these states. Texas has confirmed swift fox presence in at least three counties in its northern panhandle (Roy 1998). Swift fox populations also appear to be re-occupying and expanding in at least three counties in north central Montana along with increasing numbers of reports from several southeastern counties in the state (Giddings 1997).

In summary, we conclude that although the species' viability and distribution is limited in some areas, it appears to be stable or increasing in a significant portion of its historic range.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

Commercial trapping of furbearers occurs throughout the range of the swift fox. However, available information suggests that this harvest has had no impact in limiting swift fox populations. For example, swift fox populations in Colorado have remained widespread despite 55 years of harvest. No noticeable reduction in distribution has occurred in Kansas since the opening of a trapping season on swift fox in 1982. In comparison, swift fox have been protected from harvest in South Dakota, Nebraska, and Oklahoma, with no apparent increase in distribution or abundance during the same period. Individual pelt prices during the last 10 years have remained low, varying from \$3-\$10. Therefore, there is little interest or incentive to actively harvest swift fox. Most swift fox are taken incidental to coyote trapping activities and are not considered a target species (Kahn et al. 1997).

Predator control activities are currently a very small percentage of total mortality. Significant changes have occurred in predator control programs within the past few decades. During the 1950's, Federal and State predator control programs replaced nonselective poisons such as strychnine with more selective toxicants. The 1972 Presidential ban (Executive Order 11643) on use of predator toxicants (strychnine, compound 1080, etc.) on Federal lands is considered to be a positive factor in swift fox conservation (Kahn et al. 1997). Current predator control programs have developed selective techniques, such as pan tension devices, snare stops, and bait placement techniques, in attempts to exclude swift fox from traps. In parts of the swift fox range where mortality may be high as a result of predation or other factors, additive losses due to predator control activities could become a concern (U.S. Fish and Wildlife 1995).

C. Disease or predation.

There is no indication that parasites or diseases are significant factors in the population

dynamics of wild foxes. Nematode parasites tend to dominate the parasite fauna of swift fox. Hookworms, whipworms, protozoans, and ectoparasite species also have been found (U.S. Fish and Wildlife 1995). Various diseases have been documented serologically (bubonic plague, canine distemper); however, there are few cases of confirmed overt disease in wild swift fox. According to the CACS, of 185 swift fox mortalities from 369 monitored animals in various studies, none were attributed to disease (Kahn et al. 1997). However, in 1997, one mortality from canine distemper was documented in Wyoming (Olson and Lindzey 2000).

Predation by coyotes appears to be the most important mortality factor for swift fox populations (Carbyn et al. 1994, Covell 1992, Laurion 1988, Sovada et al. 1998). The Canadian Wildlife Service reported that between 1995 and 1998 coyotes were found to be the major source of swift fox mortality (Carbyn 1998). In Wyoming, researchers radio-collared 28 swift fox in early 1999. By the end of August, 1999, 9 of the radio-collared fox had died. Mortality was primarily due to coyote predation (7 of 9) (Olson and Lindzey 2000). Coyote predation on swift fox at the Pinyon Canyon Maneuver Site in southeast Colorado accounted for at least 80 percent of all swift fox mortalities where a cause was determined (Kitchen 1999). Predation by coyotes is the major cause of mortality for swift fox in Kansas in both rangeland and cropland (Sovada et al. 1998). In addition to avian predators, predation by mammals such as badger (*Taxidae taxus*) and red fox has also been documented (Carbyn 1998, Olson and Lindzey 2000, Rongstad et al. 1989).

Predation and interspecific competition with coyotes and expanding red fox populations may be the two most serious limiting factors to swift fox recolonization of potential habitat within the historic range. Competition with coyote and red fox confer a likely ecological barrier for settling into new areas. Coyote killing of swift foxes appears to have significantly affected the experimental reintroduction of swift foxes in Canada (Sovada 1995).

