

**SWIFT FOX
CONSERVATION
TEAM**

2002 Annual Completion Report

**SWIFT FOX CONSERVATION TEAM
2002 ANNUAL REPORT**

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Grenier, M., editor. 2003. Swift Fox Conservation Team 2002 annual report. Wyoming Game and Fish Department, Lander, Wyoming.

The Swift Fox Conservation Team (SFCT) members and cooperators have met annually since 1994 to report on their respective state management and research activities. This document represents a compilation of those reports provided by the SFCT in 2002. This is the 8th annual report produced by the SFCT. The purpose of this document is to provide ongoing species status information and state and agency progress in achieving goals set forth in the Conservation Assessment and Conservation Strategy For Swift Fox in the United States (Kahn et al. 1997).

LITERATURE CITED

Kahn, R., L. Fox, P. Horner, B. Giddings, and C. Roy, editors. 1997. Conservation assessment and conservation strategy for swift fox in the United States. Colorado Division of Wildlife, Ft. Collins, Colorado.

DISCUSSION

The Swift Fox Conservation Team (SFCT) was established in 1994 by the affected state agencies following the release of the petition to list the swift fox as threatened under the Endangered Species Act (ESA) in 1992. The U.S. Fish and Wildlife Service's (Service) first 12-month finding, in 1995, stated that the swift fox was warranted but precluded for listing by higher priorities. The decision resulted in the swift fox being placed on the ESA Candidate List. This afforded the SFCT additional time to complete and implement the Conservation Assessment and Conservation Strategy for the Swift Fox in the United States (CACS) (Kahn et al. 1997). The CACS was completed in September of 1997.

Since then, the SFCT and the agencies involved have been successful in addressing conservation needs of the swift fox over the last 6 years. In particular, improved management and conservation of the species by members of the SFCT resulted in a more comprehensive accounting of distribution records and a better understanding of habitat requirements. This led to the removal of the swift fox from the ESA Candidate List in January 2001. Over the last two years the SFCT has remained committed to precluding the need to list the species under the ESA.

All the states on the SFCT are either currently involved in or are the process of developing long-term monitoring programs for the swift fox in their region. States agencies methodologies vary due to temporal differences and the resources available to the states. However, state survey efforts have contributed greatly to the overall knowledge of the species, increased the amount of reliable and credible scientific data and have also greatly facilitated conservation of the species. The SFCT Habitat and Research Committee is currently developing a range-wide baseline habitat model map for swift fox by utilizing results from the monitoring and baseline distribution surveys conducted since 1995. Completion and periodic update of the habitat model map will likely significantly improve knowledge of swift fox habitat requirements across the range and provide evidence of the continuing stability and potential expansion of swift fox occupied habitat.

The SFCT Education Committee continues to focus their efforts and resources on educational outreach programs. A periodic newsletter provides the public with the most current developments of the SFCT and has increased public awareness of the species. Additionally, the SFCT is also exploring other opportunities (e.g. landowner brochure) to work more closely with the Natural Resources Conservation Service in planning and development of projects that would enhance swift fox habitat on private lands.

Swift fox have been reintroduced into many parts of the species historical range where they were recently extirpated. Successful reintroductions have occurred at the Blackfeet Reservation and in Canada. Turner Endangered Species Fund initiated a reintroduction program on the Bad River Ranch, South Dakota in 2002. Badlands National Park is proposing to initiate a reintroduction program in 2003. Lower Brule Indian Reservation in South Dakota is also in the planning stages of a swift fox

reintroduction project. Wyoming and Colorado continue to be the source for these founder populations. Close coordination between reintroduction sites and state agencies appear to be benefiting both groups.

However, many issues and concerns identified in the 1996 SFCT annual report (Luce and Lindzey 1996) and CACS still persist. During the 2002 annual SFCT meeting, efforts were focused on evaluating progress made by the affected states on objectives outlined in the CACS (see 2002 meeting minutes).

Taxonomic classification of swift and kit fox must be resolved. Among SFCT members, there appears to be valid concern that swift and kit fox may not be separate species (see 2002 meeting minutes). Current available data certainly indicates that geneticists and taxonomists disagree on this important point. Resolving this issue is of most interest in the southern plains states (e.g. Texas and New Mexico) where both species potentially occur. If the species are not separate then the case for classification of swift fox under the ESA is weakened.

Recent removal of swift fox from the ESA Candidate List, a great conservation success, brought forth by the creation of the SFCT, has unfortunately resulted in reduced funding opportunities (e.g. Section 6 Funding) to address swift fox conservation needs. Taxonomic issues are likely to remain unresolved if adequate funding is not secured. The SFCT continues to request that all swift fox specimens be deposited in a museum collection and that reintroduction sites keep genetic samples archived for future analysis, if and when funding sources can be secured.

Luce and Lindzey (1996) identified interspecific competition between swift fox and red fox as potentially being catastrophic to the species survival based on similar interactions recorded in California between kit fox and red fox. Six years later, the SFCT has yet to secure adequate funding sources to explore interspecific competition between the red and swift fox.

Despite the funding challenges faced, the SFCT continues to strive forward and remains dedicated to the conservation of swift fox across North America. The SFCT has also addressed the species Global Heritage Rank Status narrative with NatureServe. Recent data and conservation successes warranted an update of the original narrative assigned to swift fox by NatureServe. The SFCT agrees that the new species information better reflects the current level of knowledge for the species and is also pursuing downlisting the Heritage Rank Status from G3 (vulnerable) to the next level of G4 (apparently secure).

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revised August 21, 2003

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STATUS OF SWIFT FOX (*VULPES VELOX*) IN COLORADO, APRIL 2003

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INVENTORY EFFORTS

Colorado is currently designing a monitoring project that will include mark/recapture methodologies to sample swift fox distribution in Colorado. The project will begin in September 2003 and is expected to be completed in the spring of 2004.

COLORADO SPECIES CONSERVATION PARTNERSHIP

The Great Outdoors Colorado Trust Fund (GOCO), in partnership with the Division of Wildlife, private landowners, nongovernmental organizations, and the US Department of the Interior have developed a species protection program with the goals of:

- Preventing the further decline of Colorado's Wildlife Species
- Meeting species conservation goals that secure recovery of declining species
- Reducing the necessity of further listing of species under the ESA
- Down and de-listing species currently listed as Threatened and Endangered.

The protection strategy entails the use of habitat protection tools such as conservation easements, management agreements, and stewardship incentives with private landowners to actively assist with the management and protection of Colorado's declining species while maintaining the long-term economic viability of agricultural operations.

In the first application period for the Shortgrass Prairie Focus Area, we received applications representing over 150,000 acres at a cost of \$15 million dollars. On April 4th, 2003, the top two grassland applications were approved. These two applications include over 18,000 acres of shortgrass prairie for a term of 30 years for nearly 2 million dollars for the conservation of shortgrass prairie species.

GRASSLAND SPECIES CONSERVATION WORKING GROUP

In July 2002, Colorado's Grassland Species Conservation Working Group held its first meeting. The 15 member group includes environmental, agricultural, animal welfare, economic, and governmental interests. While the plan will focus on black-tailed prairie dogs as a keystone species, the intent is to take a broader approach and address all declining grassland species in Colorado. The group is currently meeting monthly and is hoping to have a draft plan by the summer 2003 and a final Grassland Species Conservation Plan by the fall 2003.

SWIFT FOX INVESTIGATIONS IN KANSAS, 2002

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OVERVIEW

Swift fox populations and harvests in Kansas are monitored through a variety of annual furbearer surveys. These include a roadside survey, a furbearer harvest survey, furdealer record book summaries and price surveys, and an employee opinion survey. However, because of the low sample size of swift fox resulting from limited range and furharvester participation in Kansas, or the non-quantitative nature of the survey itself, the reliability of these surveys at predicting changes in swift fox population or harvest trends has been unknown in recent times. In an attempt to improve the monitoring of swift fox in Kansas, a swift fox pelt tagging program was initiated in 1994, and a track survey was initiated in 1997. As indicated below, more in-depth reports on these procedures are provided elsewhere. The purpose of this report is to provide a brief update on these two swift fox monitoring procedures.

TRACK SURVEYS

Systematic swift fox track surveys were conducted in Kansas from 1997 to 1999 (M. A. Sovada, G. A. Sargeant, A. L. Zimmerman, and C. Roy, Kansas Department of Wildlife and Parks, unpublished data). As part of an effort to monitor the long-term status of swift fox in western Kansas, these surveys were reinitiated in August and September 2002. The surveys were generally conducted according to guidelines described by Sovada et al. (2001), with alternate townships being searched for tracks from 30 to 90 minutes. Given that this was the first of a three-year project, only a brief overview of results will be reported at this time.

A total of 286 townships were surveyed in 23 western Kansas counties. Swift fox tracks were located in 75 townships (26%) and 18 counties (78%). Further analysis is needed, but this is a decline in the percentage of townships where swift fox tracks were identified in 1997. All but seven townships were surveyed by individuals who participated in the track surveys from 1997-1999, so changes in personnel should not have been a factor. Swift fox tracks were primarily found in the immediate vicinity of fallow and winter wheat fields, and conditions during the survey period appeared fairly favorable for tracking by western Kansas standards. Surveyors generally indicated it had been about 4 days since the last wind or rain event that would have cleared tracks, and that there were a moderate (ave 2.8 on a 4 point Likert scale) number of sites available for track observation. Average soil condition for distinguishing tracks was rated only as 2.9 on a 5-point Likert scale (impossible to distinguish tracks (1) to excellent (5)). As part of an effort to overcome the difficulties posed by the conditions of the western Kansas landscape, the feasibility of

running surveys only in the mornings is being considered. While tracks at the best locations are visible throughout the day (i.e. – in mud beside puddles/ditches), tracks on unimproved dirt roads may often become indistinguishable by late morning as winds pick up, and may cause detection rates to decline throughout the day.

PELT TAGGING PROGRAM

The swift fox (*Vulpes velox*) is classified as a legally-harvestable furbearer in Kansas. Since 1994, a pelt tagging program has specified that all legally taken swift fox must be presented to KDWP within a week of the close of the annual furbearer season for tagging. A complete description and analysis of pelt tagging activities from 1994-2001 was provided in the 2001 Swift Fox Conservation Team Annual Report (Peek 2002). An update of 2002 pelt tagging activities is provided below.

A total of 86 swift fox were tagged during the 2002-03 furbearer season. This topped the previous record high of 48 tagged in 1994-95, and was an increase from 32 tagged during the 2001-02 season. Fifteen furharvesters were responsible for the take, though four of them accounted for 77% of the harvest (n = 66). Harvest techniques were generally similar to those from prior seasons with two notable exceptions. First, most (n = 50; 58%) of the swift fox were taken intentionally, not as incidentals to coyote trapping. Secondly, the individuals who intentionally took swift fox primarily did so with cage (n = 28) and conibear (n = 18) traps. Only 32 swift foxes (37%) were taken in foothold traps. Almost three-quarters of the swift fox (n = 62) were reportedly taken from short grass habitat. Twenty percent (n = 17) were taken from dryland crop habitat.

Several factors were probably partially responsible for the increased harvest of swift fox during the 2002-03 season. General furbearer units were dissolved prior to this season, which increased the effective season length by 15 days. Nine swift fox were taken during this extended harvest period (Feb. 1 – Feb. 15). Probably more importantly, both swift fox and coyote pelt prices increased substantially this season, which likely increased the number of active furharvesters as well as their effort (specific data not yet available). Also, there is some indication that an expanding novelty market for swift fox pelts (i.e. – taxidermy, tanned for display, etc) may exist. Despite the increased number of swift fox tagged, harvest levels are still well below estimates from the late 1980's when furharvester numbers and both coyote and swift fox pelt prices were much higher.

LITERATURE CITED

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SWIFT FOX INVESTIGATIONS IN OKLAHOMA, 2002

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ABSTRACT:

A swift fox track search survey was conducted over a three-year period, 1998 - 2000. Habitat associated with track locations was investigated. Swift fox tracks were observed 59% of the time in the USGS rangeland Land Use and Cover (LULC) types in 1998, 68% in 1999, and 74% in 2000. Available swift fox habitat was examined within a 3 km radius circular buffer drawn around the known track locations. Herbaceous rangeland LULC comprised at least half of the 3 km radius home range buffer circles drawn around the track locations for all three years (range 44.9% to 59.6%), while croplands (including CRP lands) made up anywhere from 37.7% to 44.9% of the buffer circles. Nearly half of the shortgrass High Plains region within the Oklahoma Panhandle was comprised of cropland and the other half rangeland. Herbaceous range may be slightly higher in the buffer circles when compared to the availability because rangeland was surveyed for swift fox tracks when it was available. Historic plat maps and recent digital orthophotos were examined within the swift fox's range as part of an overall shortgrass High Plains species of management concern project.

INTRODUCTION

Historically, the swift fox was considered to occur throughout the Oklahoma panhandle counties of Cimarron, Texas and Beaver, and in the three northwestern counties, Harper, Woodward and Ellis (Caire et al. 1989, Duck and Fletcher 1945, Hoagland 2002a). Swift foxes were observed in Texas and Beaver counties during the 1950s and 1960s by several researchers (Cutter 1959, Glass 1959, Kilgore 1969). More recently, the swift fox (*Vulpes velox*) has been documented to occur throughout the panhandle region as well as in four counties in the northwestern corner of Oklahoma. A 1988 landowner survey conducted by the Oklahoma Department of Wildlife Conservation (ODWC) produced 21 swift fox sightings and eight den locations in the panhandle region (Kocka 1988). Additionally, five verified swift fox sightings between 1988 and 1994 by ODWC biologists were reported from Cimarron, Texas, Beaver and Roger Mills counties (Hoagland 1996).

From 1998 through 2000, Section 6 funds were available to conduct a swift fox population distribution survey in the panhandle and northwestern Oklahoma, by using a systematic track search survey. The objectives of that project were to, establish a track search survey to monitor population trends of swift foxes throughout the shortgrass High Plains ecoregion in Oklahoma, and develop a baseline database of swift fox distribution and abundance in northwestern Oklahoma. The survey was conducted in portions of six

Oklahoma counties (Cimarron, Texas, Beaver, Harper, Ellis, and Woodward) in order to investigate the species' distribution within its historical range. During 1998, tracks were found in 35 of the 57 townships surveyed, within Cimarron and Texas counties. During 1999, the entire shortgrass High Plains area was surveyed, and swift foxes were detected in 43 of 114 townships. During 2000, swift foxes were detected in 36 of 101 townships surveyed. All townships where swift fox tracks were successfully detected were in the panhandle region of Cimarron, Texas and Beaver counties. A detailed presentation of these results can be found in the 2001 Swift Fox Conservation's Team annual report (Hoagland 2002b).

Efforts for swift fox conservation require a biologically sound basis for defining suitable habitats and the composition of habitats in landscapes that are optimal for swift foxes. The swift fox is native to the shortgrass and mixed-grass prairies, once occupying most of the Great Plains from west-central Texas to southern Alberta (Sovada and Scheick 2000). Optimal habitat for swift foxes is believed to be shortgrass prairie with relatively level terrain and available holes for shelter and protection (Scott-Brown et al. 1987). In a preliminary effort to examine swift fox habitat use in Oklahoma, US Geological Survey (USGS) Land Use and Land Cover (LULC) categories were measured within 3 km radius buffer circles drawn around the swift fox track points.

SUMMARY OF PROGRESS

Baseline distribution data have been collected for swift fox (Hoagland 2002a). Relative abundance and population density information, however, does not exist at this time. A new project, to be conducted by Oklahoma State University under a Wildlife Conservation and Restoration Program (WCRP) grant, will look at abundance and habitat associations of the swift fox in Oklahoma. Objectives are: 1) to estimate density of swift foxes throughout the Oklahoma Panhandle; 2) to develop quantitative relationships between density estimates and indices of relative abundance; and 3) to assess habitat suitability for swift fox by linking density estimates and survey results to landscape and habitat characteristics with GIS analyses. Field work will begin summer 2003 and run for two years.

