

# **SWIFT FOX CONSERVATION TEAM**

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## **2001 ANNUAL REPORT**

**SWIFT FOX CONSERVATION TEAM**  
**ANNUAL REPORT**

**COMPILED AND EDITED BY:**

**Matt Peek**  
**Kansas Department of Wildlife and Parks**

**June 2002**

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## Overview

Peek, Matthew S., ed. 2002. Swift Fox Conservation Team 2001 annual report. Kansas Department of Wildlife and Parks. Emporia, KS 66801. 120pp.

The Swift Fox Conservation Team (SFCT) is a multi-agency group comprised of representatives from the 10 state wildlife agencies within the historic range of the swift fox, select federal wildlife and land management agencies, and Canada. The SFCT formed in 1994 in response to the U.S. Fish and Wildlife Service (USFWS) finding that listing the swift fox as threatened or endangered “may be warranted” throughout its entire range. Since that time, the SFCT has met annually with the objective of comparing and improving upon research and management techniques for swift fox. This document represents a compilation of the activities and findings of the SFCT in 2001, and is the seventh of such annual reports.

In January of 2001, a significant accomplishment was achieved with the swift fox being removed from the USFWS’s candidate species list. However, the SFCT remains actively committed to their initial goals and to ensuring the long-term conservation of the species. The “Conservation Assessment and Conservation Strategy for Swift Fox in the United States” continues to act as the primary guideline for achieving these goals.

As part of this continuing pursuit of swift fox conservation objectives, the SFCT has undertaken a project entitled “Determination of swift fox habitat characteristics associated with range-wide distribution data.” A challenge grant from the National Fish and Wildlife Foundation (NFWF) was awarded for this GIS project, which will use swift fox data primarily acquired through research initiated as part of the SFCT objectives outlined in the “Conservation Strategy” mentioned above. The grant will require a 2:1 ratio of non-federal funds to the NFWF's federal funds. The project will be an attempt to identify habitat characteristics associated with current range-wide swift fox distribution.

The SFCT’s support of two swift fox reintroduction projects was also a significant occurrence taking place in 2001. Although the SFCT rated reintroduction as a low priority from a range wide perspective for the purpose of the “Conservation Strategy,” various monitoring and research projects have lead to an increased understanding of the life history and habitat requirements of swift fox. With this knowledge, the SFCT has become increasingly interested in the potential for reintroduction efforts in the large areas of unoccupied habitat in the northern portions of the historic swift fox range in the U.S. As such, the SFCT has officially supported the Turner Endangered Species Fund swift fox reintroduction project on the Bad River Ranch in South Dakota, and has also encouraged the National Park Service to proceed with efforts to secure funding for a reintroduction project at Badlands National Park in South Dakota. The status of these projects has yet to be determined, but regardless of their outcome, the SFCT’s interest in reintroductions is potentially the beginning of a new page in swift fox conservation.

## SWIFT FOX CONSERVATION TEAM

revised October 24, 2002

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revised October 24, 2002

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## Minutes of the Swift Fox Conservation Team 2001 Annual Meeting

October 17-18, 2001  
Western Inn/Ramkota Hotel  
Rapid City, South Dakota

The meeting was called to order at 1:00 pm on 10/17/2001

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### Participants (Team members in bold):

1. **Brian Giddings** (Montana Fish, Wildlife and Parks)
  2. **Eileen Dowd Stukel** (South Dakota Dept Game, Fish and Parks)
  3. **Dan Licht** (National Park Service, Badlands National Park)
  4. Lu Carbyn (Canadian Wildlife Service)
  5. **Martin Grenier** (Wyoming Game and Fish Department)
  6. **Matt Peek** (Kansas Department of Wildlife and Parks)
  7. **Jacquie Gerads** (North Dakota Game and Fish Department)
  8. Marcie Carter (Lower Brule Tribe)
  9. **Francie Pusateri** (Colorado Division of Wildlife)
  10. **Jeff Green** (Wildlife Services)
  11. **Marsha Sovada** (US Geological Survey)
  12. Travis Lavierre (US Forest Service, also representing nonprofit org)
  13. Doug Seargent (Wildlife Biologist for Forest Service, Buffalo Gap National Grassland)
  14. Doug Albertson (National Park Service, Badlands National Park)
  15. **Bob Hodorff** (US Forest Service)
  16. **Pete Gober** (Fish and Wildlife Service)
  17. Sian Waters (Research Associate, Cochrane Ecological Institute in Canada)
  18. Craig Knowles (Montana)
  19. Chuck Berdan (BLM)
  20. Robert Harrison (University of New Mexico)
  21. Jerry Dragoo (University of New Mexico)
  22. Jon Jenks (South Dakota State University).
  23. Brian Ocepek (National Fish and Wildlife Foundation)
  24. Shaun Grassel (Lower Brule Tribe)
  25. Kevin Honness (Turner Endangered Species Fund)
  26. Kyran Kunkel (Turner Endangered Species Fund)
  27. Greg Schroeder (National Park Service, Badlands National Park)
  28. **Richard Bischof** (Nebraska Game and Parks Commission)
-

## Agency Reports

### Montana:

Brian Giddings: Put current info in 2000 annual report. In the process of 3 year inventory and distribution surveys. Conducted first fall survey 2 years ago. Conducting another one right now. Craig Knowles and another individual are participating in this survey on contract. Next fall the survey will be completed. Did international swift fox census with Canada past winter. Surveyed 60 townships and captured 34 foxes, surveyed additional 14 townships and captured 4 more foxes. Have population estimate of 221 foxes. Continue to work on this survey with Axel Moehrenschrager.

### South Dakota:

Jon Jenks: Had technician this summer for 2 ½ months surveying within ¼-sections of land to see if they could document reproduction. Searched 6275 ha on public land, Buffalo Gap National Grasslands and state land and 1813 ha on private land. Little private land searched because only 2 out of 9 landowners allowed access to their land, which was opposite of what they had experienced during the 2 years of previous surveying. Associates this development with the prairie dog issue. Over all areas searched, the technician found 5 dens and only 2 were active. One of the dens was a natal den. All but the natal den were on private land. Have conducted behavioral observations (4 days over 2-3 week period) at the natal den, mainly to identify potential problems, for instance due to coyotes. This information has not yet been analyzed. Question: Are there red foxes in the area?

Jon: Yes, but there are more coyotes than red foxes.

### National Parks Service:

Dan Licht: Probably do not have resident swift fox in any of the park units (on the premise that the "kit" fox is a separate species). Occasional claims, but there are no documented reports. National Parks Service is building up a national biological inventory and monitoring program. Thus, their efforts will be increasing for monitoring of all types of species, including swift fox. In the end, all the parks will be conducting systematic monitoring (could be automatic cameras, etc.) Badlands National Park is exploring the possibility of restoring fox to the park.

### Canada:

Lu Carbyn: Swift fox were possibly extirpated in Canada since the turn of the century (last foxes recorded in 1930s). Reintroduction efforts since 1984 to reestablish swift fox in the northern end of the distribution, many agencies involved. Good news: after 17-year period swift fox are reproducing and are established in the Canadian prairies. Last detailed census in 1996/97. Most recent international census conducted by Axel Moehrenschrager and other involved individuals and agencies. The population has roughly tripled during the last 4 years. Total population is 877 swift foxes (including 221 in Montana). There are two nuclei with swift fox: 1) Grasslands National Park (100 foxes, some increase), and 2) Alberta/Saskatchewan border (560 foxes, major increase from 192 estimated in 1996/97 census). Detailed survey efforts, using trapping in

different townships. 98% of captured foxes were unmarked so they are all born in the wild. These findings are very encouraging – don't know what caused them to become extinct, but the reintroduction was a success.

Question: How many foxes were released over the 17-year period?

Lu: 990. High mortalities. Foxes that reproduce are the sign of success. Even in natural situations there is 70% mortality.

Question: What are the main mortality factors?

Lu: Coyote, eagle and roadkill

Craig Knowles: Roadkill swift fox in September about 10 miles west of Vesperich, along the Old Man River.

Lu: There is supposed to be some denning there.

Brian: Foxes became extinct in Montana around 1918. Foxes from Canada reintroduction have immigrated into Montana and occupied 3, perhaps 4 north central Montana counties. Thus, Canadian release was a success also in respect to bringing swift fox into Montana.

Question: Any coyote control on public or private land?

Lu: No official coyote control, but there is coyote fur harvest (depends on fur prices) and incidental coyote shooting on private lands.

Question: Use mark and recapture?

Lu: No, just systematic trapping. Although after the releases there were tagged animals, so there is some recapture data.

### Wyoming:

Martin Grenier: Wyoming is in the process of initiating a monitoring program using track plates to gain presence/absence data. Plan to do 15-20 transects in 3 regions of the state, covering the eastern part of Wyoming. This will be done in conjunction with the Turner Endangered Species Fund. Plan to do this survey annually until Turner reintro in SD is completed, and then switch to a 3-year monitoring program.

### Kansas:

Matt Peek: Kansas track survey results are out and they are happy with the number of foxes that were detected. Just getting started as furbearer biologist, nothing else to report at this time.