D. The inadequacy of existing regulatory mechanisms.

Although the level of regulatory protection of the species varies among the 10 States presently involved in swift fox conservation, we have found no evidence that indicates that the degree or level of regulatory protection is a significant factor affecting distribution and abundance of the species. Legal harvest of swift fox is allowed in 4 of the 10 States within the species' range. Limited harvest is allowed in Wyoming to assist biologists with distribution documentation. Kansas (with a mandatory pelt tagging program), New Mexico, and Texas allow legal harvest of swift fox as a furbearer. The species is classified as endangered in Nebraska and threatened in South Dakota. The season remains closed in Colorado, Montana, North Dakota, and Oklahoma.

The 10 State wildlife agencies within the historic range of the swift fox have committed significant resources towards the conservation of the species with the development of the CACS (Kahn et al. 1997). The primary objectives of the CACS have largely been completed with the organization of the SFCT, the acquisition of State and Federal funding, the

generation of annual reports, and the determination of current distribution of the swift fox. Notable progress has been made in monitoring the status of swift fox populations and delineating existing suitable habitat within each State. A few States also have been able to implement research on swift fox biology and ecology related to other objectives (Allen et al. 1995, Giddings 1997, Luce and Lindzey 1996, Roy 1998, Schmitt 2000).

E. Other natural or manmade factors affecting its continued existence.

Widespread use of strychnine intended to kill wolves and coyotes was likely a significant cause of decline in historic swift fox populations (Scott-Brown et al. 1987). Additionally, rodent control activities, specifically prairie dog control, may have had significant, adverse impacts on swift fox populations in portions of the species' range by reducing prey availability. In South Dakota, where some of the most viable black-tail prairie dog populations remain, a close association between swift fox and the prairie dog ecosystem has been observed (Hillman and Sharps 1978, Uresk and Sharps 1986). This ecosystem is believed to provide a stable, year-round source of food, shelter, and escape cover for swift fox in some portions of their range. In northern portions of the swift fox range, where climatic conditions are harsh, the prairie dog ecosystem may have greater importance to the long-term stability and viability of swift fox populations than in the southern latitudes (U.S. Fish and Wildlife Service 1995).

BRIEF SUMMARY OF REASONS FOR REMOVAL OR LISTING PRIORITY CHANGE:

In 1994 the SFCT was formed by the 10 States within the historic range of the swift fox, Canada, and several Federal agencies, including the Service. This team has drafted the CACS (Kahn et al. 1997) and produced five annual reports (Allen et al. 1995, Giddings 1997, Luce and Lindzey 1996, Roy 1998, Schmitt 2000) which have provided additional information regarding the distribution and abundance of the species. Swift fox distribution is more widespread than originally concluded in the 1995 12-month Finding. The species occurs in 9 of the 10 States within the historic range and in approximately 40 percent of its historic range. Evaluations conducted by the SFCT have demonstrated nearly continuous distribution of swift fox populations from Wyoming south throughout eastern Colorado, western Kansas, the Oklahoma Panhandle, eastern New Mexico, and in two or three counties in the extreme northern panhandle of Texas. Scattered populations can also be found in Montana, South Dakota, and Nebraska.

Historic distribution of swift fox was strongly associated with the short and mixed-grass prairie. The SFCT has calculated two estimates of historic distribution—a conservative estimate of approximately 307 million acres and a more liberal estimate of approximately 394 million acres. The proportion of the historical range currently occupied by the species, based upon occurrence data by county collected from 1995-2000 is 41 percent for the conservative estimate and 38 percent for the liberal estimate. Both of these figures may underestimate the actual proportion of the historic range currently occupied because only those counties for which recent records

(1995-2000) were available were used in the analysis. However, it can be concluded that at least 40 percent of the historic range of the swift fox is currently occupied by the species. This habitat is contiguous and occurs throughout the entire north-south axis of the historic range of the species (Hoagland, Swift Fox Conservation Team Chair, in litt. 2000).