Other related habitat assessment activities underway include habitat inventories and a landscape analysis of suitable habitat for high priority species associated with the black-tailed prairie dog. For historical comparison, all 325 of the 1870 and 1890 General Land Office Survey plat maps for the panhandle region and Harper, Ellis, Woodward and Roger Mills counties were digitized in ArcInfo. Each plat map represents a single township (36 mi²). Each feature category digitized was stored in an individual GIS coverage. Once the digitizing was completed of the plats for a county, the like coverages were merged together. The resulting data set consists of eight coverages: fence 1891; hydrology point features; hydrology polygon features; hydrology line features; roads; settlement point features; settlement polygon features; vegetation.

As a first step in assessing the landscape as it exists today, the USGS LULC data

at 1:250,000 (USGS 1990) were used to determine what landscapes remain untilled and in native grassland vegetation communities, by using ArcView 3.2a. A more detailed analysis of the existing landscape was initiated for the shortgrass High Plains region and is underway. This project, being conducted by the University of Oklahoma, involves examining 1995 digital orthophoto quarter quads (DOQQs) and computer mapping the landscape components by using Hoagland's (2000) vegetation of Oklahoma classification.

Preliminary swift fox habitat analysis, initiated in 2001, was completed during 2002. Swift fox track locations, generated between 1998 and 2000 from the track survey, were used to determine the habitat associated with swift fox distribution across the shortgrass High Plains region of Oklahoma. Swift fox tracks were observed 59% of the time in the rangeland LULC type in 1998, 68% in 1999, and 74% in 2000. To further examine the habitat associated with the swift fox track location point data, a 3 km radius circle was drawn around all swift fox track locations. A 2km radius circle was equal to the 95% minimum convex polygon home range size for a family of swift fox, based on swift fox home ranges in neighboring Kansas (M. Sovada, USGS Biological Resources Division, personal communication). To be sure to adequately survey habitat associated with the track location point data, a buffer of ½ the radius of the home range circle was added, resulting in a 3km radius circle. Classification codes from the USGS LULC used in data analysis included urban/industrial, cropland, herbaceous rangeland, shrub rangeland, mixed shrub and herbaceous rangeland, deciduous forest, evergreen forest, and water/wetlands. The area of each LULC category within the 3 km radius circles was measured. All lands classified as cropland and tame pasture were examined in the field to determine distribution of Conservation Reserve Program (CRP) fields.

Home range buffer circles were drawn around the 114 swift track locations detected over the three years, 1998 through 2000. Of the 35 track locations detected during 1998, 94,745 ha within the habitat evaluation buffer circles were examined for LULC. Herbaceous range comprised 56.1% of the 1998 home range buffer circles while 37.7% of the area contained agricultural land (Table 1). Within the agricultural lands, 32.5% were enrolled as CRP lands. The other 67.5% of the agricultural land included cropland, consisting primarily of winter wheat, milo, center pivot irrigated corn, or was fallow. Land use and land cover was examined in 122,373 ha surrounding the 43 track locations detected in 1999. Half of the total area was comprised of herbaceous range while agricultural land made up 44.9% (Table 1). Conservation Reserve Program fields comprised 33.7% of the agricultural land with 66.3% of the agricultural land consisting of other types of cropland or fallow fields. For the 36 track locations found in 2000, 101,593 ha were examined within the 3km radius buffer circles. Herbaceous range comprised 59.6% of the home range buffer circles while agricultural land encompassed 39.0% (Table 1). While other crops or fallow fields made up 55.4% of the agricultural land, 44.6% of this land use category consisted of CRP lands (Table 1).

Swift fox tracks were encountered more often in herbaceous rangeland LULC type than in other land use categories. Herbaceous rangeland, however, was the land cover type searched whenever it was available within a survey township. Swift fox

tracks were observed in agricultural areas throughout the study area, but agricultural areas were not searched in proportion to their availability. If cropland and rangeland were both present in a township, only the rangeland was most likely surveyed. The proportion of rangeland existing as herbaceous rangeland in Panhandle was 92.2% while shrub and mixed range comprised only 7.7%. Outside the Panhandle, the percentage of the existing rangeland that occurred as herbaceous range dropped to 57.0%, while the mixed herbaceous/shrub range increased to 42.9%. Because of the increasing vegetation density and height in the mixed herbaceous/shrub range, this LULC type was not considered suitable for swift fox when compared to the relatively shorter, herbaceous rangeland vegetation that occurred in the shortgrass High Plains ecoregion.

Herbaceous range also comprised at least half of the 3 km radius home range buffer circles drawn around the track locations for all three years (range 50.8% to 59.6%), while croplands (including CRP lands) made up anywhere from 37.7% to 44.9% of the buffer circles. The proportion of the cropland that was comprised of CRP lands increased each year over the three years surveyed (32.5% to 44.6 %). Nearly half of the panhandle region, where all track locations were recorded over the three years, was comprised of cropland and the other half rangeland, with the 92.2% of that rangeland existing as herbaceous range. This is just slightly different from the proportion of the LULC classifications found within the 3 km radius buffer circles of the track locations. Herbaceous range may be slightly higher in the buffer circles when compared to the availability because rangeland was surveyed for tracks when it was available. Further habitat evaluation studies will be conducted in the future to determine habitat characteristics at the landscape level that are necessary to support swift fox in the shortgrass High Plains ecoregion of Oklahoma.

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Table 1. Land use and cover categories found within 3 km radius track buffer circles. CRP is the percentage of the total agricultural land.

Land Use and Cover Category	1998* (n = 35)		1999 (n = 43)		2000 (n = 36)	
	Area (ha)	% Total	Area (ha)	% Total	Area (ha)	% Total
Agricultural Land	35,721	37.7	55,060	44.9	37,356	39.0
CRP	11,594	32.5	19,154	33.7	16,69	44.6
Herbaceous Range	53,180	56.1	62,223	50.8	57,125	59.6
Shrub Range	1,807	1.9	2,348	1.9	347	0.5
Mixed Range	3,212	3.4	1,983	1.6	308	0.4
Forest	210	0.2	197	0.2	223	0.3
Water / Barren	516	0.5	562	0.5	423	0.6
Total	94,745		122,562		95,822	

* Only includes Texas and Cimarron counties in 1998.

MANAGEMENT ACTIVITIES FOR SWIFT FOX IN MONTANA

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ABSTRACT

Activities completed during the 2002 period involved the third and final year of a statewide species distribution survey. Swift fox surveys contributed new information to document statewide distribution and occurrence. State working group activities will meet national Swift Fox Conservation Team (SFCT) conservation strategy objectives (Kahn et al. 1997).

INTRODUCTION

Montana has provided annual project activity summaries related to accomplishing conservation strategies as outlined in the Conservation Assessment and Conservation Strategy of Swift Fox in the United States (CACS) (Kahn et al. 1997) since 1994 (Giddings and Knowles 1995, Giddings 1996, Zimmerman and Giddings 1997, Giddings 1999, Giddings 2000, Giddings 2001, Giddings 2002). Current management direction is to determine both species distribution and relative population size for swift fox in the state to serve as baseline data to measure changes as future survey and inventory activities occur. The Montana state working group will concurrently determine suitable habitat (occupied and unoccupied) to initiate land management activities for swift fox and protect designated habitat corridors to encourage natural dispersal, so that northern populations will become connected to the larger contiguous continental swift fox population.

METHODS

In the fall of 2002, FWP spent \$5,000 on the third year of a statewide swift fox distribution survey. This survey area was located in southeastern Montana, encompassing approximately 250 townships within Bighorn, Powder River, Carter, Fallon, Custer, Prairie, and Wibaux counties. Only alternate townships were selected for a total of 100 surveyed townships. Track and sign searches were conducted, by two private wildlife contractors, for up to 2 hours in each sampled township following the survey protocol as outlined in Roy et al. (1999). Survey detection information will be added to existing occurrence data in an effort to produce a composite map of GIS-generated land ownership and cover type layers under a current swift fox distribution map. Swift fox observation reports were also solicited during the 2002 report period for inclusion into the FWP species database.

RESULTS

Species distribution survey results from 2002 indicated swift fox presence in two counties, both located directly adjacent to the Wyoming state line (Fig. 1). Track detections were observed in one township in Powder River county within one mile of the state line and one township in Carter county within 14 miles of the state line (Hook 2002). No detections occurred in the other counties that were surveyed (Knowles 2002). Survey occurrence locations will be entered into the swift fox database to generate a current species distribution map. Approximately 20 observation reports were compiled during the 2002 period and will be added to the swift fox database. Reports originated primarily from northcentral Montana (R. Stoneberg, Montana Fish Wildlife and Parks, personal communication and J. Peters, Bureau of Land Management personal communication) with several received from northeastern and southeastern portions of the state.

DISCUSSION

FWP considers determination of current swift fox distribution in Montana as a significant step toward state and national efforts with regards to population monitoring activities and specific conservation measures. The distribution survey conducted in 2002 suggests swift fox exist in extreme southeastern Montana, likely dispersing from, or as part of populations in northeastern Wyoming. This evidence shortens the gap between the northern-most populations of swift fox in north central Montana and Canada with the major U.S. continental population.

State working group activities include species and habitat mapping analysis, using current swift fox distribution, which will lead to conservation planning on the part of state and federal land management agencies. The working group will help coordinate future activities directed at habitat protection and maintaining habitat connectivity in the state. Current swift fox maps are intended to facilitate species conservation planning through land management activities or habitat protection efforts. Potential dispersal corridors, based on land ownership patterns and presence of suitable swift fox habitat, will be identified to allow population connectivity between expanding US/Canadian populations and the adjacent continental population to the south.

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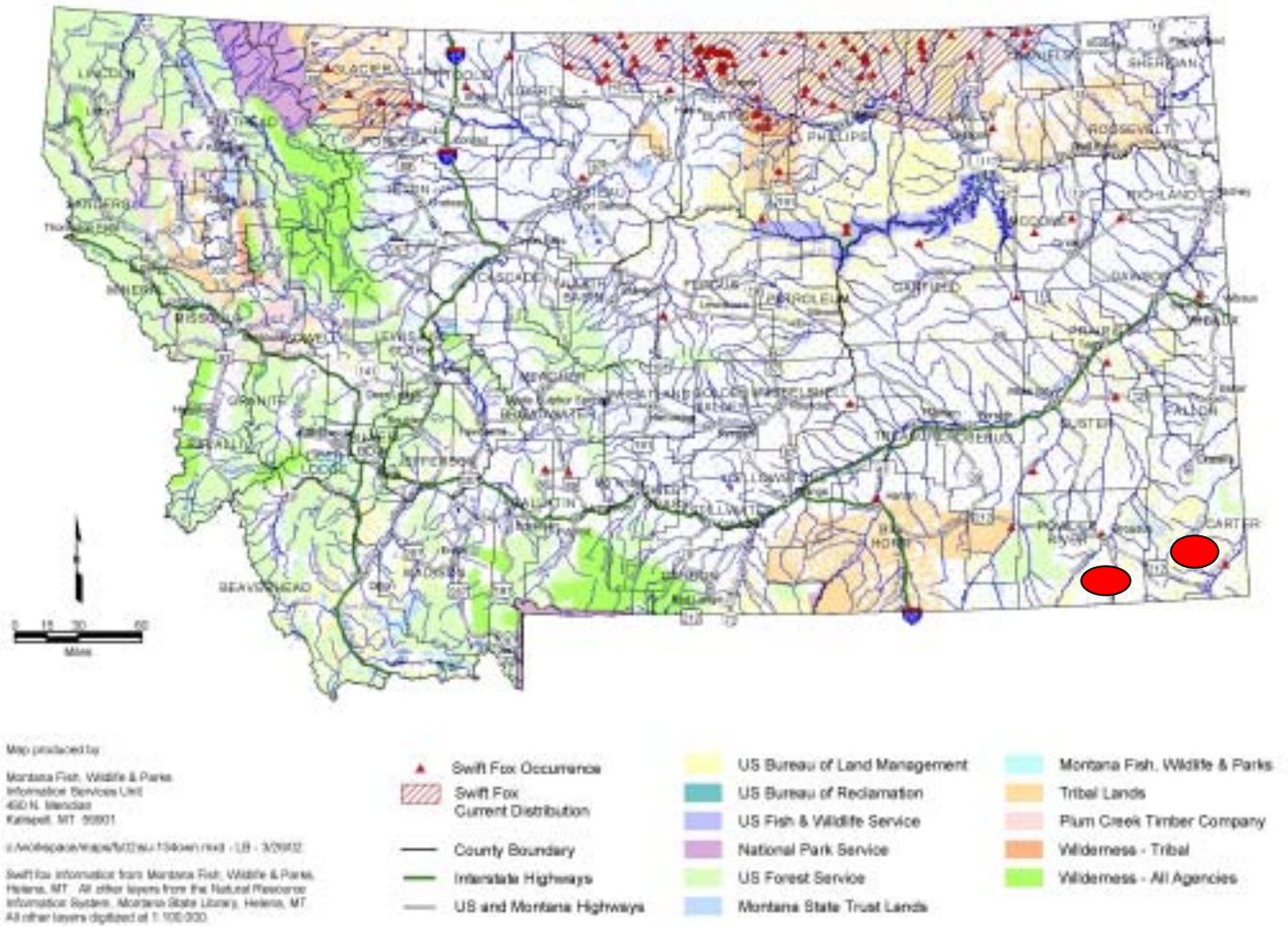


Figure 1. Swift fox distribution map delineating 2002 survey result locations in southeastern

NEBRASKA SWIFT FOX REPORT 2002

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To circumvent problems with precipitation that occurred during the previous year's scent station survey (Bischof 2002), surveys in 2002 were conducted during a drier time of year, August. A total of 78 scent stations were set in 24 townships (3 per township) in the Nebraska panhandle. Stations were created in the right-of-way along county roads (gravel or dirt) by clearing vegetation and sifting fine sand mixed with glycerin (to create a good tracking medium). A plaster tablet soaked in a cod-liver/salmon oil mix was placed in the center of the station (attached to the ground with a nail and covered with a thin layer of sand). All three scent stations in each township were inspected for tracks after a single night of operation.

During the 2002 surveys no swift fox tracks were detected at any of the scent stations. Since this year's survey had been conducted in some of the same areas that had resulted in several swift fox detections during the spring of 2001; it appears that the conditions during this year's survey and/or other attributes of the survey design were not conducive for this type of investigation in the region. In addition, several scent stations were placed > 0.5 mile from an area that was occupied by at least 1 adult and 3 juvenile swift fox during the survey. None of these scent stations showed signs of having been visited by swift fox. The probability of detecting swift fox was further limited by the short operating period of the scent stations (one night). It could also be speculated that the lack of detection was due to reduced motivation resulting from abundant food sources during the late summer and/or that the extremely dry conditions did not facilitate scent proliferation.

In addition to the scent station survey, an attempt was made to conduct swift fox track searches in selected townships in the Nebraska panhandle using the method described by Sovada et al. (2001). To evaluate the feasibility of using this method in Nebraska, track searches were conducted in nine townships with known swift fox presence. Soil conditions proved extremely poor for track recognition. Dry, dusty conditions resulted in a lack of suitable tracking medium, and animal tracks encountered were often obscured and in most cases not recognizable. Only one potential swift fox track was found.

Based on the 2001 and 2002 results, a revised monitoring protocol will likely be implemented in 2003. Weather permitting; a scent station survey will be conducted during the spring. Transects containing five scent stations will be set in each township surveyed. Scent stations will be operated for three consecutive nights or until one or more scent stations in a township show signs of swift fox visitation.

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SWIFT FOX INVESTIGATIONS IN NORTH DAKOTA, 2002

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ABSTRACT

Track surveys were conducted on randomly selected sections of land. Optimal quarter-sections within those sections were selected on site for surveying (n = 35). Furbearer occurrence was determined by identifying tracks to species. No swift fox were detected. Differential reporting rates for red fox and coyote harvests in North Dakota and past confirmed swift fox observations indicate swift fox exist at extremely low densities if at all in North Dakota.