### North Dakota:

Jacquie Gerads: Since Steve Allen retired, a lot of ND's furbearer activities were put on hold. ND Game and Fish personnel did conduct ¼ section searches (track survey) in 2000. Did not find any swift fox tracks in 2000. Track surveys were not conducted in 2001, but we plan to continue again in 2002.

### Colorado:

Francie Pusateri: (provided handout) Current swift fox population estimate for Colorado: 7,000 to 10,000 in short grass prairie habitat. Known to inhabit other areas as well. Last inventory efforts completed in 2000. Plan to continue monitoring in 5-year intervals at a cost of \$55,000

per year. Currently there is an ongoing transplant effort with South Dakota. Colorado trapping association petitioned that the swift fox season be reopened. Season would be open from December 1<sup>st</sup> to January 21. Considering bag and possession limit of 25 and quota of 500 foxes. Season will be reevaluated after 3 years. Swift fox taken would have to be tagged. Legal methods of take will be firearm and live trapping. Opening the season is consistent with the conservation strategy. Average harvest between 1982 and 1991 was 880 animals per year. Don't think the harvest quota of 500 animals will have a negative effect on the population.

Question: How will the season be evaluated?

Francie: Information will be gathered from harvest survey.

Question: Season for all of Colorado?

Francie: No, only eastern part.

Marsha: Suggests that open season should be restricted to certain counties/areas.

Francie: Currently no such considerations – these are the recommendations that were presented to the wildlife commission.

Question: Will this season be open to any trapping.

Francie: Only live trapping is legal in Colorado.

Comment: Swift fox tend to be susceptible to live traps.

Francie: Most foxes occur on private land and landowners tend to be pretty protective of them. CO does not project to even reach the quota.

Question: What is the reason behind reopening the season (can't be fur prices)?

Francie: Basically pressure from the CO trappers association.

Question: What was the inventory method used?

Francie: A whole series of inventories. Primary method is mark recapture. Recent work done in the Pinedon Canon area looking at general biology, homerange etc. (abstract on back of her handout).

#### Wildlife Services:

Jeff Green: Swift fox are not targets of any control activities. May take incidental fox here and there but he is not aware of any recent data on that. He may be able to get some data but he doubts that there is much if any take. Where there is take, it would be incidental to coyote control. No activities in eastern Colorado.

#### Northern Prairie Research Center:

Marsha Sovada: Northern Prairie had been contracted to analyze Kansas' monitoring data. Data used were track survey data from ¼ sections from every other township throughout the western part of the state. Use spatial smoothing to look at probability of detection and probability of occurrence. They were able to get detailed distribution maps for Kansas. The result is a better way of using such data to determine distributions and changes in distributions.

### Forest Service:

Bob Hodorff: Still has to contact a number of Forest Service Biologists to get their updates. These will be included in the Forest Service's report (to be included in the 2001 report). There is no reason to believe that anything has changed on any of the National Grasslands in Colorado or Kansas. Jeff Abegglen (the wildlife biologist on the Ogallala National Grasslands in Nebraska) has found an active den near the Ogallala National Grassland (first one in a long time). In South Dakota they are continuing to run track stations on the Buffalo Gap National Grassland. The Ardmore population is there (1 den site found).

### Fish and Wildlife Service:

Pete Gober: FWS received little or no comments about the removal from the list of candidate species. FWS remains an interested party in a resident species.

Question: Any comment at all on the removal from the Candidate List?

Pete: No formal comment.

### Nebraska:

Richard Bischof: Observation reports and occasional mortalities were the only data collected in the past few years. Conducted a scent station survey this year (using the Robert Harrison's and Greg Schmitt's technique). This was preliminary survey to find out if the technique is going to work in Nebraska. Worked well. Set 18 transects, 7 were positive. Detected swift fox in Sioux and Kimball Counties. Had problems with the weather since the survey was run in the spring (rain obscured the stations). Also, difficult to find enough roads in some of the western counties. Similar to Kansas, swift fox were found in row crops and fallow (Kimball County). Will continue this survey next year on a large scale and on the periphery of estimated swift fox range in Nebraska.

Two additional surveys were conducted by private companies contracted by the Department of Roads and a telephone company. These surveys were required by the Heritage Program in order to do construction work. In both locations (Sioux and Kimball County) active dens were found.

Question: Have foxes been found in the Sandhills?

Richard: There have been occasional observations, but those are believed to be dispersing animals. Sandhills not considered suitable because of the sandy soils.

### BLM:

Chuck Berdan: BLM involvement has been in Montana along the Canadian border with the program Brian Giddings discussed earlier.

## New Mexico:

Robert Harrison: Finished a 3-year study on survey methods and general ecology of swift fox. In the process of analyzing the last of the data and writing everything up. Best survey method for NM is gathering scat and then id it for species. Population ecology results are similar to what has been found in other areas. Was working on the National Grasslands and had a high turnover of foxes there. At the end of the study only 4 were left out of 36 originally caught. Appears the area may be a sink for foxes. Submitted a proposal to the NM Game and Fish Dept. to begin annual monitoring using scat DNA analysis. Might begin in January.

Question: How much time between when the first foxes were caught and the end of the study?

Robert: 2 years and 9 months.

Question: Did the population size change 26 to 4?

Robert: 4 that were still marked at the end. Did 2 estimates: 1<sup>st</sup> year: 23 foxes, 2<sup>nd</sup> year: 16.

Biggest factor was coyote kill (especially during 2<sup>nd</sup> year).

---

## **Education Committee**

### Members:

Eileen Dowd Stukel

Bob Hodorf

Bob Sullivan

Richard Bischof

Lynette Johnson

### New:

Kyran Kunkel (will help out with newsletter)

### Update:

Not much of a committee left. Several people were interested in helping last year. Bob Sullivan was interested in developing a brochure on swift fox habitat needs that people could customize for their individual needs. He is still waiting on information from a few states to incorporate in the brochure. Eileen is working on the Newsletter, has yet to receive project/effort updates from most Team members. Eileen emphasizes that this is a unique situation where various agencies work together toward a common goal and make some progress – a story that needs to be told. Eileen and Richard will work on a report of summarized team accomplishments.

### Problem:

News release was put out by someone without consulting the Team. Pete Gober: Team should be careful not to have someone steal our “thunder”.

Eileen wants something in the minutes about a Team procedure on News Releases. This was not formulated during the 2001 meeting.

Tasks:

1. Management/habitat publication (Bob Sullivan)
  2. Newsletter
  3. Photos for newsletter
  4. Photos for brochure
- 

## **Research Committee**

Members:

Marsha Sovada  
Lu Carbyn  
Axel Moehrensclager

New:

Sian Waters

Tasks:

1. Review interspecies competition – generate recommendations for landowners (best ways of controlling coyotes and other predators competing with swift fox)
  2. Review swift fox ability to colonize areas that are considered marginally suitable
- 

## **Habitat Committee**

Members:

Julianne Hoagland  
Bob Oakleaf  
Bob Sullivan  
Robert Harrison  
Lu Carbyn

New:

Martin Grenier

Update:

Julianne Hoagland not here. Marsha Sovada will speak about habitat proposal.

Tasks:

1. Help Marsha Sovada with the habitat project (e.g. submit data points)
  2. Ensure continuation of habitat research after the first bout is over (NFWF grant) – follow-up proposal
-

## **Funding Update**

### NFWF:

Brian Ocepek: (provided handouts) Grants Manager for the Funds Intermountain-West (responsible for 4 states: CO, MT, WY, UT. Some overlap into Dakotas, Kansas and Nebraska, New Mexico). Short grass prairie and associated species have priorities in their office. Also involved with black-tailed prairie dog and black-footed ferret meetings.

2 swift fox proposals pending before their board: one with Minette Johnson and one with SFCT. Proposal well received by staff and likely to be funded. 3 board meetings per year (spring, summer, fall), applications for funding collected throughout the year. Aside from habitat restoration work the NFWF will also fund outreach projects, education type projects. NFWF has also funded scat DNA research. Due to the prominence of Forest Service and BLM lands (a lot of money available), support from those agencies for projects can increase chances of funding.

### Habitat Project:

Marsha Sovada: Objective is to compile point and other swift fox data provided by all states and look at it using GIS tools, overlay habitat and then analyze to identify patterns. Emphasizes that everyone need for everyone's data to be able to get a product (the whole picture) from the habitat project. Research will be conducted at Northern Prairie Research Center, will be contracted through Nebraska.

Comment (Pete Gober): Data management approach is what allowed the removal of the swift fox from the candidate species list and will allow to deal with additional petitions in the future. Suggest that SFCT reapply (possibly as soon as spring 2002) for funding to continue the habitat project after 2002. Emphasizes that this projects and other efforts need to be continued since a new petition could occur at any time.

Question: Could the habitat project be extended to encompass the continent, not just the US portion of swift fox range? Canada has a lot of information that they would like to have centrally stored.

Marsha Sovada: Certainly.

Question: Is this study basically an extension of the past compilation of point data by Marsha?

Marsha Sovada: Yes, now basically the individual data layers (habitat, soil, etc.) are added for analysis.

Eileen Dowd Stukel: Thanks to Pete Gober for coming up with the idea and pushing the SFCT to follow it through.

Question: Are red fox and coyote data going to be included in the habitat project?