The swift fox also appears to be more general in its habitat requirements than concluded in the 12-month Finding. Information gathered by the SFCT in Kansas and Colorado demonstrates that the swift fox has been able to adapt to a mixed prairie-agricultural landscape. Adaptability to various habitat types was further demonstrated in Wyoming where the swift fox was found to occupy sagebrush-grassland and sagebrush-greasewood habitat types with topography ranging from flat to badland-like terrain. Other habitat types used by swift fox included the sandhills of Nebraska and pinon-juniper habitat in Colorado and Oklahoma (Hoagland, Swift Fox Conservation Team Chair, in litt. 2000). Historic and recent data indicate that the swift fox can be regionally adaptable in its food preferences and is not dependent upon prairie dog communities to provide forage across most of its current range (Allen et al. 1995, Giddings 1997, Luce and Lindzey 1996, Roy 1998, Schmitt 2000).

The CACS is committed to continued conservation efforts to expand distribution of the swift fox in the United State. Swift fox reintroduction guidelines have been developed by the SFCT (Swift Fox Conservation Team 2000). Increased interest and concern for the species have resulted in reintroduction efforts in Canada and more recently on the Blackfeet Reservation in Montana. Preliminary reintroduction efforts also have been undertaken by the Turner Endangered Species Fund in South Dakota. The SFCT and the American Zoological Association are developing a captive conservation program which will support public education, field conservation, research, and maintenance of a healthy, genetically-viable captive population (Schmitt 2000).

As a result of new information indicating that—(1) the swift fox is more abundant and distributed more widely than previously thought, and (2) the species is more flexible in its habitat requirements than originally believed, we propose to withdraw the swift fox as a candidate species for listing as an endangered species under the Endangered Species Act of 1973, as amended.

FOR RECYCLED PETITIONS:

- a. Is listing still warranted? No
- b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
- c. Is a proposal to list the species as threatened or endangered in preparation? No
- d. If the answer to c. above is no, provide an explanation of why the action is still precluded.

LAND OWNERSHIP: Seventy to 75 percent of swift fox populations are believed to reside on private lands, with the remaining populations on Federal lands belonging to the U.S. Forest Service, the National Park Service, the Bureau of Land Management, and the Department of the Army.

PRELISTING: The SFCT was initially formed in 1994, and a CACS was developed by the team in 1995. The CACS is a working document with the goal of “maintaining or restoring swift fox populations within each State to provide the spatial, genetic, and demographic structure of the United States swift fox population, throughout at least 50 percent of the suitable habitat available, to ensure long-term species viability and to provide species management flexibility.” Accomplishments are reported to the Service on an annual basis; to date, five reports have been received.

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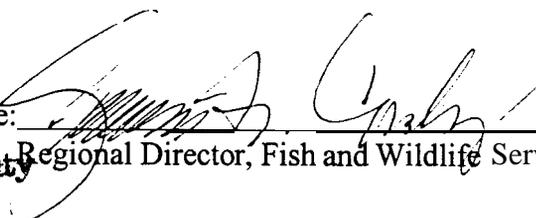
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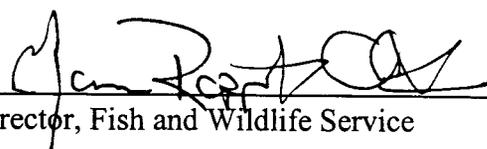
LISTING PRIORITY

THREAT			
MAGNITUDE	IMMEDIACY	TAXONOMY	PRIORITY
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, annual retentions of candidates, removal of candidates, and listing priority changes.

Approve: 
Acting Deputy Regional Director, Fish and Wildlife Service

9/23/00
Date

Concur: 
Director, Fish and Wildlife Service

12/18/00
Date

Do not concur: _____
Director, Fish and Wildlife Service

Date

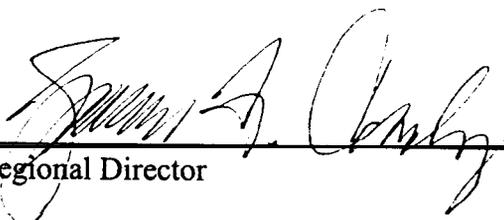
Director's Remarks: _____

Date of annual review: September 22, 2000

Conducted by: Pete Gober

Changes from October 25, 1999 CNOR: Yes(X) No ()

Approval:


Regional Director

9/30/00
Date