INTRODUCTION

Swift fox (*Vulpes velox*) were common in North Dakota during pre-settlement times (Thwaites 1953); however, the species became very rare about 1880-1900 (Bailey 1926). Although swift fox are known to be very rare in North Dakota, track surveys are being conducted every third year and data are collected with which to make inference concerning the occurrence of the species. Since 1970 we have obtained 4 confirmed observations of swift fox in North Dakota. Southwestern North Dakota has been selected for study because of occasional reports of possible swift fox in these areas and occurrence of swift fox in the adjoining state of Montana. The objective of this report is to present the results of the track survey to determine relative occurrence of all furbearer species in this area with special reference to swift fox.

STUDY AREA AND METHODS

Surveys were conducted in southwestern North Dakota in 2002. This area is primarily semi-arid prairie grassland with some intermixed cropland and hayland. Topography is generally rolling grassland to rough broken badlands; native hardwoods trees and shrubs occur in many of the deeper coulees. Climate in North Dakota is typical of sub-arctic continental interiors with hot summers and cold winters.

Track surveys were conducted in late April to determine relative occurrence of furbearers in each quarter section surveyed. The survey was modified from one developed by Sargeant et al. (1993). Timing of the survey minimizes errors in correctly identifying species caused by movement of young, especially among the canids.

Sections were selected randomly to survey; within each section one quarter-section study area was selected at the site, which had the best potential for identifying furbearer

tracks. Some randomly selected sections were relocated to improve field logistics due to remoteness and inaccessibility of some of the original selections or proximity to human habitations. All study areas were surveyed no sooner than 48 hours after a rain. The search pattern consisted of visiting as many locations on each study area as possible on foot within 30 minutes that have potential to reveal furbearer tracks. Tracks were identified to species when possible.

Data collected for each quarter-section visited consisted of relative abundance of tracks identified by species (none, scarce, common, abundant), predominant cover type (pasture, hayland, cropland, marsh, idle), relative amount of available track sites (many, moderate, few, almost none), relative soil condition for holding tracks (excellent, good, fair, poor), and the track accumulation period (1 day, 2-3 days, 4-6 days, 7 or more days). Coyote and red fox tracks were distinguished based on size (Allen, North Dakota Game and Fish). Swift fox tracks are easily distinguished from other canids, because they average about 10 mm shorter than the smallest red fox tracks (Orloff et al. 1993). Data analysis consisted of examining the number of study areas with furbearer track occurrence by species.

RESULTS

During the 2002 track survey, 35 quarter-sections were searched for swift fox and other furbearer tracks. Relative occurrence of furbearer species identified (Table 1) consisted of coyotes (*Canis latrans*-14 areas), red fox (*Vulpes vulpes*-4 areas), raccoon (*Procyon lotor*-10 areas), skunk (*Mephitis mephitis*-2 areas), and mink (*Mustela vison*-2 areas), badger (*Taxidea taxus*- 3 areas), and bobcat (*Felis rufus*- 1 area). No swift fox tracks were identified on any of the 35 study areas. No visual observation of any furbearer was made on any study area except a feral cat was seen on a study area in Slope County. Twenty-two of the 35 study areas contained tracks of at least 1 furbearer species. Land cover types on the quarter-sections consisted mainly of pasture; other sites included idle grasslands, croplands, and haylands. Densities of furbearer species were not determined in this study.

Other relative occurrence data for canids are also available in North Dakota. Since 1970 we have obtained 4 confirmed observations of swift fox in North Dakota. During that same time period there have been 704,060 red fox and 222,395 coyotes sold to North Dakota furbuyers.

DISCUSSION

This investigation indicates that various species of furbearers occur on almost all quarter-section survey areas, and occurrence of coyotes or red fox or both species is likely in many areas. Other species such as swift fox may be present, but they appear to exist at extremely low levels. We encounter some problems with track surveys because we do not always detect tracks of a species even though that species is present, and there

is potential for error in correctly identifying tracks to species, especially in a state where swift fox and their tracks are rare. Track surveys should represent a minimum distribution, because some quarter-sections with no canid tracks observed likely had canids present.

Considering the density and distribution of red fox and coyotes in North Dakota and the observations of Ralls and White (1995), the potential for viable swift fox populations may be quite remote. Historically, interspecific competition may not have been as severe on swift fox prior to settlement in the region. At that time wolves were the dominant canids, and coyotes were probably very rare (Johnson and Sargeant 1977). With removal of wolves during and after settlement the canid composition changed and coyotes became more abundant, and conditions for swift fox survival may have deteriorated dramatically. If this hypothesis is correct, the probability for existence of viable natural or reintroduced swift fox populations in this area is extremely limited without major alterations to the present canid community.

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Table 1. Number (% occurrence) of quarter-sections with furbearer tracks by species and county detected on randomly selected study sites in southwestern North Dakota, 2002.

Species	County			
	Bowman (n = 15)	Slope (n = 16)	Golden Valley (n = 4)	Total (n = 35)
Red fox	2 (13.3)	2 (12.5)	0	4 (11.4)
Coyote	4 (26.7)	7 (43.7)	3 (75.0)	14 (40.0)
Striped skunk	0	2 (12.5)	0	2 (5.7)
Mink	2 (13.3)	0	0	2 (5.7)
Raccoon	3 (20.0)	4 (25.0)	3 (75.0)	10 (28.6)
Badger	2 (13.3)	1 (6.2)	0	3 (8.6)
Bobcat	1 (6.7)	1 (6.2)	0	1 (2.9)

2002 ANNUAL REPORT: STATUS OF SWIFT FOX IN TEXAS

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SUMMARY OF CURRENT AND FUTURE ACTIVITIES

In 2002, swift fox (*Vulpes velox*) efforts in Texas focused on:

- 1) Completing ongoing research on swift fox–coyote (*Canis latrans*) interactions (Kamler 2002, Lemons 2001)
- 2) Initiation of new research on the role of artificial escape dens for increasing swift fox populations in NW Texas (W. B. Ballard, B. McGee, and K. Nicholson, National Fish and Wildlife Foundation, unpublished data)
- 3) Investigating/securing funding for ongoing (artificial escape dens) and additional research (reexamining the distribution of swift foxes within the 25 counties surveyed by Mote [1996] using recently published methods [Harrison et al. 2002] and determine the current population size of the species within these counties)
- 4) Developing comprehensive guidelines for conservation and management of swift fox in the Texas Panhandle (e.g., a recently prepared summary document [Sullivan et al. 2003] will be used in development of a long-term strategic plan for conservation and management of swift fox in the Texas Panhandle)

CURRENT RESEARCH

Title: Importance of Artificial Escape Dens for Increasing Swift Fox Populations in Northwest Texas

Conducted By: Dr. Warren B. Ballard (P. I), Brady McGee (PhD Candidate), and Kerry Nicholson (MSc Candidate), Range Wildlife, & Fisheries Management, Texas Tech University, Lubbock, TX

Funding Sources: 1) National Fish and Wildlife Foundation (Dallas, TX) AND 2) Department of Range, Wildlife, and Fisheries Management, Texas Tech University, Lubbock, TX

Project Summary: The availability of suitable den sites and escape cover may limit densities and distribution of swift fox populations in northwest Texas. Therefore, in April 2002 we installed artificial escape dens to test the above hypothesis and attempt to reduce the effects of coyote related mortalities on swift fox. The

primary objective of this research is to determine the utility and applicability of artificial escape dens for population enhancement of swift fox where sympatric with coyotes on two study sites, the Rita Blanca National Grasslands (NG) and a private ranch (PR). The secondary objective is to document spatial arrangements, identify mortality causes, and determine survival and recruitment rates. Beginning in January 2002, we began trapping and attaching radio-transmitters to free-ranging coyotes and swift fox where sympatric on a private ranch and on the national grasslands. From 01 January 2002 to 01 March 2003, 50 swift foxes were captured and radio-collared in 1251 trap-nights. Twenty-four swift foxes (12 adults, 12 juveniles) were captured on the NG study site (734 trapnights), while 26 swift foxes (9 adults, 17 juveniles in 517 trapnights) and 2 coyotes (both adults) were captured on PR study site (180 trapnights on PR). No coyotes were caught during the 210 trapnights on NG. Preliminary data indicate that swift fox in treatment areas (i.e., with artificial escape dens) had higher recruitment (2.8 young/adult) than in control groups (1.9 young/adult) for both study sites combined.

PROPOSED RESEARCH

Title: Distribution of Swift Foxes in Texas

Proposed By: Dr. Warren B. Ballard (P. I), Range Wildlife, & Fisheries Management, Texas Tech University, Lubbock, TX; Dr. Robert Baker (Co P.I.), Department of Biology, Texas Tech University, Lubbock, TX, Heather Whitlaw (Co P.I.) Texas Parks and Wildlife, Lubbock, Texas, and Mr. John Young (Co.P.I), Texas Parks and Wildlife, Austin, Texas

Proposed Funding Source: TPWD Conservation Action Grants (2003-2004)

Purpose and Need: There continues to be a paucity of data concerning current distribution of swift foxes in Texas. There are late-Pliocene fossil records of swift fox from Scurry County and mid-Holocene fossils from Edwards County (i.e., Schulze Cave) (Dalquest et al. 1969, Sovada and Scheick 2000). Swift fox were first reported from Stanton, Martin, Midland, Oldham, and Armstrong counties, and at the time were considered more scarce than in prior years (Bailey 1905). A specimen from Armstrong County was the last recorded specimen until mid-century, when one fox was collected in Swisher County in 1948 (Glass 1959). Cutter (1958) noted that swift fox were reasonably common in Hansford County during the mid-century, suggesting that they reoccupied many areas of the Texas Panhandle where they were once considered extinct (Sovada and Scheick 2000). Egoscue (1979) hypothesized that a population recovery occurred in the 1950s, resulting in more specimens being collect during the 1960s and 1970s. Hall (1981) and Jones et al. (1987) defined the historic range of the swift fox in Texas to include the Panhandle down into the west-central portion of the state, which included approximately 78 counties (Mote et al. 1999). Jones et al. (1987)

indicated that only 28 counties in Texas had reliable records of swift fox based on literature, trapping records, or museum specimens. Jones et al. (1987) estimated that half of the historic range of the swift fox (i.e., High Plains below the 34th parallel) was no longer suitable for swift foxes due to habitat conversion to intensive agriculture.

The apparent current range of swift fox in Texas covers most of the Pecos and Staked Plains north to the Canadian River, Llano Estacado, and southward to Midland and Ector counties in the Permian Basin (Sullivan et al. 2003). In the east, it reaches the western edge of the Rolling Plains, southeastward to Menard County on the northern edge of the Edwards Plateau (Jones et al. 1987). Sovada and Scheick (2000) noted that their initial accounting of historical and current records included swift foxes in 26 counties with another observation from the convergence of three counties (i.e., Crane, Pecos, and Upton). Although swift fox probably occurred in other counties they documentation. There was a distinct absence of records from the grassland type of southern mixed-grass prairie with shrubs (Risser et al. 1981), suggesting that this grass and scrubland habitat may be less suitable for foxes (Sovada and Scheick 2000). Similar to the shifting nature of the boundary between mixed-grass and tall grass prairie, encroachment of shrubs into the southern mixed-grass prairie may influence swift fox distributions. Although a status review for swift fox was conducted in 1987 because of concerns during the early 1980s over rapid loss of native short grass prairie (Swepston 1981) not all areas identified as potential suitable habitat appeared to contain swift foxes (Jones et al. 1987, Mote et al. 1998).

In 1996, the first systematic search for swift fox was conducted on 25 counties ($n = 28$ transects) within the known historic range to determine current distribution in Texas (Horner 1995, Mote 1996). Seventy-eight trap-nights produced four swift fox females and spotlight surveys ($n = 380$ km) produced three individuals. No fox were sighted in headlight surveys ($n = 1,225$ km). Live-trapping and spotlight surveys were conducted in both Dallam and Sherman Counties and represented the first confirmed report of the species in Texas in 10 years (Sullivan et al. 2003). These results suggested that swift foxes only occurred within 2 of the 25 counties surveyed. However, surveys were conducted along major primary roads and were not located in potentially suitable habitat (K. Mote, Texas Parks and Wildlife Department, personal communication). Also, methods used to determine presence or absence of swift foxes (spotlight surveys and live-trapping) are not the best methods for determining swift fox distribution (Schauster et al. 2002). Therefore, swift foxes may be more abundant than what currently available data indicate.

Schauster et al. (2002) conducted a study to evaluate 6 survey methods for determining distribution and abundance of swift foxes. They evaluated catch-per-unit-effort (trapping surveys), mark-recapture estimates, scent-post surveys, spotlight counts, scat deposition rate surveys, and an activity index. All methods, with the exception of spotlight surveys, were reliable and consistent for detecting

swift fox presence. However, a combination of survey methods was desirable for estimating swift fox density. Scat transects appeared to hold much promise but misidentification of scats of other mesocarnivores could be a major problem. Recently, Harrison et al. (2002) found that scat surveys followed by identification of individual scats with DNA analyses was the most effective method for determining presence or absence of swift foxes in New Mexico. Detection rates were between 60 and 70% in known populations. We propose to reexamine the distribution of swift foxes within the 25 counties surveyed by Mote (1996) using the methods outlined by Harrison et al. (2002).

SUMMARY OF SULLIVAN ET AL. (2003)

REVIEW OF THE HISTORIC AND CURRENT STATUS OF THE SWIFT FOX (*VULPES VELOX*) IN TEXAS

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ABSTRACT

Historically, the range of swift fox (*Vulpes velox*) in Texas encompassed 78 counties within the Pecos and Staked Plains and Red Rolling Plains. At least 25 counties still contain sufficient quality and quantity of habitat to support viable populations, but only 3 counties in northwest Texas have verified reports of swift fox within the last 10 years. Loss of grassland habitat through conversion of native prairies to agricultural land, detrimental cropping patterns, and changes in canid community structure continue to threaten remnant populations of the swift fox and its critical habitat in northwestern Texas. Predation by coyotes likely is the most significant cause of natural mortality in swift fox populations; however, potential competition for food resources between coyotes and swift fox may also help shape canid communities. Collectively, these phenomena have important implications for swift fox conservation and management in Texas. Because most populations of swift foxes are on privately owned lands, a conservation strategy designed to conserve swift fox and their prairie ecosystem must engage a wide range of stakeholders in a dialogue about proactive approaches to conservation. To be successful, this effort must enlist collaborative efforts and partnerships, including representatives of state and federal agencies, conservation organizations, industry,

scientists, and particularly private landowners. Additionally, education through various outreach and conservation programs can significantly increase public awareness of the plight of the swift fox and reduce unnecessary mortality. Herein, a historical chronology of swift fox research and conservation in northwestern Texas is presented, and specific actions that need to be part of a state strategy to conserve the species and its critical prairie ecosystem are discussed.

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WYOMING SWIFT FOX COMPLETION REPORT

STATE OF WYOMING

NONGAME MAMMALS – Species of Special Concern

PERIOD COVERED: 15 April 2002 – 14 April 2003

PREPARED BY: Martin Grenier, Nongame Mammal Biologist
Laurie Van Fleet, Nongame Biologist
Matt Martin, Nongame Biological Aide
Melanie Purcell, Nongame Biological Aide

INTRODUCTION

The purpose of the distribution surveys conducted in 1999, 2000 and 2001 were to document recent locations of swift fox (*Vulpes velox*) in Wyoming. Baited track plates placed in a continuous transect up to several miles long with a track plate spacing of 1.6 km (1 mi) between plates was found to be the most effective method for documenting swift fox in areas with potential habitat but unknown population status (Dieni et al. 1997). To establish transect locations, suitable areas of swift fox habitat were determined and randomly selected sections (1 mi²) within the areas identified (Olsen et al. 1999).

Surveys to develop baseline transects for monitoring long-term population trends were initiated in 2001. These trend surveys occurred in locations documented to have swift fox during the 1999 and 2000 distribution surveys. Survey methods previously developed were used (Olson et al. 1999). Transects for monitoring population trend utilized a more intensive survey method (five track plates at a spacing of 0.8 km (0.5mi) between plates). Approximately 20 transects will be surveyed in each of three geographic regions with each transect no closer than 7 km (5 mi) to another. The method is based on previous findings and estimates that there is an 88% probability that a swift fox will be detected if it occupies an area.