Marsha Sovada: Perhaps for certain parts of the range, wherever the data are available.

Richard Bischof: Scent station surveys provide presence-absence data for other species as well, so at least scent station survey areas can be analyzed for coinciding species.

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## **Presentation: Bad River Ranch Swift Fox Reintroduction**

Kyran Kunkel: This is their third year of providing updates of evaluations and planning for swift fox releases on the Bad River Ranch. Mission of the Turner Endangered Species Fund is to conserve biodiversity ensuring a persistence of imperiled species and their habitats. The Turner Enterprises is the ranch operation of Turner properties: over 2 Million Acres in North America (largest private landowner). They try to involve as many partners (federal agencies, state agencies, private organizations) in their endeavors as possible to ensure success of their projects.

Recent review of terrestrial habitats in North America indicated that Northern Great Plains region only remains 1-4 % intact. Also noticed that northern populations of swift fox are smaller and more fragmented than those in the south. Swift fox in the northern part of the range are not doing as well as they have in the past decade. The only extension of swift fox in the northern range has been the result of reintroductions. Scattered small populations are at greater risk of extinction.

Population dynamics modeling with various parameters (using real data of survival rates from various populations) showed that all populations in the northern range, except in core areas in Colorado, went extinct within 100 years. Their goal is not only the reintro of swift fox on the Turner Ranch in South Dakota, but also the restoration of the prairie ecosystem on and around the ranch and include as many partners as they can. They are re-seeding 10,000 acres of tilled land to native grasslands. Objective for the swift fox releases is to obtain a self-sustaining population on and around the Bad River Ranch and have that population serve as a source for recovery of swift fox in South Dakota. They are working on this with SD Game, Fish and Parks, the US Forest Service, Fish and Wildlife Service, and National Park Service.

Bad River Prairie was identified by the Nature Conservancy as an area of concern and the Bad River Ranch falls within this area.

Held public meeting since last year to inform the communities around the Turner property about their plans. Poll done by SD Game, Fish and Parks shows highly favorable attitudes towards native species.

They had planned to start capture work in Wyoming at the end of August, early September. Foxes would have been held in quarantine for 2 weeks and subsequently released (hard releases). That plan was spoiled by difficulties with the SD Animal Industry Board: ambiguity about who has the authority in SD to import animals. After a hearing it was decided that the Animal Live Stock Board has to give approval to Turner to import swift foxes. A second hearing is now required to determine whether they will be allowed to import foxes. Kyran concludes that they need to do more home work (inform public, other agencies, etc.). SD livestock groups opposed

the Turner plan because of background issues such as the endangered species act, prairie dogs, etc.

They now plan to do more education work with these organizations and private individuals to inform them about their plans and alleviate concerns about negative impacts. They are reaching out to organizations such as American Farm Bureau, SD Cattlemen Association, and National Farmers Union.

Farm economy in the Great Plains is in decline (over the past 30-40 years) - not a result of endangered species. Farm income and populations in the Great Plains have also declined, thus new solutions for the Great Plains are needed. Endangered species and conservation may be part of the solution and not part of the problem to this situation.

Over 80% of the landscape was suitable for swift fox (used prairie dog model). Based on habitat and prey base they estimate, they can reintroduce more than 200 foxes into the area and have a sustainable population. Planning a 6-year reintroduction of 30 foxes and anticipate coyote control doing those 6 years.

Did a feasibility evaluation for Fort Pierre National Grassland (prey base, predator densities). Lower Brule Tribe has a biologist that will do the same thing for the reservation.

They have cooperative agreement with WY to gather and translocate foxes and in return they will assist WY with their swift fox surveys (same thing for CO). Built 11 holding facilities for swift foxes to meet the state of SD's requirement to quarantine foxes for 14 days before release. Have started coyote control on the release area and the vicinity. Current plan is to catch foxes in WY in January, February 2002, and hold them for a soft release in the spring. All foxes will be radio collared.

There will be another hearing with the animal industry board in December to determine if foxes can be imported.

Success criteria over next 3-10 years: demographic rates that approach self-sustaining levels with low probability of extinction. On long range (100 years): SD is part of swift fox meta population in the northern range.

Question: Are the nearest swift fox populations close enough for dispersals from the Bad River Ranch? Will this population really have a chance to tie into the metapopulation or will it become another isolated island?

Kyran Kunkel: Hope that by working with the Lower Brule Tribe, Fort Pierre National Grasslands, Bad Lands National Park and others, that swift foxes will occupy all of western South Dakota. Subsequently they anticipate a gradual expansion to and connection with Nebraska and Wyoming populations.

Lu Carbyn: Coyotes can't be kept out of an area despite heavy control efforts. May have less of a problem with an established coyote population than one that keeps flooding in.

Kyran Kunkel: Hope to prop up survival rates of newly reintroduced foxes over the short term, but does not anticipate long-term coyote control. Also, it has been shown that coyote control can turn a sink population into a source population by increasing juvenile survival and dispersal (e.g. in Texas).

Question: Will there be areas with and areas without coyote control to allow for a comparison?

Kyran Kunkel: Yes, since they will not be able to do coyote control on the National Grasslands.

Question: Is the project over if the Animal Industry Board does not approve swift fox importation.

Kyran Kunkel: No, several options, e.g. go back and redouble PR efforts or work with a tribe or other organization that does not have to answer to the Animal Industry Board.

Question: What does habitat look like towards the west? Is there a dispersal avenue?

Kyran Kunkel: Yes there is an avenue to the nearest Wyoming population. Habitat gets better further west.

Kevin Honness: In 1980 there was a reintroduction of swift fox by SD Game, Fish and Parks 30 miles from the Turner release site. One fox ended up 4 days later in the southern Black Hills region (120km straight line distance). Another 30km and it would have hooked up with the Fall River Population.

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## **Discussion: Badlands National Park Reintroduction Plan**

Dan Licht and Greg Schroeder: (provided handout) Summarized sightings in and around Badlands National Park. Last confirmed sightings were 10-15 miles south of the park. Occasional swift fox sightings on the grasslands from 1996 and 1999, one possibly in the park. Conclude that swift fox may have been detected in the area, but there is no resident population. Do 400-600 hours of spotlighting and the Forest Service does twice as much – still, no foxes are detected. A swift fox release/salvage was conducted within the park in 1987: one family was trapped on the Pine Ridge Indian Reservation and released (soft release) in the park. The female was radio collared and rest were ear-tagged, but no monitoring occurred. Another small family group was translocated into the park the following year (soft release, again no follow-up). They are trying to get feedback from the Team to help them decide if they should endeavor on a real release in Badlands National Park. Concerned with coyote densities and will do coyote monitoring (telemetry). If swift fox will be released, they will all be collared as well. Will attempt to have some soft release pens set up between coyote home ranges.

Question: Will there be a comparison between the effects of coyote control and no coyote control?

Greg Schroeder : Not at this point.

Eileen Dowd Stukel: Don't know why, but ferrets on Forest Service land are doing better than ferrets in the park.

Greg Schroeder: Prairie dog towns on the Forest Service land are much larger and closer together than the towns in the Park.

Eileen Dowd Stukel: They also have coyote control.

Greg Schroeder :Yes, but no longer state coyote control.

Question: How large is the area?

Greg Schroeder: The park is 244,000 acres.

Dan Licht: Will have to cooperate with the Forest Service on this project. Also, it is the National Park Service's Policy to restore native wildlife.

Question: Is there information that swift fox benefit from prairie dogs by using their burrows as escape holes?

Marsha Sovada: No data showing such a relationship, but prairie dog towns provide escape holes and there may also be holes by other species such as badgers in a prairie dog town.

Lu Carbyn: Prairie dogs could be a liability to swift fox, because they attract a lot of predators. Swift fox that are in an area long enough will establish a number of escape holes that are passed on to the next generation.

Kyran Kunkel: In the Bad River Ranch evaluation, prairie dogs were incorporated based on the escape holes they provide and the increased prey base.

Lu Carbyn: The best area from the Canadian reintroduction is not associated with prairie dog colonies. Other areas do not have such a good long-term survival of swift fox, and these are the areas with prairie dogs.

Brian Giddings: The best areas seem to be those with ground squirrels and badgers. Ground squirrels provide prey base and badger holes provide escape opportunities.

Sian Waters: Portable protection shelters used in the Black-feet reintroduction are placed over badger holes.

Marsha Sovada: Have never observed swift fox use prairie dog holes.

Craig Knowles: Did pre-release assessment of the Black-Feet reintroduction site. Area was just as dense with Richardson's ground squirrel holes as holes are found in a prairie dog town (20-40 burrows/acre). Burrow distribution was clumped (several hundred) and several badger holes

were associated with these clumps. This combination seems to work really well with the swift fox reintroduction. Black-Feet consider badger a keystone species for prairie dog. Radio marked foxes almost exclusively use badger holes. Richardson's ground squirrel not so important as a food source, but it is important in attracting badgers.

Lu Carbyn: Ground squirrels may be important prey in early summer when pups are growing.

Question: Where did the rumor get started that swift fox use prairie dog holes as escape holes?

Craig Knowles: Only comment on possible association in the literature came from Kansas, stating that most abundant mammal in Kansas was prairie dog, second most abundant was swift fox.

Question: What is the best time of year for a release?