According to Woolley et al. 1995, the current population occurs primarily in three geographic regions: Region 1) Laramie Valley and Shirley Basin in Albany and Carbon counties, Region 2) Southeastern Plains—parts of Laramie, Platte and Goshen counties, and Region 3) Powder River Basin- parts of Converse, Natrona, Weston and Niobrara counties. Surveys were conducted in the Laramie Valley and Shirley Basin areas in 1999. The Regions 2 and 3 were surveyed in 2000 and 2001.

Future trend surveys will be completed on an annual basis with the cooperation of Turner Endangered Species Fund (TESF), while the swift fox translocations to Bad River Ranch, South Dakota are on going (3-5 years). Following the translocation effort, surveys will then be scaled back to once every three years to monitor long-term swift fox trends.

METHODS

Track plates were made of 16-gauge sheet steel, measured 61cm x 61cm (2ft. x 2ft.) painted with two coats each of gray primer and gray paint. A one-gallon weed sprayer was used to coat the plates with talc/carpenter's chalk and ethyl alcohol mixture, the ratio used was 1 cup talc: 1.5 cups carpenter's chalk : 1 gallon 95% ethyl alcohol. This mixture will prepare 40-50 plates. Approximately 15g of stirred jack mackerel were placed in the center of the plate as an attractant. Plates were spaced 0.8 km (0.5 mi) apart within public road easements where tracks could be observed without requiring private land access. Track plates were placed along an existing fence if one was present. When a fence was not present, plates were placed 10 m to 25 m from the centerline of the road.

Flagging marked locations of plates and a GPS location in UTM coordinates were recorded for all track plates in each transect. Transects were observed for a maximum of six days, but monitoring ceased the day after swift fox presence was confirmed. This method is designed to detect declines in the population under the assumption that there is an 88% chance that a fox will remain in or return to the same area from one year to the next (Olson et al. 1998). During periods of heavy rain and snow plates were left in-place for up to two additional nights. If rain or snow persisted for more than two nights, the survey effort was abandoned and postponed until favorable weather conditions returned.

Eastern Wyoming was divided into three study regions encompassing 10 counties: Study Region 1 – Portions of Albany and Carbon Counties; Study Region 2 – Portions of Goshen and Laramie Counties; and Study Region 3 – Portions of Campbell, Johnson and Niobrara Counties (Woolley et. al 1995).

Tracks of swift fox were identified utilizing (Grenier et al. 2002), recorded, and lifted for future reference and measurements with 2-inch clear packing tape. In some cases, clear contact paper was used to preserve an entire track plate for future use in identifying tracks. Plates were cleaned with a stiff brush or steel wool before reuse.

Baseline transects used during the 2001 trend monitoring survey were those locations with positive identification of a swift fox track on a track plate during the 1999 and 2000 surveys or known den sites. Recorded den sites along roads were used as center locations for baseline transects. Short and mixed grass prairies mostly devoid of heavy shrub coverage characterized areas where swift fox were most commonly found. Selection of survey routes took into account accidental swift fox observations made by USDA -Wildlife Services, Wyoming Game and Fish Department, and Wyoming Cooperative Fish and Wildlife Research Unit personnel.

RESULTS

Surveys were completed in 3 study regions and 10 counties in eastern Wyoming (Study Region 1 – Portions of Albany and Carbon Counties) (Study Region 2 – Portions

of Goshen and Laramie Counties) and (Study Region 3 – Portions of Campbell, Johnson and Niobrara Counties). The 2002 inventory was completed utilizing a field crew of 8 personnel. Wyoming Game & Fish Dept. provided 4 personnel and the Turner Endangered Species Fund (TESF) provided an additional 4 field personnel. The survey totals for all regions combined are as follows: 1,411 track plate nights; 150.5 miles surveyed; Swift fox were detected at 25 of 63 locations; A minimum of 56.4 track plate nights, were required to detect swift fox (Table 1).

Study Region 1: Prior to the initiation of the survey there existed 18 recent locations/sightings. Swift fox were detected at 16 of the 18 (89%) locations. A total of 245 track plate nights were utilized. A minimum of 15.3 track plate nights (3.1 survey nights), were required to detect swift fox.

Study Region 2: Prior to the initiation of the survey there existed 17 recent locations/sightings. Swift fox were detected at only 5 of the 17 (29%) locations. A total of 420 track plate nights were utilized. A minimum of 84 track plate nights (16.8 survey nights), were required to detect swift fox.

Study Region 3: Due to small sample sizes of 13 locations in Study Region 3 prior to the 2002 monitoring effort, additional effort was spent on establishing new survey routes, between 2 and 7 new locations, in 2002.

A total of 13 known swift fox locations were utilized and swift fox were detected at 4 of the 13 (31%) locations. A total of 334 track plate nights were utilized. A minimum of 43 track plate nights (10.8 survey nights), were required to detect swift fox.

An additional 15 transect routes with a combined, 412 track plate nights, were run in Study Region 3 in 2002. The additional 87.7 km (54.5 mi) of new routes failed to detect swift fox.

DISCUSSION

Surveys for swift fox in 1999 and 2000 were designed to establish a sufficient sample size (15 to 20 locations) of occupied swift fox locations to serve as transect locations for monitoring population trends. In study region 3 however, we have had difficulties locating additional survey routes in all survey years 1999-2002, therefore in future surveys only the existing 13 routes will be utilized.

Overall for 2002 the detection percentage for all regions declined from 77% (37 of 48) to 52% (25 of 48) (Fig 1). Study region 2 and 3 detections declined in 2002 from 14 of 17 (82%) to 5 of 17 (29%) and 9 of 13 (69%) to 4 of 13 (31%), respectively from the 2001 survey (Fig. 2). Study region 1, however, increased from 14 of 18 (78%) to 16 of 18 (89%) detections in 2002 (Fig 2.).

It is unclear if the declines recorded in 2002 in study regions 2 and 3 are indicative of true declines or are a one-year anomaly. For example in study region 2 although we observed a decline in detections of swift fox along the survey routes, captures of swift fox by TESH in different target areas within the same study region indicate that swift fox are quite abundant within the study area. There exist 5 possible hypothesis for these observations in 2002: 1) Location of survey routes may bias detection rates; 2) Non-target species maybe negatively effecting swift fox detections; 3) Development in Region 2 (Natural Resources) and Region 3 (Urbanization) maybe fragmenting existing swift fox habitat; 4) Technique is only applicable in study region 1 where it was developed; and 4) Any combination of the above.

Non-discreet detections for non-target species in 2002 nearly doubled from the previous year, with nearly a tri-fold increase in region 3. The number of detections increased from 99 to 167 for all study regions combined (Fig. 3). In study regions 2 and 3 at least three non-target species comprised the bulk of those detections: stripped skunk; domestic cat; and raccoon (Table 3). These species comprised 61% and 91% of the number of non-target detections in study regions 2 and 3 respectively in 2002. As compared to study region 1 where stripped skunk, domestic cat, and raccoon comprised only 22% of non-target species. Red fox and coyote were detected most often and comprised 78% of the non-target species detections in study region1 as compared to 21% and 5% in study regions 2 and 3 respectively.

The increase in non-target species, primarily stripped skunk, domestic cat, and raccoon, detections suggest that the habitat in study regions 2 and 3 may be changing. Historically, stripped skunk, domestic cat and raccoon were not associated with prairie grassland systems and are more closely associated with human disturbances. Further investigation, possibly alternate survey techniques are warranted to determine swift fox population trends in study region 2 and 3.

I. ACKNOWLEDGEMENTS

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Table 1. 2002 Results

Study Region	County	Total # Transects Run	Total # Track Plates	Ave # of Plates/ Transect	Total # Nights Run	Total # of Track Plate Nights	Total Miles of Transects	Previous Swift Fox Locations	2002 Transect Detections
1	Albany	12	60	5	38	190	24	11	11
	Carbon	6	30	5	11	55	12	7	5
Total		18	90	5	49	245	36	18	16
2	Goshen	8	40	5	45	225	16	8	0
	Laramie	9	45	5	39	195	18	9	5
Total		17	85	5	84	420	34	17	5
3	Campbell	9	47	5.2	1	227	19	8	1
	Converse	8	75	9.4	31	262	33.5	0	0
	Niobrara	11	67	6.1	44	257	28	5	3
Total		28	189	6.75	76	746	80.5	13	4
Total (all regions)		63	364	16.75	209	1411	150.5	48	25

Table 2. 2001 Results.

Study Region	County	Total # Transects Run	Total # Track Plates	Ave # of Plates/ Transect	Total # Nights Run	Total # of Track Plate Nights	Total Miles of Transects	Previous Swift Fox Locations	2001 Swift Fox Detections
1	Albany	12	60	5	36	180	24	12	9
	Carbon	6	30	5	17	85	12	6	5
	Total	18	90	5	53	265	36	18	14
2	Goshen	17	205	12.1	73	646	231	8	5
	Laramie	15	154	10.3	27	310	68	9	9
	Total	32	359	11.2	100	956	299	17	14
3	Campbell	10	58	5.8	40	230	24	8	4
	Converse	4	76	19.0	19	335	36	0	0
	Niobrara	6	92	15.3	15	216	43.5	5	5
	Total	20	226	11.3	74	781	103.5	13	9
Total (all regions)		70	675	27.5	227	2002	438.5	48	37

Table 3. Non-target species detection percentages in Eastern WY.

	Region 1		Region 2		Region 3	
	2001	2002	2001	2002	2001	2002
CAFA	0	0	0	21%	0	0
CALA	32%	28%	6%	11%	0	1%
FECA	32%	22%	52%	39%	47%	35%
MEME	4%	0	36%	16%	5%	46%
PRLO	7%	0	6%	0	45%	10%
TATA	11%	0	0	16%	3%	4%
VUVU	14%	50%	0	11%	0	5%

Note: CAFA = Domestic Dog
 CALA = Coyote
 FECA = Domestic Cat
 MEME = Stripped Skunk
 PRLO = Raccoon
 TATA = Badger
 VUVU = Red Fox

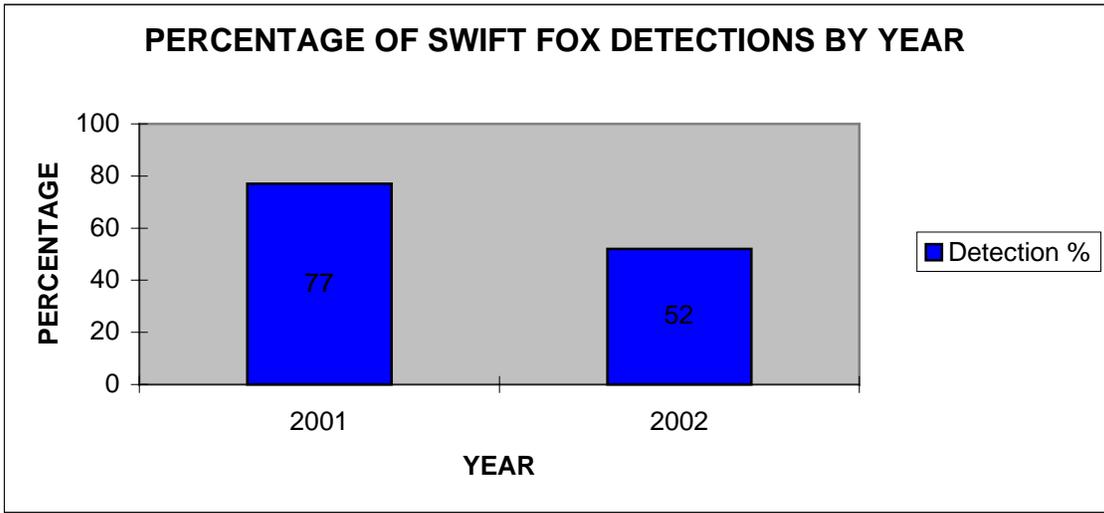


Figure 1. Comparison of swift fox detections percentage for all study regions by survey year in Eastern Wyoming.

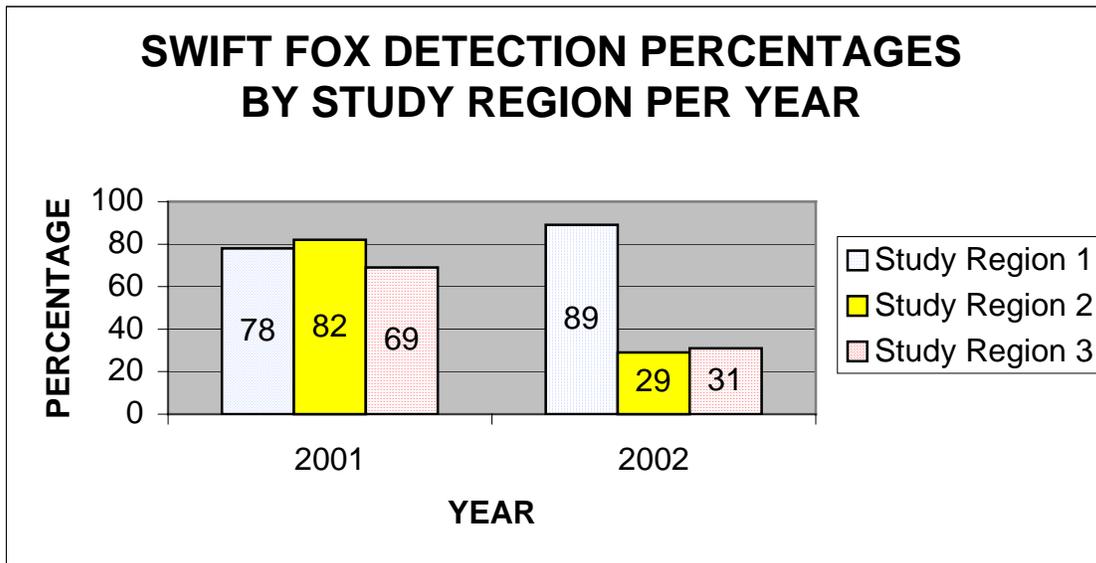


Figure 2. Comparison of swift fox detection percentages by study region per year in Eastern Wyoming.

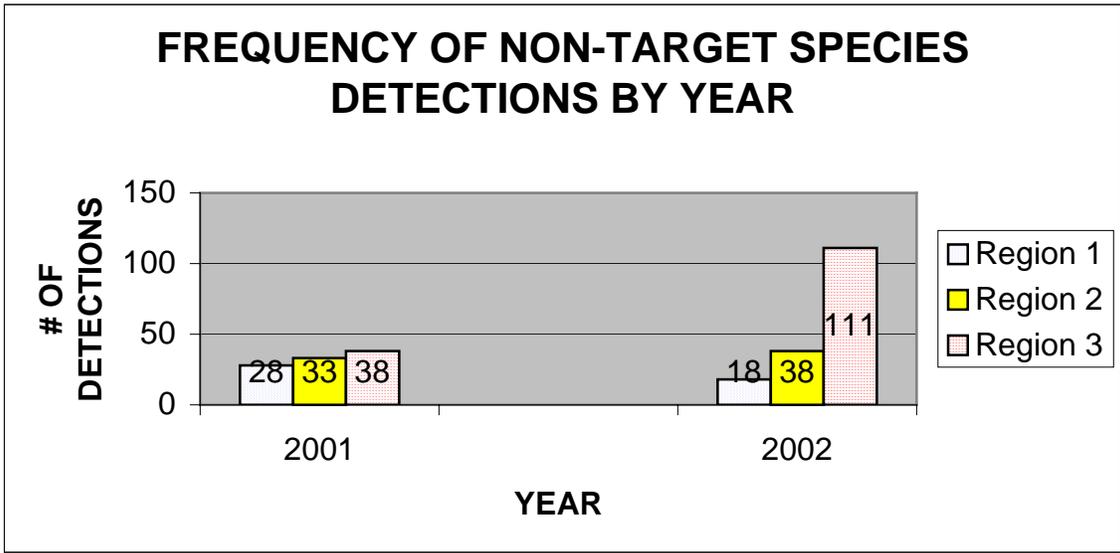


Figure 3. Frequency of non-target species detections per region by year in Eastern Wyoming.

STATUS OF SWIFT FOX ON NATIONAL PARK SERVICE LANDS

DAN LICHT, National Park Service, Badlands National Park, Cedar Pass R. 240
Interior SD 57750

Swift fox appear to be mostly absent from National Park Service lands. A sighting was reported from Agate Fossil Beds National Monument in October of 2002 by park staff. The park is located in western Nebraska, on the periphery of the species current range. Other than that report, there were no credible reports in 2002 from any National Park Service units. Mammal inventories (primarily for small mammals) were initiated at several park units in 2002; however, they did not record the presence of swift fox. Badlands National Park continues to conduct nighttime spotlight surveys for black-footed ferrets; these efforts have not detected any swift fox. Mammal inventories will continue at several park units in 2003; the inventories will include the use of automated motion-sensing cameras and bait stations.

Badlands National Park has received funding for a swift fox reintroduction at the park. The reintroduction effort is being closely coordinated with the reintroduction of swift fox at the Turner Bad River Ranch near Pierre, South Dakota. The park anticipates releasing swift fox in the late fall of 2003. The park reintroduction effort will include a research component that documents coyote movements and densities prior to the release. This information will be used in identifying optimal fox release locations and interpreting fox survival and success. The primary park contact for the park's fox reintroduction program is Greg Schroeder (605-433-5269).

In February of 2003, Cay Ogden of the NPS Inter-mountain Region queried parks in that region for swift fox reports and status. Specifically, she asked; 1) have you had any sightings of swift fox reported in the past year or two, 2) do you consider the park to have suitable habitat for this species, and, 3) is there a potential for reintroduction of swift fox at the park? She received the following responses from park staff (edited for clarity).

Bent's Old Fort NHS: We have swift fox reports from around the fort up on the upland out of the river valley, but not in the park. Swift fox might move through, but we don't have the right environment for them. We have some restored upland prairie on the north side, but it would be too busy with human activity for the foxes. No, I don't think the park would be suitable for reintroduction because there are small populations around here anyway and because our suitable habitat is too small to sustain a population.

Washita Battlefield NHS: From what I have read, they have not been here in recorded history.

Devil's Tower NM: No sightings, no suitable habitat, and no potential for reintroduction.

Lake Meredith NRA: I have not heard of any past swift fox sightings in or near the park. They have been sighted in two of the three counties Lake Meredith resides in according to Davis and Schmidley in "The Mammals of Texas." The majority of the park is not typical High Plains habitat of short grass prairie, but rather, is composed of steep brushy slopes and riverine habitat of the Canadian River Breaks. So the park may be marginal for reintroduction. We do have day hunting about 6 months of the year. We get heavy public participation during deer season and quite a few folks for turkey, dove, and quail. Trapping has been prohibited in recent years. This end to trapping has led to an increased coyote population.

Fort Laramie NHS: Fort Laramie has red fox; however swift fox have not been seen. I understand they were in this area historically.

SUMMARY OF SWIFT FOX INFORMATION FOR THE NATIONAL GRASSLANDS 2002

BOB HODORFF, USFS Fall River Ranger District, P.O. Box 732, 1801 Highway 18
Truck Bypass, Hot Springs, SD 57747

**DAKOTA PRAIRIE GRASSLANDS
LITTLE MISSOURI NATIONAL GRASSLAND
SHEYENNE NATIONAL GRASSLAND
CEDAR RIVER NATIONAL GRASSLAND
GRAND RIVER NATIONAL GRASSLAND**

No formal surveys were completed. We had no incidental sightings in FY2002 (or for that matter, in calendar year 2002 to date).

Contact: Dan Svingen

FORT PIERRE NATIONAL GRASSLAND (FPNG) REPORT 2002

Turner Endangered Species Fund (TESF) has released about 20 swift fox on Ted Turner's Bad River Ranch west of FPNG. Two of the radio-collared foxes from the reintroduction effort were later located on the National Grassland. A collar on a male was heard in a line of hills a little over a mile from a ranch base. Signals from a female's collar were heard coming from a prairie dog town about seven miles away. The female's collar has not been heard in some time. TESF continues to monitor from the air and land. Direct swift fox releases may occur on FPNG in the future.

Contact: Glenn Moravek

OGLALA NATIONAL GRASSLAND REPORT 2002

No formal surveys were completed. There have been incidental sightings of swift on the Oglala National Grassland but there is no evidence of a resident population.

Contact: Jeff Abegglen

THUNDER BASIN NATIONAL GRASSLAND REPORT 2002

No formal surveys were completed, apart from surveys completed by the Wyoming Game and Fish Department in 2002. There is a resident population of swift foxes on the Thunder Basin Grasslands.

Contact: Tim Byer

CIMARRON NATIONAL GRASSLAND REPORT 2002

No formal surveys were completed. There is a resident population of swift foxes on the Cimarron Grasslands.

Contact: Dan Garcia

COMANCHE NATIONAL GRASSLAND REPORT 2002

No formal surveys were completed. There is a resident population of swift foxes on the Comanche Grassland.

Contact: Dan Garcia

BUFFALO GAP NATIONAL GRASSLAND REPORT 2002

WALL RANGER DISTRICT

No formal surveys were completed. Conata Basin is a Black-footed Ferret reintroduction site and many hours of spotlighting were completed on the prairie dog colonies in Conata Basin and the surrounding areas (including Badlands National Park). No swift fox observations were made in 2002. We are unable to confidently state whether or not a population exists on or near the Wall Ranger District at this time due to the lack of field observation data. Further, we strongly suspect that no swift population exists on the Wall Ranger District.

The Badlands National Park, which is adjacent to the National Grassland, is planning to release swift fox in the fall of 2003. The National Park Service is developing an agreement with the Forest Service concerning the reintroduction.

Contact: Doug Sargent

PAWNEE NATIONAL GRASSLAND

Formal surveys were conducted in summer of 2002. See attached report.

Contact: Mark Ball

FALL RIVER RANGER DISTRICT

Formal surveys were conducted in summer of 2002. See attached report.

Contact: Bob Hodorff

SWIFT FOX SURVEY FOR 2002 PAWNEE NATIONAL GRASSLAND

INTRODUCTION AND BACKGROUND

The swift fox (*Vulpes velox*) is endemic to the short and midgrass prairies of western North America. It is conspecific with the kit fox (*Vulpes macrotis*) of the American southwest. The swift fox has declined over much of its former range especially the northern sub-species (*V. velox hebes*). Over hunting, trapping and the poisoning programs promulgated against gray wolves and coyotes, is believed to be responsible for the decline. The fox is listed as Endangered by Canada and the State of Nebraska. It is a Candidate Species under the Endangered Species Act of 1973, as amended, for Colorado and Endangered in Canada. Swift fox is identified as a sensitive species in the Forest Plan (1997), as amended, for the Arapaho and Roosevelt National Forests and Pawnee National Grassland.

The status of swift fox in Colorado, and in particular, the Pawnee National Grassland is currently unknown, but thought to be stable or increasing (**Fitzgerald et al, 1994**). The Grassland is considered important habitat for this small canid.

To manage for a viable population of swift fox a multitude of information must be gathered on population size, distribution, ecology, and the effects of different management practices on the species.

Little information specific to the Grassland is available on the species. A study by **Loy (1981)** identified some of the species ecological relationships and some occupied habitat on the western half of the grassland. We will utilize this information to help identify potential areas to survey for occupied habitat. The University of Northern Colorado is currently heading up several efforts fill in the informational gaps.

Identifying potential habitat is the first step in developing a sound management strategy. The second step is to identify occupied habitat, one of the purposes of this annual survey. Cooperation with the Colorado Division of Wildlife, the U.S. Fish and Wildlife Service, and utilization of the expertise available through the University of Northern Colorado and Colorado State University will be necessary in the development of this strategy.

The Forest Service is a multiple use agency. Dispersed recreational use of the Grassland is multiplying at a steady rate as the Front Range population turns away from the mountains to discover their heritage on the Great Plains. Other uses also have the potential to effect swift fox habitat. It is important to gather enough information to proactively manage for a viable population prior to irretrievable or irreversible commitment of swift fox habitat to other uses due to ignorance of the species needs. Over a number of years this survey information should help establish a pattern of use by swift fox on the Grassland identifying the key areas of habitat.

METHODS

A standard survey route was established through potential swift fox habitat in 1998. Nocturnal surveys were conducted for three nights in the month of September. September was chosen because the young dispersing and the weather is reasonably comfortable for the surveyors. Approximately 6 hours of continual spotlighting was conducted per night. Survey times, total survey hours, mileage, and other pertinent information were recorded on survey data sheets (Appendix A). A survey crew of two provided adequate coverage on both sides of the vehicle.

The crew traveled the survey route at a speed of not more than 20 mph sweeping areas to the front and sides of the vehicle with 1,000,000 candlepower spotlights. Observations were recorded when swift fox were seen and/or the swift fox eye shine. Swift fox eyes shine is either amber or green. Animals are often attracted to the first pass of the spotlight causing them to be sighted on subsequent passes. Therefore the spotlight passed at least twice over the field of view. Positive identification of all animals, swift fox or not, was attempted and recorded, before continuing the survey.

RESULTS AND DISCUSSION

The swift fox surveys for 2002 were conducted from September 3rd to September 5th. A total of 292 miles were surveyed and approximately 22 hours were expended over the three survey nights. Twenty-two swift fox were confirmed during the survey. This compares to 39 in 2001, 80 in 2000, 45 in 1999, 56 in 1997, 54 in 1996, 37 in 1994, 28 in 1993, 30 in 1991, and 14 sightings during the 1990 survey.

Usually some observation of eye shine that appears to be fox, from physical and behavioral characteristics, cannot be confirmed. This is often a result of distances being too great, lack of access due to fencing, terrain or land ownership. These occurrences are also mapped as they may provide information useful for future efforts. Five unconfirmed sightings occurred in 2002.

The fox appears to be active during all hours of darkness. Observations were made at a fairly consistent rate from dusk to dawn. Spotlighting can continue into dawn until the spotlight is barely visible on the ground as reflected eye shine is still visible. In 2002, surveys were conducted between the hours of 8:00 PM to 4:00 AM. The majority of the observations occurred while lone swift fox were on open prairie as they went about their nightly routine. There was one observation of a pair of swift fox.

Reaction of swift fox to the spotlight varies. Some have been observed running from the light, while others take advantage of the light to aid in foraging activities.

Spotlighting appears to be an effective method for locating swift fox on shortgrass prairie. Almost all sightings occurred on shortgrass types, which were grazed. Over the 10 years of survey, only two swift fox were observed in stubble fields.

Swift fox have been observed utilizing cropland in Kansas, where the cropland is isolated from native prairie habitat. It appears that swift fox prefer native shortgrass prairie on the Pawnee National Grassland. A few swift fox, in previous surveys, were observed in a four-wing saltbush type with a moderately grazed shortgrass understory. Go-back vegetation and short grass types with patches of taller native grasses such as western wheatgrass (PASM) or needle and thread (STCO) appear to be utilized as readily as pure shortgrass, as long as they are moderate to heavily grazed. On the Grassland swift fox are rarely sighted where grass cover is taller than 6 inches, as found on Conservation Reserve Program (CRP) land or crested wheatgrass pastures. However, there is one CRP field where three fox were observed in a shortgrass patch within the field in 1993. Two unconfirmed swift fox observations were made in this same field in 1994. An additional two confirmed swift fox moved from adjacent shortgrass habitat into the field after being spotlighted for several minutes in 1996. This field presumably contains a den site. One observation occurred in a CRP field on the east half of the Grassland in 1996 and no observations were made in 1997 or 1999.

Confirmation of sightings is more difficult in midgrass or shrub habitats when eye shine is located at a distance or vehicle access is restricted. It is common to only see a glimpse of eye shine, as many fox are not overly interested in the spotlight. Immediate follow up by driving towards the site helps to recapture the animal's attention and positively identify the species. If vehicle access is restricted, repeated sweeps of the spotlight will usually recapture the animals attention. At times observers working in tandem, one person looking through binoculars while the other operates the spotlight, has resulted in additional swift fox sightings in the distance where eye shine was not visible to the naked eye.

Sightings of swift fox were the lowest observed for all survey years except 1990. Results from 2002 were approximately half of the 39 observed in 2001. This sharp decrease in sightings is speculated to be drought related. Drought affects swift fox by reducing available prey, which leads to starvation of both pups and adults and potentially to a temporary reduction in population size. Swift fox have been removed from the Candidate Species list under the Endangered Species Act, as amended (P.Gober, Swift Fox Conservation Team, 2000 Annual Coordination Meeting, Jan.23-24, 2001)

THE SURVEY CREW CONSISTED OF TWO PEOPLE PER SURVEY PERIOD:

Mark Ball, USDA, Forest Service. Surveyed September 3th, 4th.

Richard E. Hill, USDA, Forest Service. Surveyed September 4th, 5th.

Steve Kittrell, USDA, Forest Service. Surveyed September 3th, 5th.

LITERATURE CITED

Fitzgerald et al 1994

Loy 1981

Appendix A. Survey summary and data sheets.

SURVEY SUMMARY

1. START AND COMPLETION DATES: 9/03/02 to 9/05/02
2. TOTAL HOURS OF SPOTLIGHT SEARCH: 22.0 hours
3. TOTAL MILES SEARCHED BY SPOTLIGHT: 292 miles
4. TOTAL SWIFT FOX OBSERVED BY SPOTLIGHT SEARCH:
22 Confirmed, 4 Unconfirmed
5. LOCATION OF SWIFT FOX OBSERVED: (See nightly data sheet)
6. NARRATIVE DESCRIBING SEARCH TECHNIQUE USED: (See report)
12. COPIES OF FIELD DATA SHEETS. (Attached)

THE FOLLOWING SPECIES WERE OBSERVED DURING THE SURVEY:

Horned Lark	Coyote
Badger	Burrowing Owl
Ord's Kangaroo Rat	Burrowing Owl
Cottontail Rabbit	Black-tailed Jackrabbit
White-tailed Jackrabbit	Striped Skunk
Mule Deer	Antelope
Domestic House Cat	Domestic Cattle
Domestic Horse	Raccoon
Porcupine	Falcon

NIGHTLY DATA SHEET

1. DATE: 9/03/2002
2. HOURS SPENT SEARCHING: 8:00 PM to 2:25 AM
3. MILES SEARCHED: 82.8 miles
4. SWIFT FOX, LOCATION, TIME, HABITAT:

CONFIRMED

One	NE NE	Sec 1	10N	64W	9:05 PM	Shortgrass
One	NWNW	Sec 7	8N	63W	11:26 PM	Shortgrass
One	NE NW	Sec 32	9N	62W	23:47	Shortgrass
One	NE SE	Sec 2	9N	64W	1:16 AM	Shortgrass
One	NWNW	Sec 25	10N	64W	1:27 AM	Shortgrass

TOTAL CONFIRMED: 5

UNCONFIRMED

One	SE SE	Sec 35	11 N	65 w	8:55 PM	Shortgrass
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TOTAL UNCONFIRMED: 1

5. PHOTOS TAKEN: None
6. NAME, ADDRESS, PHONE, & AGENCY:

Mark Ball
USDA Forest Service
660 "O" Street
Greeley, CO 80631
303-353-5004
Wildlife Biologist

Steve Kittrell
USDA Forest Service
660 "O" Street
Greeley, CO 80631
303-353-5004
Biological Technician

7. WEATHER CONDITIONS: Wind NW < 5mph, Partly Cloudy Skies 72 Degrees F.
8. METHOD USED TO SEARCH: Vehicle/spotlight.
9. MAPPED SURVEY ROUTE AND LOCATION:

NIGHTLY DATA SHEET

1. DATE: 9/04/2002

2. HOURS SPENT SEARCHING: 8:00 PM to 2:36 AM

3. MILES SEARCHED: 84.6 miles

4. SWIFT FOX, LOCATION, TIME, HABITAT:

CONFIRMED

One	SE	SE	Sec 33	8N	60W	8:08 PM	Shortgrass
One	NE	NE	Sec 28	8N	60W	8:15 PM	Shortgrass
One	SE	SE	Sec 21	8N	60W	8:19 PM	Shortgrass, by plya
One	SE	NE	Sec 21	8N	60W	9:23 PM	Shortgrass
One	SE	SW	Sec 24	8N	60W	9:06 PM	Shortgrass, by plya
One	NW	NW	Sec 2	8N	60W	9:20 PM	Shortgrass / saltbush
One	NW	SW	Sec 34	10N	59W	10:07 PM	Shortgrass / snakeweed
One	SW	NW	Sec 15	9N	58W	10:51 PM	Shortgrass
One	NW	NW	Sec 8	8N	58W	11:27 PM	Shortgrass
One	SE	SW	Sec 15	8N	59W	12:02 AM	Shortgrass
One	NE	NE	Sec 33	8N	59W	12:43 AM	Shortgrass
Two	SW	SW	Sec 26	8N	57W	1:33 AM	Shortgrass
One	NW	SW	Sec 26	8N	57W	1:42 AM	Shortgrass

TOTAL CONFIRMED 14

UNCONFIRMED

Two	SE	SE	Sec 31	10N	58W	10:30 PM	Shortgrass / saltbush
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TOTAL UNCONFIRMED: 2

5. PHOTOS TAKEN: None

6. NAME, ADDRESS, PHONE, & AGENCY:

Mark Ball
USDA Forest Service
660 "O" Street
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303-353-5005
Wildlife Biologist

Richard E. Hill
USDA Forest Service
660 "O" Street
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303-353-5004
Biological Technician

7. WEATHER CONDITIONS: Wind Calm, 69 Degrees F, High Clouds

8. METHOD USED TO SEARCH: Vehicle/spotlight.

9. MAPPED SURVEY ROUTE AND LOCATION:

NIGHTLY DATA SHEET

1. DATE: 9/05/2002
2. HOURS SPENT SEARCHING: 8:00 PM to 4:00 AM
3. MILES SEARCHED: 124 miles
4. SWIFT FOX, LOCATION, TIME, HABITAT:

CONFIRMED

One	SE	SE	Sec 19	9N	56W	9:18 PM	Ag.Field/stubble
One	NW	NW	Sec 8	10N	61W	2:09 AM	Shortgrass
One	SW	SW	Sec 35	10N	65W	3:52 AM	Shortgrass

TOTAL CONFIRMED 3

UNCOMFIRMED

One	NW	SW	Sec 14	10N	65W	3:37 AM	Shortgrass
One	SE	SW	Sec 23	10N	65W	3:46 AM	Shortgrass

TOTAL UNCONFIRMED 2

5. PHOTOS TAKEN: None
6. NAME, ADDRESS, PHONE, & AGENCY:

Richard E. Hill
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660 "O" Street
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303-353-5006
Biological Technician

Steve Kittrell
USDA Forest Service
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Greeley, CO 80631
303-353-5004
Biological Technician

7. WEATHER CONDITIONS: Wind SE < 5mph, Partly Cloudy skies, 70 degrees F.
8. METHOD USED TO SEARCH: Vehicle/spotlight.
9. MAPPED SURVEY ROUTE AND LOCATION:

**2002 SWIFT FOX SURVEY
FALL RIVER RANGER DISTRICT
BUFFALO GAP NATIONAL GRASSLANDS
NEBRASKA NATIONAL FOREST**

LYNN ALLAN HETLET, USFS Fall River Ranger District, P.O. Box 732,1801
Highway 18 Truck Bypass, Hot Springs, SD 57747

INTRODUCTION

Surveys to determine locations of swift fox (*Vulpes velox*) were conducted on the Fall River District of the Buffalo Gap National Grassland from 1989 through 2001. Of the annual routes established in 1994, only the Ardmore route still shows evidence of a swift fox population. This route was surveyed, and additional acres were surveyed in the proposed black-footed ferret introduction area.

SURVEY AREAS

The Ardmore route surveyed annually surveys 2,720 acres (Map 1). Additionally, 9,600 acres were surveyed in the proposed black-footed ferret area (Bochert and Gamet Allotments—Map 2).

METHODS

Approximately 120 man-hours (including travel time) were spent establishing and utilizing bait stations. A bait station consists of a circular area 18 to 20 inches in diameter cleared of all vegetation. A mixture of fine masonry sand and vegetable oil is spread over the area and smoothed. The mixture consists of one cup of oil to one gallon of sand.

Approximately one-half ounce of canned Jack mackerel is placed in the center of the station to serve as bait. Because of the swift fox's primarily nocturnal habits, the stations are baited during the early evening hours to decrease the time of drying and therefore insure a high degree of scent dispersal.

This sand/oil mixture will hold a track impression quite well, and if insects such as grasshoppers and carrion beetles are not abundant enough to be disturbing the bait and sand, (through either digging or simply hopping through it), it is not necessary to check the sites early; however, the slanting light of the early hours greatly facilitates seeing details in the track.

Bait stations were placed approximately 1/4 mile apart in the Ardmore area and

the proposed ferret introduction area, following ridge tops where possible to give better scent dispersal on the evening downdrafts.

RESULTS AND DISCUSSION

The area surveyed in the Bochert and Gamet Allotments (Map 2) resulted in tracks of striped skunk at 16 station, cottontail species at 1, American badger at 1, coyote at 15, prairie dogs at 2, and, surprisingly, unidentified small rodents at 33, from a total of 180 bait station-nights. (Tables 1 & 2). No swift fox tracks were found in the area. The presence of coyotes could be a factor in their absence.

The number of small rodents visiting the bait stations was very unusual; in fact, in the past they have not been recorded, as they were infrequent, and our interest has been in the carnivores in the area. Due to the unusual frequency of them in the Bochert/Gamet area this year, they were recorded. Twenty-one (64%) of the visits to the stations by small rodents occurred the first night of the survey. A possible explanation for this could be a protein deficiency among the rodent population that was met by one feast on the mackerel (only 6 [18%] of the stations were visited more than one night by rodents—and these could easily have been different rodents than visited the first time). Another possibility is that it is tied into the drought conditions in the area—is the fat content—or the protein content-- of seeds produced during a drought lower than those produced under normal conditions?

The annual survey in the Ardmore area resulted in swift fox tracks at 29 bait stations over the three nights, and striped skunk at 4 stations, out of a possible 93 bait station-nights (Table 3).

Table 1. Tracks on Gamet Allotment (Sept. 3-5)

Bait Station	Day 1	Day 2	Day 3
1	rodent	rodent	
2			
3	rodent		
4		CALA	
5			rodent
6	MEME		
7	SYSP	TATA	
8		MEME	rodent
9		MEME	MEME
10			
11			
12			MEME
13	CALA		
14			
15			MEME
16			
17			
18			CALA
19			
20		rodent	
21		CYLU	CYLU
22			
23			

MEME – striped skunk

CALA – coyote

SYSP – cottontail species

TATA – American badger

CYLU – Black-tailed prairie dog

rodent – unidentified small rodent species

Table 2. Tracks on the Bochert Allotment (Stations 1-23: Aug. 20, 21, 22; Stations 24-37: Sept. 3-5)

Bait Station	Day 1	Day 2	Day 3
1			
2	rodent	rodent	
3	rodent		
4	rodent		
5	rodent		
6			
7			CALA, MEME
8			CALA
9			CALA
10			CALA
11	rodent		CALA
12			
13	rodent		
14	rodent		
15	rodent	rodent	
16	rodent	rodent	
17	rodent	rodent	
18	rodent		
19	rodent		
20			CALA
21	CALA		
22	rodent		
23			
24			
25			
26	rodent		
27	rodent		
28	rodent	rodent	rodent
29	rodent	CALA	rodent
30	MEME	CALA	
31	rodent		rodent, MEME
32	rodent	MEME	
33			CALA
34	MEME		MEME
35	MEME		CALA
36			CALA, MEME
37		MEME	MEME

CALA – Coyote

MEME – Striped skunk

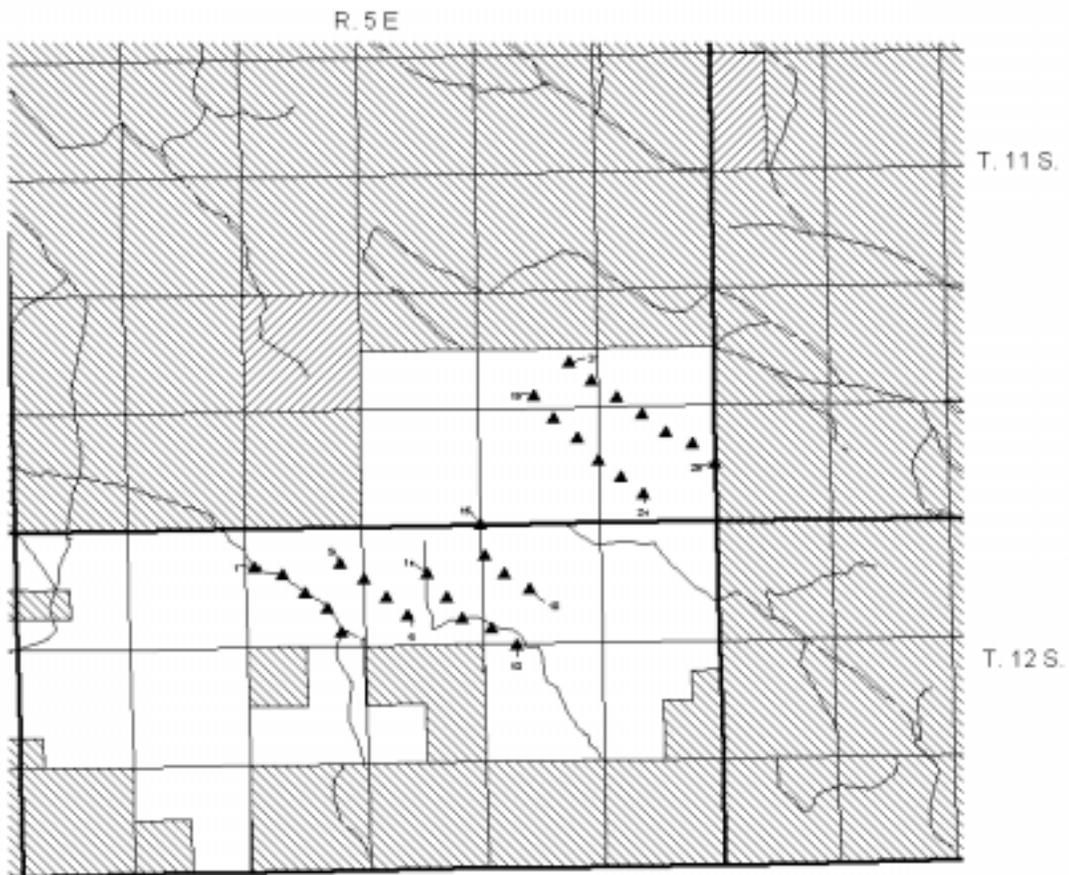
rodents – Unidentified small rodents

Table 3. Tracks on Ardmore Survey Area.

Bait Station	Day 1	Day 2	Day 3
1			
2			
3			
4	MEME		
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19	VUVE	VUVE	VUVE
20			VUVE
21	VUVE	VUVE	VUVE
22			VUVE
23			MEME
24	VUVE	VUVE	VUVE
25	VUVE	MEME	VUVE
26	VUVE	VUVE	VUVE
27	VUVE	VUVE	VUVE
28	VUVE	VUVE	VUVE
29	VUVE	VUVE	VUVE
30	VUVE, MEME	VUVE	VUVE
31			VUVE

MEME – Striped skunk

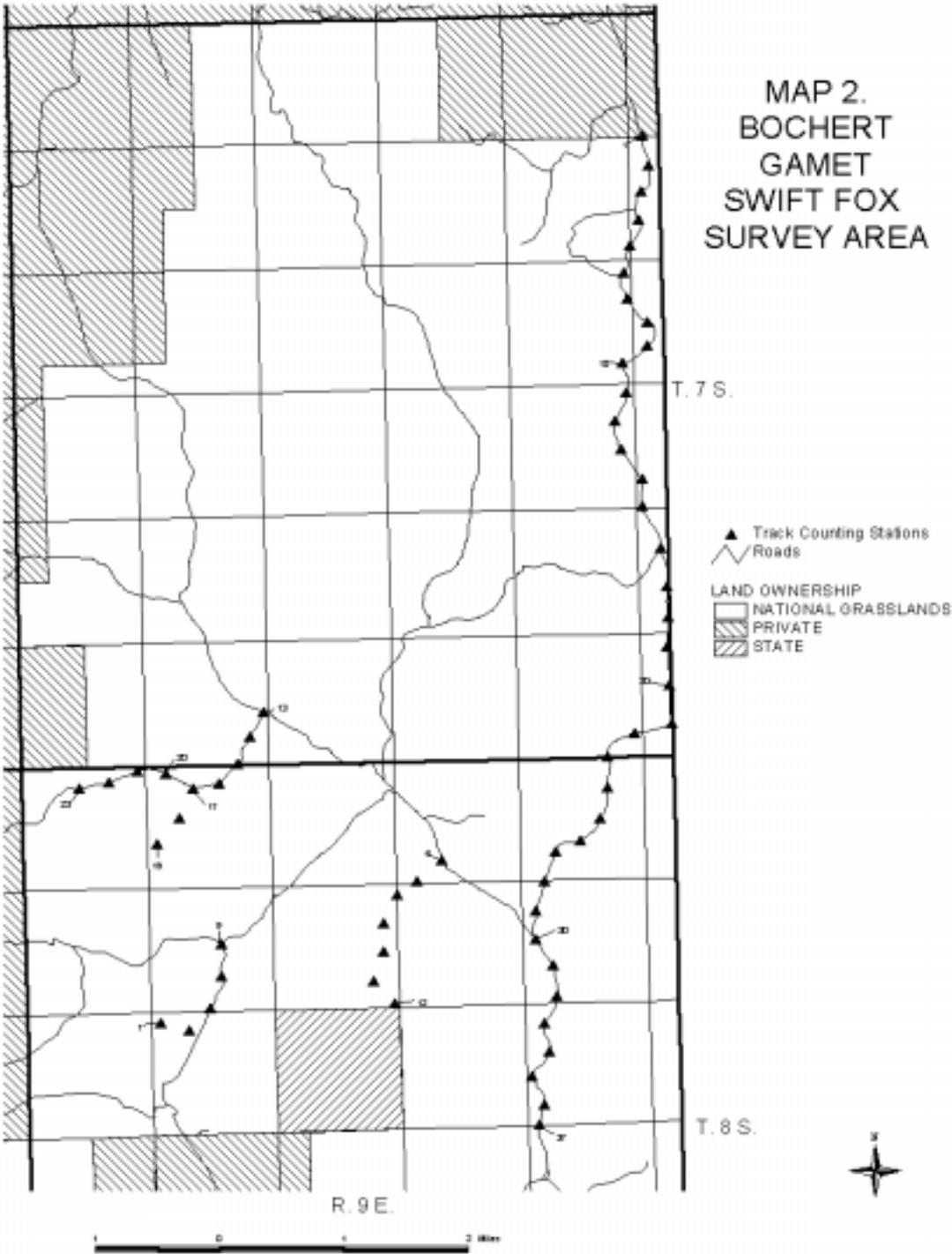
VUVE – Swift fox



- ▲ Track Counting Stations
 - ↗ Roads
- LAND OWNERSHIP
- NATIONAL GRASSLANDS
 - ▨ PRIVATE
 - ▩ STATE

MAP 1.
ARDMORE
SWIFT FOX SURVEY AREA

MAP 2.
BOCHERT
GAMET
SWIFT FOX
SURVEY AREA



MEETING MINUTES
SWIFT FOX CONSERVATION TEAM
September 23, 2002 – Radisson Inn, Bismarck, ND

Chair Richard Bischof began the meeting at 1:10 PM with introductions. No changes were made to the agenda.