Sian Waters: Seems that release in Spring is not as successful as release at end of Summer/Fall, possibly because of greater insect abundance. It provides enough time to establish territories and identify escape holes before the winter. Plus, portable protection shelters are left out for 10 days and are used by the foxes.

Lu Carbyn: Insect and Rodent populations are lower in the spring than in the fall.

Marsha Sovada: Coyote may also be greater threat in the spring.

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## **Report: History of Swift Fox Reintroductions in Montana**

Craig Knowles: Had plans in the 80's to capture swift fox on Pawnee National Grassland in Colorado and reintroduce in Charles M. Russell Wildlife Refuge (CMR) in Montana. However, MT Fish, Wildlife and Parks did not grant a permit to reintroduce foxes due to the potential of CMR for black-footed ferret reintro (conducted in 1994) and concerns of interference with trapping regulations. Thus swift fox were never reintroduced to CMR. Craig received a contract from the MT Fish, Wildlife and Parks to write literature review of swift fox in 1990. This lit review summarized information about swift fox in Montana from historical records and also constituted a general ecological review of what was available in the literature.

In this paper Craig identified the Black-Feet Indian Reservation as a potential release site for swift fox because 43 swift fox were captured on the reservation in the early 1900s, and Lewis and Clark also identified swift fox on the reservation. They flew transects across the state in 1993 to identify the large blocks of grasslands. Black-feet reservation showed up as very good grassland habitat. In 1998, Craig and Brian Giddings presented a paper on the status of the swift fox in Montana at the swift fox symposium in Canada. Craig and Cleo Smeeton agreed that the CEI will provide foxes for reintroduction in Montana if funding is found for the CEI. Minette Johnson came up with funds and arrangements were made with the Black-Feet tribe to reintroduce foxes at a site only 5 miles from the location where Lewis and Clark had made their observations. Sian Waters will talk about the reintroduction.

Craig conducted a pre-release survey for prey density (ground squirrel burrows) and identified sites for release shelters.

Recent census shows that swift fox reintro on Black-Feet reservation is a success.

Reintroductions are a way of preventing extinction, because after a series of small, isolated populations are created, these can be linked together to become a large metapopulation. There are 6 million acres of suitable habitat in Montana for swift fox. It is just a matter of putting the foxes there.

He had a contract with Defenders of Wildlife to come up with swift foxes for CEI. Foxes were provided by the Dakota Zoo, and not caught in Wyoming as originally planned. There are currently about 5 foxes that were born in zoos (mostly in the Midwest), and that are available for reintroductions. Zoos are very interested in contributing to the conservation of endangered species and this is a great opportunity for reintroduction projects.

Craig's comment on the swift fox season in Kansas and potential season in CO: Why are swift fox being killed in the southern range if most of the northern range is unpopulated? One could take those foxes instead and move them to the northern range.

Swift fox reintroductions work, but are basically private endeavors. Agencies should become more involved. There are other Indian reservations in MT that want swift fox reintroductions.

Question: Would it be better to release a whole bunch of foxes at once instead of releasing a few at a time over a longer period (particularly if coyote control is going on)?

Lu Carbyn: Should release as many as one can get. Better to release those in groups over a longer period of time instead of dumping them all out and backing off.

Craig Knowles: Reintro has to be a continuous process with the objective of building up a big metapopulation.

Kyran Kunkel: Vortex modeling showed that most sensitive parameter is adult survival rate. Less than 30 animals would not work over a long period of time. Biggest factor in logistic regression is the number of releases. Anything less than 30 should not be considered for a release.

Lu Carbyn: What sex ratio was used in the model?

Kyran Kunkel: 1:1, since it is a monogamous species.

Sian Waters: Has also done vortex modeling and found that releases would have to go on for longer than 5 years at a rate of 25-30 animals per release.

## **Report: Black-Foot Swift Fox Reintroduction**

Sian Waters: This release uses captive reared swift foxes from the colony at the Cochrane Ecological Institute (CEI) in Canada. Since an international border is involved, they had to obtain various export and health certificates, as well as import certificates. 2001 is the 4<sup>th</sup> release year. A total of 101 captive reared swift foxes have been released. Since 1990 animals have been equipped with radio collars (30 animals released in 1998 were not collared). Spring surveys in 1999 showed that breeding had occurred in some individuals. 15 animals were released in 1999, 8 with radio collars. 2 of the ones collared were found dead after the release, the remaining 6 were alive 2 years after their release. 31 animals released in 2000, 16 radio collared, 8 individuals still surviving after a year. 25 animals released in 2001, 10 females radio collared. Focused on the females to find out the breeding success rate. 4 wild caught females were over 8 years old (females breed until the age of 8); one however had pup. 2 animals have been found dead so far from the 2001 release. Release location is the same each year. Dispersal distances can be quite long. One swift fox den found 15 (?) miles from the original release site. Monitoring is being conducted by the Black-Foot Wildlife Department. Monitoring this year will include the use of a hair trapping device that is being developed and tested by CEI in Canada and Montana. Intensive surveying for natal dens will be undertaken in the spring of 2002. Breeding population estimate is more important than an actual population estimate. Wild born pups will be trapped and radio collared this year to investigate the rate of juvenile mortality. Their improved release methodology appears to have increased survivorship among captive bred foxes in comparison to the relatively poor results with captive reared foxes in Canada. Noninvasive survey methods (such as hair trap device) are also aimed at an increase of survivorship. Another potential survey method being developed by CEI is voice-printing: identify individuals based on vocal characteristics. This technique has not yet been tested in the field. Zoos show interest in participating in the releases (Bismarck has provided 8 foxes to CEI). They deem this as a more preferable alternative over capturing animals in the wild. CEI is in the process of developing a husbandry and management protocol. Reintroduction is due to end next year, but may possibly go longer.

Sian Waters: For the record, rumors that they have smuggled swift fox across the border are unfounded. It is difficult to smuggle anything across the border. Plus they've always obtained all the necessary paperwork.

Question: Can you describe the hair snare?

Sian Waters: No, but there will be a publication out very soon.

Question: What type of analysis are you going to run on the hair?

Sian Waters: Individual ID (have the ancestors).

Craig Knowles: Would like to see reintroduction extended further to the south. Additional Comment: When coming through customs from Canada to Montana, all Canadian customs people know about swift fox, due to good education work by Lu Carbyn. Also, got feedback from truck driver who claims to have seen a number of roadkill swift fox in Canada.

Question: What is the reason for releasing animals in the exact same location year after year?

Sian Waters: Because it is a good place to release (extra escape holes, etc.). Plus, they do disperse very quickly.

Marsha Sovada: Maybe better if they wouldn't have to disperse so far.

Craig Knowles: Release site is political choice: tribal ranch – do not have to deal with anybody.

Sian Waters: Swift fox is a very important animal for the Black-Foot tribe (spiritually).

Craig Knowles: It is time for looking at other sites and using the available habitat to the north and the south of the reservation.

Question: Are there any other releases that are imminent (aside from the final Black-Foot release and the BRR release)?

Craig Knowles: Northern Cheyenne would take swift fox in fall 2001.

Question: Is it just a matter of having the animals or does there need to be funding for the follow-up studies?

Craig Knowles: Funding is a yearly thing. Donors have watched the releases and there seems to be a commitment. Comment on Black-Foot reintroduction: It is a minor event (release 1 day each year): no land use changes, no coyote control.

Sian Waters: Roadkill is an important mortality factor.

Marsha Sovada: The Black-Foot release seems to have incredibly high survivorship compared with other populations, which may mean that coyotes are not such a huge issue as everyone thinks.

Sian Waters: There is some aerial coyote shooting.

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## **Discussion: Team Perspective on Reintroductions**

Brian Giddings: Reintroductions were not considered of highest priority by the team in its objectives. Perhaps the document needs to be changed to reflect shift in priorities. Everyone should be familiar with “Guidelines for reintroductions” (1999 Annual Report, by Eileen). Team should discuss a prioritization among the different potential release sites. In Montana, they are trying to evaluate habitat and identify corridors and possible additional release sites for swift fox using GIS (cover types, landowner ship, current swift fox distribution, etc.). Such efforts may assist with determining where efforts regarding reintroductions should be targeted at in the future. Should look at the larger picture, not just at any release.

Lu Carbyn: Reintroduction of swift fox may impact other species, such as the burrowing owl.

Kyran Kunkel: Obviously effort will be directed at the northern part of the range and some of these releases will be opportunistic. If there weren't a Canadian and Black-Foot reintroduction then there still wouldn't be any foxes in Montana. All of the private reintroductions follow the guidelines by the SFCT.

Dan Licht: There are limits to where one can go and what can be done. About the only way the National Park can currently help the swift fox population is with a reintroduction.

Richard Bischof: The proposed habitat project may assist with the identification of key release sites, especially with respect to corridors.

Brian Giddings: Part of the strategy was to see how to connect Canada to Texas (with respect to swift fox range), thus corridors need to be identified and then it needs to be decided how each land tract can be made available for swift fox (i.e. conservation easements on private lands).

Question: Would the state of Montana really be interested in the reintroduction of a nongame species?

Brian Giddings: Yes, prairie dogs are being moved around, and they are also a nongame species. There is more emphasize on native wildlife than there has been in the past.

Richard Bischof: If there is a limited nationwide reservoir of swift fox available for releases, perhaps there is a greater need for prioritizing releases so that foxes are allocated depending on each release's importance regarding the conservation strategy.

Kyran Kunkel: Canada ran into that issue when they were planning to reintroduce foxes from Wyoming. Yes, on some level there is a limit on the available pool of foxes. If every other organization does release on their own, we will run out of foxes.

Eileen Dowd Stukel: Consensus may have changed, but it seemed to be that each entity had to decide for themselves whether they need a reintroduction or whether they feel they can provide animals for someone else's reintroduction.

Pete Gober: Parallel with the ferret reintroductions: allocation was looked at from a biological perspective which was always compromised by political and financial limitations. There are stricter guidelines due to the endangered listing of the ferret and it is messy. Thus it may be even messier for the swift fox. Everyone is going to make their own decision based on their interests and abilities. SFCT can provide guidance, but that doesn't mean that everyone is going to listen.

Brian Giddings: Perhaps the team could use some of the habitat research that Marsha is going to work on to identify areas that contain good habitat but are void of foxes.

Richard Bischof: This may help alleviate some of the funding issues as well: Release proposals that are in the focal areas that have been identified by the team may have a greater chance of funding, if funding organizations are made aware of these focal areas.

Brian Giddings: Maybe this issue needs to be carried forward to another meeting.

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## **Population Monitoring Update**

Every state is picking their own surveying methods and schedules, mostly due to differences in funding. That's okay, because everyone is doing monitoring of some sort and taking a hard look at the distribution within their state.

A recent thesis compared 5 techniques: 1) feces counts, 2) spotlighting, 3) some type of track survey, 4) scent posts and 5) mark-recapture (?). Abstracts for paper resulting from this thesis are on Northern Prairie's webpage ([www.npwfrc.usgs.gov](http://www.npwfrc.usgs.gov)). The website contains a bibliography and reviews of swift fox related literature. If anyone has publications coming out, they should let Marsha know, so she can update the site.

Robert Harrison: There is another online bibliography (on swift fox and kit fox): [www.wildlifer.com](http://www.wildlifer.com) (maintained by Bill Stanley).

Question: Would like to know what everyone's motives are for preferring a certain survey method over another.

Marsha Sovada: Kansas and Oklahoma survey every other township (township=sampling unit) by having trained personnel look for tracks. They spend 2 hours in each township. Their conditions make it feasible for them to do this survey. Northern Prairie takes the data and through a smoothing process looks at probability of occurrence and eventually presents a map using detection rates. End-result: indication of distribution and probability of occurrence. It takes the state 3 weeks to do the survey with 2 people and some help from the conservation officers. The report will be on the Kansas website.

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## **Specimen Deposition**

Richard Bischof: Remember from last year a discussion about specimen disposition and sample collection and associated protocols?

Question: Wasn't Christiane working on a protocol of that type (blood sampling protocol), however that protocol was never signed and numbered because they didn't feel it was finished?

Unknown: We have one for our office.

Eileen Dowd Stukel: There was a discussion in the past as to how to get and store samples if there is going to be a centralized location (museum, etc.). Should an address for such a centralized location be added to the protocol?

Marsha Sovada: I think that was part of what Christiane was doing. Uncertain about the central location.

Question: Was this only for blood sampling?

Marsha Sovada: Yes.

Richard Bischof: We had talked of a wider range of specimen types such as tissue, feces, whole specimen, etc.

Eileen Dowd Stukel: This is still unfinished and should be resolved.

Kyran Kunkel: Had asked about it this summer (regarding their foxes), but there was no answer, so he talked with Jerry Dragoo and was just going to send him their samples.

Jerry Dragoo: Emphasizes the importance of submitting swift fox specimen to a museum, etc. to make available for future research and voucher specimen. For example, Jerry utilized swift fox specimens from all across the country for morphometrical research. (Also have tissue samples, blood samples – this database is not online yet.) Voucher specimen can be collected by anyone and can be deposited locally in a state museum or at another, central institution.

Question: Do you charge anything for specimen deposition?

Jerry Dragoo: No. Genetic (tissue, blood) materials are more difficult to deposit because not all museums have the capabilities to store such samples. MSB has one of the largest frozen tissue collections in the world (competing with Berkley, TT). Should be online soon.

Question: Is this just for foxes?

Jerry Dragoo: No, for every organism. So one can ask environmental and ecological questions about other species found in swift fox areas based on museum specimens.

Dan Licht: We are encouraged to use ITIS (Integrated Taxonomic Information System – multi-agency effort by the federal government to standardize scientific names). So, despite the fact that one study shows swift and kit fox as same species, the National Parks Service will treat them as separate species if that is the way that they are listed in ITIS.

Jerry Dragoo: A book “Mammal Species of the World” (Editor: Don Wilson, Smithsonian): recognizes swift and kit fox as only one species. Policies for specimen storage are pretty standard for most museums.

SFCT: Agrees that each state will make an effort to deposit swift fox samples.

Creating a document that specifies procedures for specimen deposition would be beneficial (e.g. for continuity). Richard Bischof will be responsible for writing a protocol or updating Christiane's protocol.

Jerry Dragoo: Will provide a list of museums published by the American Society of Mammalogists. Good resource for members to ID museum or state (or other locations).

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## **Presentation: Swift Fox Genetics**

Jerry Dragoo: Historic range of Swift and Kit foxes (displayed by different colors for swift and kit fox). Looked at museum skulls in 1990 from around the country (close to 1,000 specimens). Couldn't really distinguish between swift and kit fox based on skull measurements. Also, looked at proteins. There were again no differences between swift foxes in Kansas and kit foxes in New Mexico. Very high similarity between swift and kit fox from other regions as well. Thus concluded that swift and kit fox are the same species.

Bob Wayne and collaborators looked at mitochondrial DNA (via Restriction Fragment Length Polymorphism analysis). Analysis resulted in a swift fox group and a kit fox group (1% sequence diversion). Thus Bob Wayne et al. concluded they were 2 different species. Problem with mitochondrial DNA is that only half of the picture is presented (since only maternally inherited).

Jerry Dragoo et al examined nuclear DNA (maternally and paternally inherited). Criticism: mutation rates are low. Genes did not have time to incorporate any mutations. Thus they may have had the same genes even though speciation already occurred. Need to look at nuclear marker with a higher mutation rate.

If swift and kit fox are the same species, reintroduction could use either swift or kit for reintroductions into its former range.

Question: What about ecological differences?

Jerry Dragoo: We will be looking at selection pressures. Only 3 states have both swift and kit fox: Texas, New Mexico and Colorado. Texas and New Mexico have potential overlap between swift and kit fox. It is important to understand the phylogenetics, especially if one species is listed as endangered and the other is not.

They used mitochondrial DNA to assign each of the seven populations studied to either swift or kit fox. Then they used nuclear DNA to analyze those populations. Mitochondrial DNA: 67 bases are different between dog and red fox. 9% sequence diversion between red fox and swift, kit and arctic fox. 2% sequence diversion between arctic fox and swift fox. 1% sequence diversion between swift and kit fox (only 4 out of 350 bases were different).

Compared the swift fox and kit fox groups (nuclear DNA) and found no diversion. However, found significant amounts of genetic variation within and between populations.

Want to test if the populations are in Hardy-Weinberg equilibrium. F statistics (inbreeding coefficient) will tell if there are more or fewer heterozygotes in a population than expected.

Lack of heterozygotes may indicate inbreeding. Another reason for low number of heterozygotes may be if two populations that are being investigated are in fact the same population.

Next step: Utilized likelihood model to determine from where animals may have originated based on the observed genotypes. Model does not consider travel distances, barriers, etc. – just based on genotype.

Results indicate that there is only one population in southeastern New Mexico, thus swift and kit fox are the same species. Most of the genetic variation observed is within populations. Indicate healthy populations, at least in New Mexico. There is also significant variation among populations. Thus, one wouldn't want to take animals from Arizona or Nevada and move them to South Dakota.

Question: Would you say that by calling them the same species, you can combine their ranges and make statements about swift fox range being x% of its former range?

Jerry Dragoo: Wouldn't affect the management of endangered populations (instead of species). Each population is on its own evolutionary trajectory.

Question: Is there evidence in your data of increasing integration of kit foxes moving into swift fox areas or red fox?

Jerry Dragoo: The Rio Grande and the Canadian River may pose major barriers. Seen more swift foxes move toward the Rio Grande area.

Question: Where do the specimens come from?

Jerry Dragoo: Hunters, trappers, road kills, scat, blood samples collected during studies.

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## **Conservation Strategies**

(For description of strategies see Meeting Minutes in 2000 Annual Report of the SFCT)

### 6.1.1 through 6.2.2:

Nebraska: These strategies will tie in with the prairie dog conservation plan (should it be approved in Nebraska).

Montana: Trying to get an idea of land ownership where swift fox are. Moved more toward prairie habitat protection in the past few years (through easements). It is a matter of identifying those tracts of land that may be corridors or important core areas for swift fox. Currently considering to commit dollars (easements) specifically for swift fox in northeastern Montana.

Question: What would that pay for?