AGENCY REPORTS

National Park Service

Dan Licht: No resident swift fox are known to occur in NPS Units in the Great Plains. No active surveys are being conducted at most sites. Badlands National Park is in the planning stages of a swift fox reintroduction project.

New Mexico

Chuck Hayes: Robert Harrison is establishing swift fox monitoring procedures for the State of Mexico. Robert has used scat collection as a survey technique – of 99 transects, he found swift fox scat at 79 transects. In New Mexico, scats are typically easy to find; but are more difficult to find in poor habitats. Robert is still working on the protocol, which may include additional variables, such as coyote density. The method may lead to an index of scat densities. Scats can last for more than one year. Scat analysis for 100-200 scats may cost \$18,000. Greg Schmitt retired from New Mexico Game and Fish and has been replaced temporarily by Chuck Hayes. Survey work covers the eastern ¼ of the state. According to Marsha Sovada, researchers in California are using dogs to find kit fox scat. Northern Prairie Wildlife Research Center (NPWRC) would like to initiate a similar study.

Canada

Lu Carbyn: Axel Moehrensclager and Pat Fargay are the new co-chairs of Canadian Recovery Team. (see attached letter from Axel). Lu summarized the Turner Endangered Species Fund's (TESF) trapping efforts in Wyoming. Thirty swift fox were trapped near Cheyenne (13 adults, 17 juveniles; 12 males, 18 females). All were radio-collared and disease-tested. TESF will use hard and soft releases, with hard releases planned for September 30, 2002. All SFCT members are invited to attend the release (see attached letter from TESF).

Northern Prairie Wildlife Research Center/BRD

Marsha Sovada: Marsha is involved in Badland's release plan; also involved in a BRD proposal to use dogs to collect scat for DNA analysis; paper has been submitted regarding monitoring techniques tested in Kansas (paper will be presented at TWS meeting this week), analyzing use

of presence/absence data. NPWRC continues to maintain a swift fox bibliography (see attachment), and she asked to be notified of any relevant studies or reports. Swift fox book is in the final stages, possibly finished by end of 2002 (26-27 chapters), available next year. Lu commented on the desired quality of the publication and the time involved in publishing.

Bureau of Land Management

Julie Moore: BLM in Colorado wants to add swift fox to their sensitive species list to increase emphasis. BLM in Montana – southeastern Montana survey work will soon be completed; BLM in Havre, Montana is conducting swift fox surveys in oil/gas areas, using USFWS funds. BLM would like to do more with swift fox to avoid federal listing.

Wildlife Services

Jeff Green: APHIS' only relevant activity is to report swift fox incidental take during other activities. SD, NE, KS – no recent APHIS take. Figures for other states: NM – 10 in FY2001; OK – 5 during past 10 years; CO – 7 in last 5 years; TX – none in recent history; WY – 2 in FY2002; MT – none in last 13 years at least. Nearly all incidental takes resulted from use of M44s. All traps have pan-tension devices, which nearly always avoids swift fox take. According to Sovada, research on M44s showed that they could not be adjusted to avoid swift fox.

Montana

Brian Giddings: (Powerpoint presentation) In 1978, the first swift fox was recorded in Montana in recent history. In 1993, status report was completed, including previous recorded occurrences. Amy Zimmerman conducted a research project in 1996-97 to document that a resident, reproducing population existed. The study also included survivorship indicators, mainly in northcentral Montana; FWP conducted statewide distribution surveys during falls, mainly with track and sign-searching in 1998 and 1999. Cooperated with Canada during 2000-01 on international survey to help estimate populations, with funding from BLM and National Fish and Wildlife Foundation (NFWF.) The Blackfeet Tribe, in cooperation with Defenders of Wildlife and Cochrane Institute has completed 5 years of reintroduction to date. Current work – should complete statewide distribution survey this fall, through a contract with Craig Knowles, using Kansas' township survey method (50 townships.) Would like to work on habitat issues and delineate a corridor of prairie habitat to connect populations between Canada and the other known population in southeastern Montana, using habitat and landownership information. This should also help land managers incorporate swift fox into management planning. Sightings and one carcass of a swift fox have been reported on the other (south) side of Missouri River in Montana (source – Canadian reintroduction). Hope to resurvey areas in 5-7 years.

Surveys are targeting BLM lands, with additional opportunistic areas, such as state school lands.

Kansas

Matt Peek: Swift fox is a legally harvestable species; 32 animals tagged the past season; summary of state pelt tagging was included in SFCT 2001 report. They also record all observations and carcasses seen year-round. Track surveys were begun on August 15 and are now concluding. Conditions are poorer than in previous years. Surveys were planned to coincide with low traffic, but road conditions were crusty this year and did not hold tracks well (first year observation of Matt). Will continue track surveys for two more years and then reassess the use of this method. Keep canine tooth from any incidental carcasses found.

Natural Resources Conservation Service

Jerry Jasmer: Jerry described the various services offered by his agency; each state has an NRCS wildlife biologist, with rare species attention focussed on state or federal listed species. In Nebraska, NRCS shares life history information with landowners. Jerry suggested that SFCT state members should provide NRCS with distribution maps in their respective states. Opportunities in the farm bill include seeding mixtures in CRP. New Farm Bill may include more opportunities for influencing landowner participation to benefit rare species. WHIP – planned grazing systems in NE to benefit grassland species. Grassland Reserve Program – small number of acres nationwide, but will hopefully protect grassland acres against development and maintain as grassland/rangeland. SFCT members should consider possibilities to influence State Technical Committee within their states. NRCS needs management recommendations for swift fox enhancement on private lands.

USFWS

Pete Gober: They remain interested in species' status and in results of swift fox distribution work..

Texas

Paul Robertson: His agency remains interested in promoting swift fox needs in Texas. Warren Ballard's research indicated that swift fox use agricultural lands in Texas as refugia, due to coyote influence on swift fox. They are finishing a prairie dog inventory, and they will then select focus areas for conservation and incentives. Will include Rita Blanca National Grassland and adjacent private lands to encourage prairie wildlife species conservation. Prairie dog focus areas may total 6 million acres and will help swift fox. Texas will actively pursue State Conservation Agreements because of lack of federal lands. Have been discouraged from pursuing EQIP funds, but plan to continue pursuit of this funding. Also plan to use

State Wildlife Grants funds to prairie species. An additional \$700,000 will go to Warren Ballard for prairie wildlife species research.

Colorado

Francie Pusateri: Gary White, Colorado State University, is working on monitoring design (mark-recapture method); they want to expand on previous research and expand to adjacent agricultural lands, esp. those adjacent to Kansas. Hope to start in November and finish during spring of 2003. Pawnee National Grassland results suggest drought effects on swift fox population recruitment. Unknown if this was localized or statewide. Much of grassland acreage is privately owned, so conservation efforts in Colorado are focused on private lands. Colorado's Species Conservation Partnership (GOCO) has \$4-5 million in state match dollars available to focus on declining prairie species. Targeting swift fox, prairie dogs, mountain plovers, and burrowing owls. Pilot landowner incentive program will be rolled into the new landowner program. Will make use of Farm Bill third-party assistance grants – plan to put people in place to work with NRCS on new Farm Bill programs. Prairie dog planning effort in Colorado will be a grassland species conservation plan, with primary focus on black-tailed prairie dogs. Hope to complete the plan by summer of 2003. Comment by Lu – foxes captured in WY, near Cheyenne, were thinner and may have been food-stressed and also observed more often during the daytime this year than in previous years.

Wyoming

Martin Grenier: TESH captured foxes this year and assisted in annual monitoring in association with translocation (method was track plates). 2002 surveys in progress; 2001 results – 3 regions were surveyed (10 counties in eastern Wyoming). 37 foxes detected in 48 known locations (4.7 track nights needed to detect a swift fox). Question about ability to support translocation – Martin believes the Cheyenne area population can easily support trapping of 30 foxes/year for TESH project.

Badlands National Park

Greg Schroeder: No swift fox detections during spotlighting – possible recent sighting was probably a transient animal.

North Dakota

Jacque Gerads: Presently searching 35 quarter sections (found raccoons and coyotes), to conclude during spring of 2003; will probably do searching every 2-3 years instead of annually. Keep track of incidental sightings – none recently. Craig Knowles reported on a North Dakota den site observation in Sioux County 12-13 years ago. One of the adults was road-killed and sent to a museum in New York.

Nebraska

Richard Bischof: Used scent-stations as survey method last year. Had problems with excessive rain, so switched to track surveys this year, especially in Sioux County. Found very little evidence, even of coyotes, because of soil conditions and access issues (restricted to roads). Next plan is to combine the two methods (spring – scent stations within selected townships, with searching limited to scent stations). Prairie dog conservation planning – habitat suitability model was completed for black-tailed prairie dog and was easily modified for swift fox. This tool may help in designing habitat corridors.

Oklahoma

Julianne Hoagland: Will begin track searching again next year. Mapped habitats (3-km buffers) around previous track search results, using Oklahoma's vegetation classification and DOQQs, producing maps indicating historic and current shortgrass prairie habitats. Also analyzing 1894 records made as lands were being evaluated for agricultural purposes in Oklahoma's panhandle.

South Dakota

Eileen Dowd Stukel: Summarized current survey work conducted by Zach Olson and Jon Jenks of SDSU in Fall River County, funded with Section 6 dollars. Survey methods included scent stations and searching for sign. Private land access was a problem because of drought conditions and concerns about fire. Sign searching of trackable surveys indicated 2 swift fox tracks on Buffalo Gap National Grassland and 12 scent station hits for the area. More detailed results will be included in the SFCT 2002 annual report.

COMMITTEE REPORTS

Education

Team newsletter and meeting news release were completed this year. Richard will draft a news release regarding this year's meeting. The next issue of the newsletter should be prepared by mid-2003 and include results from the NFWF study. The group revisited the landowner brochure idea originally proposed by Bob Sullivan. This could help meet NRCS needs. Lu will pursue this idea for SFCT review. Question about how specific or general the content should be and how it might meet state-specific needs. The Defenders' burrowing owl brochure for private landowners may help in brochure design. Discussion of web-sites - SFCT should have a team-specific web-site. Marsha will ask if NPWRC could serve the site, which could include annual reports, news releases, state updates, and team purpose and activities. Pete also offered his agency's assistance in education activities and web-site maintenance.

Habitat and Research

Previous year focused on getting NFWF grant for habitat work at NPWRC. Brian Ocepek reported that NFWF is presently funding 6 swift fox grants (NPWRC, BLM in Montana, Montana Fish, Wildlife and Parks, Defenders and Blackfeet Tribe release, TESH release at Bad River Ranches in South Dakota, and Wayne Ballard's Texas Tech. University research). Their focus is on education, reintroduction, and on-the-ground management projects. Funding source depends on project specifics (BLM, USFWS, NRCS). Presently funding a research project to use dogs to locate bear scat in Alaska and Alberta (NFWF funding possibility). SFCT NFWF grant - \$22,000 for personnel and materials and supplies; required \$44,000 in nonfederal match, which can include in-kind services. About \$12,000 has been committed to date, about half of what is needed. Richard needs commitment letters to cover previous work (March 2000 through 2004) to obligate NFWF's grant. Marsha needs swift fox data points from everyone with data; Amy Zimmerman will conduct the project under Marsha's direction, beginning work on October 1, 2002. Data can have limitations for use; data remain property of data supplier.

BLACKFEET SWIFT FOX UPDATE

Defenders of Wildlife

Minette Johnson: Defenders was formed in 1949 as Defenders of Furbearers. Projects have included wolves, prairie dogs, black-footed ferrets. Blackfeet Reservation project – 43 specimens have been collected historically on the Reservation. Swift fox were considered extirpated in Montana in 1969. Defenders partnered with Cochrane Institute and Blackfeet Fish and Wildlife Department in 1998. All Blackfeet animals came from the Cochrane facility. Animals were inspected by Canadian veterinarians prior to transfer to Blackfeet. Late summer releases simulated natural dispersal. Shelters are placed over abandoned badger dens and removed after 10 days; they believe this has helped increase swift fox survivorship. All released animals have ear tattoos and half have had radio collars, except during first year of release, when none was radioed. Animals were observed for up to 2 weeks by Cochrane personnel. Release numbers: 1998 – 30; 1999 – 15; 2000 - 30; 2001 - 35; 2002 – 22; Total – 122. Breeding documented in 1999, 2000, 2001, and 2002 (10 active den sites). 15-mile dispersal from a den site is the longest seen. Mortalities due to road kills or coyote depredation; necropsies not possible on some carcasses because of equipment problems. Swift fox brochure has been distributed among local community members. Complete annual reports of progress. Still have some radio-collared foxes from 1999. Plan to increase monitoring this year; will be replacing radio collars and placing new collars; doing hair sample collection; plan to try

using scat-finding dogs. May not be searching for radioed foxes far enough – have been using flights more and ground tracking less than in the past. Have shared information on project in many popular media outlets. Defenders' Carnivore Conference will include swift fox papers. Independent review of reintroduction project is underway, and results will be presented at Carnivore Conference. Defenders has spent \$211,000 on the project. Cochrane and Defenders may work with the Blood Reservation in future. Question about coyote control – none conducted on Blackfeet Reservation.

REINTRODUCTIONS

Bad River Ranches

Lu Carbyn: Area was evaluated, foxes obtained; and first release planned for September 30, 2002. Three people will monitor radioed foxes from the ground and air. Soft release will be used next year. Blood samples were taken, and swift fox were inoculated against rabies and distemper. Coyote control on BRR is ongoing and will continue, both on the ground and from the air. TESH has cooperated with Fort Pierre National Grassland and Lower Brule Sioux Tribe on this release; TESH also providing assistance to Badlands National Park in their reintroduction planning. Lu's perspective is that the significance of this effort is less about success of this particular project but more importantly about identifying parameters that may limit species survival in an area.

Badlands National Park

Greg Schroeder: Received funding from USGS - BRD and National Park Service to begin reintroductions next year. Plan to release 30 radioed foxes/year for three years. Will also be monitoring coyotes with radios to hopefully place swift fox in areas with lower coyote densities. Uncertain if they will use shelters, which haven't been used for wild-captured foxes (downside is aerial perch and possible coyote attractant). Don't plan any coyote control associated with swift fox release. Hope to monitor dispersal and production. Will address state permitting requirements when they begin the EA process. Wild fox source – Colorado or Wyoming likely. Will coordinate with TESH in selection of sites for trapping of wild foxes. Dragoo – Reintroductions are important opportunities for genetic research, and blood should be collected and stored for future use.

MONITORING, DISCUSSION LED BY ROBERT HARRISON

Monitoring variables might include prey and coyote densities, weather, and other variables besides swift fox numbers. What are states doing? BNP monitors coyote and prairie dog densities and has weather station data in association with black-footed ferret

program. Kansas and Oklahoma record all furbearers during track surveys; this method helps to identify statewide trends only. What level of resolution is needed during swift fox population surveys? Nevada - Very difficult and expensive to obtain more than general population trends among furbearers; state agency efforts are limited by resources. Nebraska - Richard has looked at climate data availability for Nebraska, which is likely available to all. Harvest surveys are dependent on furbearer prices; therefore, they are not good population indicators. Robertson - Important to examine scale in discussing cause and effect relationships. Kansas - Long-term roadside survey and employee information survey conducted. Texas - Coyote data would be extremely difficult to collect and unreliable when completed. Scat transect design in New Mexico - possibility of grouping by region and relating swift fox findings to coyote densities. Groups discussed example of Minnesota's scent station data, which show crude trends at 5+year intervals. Track surveys can yield data on probabilities of detection and occurrence, but not density. Shrub density - an important issue in southern New Mexico and possibly Texas, but probably not an issue in other parts of swift fox range.

END OF SEPTEMBER 23, 2002

START OF SEPTEMBER 24, 2002

NORTH DAKOTA GAME AND FISH DEPARTMENT

**REVIEW OF CONSERVATION STRATEGY OBJECTIVES FOR 2002,
DISCUSSION LED BY BISCHOF**

**6.1.1. (Identify and evaluate the levels of legal protection provided on public lands)
Considerations might include landownership, easement opportunities, and various
degrees of protection by different agencies managing grasslands.**

Montana: Work is in progress

Nebraska: Requested information from state and federal agencies, such as state school lands and Forest Service (What flexibility do managers have over their lands?); This is an important item in Nebraska because of large percentage of private lands, making public lands very important; prairie dog planning problems may cause a shift in direction because of paranoia about prairie dogs.