Brian Giddings: Standard easement package: no subdivision, oil and gas exploration is either limited or removed, rest/rotation grazing system of some sort (there are different tactics). Stresses distinction between federal and private land: conservation is much harder on private land.

Richard Bischof: Which is a big problem in Nebraska because only a small fraction of the state is not privately owned.

#### 7.2.1:

Marsha Sovada: Research committee can get these recommendations done.

Comment: Yes, the lit review is basically done.

Lu Carbyn: Comment on research – There seems to be no research on the effects of long-term climatic changes on prey base. This would be important because swift fox key in on certain elements of the prey ecosystem that are affected by climate changes, and long-term monitoring is the only way to go. Swift fox is a good candidate for a long-term study, because it is a charismatic species associated with an endangered ecosystem.

Question: Where would be the best place for such a study?

Lu Carbyn: Should be done in 3-4 key areas: Such as the southern, central and northern part of the range.

#### 7.2.2:

Richard Bischof: Nebraska also found swift fox in areas with row crops and fallow. (Similar to Kansas' results).

Francie Pusateri: Work by Darvy Findling (?) found that while swift fox occur in those marginal areas, they do not occur in the same densities.

Marsha Sovada: Increasing irrigation results in loss of fallow fields as they are converted to sunflowers and crops. Other problem in Kansas and perhaps Nebraska is the planting of CRP using tall-grass species (targeted at pheasants).

Francie Pusateri: In Colorado, red foxes are denser in crop areas (thus more overlap and competition)

#### 7.2.3:

Lu Carbyn: Wonder why they disappeared in the first place. Bottom line: most likely cause for disappearance were droughts in the 1930's. Predator control and land conversion etc. were much stronger in the US, not so much in Canada and still the swift fox survived in the US, not Canada.

Marsha Sovada: Significant drops in numbers were observed in places like Kansas much earlier (late 1800's).

Lu Carbyn: They were still in significant numbers by the turn of the century, but really disappeared in the 1930's. It could be that in Kansas there was a very sudden change in agricultural practices. That would be quite different from what happened in the North.

Dan Licht: Vern Daily (?) reported swift fox gone from North Dakota by 1910.(+/-).

Comment: When you harvest 12,000 foxes in the late 1880's, that has an impact. And that is just the reported harvest.

Richard Bischof: Nebraska encounters roadkill foxes in most years and these occurrences generally take place in the same locations. What structures (culverts, fences, signs, etc.) could be used to minimize the risk? This may also be relevant in areas with newly released foxes, where each individual (especially the females) is valuable.

Lu Carbyn: Slowing down (signs) may be the best bet.

Jerry Dragoo: People working with the San Joaquin fox may have already come up with some solutions to this problem, they should be contacted.

Kyran Kunkel: Could ask department of roads to put in culvert and then check if foxes use the culvert (radio collars).

Lu Carbyn: In Canada, swift fox den along ditches and that's where the pups get hit by cars. Plus swift fox may visit roadkills to feed on and then they get hit.

#### Other threats:

Matt Peek: Kansas has big push to increase Continuous CRP throughout the state. Most crop ground is terraced. There is a potential to grass these terraces. This increased cover likely increases prey density. May be good for swift fox or may benefit coyotes more than swift fox. CCRP is not just grassed terraces, other grass strips/buffers may be placed in different parts of the agricultural field.

Eileen Dowd Stukel: What kind of grasses?

Matt Peek: Primarily switch grass and little blue, but landowner has potential to plant whatever he wants.

Eileen Dowd Stukel: We have an NRCS representative on the Team to help us address such issues, but he was unable to attend this time.

#### 9.1.1:

This will be addressed by the brochure that Bob Sullivan is putting together.

### 9.1.2:

Same as previous

Richard Bischof: Nebraska Heritage Program has provided the NRCS with information about the state listed species (including swift fox). NRCS includes this information in their guidebooks, used when they provide technical assistance to landowners.

### 9.1.3:

Brian Giddings: Don't know if that needs to be done: was mostly dependent on listing.

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## **SFCT Position Update**

Richard Bischof: Pete Gober recommended that SFCT provide position update in form of a news release before the coordination meeting. A generic version should be written by the Team and each member can then customize it for release by their agency. Need to emphasize that SFCT's work is continuing despite the removal of the swift fox from the candidate list. Someone (education committee) has to write the next release. Eileen Dowd Stukel agreed to write the news release.

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## **Swift Fox Book Update**

Marsha Sovada / Lu Carbyn: Very close to project completion. 23 papers are in the book, 95% of these are already edited. Still have to be formatted by the publisher. It will be published in 2002 by the Great Plains Institute. Still need money, don't know exactly how much. Will have a budget once the publisher has it on his desk. Will be a benchmark publication, identifying distribution etc. At this point it's for anyone's reference. Still need images:

- Habitat in different parts of its range
- Study methods (handling, marking, trapping)

Background: Swift Fox Symposium in Canada in 1998: papers presented there are in the book as well as additional papers to make it more complete.

5 sections:

1. Setting the stage (4 papers)
  2. Distribution and population shifts (5 papers)
  3. Censusing techniques (3 papers)
  4. Population ecology (9 papers)
  5. Taxonomy, physiology, and disease (3 papers)
- + Conclusions

Have a good mix of papers, but still see a gap: need a good status paper for Texas (even a short status paper would be sufficient).

Robert Harrison: Don't know if there would be that much to say about Texas.

Lu Carbyn: The reduction would be interesting in Texas.

Robert Harrison: Will write Texas paper, don't want the book held up any longer.

Marsha Sovada / Lu Carbyn: Not so concerned with length of time needed for completion. Position was not to get the information out as quickly as possible, but to get a substantial publication in the time needed to make it as complete as possible

Brian Giddings: It will be a good reference to have and might even address some of the conservation strategies for 2002 (management recommendations etc.).

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## **Meeting Wrap-up**

The SFCT thanks the National Park Service for putting on the field trip and for helping to organize this meeting.

### 2001 Annual Report:

Matt Peek agreed to compile the next annual report. Deadline: prior to next year's meeting.

### Next meeting date/location:

Possibly tag on to Wildlife Society's meeting in September 2002 in Bismarck, ND.

---

The meeting was adjourned at 11:00 am 10/18/2001

After the meeting was adjourned, the SFCT participated in a field trip to Buffalo Gap National Grassland and Badlands National Park to inspect the black-footed ferret reintroduction sites and associated facilities.

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## **Individual Task Assignments**

Richard Bischof: write/update swift fox specimen deposition protocol.

Jerry Dragoo: provide a list of museums published by the American Society of Mammalogists.

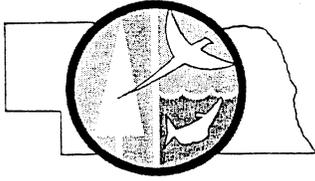
Robert Harrison: write a paper on the status of swift fox in Texas for the swift fox book.

Bob Sullivan (Education Committee): swift fox habitat management brochure.

Eileen Dowd Stukel (Education Committee): SFCT Newsletter providing a SFCT position update.

All: provide swift fox point data to Marsha Sovada for GIS project, provide swift fox specimens/samples to appropriate museum/institution as they become available.

(For Education, Research and Habitat Committee tasks, see pages 11 and 12.)



NEBRASKA GAME AND PARKS COMMISSION

Wildlife Division  
2200 N. 33rd St.  
Lincoln, NE 68503-0370  
(402) 471-5174  
*rbischof@ngpc.state.ne.us*

November 15, 2001

Sam Holland  
Animal Industry Board  
411 South Fort St  
Pierre SD 57501-4503

Dear Mr. Holland;

The Swift Fox Conservation Team is a group of federal and state biologists charged with ensuring long-term conservation of the swift fox in the Great Plains. The Team's responsibility has been to implement a Conservation Strategy Plan to ensure persistent populations of swift foxes in much of their historic range. The new information gathered by the Team and the conservation efforts of state agencies has led to the removal of swift fox from the federal candidate list in January 2001. We believe, however, that continued attention to and management of swift foxes is essential to ensure the long-term persistence of swift foxes in the Great Plains.

We have reviewed the feasibility and reintroduction reports and plans of the Turner Endangered Species Fund and their cooperators and endorse the ecological merit of this project and its value related to goals of the Team. We further believe that such a plan will be beneficial to the natural heritage of the state of South Dakota valued by its citizens. Swift fox have not been shown anywhere to cause conflicts with farm and ranch operations or private property rights. The swift fox is doing well in many parts of its range where farming and ranching practices and landownership patterns are similar to those in the northern part of swift fox range, including South Dakota.

The Swift Fox Conservation Team is available and willing to address biological concerns of the South Dakota Animal Industry Board regarding the Reintroduction Program proposed by the Turner Endangered Species Fund and their cooperators.

Sincerely,

Richard Bischof  
Swift Fox Conservation Team, Chair

Cc: Kyran Kunkel, Turner Endangered Species Fund



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

### DIVISION OF LAW ENFORCEMENT

Great Falls International Airport

2800 Terminal Dr., Suite #105

Great Falls MT 59404

(406) 453-5790 FAX 453-3657

Defenders of Wildlife  
c/o Minette Johnson  
Northern Rockies Office  
114 West Pine St.  
Missoula, MT 59802

11/14/01

Ms. Johnson:

Per our phone conversations and your letter dated 10/03/01, this letter is to confirm that all swift fox that have been imported from the Cochrane Ecological Institute (CEI) for reintroduction onto the Blackfeet Reservation, MT, have all been imported legally and with the proper export and import permits/documents.