Colorado: Most swift fox habitat is on private property, so they are focusing on management easements with private landowners for prairie wildlife conservation; Division of Wildlife has commented on BLM and FS planning efforts, which may have conflicting actions for mountain plovers and swift fox.

Gober: - commented about federal planning in southern states and referred to Bob Hodorff's letter (attached), which describes using swift fox as management indicator

species, may serve as an example. The group discussed whether the SFCT should comment on specific plans? FS and BLM representatives on SFCT should keep SFCT and individual members informed of comment opportunities. Ex: BLM Range Management Plans are upcoming and should be monitored for comment opportunities. Julie Moore volunteered to keep SFCT informed about BLM. SFCT needs a FS contact to function in a similar way. Suggestion that SFCT request to be put on mailing list for planning comment opportunities. Martin Grenier will contact John Sidle and Bob Hodorff to pursue this idea further.

Point made that not all strategies are applicable in every state or throughout swift fox range. At a minimum, states should learn about protection/management on various public land types.

6.1.2 (Each State Wildlife Agency will initiate habitat protection agreements with other government agencies for public land.)

Montana: Working on this topic in general, but not only for swift fox, using state working group

Nebraska: Will begin this task after responses received from initial letter of inquiry

6.1.3 (Each State Wildlife Agency is to identify and delineate habitat corridors and blocks through mapping to direct conservation measures, agreements or enhancement efforts.)

This work will be helped by the habitat project being coordinated by NPWRC; reminder that states should provide any helpful data layers, such as vegetation, to Marsha for the habitat project.

6.2.1 (Each State Wildlife Agency will evaluate and prioritize private lands in identified areas to implement land conservation efforts.)

The group discussed opportunities to provide input to local NRCS biologists and extension personnel. Habitat brochure should be helpful in providing information to private landowners.

7.2.1 (Technical committee to provide information and recommendations to state agencies as guidelines to interspecific competitor control.)

Technical committee is probably not needed, since information on interspecific competition is available in literature. Brochure previously discussed should include information on this topic.

7.1.3 (Technical committee to evaluate captive fox releases and make recommendations.)

Evaluation of captive fox release project is completed for Canada; analysis will be included in swift fox book. Other topics within 7.1 are being addressed on a state-by-state basis, depending on individual state priorities and individual opportunities; question about definition of “priority area”; point that prairie dog focus area concept will be relevant to swift fox priority areas; prairie dog focus areas focused on ability to build/maintain complexes, especially of 5,000 acres or more in areas of current occupation; important to look at long-term goal of connecting swift fox occupied areas; what can be done to help expand swift fox into unoccupied areas, such as coyote control.

7.2.2 (SFCT and state working groups will review and incorporate information from scientific investigations that address the adaptability of swift fox to colonize non-native habitats and which evaluate the species’ ability to maintain itself in these habitats.)

This topic is covered in literature; also relevant to NRCS (CRP plantings) and tallgrass plantings, which radioed swift fox avoided in Kansas; CP25 in Kansas now has shortgrass plantings; CO example – shortgrass plantings aren’t being managed and are not valuable to mountain plovers or swift fox; improvement to new Farm Bill should allow burning or other maintenance to make areas more suitable for shortgrass prairie wildlife species; wheat stubble used by swift fox in western Kansas, but associated with better adjacent habitat; what about “higher” wheat stubble that is promoted for pheasants; in general, swift fox like “shorter” stubble, although there may not be a lot of difference in stubble heights

7.2.3 (SFCT and state working groups will identify and report new, continuing or diminishing threats to swift fox population expansion.)

Gober – next annual report should include a SFCT conclusion/statement regarding threats to help USFWS address lack of candidate review document; Pete will work with next report editor on this task.

9.1.1 (SFCT and state working groups will collect and compile current technical literature and management information for distribution through information requests from state and federal managers and other interested individuals.)

This task will be assisted by publication of swift fox book; Montana is publishing an article in their outdoor magazine; most states have similar outlets; new landowner brochure will also help address this task.

9.1.2 (SFCT and state working groups are to provide recommendations on standard management guidelines, beneficial range management practices for swift fox, methods for data collection/database management, and current information on swift fox ecology, management, and research to wildlife and land managers, government entities, land planners, state and federal policy makers.)

This task will be assisted by publication of swift fox book, planned brochure, and planning comment opportunities.

9.1.3 (SFCT will consider cooperating on a joint publication that promotes the scientific basis for conserving prairie species, including swift fox, for distribution to wildlife and land managers.)

Role of swift fox book and planned brochure discussed for meeting this task.

CONSERVATION STRATEGY OBJECTIVES FOR 2004

New proposed strategy

Discussion led by Brian Giddings, global heritage rank: The Nature Conservancy's Science arm, now called NatureServe, currently has assigned a Global Heritage Status of G3 for the swift fox. (See handouts describing ranking criteria and summary of findings.) The G3 rank needs to be reevaluated because of more recent data on occurrence and threats. Individual state ranks can be no higher than the global rank. Brian will contact TNC to learn about ranking responsibility and opportunities to provide comment on revised rank. Discussion about pros and cons of changing global rank; ex: sensitive species list development, but the group agreed that the rank should reflect current level of knowledge.

Swift Fox DNA Specimen Collection/Deposition

Richard previously requested information on carcass deposition to museum and storage and collection protocols. He recommended that local museum use continue for specimen deposition. DNA specimen storage should be coordinated, however. Suggestion that we establish protocol for determining number of blood samples needed/population. Richard contacted the Museum of Southwestern Biology to get recommendations for standardized blood and tissue collection. Issues to be resolved include: what tissue is needed; and what commitment is there to conduct genetic analyses with the tissues. If foxes are being ear-tagged, that punch can serve as the tissue sample; Drago reminded the group of the current genetic research opportunities related to reintroductions.

New strategies:

- Continue development of focal areas - all
- Investigate global heritage rank - Giddings
- Genetic protocol development – Bischof
- States with harvest will pursue harvest information – Texas, New Mexico, and Kansas
- Continue to monitor taxonomic work and its relevance to legal/political issues relating to swift and kit fox
- Coordinate collection of samples for diseases and parasite analysis

Other strategies with no timetable specified:

3.1.3 (Harvest states will initiate pelt tagging and mandatory carcass collection.)

Kansas: Pelt tagging is conducted; concern about lack of tagging of species with low fur value; may allow furdealers to maintain swift fox tags and do tagging, rather than to require them to be tagged at agency offices, which may help assure that swift fox are tagged

New Mexico: Harvest survey information available, but limited to reporting harvest in three counties; no required pelt tagging; which is not feasible in New Mexico
Nebraska - Harvest survey underestimates such species as bobcat, so results are questionable; started pelt-tagging for gray fox to learn about state distribution; potential to do a species-specific questionnaire to harvesters for a year or two

Wyoming: Swift fox are protected as a nongame species. Swift fox are a Species of Special Concern with Native Species Status of 3 (NSS3); Wyoming and Colorado no longer harvest swift fox; placed on Wyoming's Species of Special Concern list in 1996

4.1.2 (Technical committee to resolve taxonomic issues and investigate the genetic integrity of U.S. swift fox population.)

Dragoo: Subspecies can't be distinguished, except for San Joaquin swift fox (including Bob Wayne's analyses); Jerry doesn't believe kit and swift fox are different species; with large samples, morphometric differences aren't apparent; using genetic species concept, arctic fox are same species as kit and swift fox, although Jerry doesn't agree; microsatellite data collected in southwestern New Mexico indicate that kit and swift fox are freely interbreeding and can't be told apart. Two swift fox populations are as divergent from each other as kit and swift fox are from each other. Isolated swift fox populations are helping to maintain genetic diversity. Texas, New Mexico, and Colorado need to be most concerned about genetic questions. Current genetics work evaluates responses that do not depend on limiting factors. Most Cochrane foxes now mainly originate from Wyoming foxes. Axel collected hair from Canadian foxes; unknown what

will be done with these samples. Point made that genetic findings should be released as soon as possible to the public, as long as positions are based on good science. News release can include statement about importance of maintaining populations. SFCT could invite Jerry to draft position paper and ask for opposing position to potentially appear in annual report. Jerry and Bob Wayne coauthored genetics chapter for the swift fox book. BNP release plans to use Wyoming foxes. Is there a genetic reason to investigate using Cochrane foxes that have some South Dakota origins? State of South Dakota advocates use of wild-captured foxes from areas as close to release site as possible. Is there a value to comparing Cochrane genetics with current SD foxes? Discussion on whether specific request should be made of Cochrane regarding genetics makeup and records.

8.1.1 (Provide distribution and suitable habitat information to cooperating federal agencies, universities, and conservation organizations.)

The habitat suitability analysis should help meet this need

9.2.3 (SFCT and/or state working groups are to jointly develop an informational package and educational initiative for private landowners.)

Jasmer: NRCS species sheets are available to NRCS personnel for assistance in land management planning; Wildlife Habitat Institute would likely produce a document on swift fox if provided with sufficient information; Pusateri volunteered to be SFCT coordinator on this project.

10.1.3 (Investigate susceptibility of swift fox to common diseases and parasites.)

Diseases/parasite investigations were conducted in Canada; also being done by TESH and being analyzed by Wyoming State Vet. Lab.; New Mexico – Schmitt collected carcasses; parasites were analyzed by Robert Harrison; Robert has internal parasites that need analysis, but hasn't found an interested expert; Richard will check with Scott Gardner in Nebraska to determine his interest; swift fox book has chapter on swift fox diseases written by Beth Williams; 6 of 36 captured swift fox in Wyoming had plague titers; they were left in Wyoming

INTERSPECIFIC COMPETITION, DISCUSSION LED BY CARBYN

Swift fox predators include badger, golden eagle, bobcat, domestic dog, great horned owl (Minette will provide record). Role of coyote – 200-300 years ago, coyotes and swift fox coexisted in southwestern US. Has the coyote changed since then in its adaptability as compared to the coyote of previous time? Are coyotes preventing swift fox expansion to new areas? When coyotes kill swift fox, carcasses aren't always

utilized, meaning they are likely killed because of competition. Coyotes are intermediate in size between wolves and foxes. Coyotes have a wider range of food availability (wolves – large ungulates; foxes – small mammals and birds.) Coyotes can utilize small mammals to large mammals. Food web examination is more complicated than food chain. Coyotes may benefit swift fox; ex: in Canada, coyotes may be keeping certain prey items at reduced levels (ex: lagomorphs), which would then not attract golden eagles. Wolves have eliminated coyotes in some areas, but occur together in other places. There is a need for longer-term studies to understand some of these complexities.

Role of red fox and competitive exclusion (one predator kills another). Distinction between competitive exclusion and interference competition; the latter relates to food base. Species closer in size are more likely to experience competitive exclusion. Very few red foxes exist in Canadian swift fox areas. If coyotes depress red foxes, this benefits swift fox. Marsha observed aggression and avoidance when swift and red fox were placed together in a captive situation. In literature, coyote predation may be as high as 80% on swift fox; in Canadian records, the highest rate was 72% due to coyotes. Other factors in Canada include starvation, road kills, poisoning (human impacts low compared to natural factors).

Lu stressed the importance of long-term research and collection of good data on releases, even if releases are not successful in establishing populations. Lu stated that in the Canadian program to date, swift foxes have done better in an area without prairie dogs than in an area with prairie dogs. Further, since predators are the greatest risk to swift foxes, by implication it could be that more predators that are attracted to prairie dog towns could also be detrimental to fox survival. There is no proof of that, because the lower presence of swift foxes in an area with prairie dogs in Canada may be for reasons other than the presence of prairie dogs.

In Canada, prairie dogs may be detrimental to swift fox because they attract predators to prairie dog towns. Does cover and food provided by prairie dogs override risk of attracting predators? Red fox avoid coyotes, allowing coyotes to expand further; this scenario may also hold true for red fox and swift fox interaction, where red fox may not actually kill swift fox, but intimidate them. Nebraska swift fox research (Terry Hines) showed swift fox preference for roads (travel routes, prey abundance were theories); could it be that they were forced into these areas by coyotes? Coyotes are more vulnerable to shooting by man along roads. Unknown if roads are preferred by swift fox or if they are forced here. Importance of understanding issue better for release success and relevance of road distribution. Ditches along roadsides may have better small mammal populations (attract swift fox?) Issue of farming practices that may be encouraging coyotes; ex: planting windbreaks in prairie. Important to consider impacts to other, rarer species. CRP plantings likely mostly enhance coyotes.

PUBLICATIONS - SOVADA

Distributed bibliography from NPWRC's web-site as of 9-20-2002. New or missing publications should be submitted to Marsha to keep site as current as possible. New literature: Travis Olson's paper deals with dispersal habitats; submitted to JWM; also watch for upcoming publications from Jan Kemmer, Patrick Lemmons, Ed Schauster and Ann Kitchen.

MISCELLANEOUS

SD Swift Fox State Working Group – question for Brian about composition of Montana's working group composition.

ADMINISTRATIVE DETAILS

Chair: Jacquie Gerads

Co-Chair: Matt Peek

Annual Report Editor: Martin Grenier

Next meeting: Fort Collins in September, 2003, possibly in association with BTPD Conservation Team, with possibility of visiting Pawnee National Grassland and visit to new black-footed ferret captive breeding facility; need to avoid TWS meeting dates.

END OF SEPTEMBER 24, 2002

SFCT ASSIGNMENTS BASED ON 2002 COORDINATION MEETING IN BISMARCK, ND.

Everyone:

- Compile contribution letters and send to NFWF as non-federal match for habitat study.
- Review address list and suggest changes.
- Provide updates to Martin Grenier for inclusion in the annual report.

Lu Carbyn:

- Put together swift fox habitat management brochure (landowner).
- Request disease update from Beth Williams and compile for inclusion in 2002 annual report.

Gerald Jasmer:

- Work with Lu Carbyn, Marsha Sovada, and Richard Bischof to develop NRCS swift fox document.

- Assist with landowner brochure development.

Eileen Dowd Stukel:

- Compile and distribute meeting minutes.

Martin Grenier:

- Write letters to FS and BLM regarding potential SFCT involvement/input in their planning efforts.
- Compile 2002 annual report.

Brian Giddings:

- Contact The Nature Conservancy to inquire regarding swift fox status review and to offer SFCT involvement/input in a status review.

Richard Bischof:

- Contact Museum of Southwestern Biology regarding SFCT decision to store tissue (and potentially other sources of DNA) in their collection.
- Write news release.
- Contact Scott Gardner (UNL Museum) to inquire about parasite identification of specimens collected by Robert Harrison in NM.
- Update mailing list.

Pete Gober:

- Appoint FWS staff to create webpage and to put together newsletter, using input provided by other SFCT members.
- Write letter to The Nature Conservancy to indicate that the swift fox has been removed from list of candidate species.

Jerry Dragoo:

- Write report about current DNA work and professional opinion as to the taxonomic status of swift fox/kit fox. Possibly solicit input from Bob Wayne to show the dichotomy in professional opinions.

Jacquie Gerads:

- Write letter to Director of Texas Parks and Wildlife to request new Team member assignment.

Chuck Hayes:

- Investigate the possibility of introducing a swift fox pelt tagging requirement or specific harvester survey in an effort to assess swift fox harvest in NM.

Robert Harrison:

- Assist Lu Carbyn with landowner brochure.

Frances Pusateri:

- Plan/prepare next SFCT meeting, scheduled for September 2003 in Ft. Collins, CO, possibly co-occurring with prairie dog coordination meeting (communicate with Bob Luce).
- Coordinate SFCT involvement in the NRCS brochure/Wildlife Habitat Institute's swift fox document.

Meeting notes transcribed by Eileen Dowd Stukel, South Dakota Game, Fish and Parks.