From my standpoint as a federal Wildlife Inspector, all the required federal and provincial Canadian government, Montana state government, Blackfeet tribal government, and FWS permits have been obtained and the proper import regulations adhered to for the past three years. Valid Canadian health papers were also presented and copies collected. For the first two years of reintroduction, I personally conducted inspections on and authorized the import of the swift fox, through the U.S. Customs Port of Chief Mt., MT. Due to the fact that the two previous imports and inspections were done in a professional manner, I felt no need to be physically present at the Port this year, to inspect and clear the import. As U.S. Customs has full authorization to inspect and clear FWS imports/exports, I coordinated with Port Inspectors to inspect this years import. As we are aware, this years import and clearance was no different than the two previous years.

All records that I have collected for the two previous imports have already been processed and forwarded to our Washington Office for data entry and filing. This years import documents will also be processed and forwarded at a later date.

If anyone has any questions in reference to the swift fox imports, or this reply, they may contact me directly at the above listed phone/fax #'s or address.

Thank You,

Joseph D. Early  
Wildlife Inspector, MT

cc: Ira Newbreast, Blackfeet Fish & Wildlife Dept.  
Clio Smeeton, CEI

# Swift Fox News

The Swift Fox Conservation Team

June 2002

This is the third newsletter of the Swift Fox Conservation Team, a multi-agency group formed in 1994 to work cooperatively on swift fox management and conservation. The Team was assembled by state wildlife agency directors within the U.S. swift fox range in response to a U.S. Fish and Wildlife Service finding that the species was warranted for federal listing under the Endangered Species Act. The primary purpose of this effort was to assemble existing information, collect new biological data, and implement needed swift fox monitoring and management programs so the future of the species is assured and federal listing is unneeded.

The Team also includes representatives from Canada and federal wildlife and land management agencies in the U.S. The Team has open annual meetings at rotating sites within the range of the swift fox and produces an annual report that includes updates on monitoring efforts and research projects. If you are interested in receiving copies of Team reports or results from swift fox activities in your state, contact your state wildlife agency's Team representative.

## NATIONAL FISH AND WILDLIFE FOUNDATION GRANT

The Swift Fox Conservation Team recently received funding from the National Fish and Wildlife Foundation (NFWF) for a project entitled "Determination of swift fox habitat characteristics associated with rangewide distribution data." For a number of years, many agencies and other cooperators have gathered information on swift fox habitats, but this information has never been analyzed in a collective and objective way. Dr. Marsha Sovada, of the USGS-BRD Northern Prairie Wildlife Research Center in Jamestown, North Dakota, will oversee the project.

Northern Prairie is currently generating a point database of swift fox distribution data, totalling more than 7,000 data points. Sources of data include direct observations, confirmed sightings, road-killed animals, collected specimens, track surveys, scent

stations, baited track plates, spotlighting, track surveys, harvest records, trapper surveys, and swift fox captures. Northern Prairie will attempt to determine if these data indicate preferential selection of habitats by swift fox. Project results may help identify areas suitable for swift fox expansion and possibly help formulate theories for swift fox absence in areas that appear suitable.

NFWF also awarded a \$99,000 grant to the Bureau of Land Management (BLM) in Montana for the international swift fox census in 2001. Montana Department of Fish, Wildlife and Parks received \$89,000 to participate in the international census and to complete state distribution surveys, primarily on BLM lands in northcentral and southeastern Montana in 2001 and 2002.

## HIGHLIGHTS OF THE 2001 ANNUAL MEETING OF THE SFCT

The Swift Fox Conservation Team (Team) held its annual meeting on October 17-18, 2001 in Rapid City, South Dakota. Nearly 30 people attended, including most Team members and many others interested in swift fox management and conservation. In addition to the formal meeting, participants toured portions of Badlands National Park and the Conata Basin portion of Nebraska National Forest with the assistance of Forest Service and National Park Service personnel involved in black-footed ferret reintroduction on the Conata Basin/Badlands site.

A more detailed meeting report will be included in the 2001 Annual Report of the Team. A short summary is presented below:

**Montana:** Brian Giddings reported on the state's past and present swift fox distribution survey efforts, including cooperative work with the BLM in association with Canada in completing the international swift fox census along the U.S. border. The state population estimate for northcentral Montana is now more than 200 foxes with nearly 900 foxes present in the adjacent Canada/U.S. populations.

**South Dakota:** Jon Jenks, South Dakota State University, described recent survey efforts, primarily searching for tracks and other sign, in southwestern South Dakota in association with swift fox surveys conducted on Buffalo Gap National Grassland. One problem encountered was reluctance of private landowners to grant permission (only 2 of 9 private landowners gave permission, due to concerns about the candidate listing of the black-tailed prairie dog). Five den sites were located, two were active, and one was a natal den.

**National Park Service:** Dan Licht reported that resident populations of swift fox are not known to currently occur on any NPS units. NPS is increasing its monitoring efforts. Badlands National Park is

investigating the possibility of swift fox reintroduction.

**Canada:** Lu Carbyn described the history of swift fox extirpation and restoration in Canada. Reintroduction began in 1984, with nearly 1,000 animals released during 17 years. The population estimate prior to the international census was 877, including 221 in Montana.

**Wyoming:** Martin Grenier described Wyoming's upcoming monitoring program, which will make use of track plates to determine presence/absence in eastern Wyoming. The project will be conducted in cooperation with the Turner Endangered Species Fund.

**Kansas:** Matt Peek reported that the track survey results are available, and that they are pleased with the number of foxes detected.

**North Dakota:** Jacquie Gerads assumed Steve Allen's position as the agency's furbearer biologist. Some quarter-section track searching was conducted in 2000, with no swift fox detected. These surveys will be resumed in 2002.

**Colorado:** Francie Pusateri reported that Colorado's estimated swift fox population is 7,000-10,000 animals in shortgrass prairie habitat alone. Population monitoring will be conducted at 5-year intervals. Colorado is participating in the translocation of swift fox to South Dakota. Colorado DOW is considering reopening the season on swift fox, with a possible season length of December 1-January 21, a bag and possession limit of 25, and a quota of 500 foxes. Legal methods would be firearms and live-trapping, with season results to be evaluated with a harvest survey.

**USDA, APHIS – Wildlife Services:** Jeff Green reported that swift fox are not a target of any of his agency's control effort, but some limited incidental take occurs.

**Northern Prairie Wildlife Research Center:** Marsha Sovada stated that Northern Prairie is analyzing Kansas' swift fox monitoring data, obtained from track surveys conducted in ¼-sections in western Kansas. Analyses have produced a look at probabilities of detection and occurrence. Another product is a detailed state distribution map.

**USDA, Forest Service:** Bob Hodorff described his efforts to collect data from other Forest Service biologists. Both Ogallala and Buffalo Gap National Grasslands have swift fox.

**USFWS:** Pete Gober stated that the Service received very few comments on the removal of the swift fox from the candidate species list. His agency remains interested in swift fox efforts.

**Nebraska:** Richard Bischof reported that he began a limited scent station survey, and the technique is working well in Nebraska. Similar to Kansas, swift fox were detected in row crops and fallow fields. The survey will be expanded in 2002.

**BLM:** Chuck Berdan reported that his agency participated in the international census held in Canada and Montana.

**New Mexico:** Bob Harrison has finished a 3-year study on general ecology and to determine the best survey method for swift fox in New Mexico. The best method is scat collection and analysis using DNA analysis. One of the study areas, Kiowa National Grassland, may be a population sink for swift fox. Bob has submitted a proposal to New Mexico Game and Fish to conduct annual monitoring using the scat analysis technique. If approved, the work will begin in January 2002.

**Reintroduction discussion:** Several speakers shared updates on ongoing or planned reintroduction projects, including Badlands National Park, Bad River Ranches, and Blackfeet Indian Reservation. Part of the group's field tour included a discussion of suitability of Badlands National Park for swift fox reintroduction. A total of 101 swift fox have been released on the Blackfeet Reservation. Releases may end after 2002. The Bad River Ranches have received the necessary permits to begin reintroduction during the fall of 2002.

**A few swift fox web-sites of interest...**

swift and/or kit fox bibliographies:  
<http://www.wildlifer.com/foxrefs.html>

<http://www.npwrc.usgs.gov/resource/1999/swifflit/swifflit.htm>

Turner Endangered Species Fund swift fox newsletter:  
<http://tesf.org/newsletter/swiftfox-2001-11.pdf>

USFWS swift fox web-site:  
<http://mountain-prairie.fws.gov/mammals/swiftfox/>

## SWIFT FOX BASICS

- ❖ Currently ranges from Canada, where reintroduced, south through parts of Montana, Wyoming, South Dakota, Colorado, Nebraska, Kansas, Oklahoma, Texas, and New Mexico.
- ❖ 12 inches tall at shoulder; 2-3 feet long from nose to end of tail; weight 4-6 pounds.
- ❖ Distinguishing features are small size; dark markings on either side of muzzle; and long, bushy, black-tipped tail.
- ❖ Uses dens year-round for shelter, protection from predators, and places to rear young, making the swift fox the most den-dependent and subterranean North American fox.
- ❖ Habitats vary across the broad range of the swift fox and include shortgrass and mid-grass prairies, cultivated fields, and habitats dominated by pinyon-juniper, sand sage, or mesquite.
- ❖ Habitat features often include gently rolling topography, loose soils for easy burrowing, and low grass or shrub ground cover to allow distant viewing.
- ❖ Female bears one annual litter (average 4-5/litter) in April or May. Young remain in den until about one month old.
- ❖ Foods include jackrabbits, cottontails, prairie dogs, ground squirrels, mice, insects, birds, and carrion.
- ❖ Mortality due in part to predation (badgers, bobcats, coyotes, golden eagles), poisoning, hunting and trapping, or collisions with vehicles.



## SWIFT FOX REMOVED FROM CANDIDATE SPECIES LIST

On January 8, 2001, the U.S. Fish and Wildlife Service announced that the swift fox was no longer listed as a federal candidate species. In its news release, the Service said: "In an assessment of the species' current status, the Service concluded that although the swift fox has been reduced across much of its historical range, viable populations currently occur in approximately 40% of those areas formerly occupied. The species also appears to be more adaptable to a wide range of habitat types and more tolerant of modified land uses than previously believed. Furthermore, the continuing efforts of the Conservation Team indicate that management activities for this species will be carefully considered in the future."

The work of the Swift Fox Conservation Team has not ended with the removal of this species from the candidate species list, although many of the initial research projects and intensive monitoring efforts have been concluded. Many entities are now involved in regular, although less frequent, monitoring efforts.

## SWIFT FOX BOOK NEARS COMPLETION

All but three chapters of the book are in the publisher's hands. The three remaining chapters are in the final editing state. The book should be available during the fall or winter of 2002.

update provided by Marsha Sovada

## 2002 MEETING OF SWIFT FOX CONSERVATION TEAM

The next Team meeting will be held in Bismarck, North Dakota on September 23-24 at the Radisson Inn (Sept. 23) and the North Dakota Game and Fish Department (Sept. 24). Chair Richard Bischof is preparing an agenda.



*2001 Team field trip to Badlands National Park and Buffalo Gap National Grassland*

photos by Lu Carbyn

## SWIFT AND KIT FOX GENETICS

The taxonomy of swift and kit foxes has been problematic since the late 1930's. Since that time the tendency has been to reduce the number of taxa (some species regarded as subspecies, and many subspecies considered not valid). This reduction in the number of taxa has been based on analyses of populations using cranial morphology as well as genetic characteristics. Even the recognition of swift and kit foxes as a single species or two distinct species has been controversial. Our genetic data still support the two foxes as a single species.

We here at the University of New Mexico have been using microsatellite DNA to examine gene flow among populations of swift and kit foxes. We used the mitochondrial DNA haplotypes that were found for swift and kit foxes to distinguish among these foxes. Animals with the swift fox haplotype in southeastern New Mexico were regarded as a population of swift foxes and those with the kit fox haplotype were regarded as a kit fox population. We then analyzed these populations using the nuclear microsatellite genetic markers. We found that there was no difference between the two sympatric populations in southeastern New Mexico, and therefore they should be managed as a single population in this part of the state.

We have discovered that the genetic variation observed between swift and kit foxes in general is insignificant. Whereas, the genetic variation among populations of these foxes is significant. In other words, two swift fox populations are likely to be as genetically distinct from each other as a population of swift foxes and a population of kit foxes are from each other. Each of these populations has the "potential" to undergo speciation. Therefore, protecting or managing distinct populations will preserve biodiversity regardless of taxonomic status. There currently is significant gene flow among populations however, to maintain the species' integrity. Speciation requires evolution to occur, but evolution can occur without resulting in speciation.



Jerry W. Dragoo, Ph.D.  
Mephitologist, and  
Research Assistant Professor  
Museum of Southwestern Biology  
University of New Mexico

## SWIFT FOX CONSERVATION TEAM MEMBERS AND PARTICIPATING COOPERATORS

<p><a href="#">State agencies</a>  <b>Nebraska: Richard Bischof - Chair</b>          Nebraska Game and Parks Commission          2200 N. 33<sup>rd</sup>          Lincoln, NE 68503</p>	<p><b>U.S. Forest Service: Bob Hodorff</b>          Nebraska National Forest, Fall River Ranger District          PO Box 732          Hot Springs, SD 57747</p>
<p><b>Colorado: Francie Pusateri</b>          Colorado Division of Wildlife          317 W. Prospect Road          Fort Collins, CO 80526</p>	<p><b>U.S.D.A.: Jeff Green</b>          APHIS, Wildlife Services          12345 W. Alameda Parkway #204          Lakewood, CO 80228</p>
<p><b>Kansas: Matt Peek</b>          Kansas Dept. of Wildlife and Parks          1830 Merchant, Box 1525          Emporia, KS 66801-1525</p>	<p><b>Bureau of Land Management: Eric Lawton</b>          1849 C St. NW, LS-204          Washington, DC 20240</p>
<p><b>Montana: Brian Giddings</b>          Montana Fish, Wildlife and Parks          PO Box 200701          Helena, MT 59620-0701</p>	<p><b>National Park Service: Dan Licht</b>          Badlands National Park          PO Box 6          Interior, SD 57750</p>
<p><b>New Mexico: Chuck Hayes</b>          New Mexico Dept. of Game and Fish          PO Box 25112          Santa Fe, NM 87504</p>	<p>Natural Resources Conservation Service: Gerald Jasmer          Federal Building, Room 152          100 Centennial Mall North          Lincoln, NE 68508-3866</p>
<p><b>North Dakota: Jacquie Gerads</b>          North Dakota Game and Fish Department          100 N. Bismarck Expressway          Bismarck, ND 58501</p>	<p><a href="#">Canada: Steve Brechtel</a>          Alberta Fish and Wildlife Division          9945 108<sup>th</sup> Street          Edmonton, AB T5K 2G9</p>
<p><b>Oklahoma: Julianne Whitaker Hoagland</b>          Oklahoma Dept. of Wildlife Conservation          1801 N. Lincoln Blvd.  <b>Oklahoma City, OK 73105</b></p>	<p><a href="#">Participating cooperators</a>  <b>Lu Carbyn</b>          137 Wolf Willow Crescent          Edmonton, AB T5T 1T1</p>
<p><b>South Dakota: Eileen Dowd Stukel</b>          South Dakota Department of Game, Fish and Parks          523 E. Capitol          Pierre, SD 57501</p>	<p><b>Tarren Wagener and Michael Fouraker</b>          Fort Worth Zoo          1989 Colonial Parkway          Fort Worth, TX 76110</p>
<p><b>Texas: Robert Sullivan</b>          Texas Parks and Wildlife Department          PO Box 659          Canyon, TX 79015</p>	<p><b>Robert Harrison</b>          University of New Mexico          Dept. of Biology          Albuquerque, NM 87131</p>
<p><b>Wyoming: Martin Grenier</b>          Wyoming Game and Fish Department          260 Buena Vista          Lander, WY 82520</p>	<p><b>Fred Lindzey</b>          Wyoming Coop. Unit          Box 3166          Laramie, WY 82070</p>
<p><a href="#">Federal agencies (U.S.)</a>  <b>U.S. Fish and Wildlife Service: Pete Gober</b>          South Dakota Ecological Services Office          420 S. Garfield, Suite 400          Pierre, SD 57501</p>	<p><b>Bill Andelt</b>          Dept. of Fishery and Wildlife Biology          Colorado State University          Fort Collins, CO 80523</p>
<p><b>U.S.G.S./Biological Resources Div.: Marsha Sovada</b>          Northern Prairie Wildlife Research Center          8711 37<sup>th</sup> Street SD          Jamestown, ND 58401</p>	<p><b>Axel Moehrensclager</b>          Calgary Zoo          PO Box 3036 Station B          Calgary, AB T2M 4R8</p>

<p style="text-align: center;"><u>Participating cooperators cont'd</u></p> <p><a href="#"><u>Greg Linscombe</u></a>  Fur Resources Committee, IAFWA  Louisiana Dept. of Wildlife and Fisheries  2415 Darnell Road  New Iberia, LA 70560</p>	<p><a href="#"><u>Clio Smeeton</u></a>  Cochrane Ecological Institute  PO Box 484  Cochrane, AB T4C 1A7</p>
<p><a href="#"><u>Sian Waters</u></a>  Cochrane Ecological Institute  PO Box 484  Cochrane, AB T4C 1A7</p>	<p><a href="#"><u>Kyran Kunkel</u></a>  Turner Endangered Species Fund  1123 Research Drive  Bozeman, MT 59718</p>
<p><a href="#"><u>Minette Johnson</u></a>  Defenders of Wildlife  114 West Pine Street  Missoula, MT 59802</p>	<p><a href="#"><u>Kevin Honness</u></a>  Turner Endangered Species Fund  PO Box 1118  Fort Pierre, SD 57532</p>
<p><a href="#"><u>Jerry Drago</u></a>  Museum of Southwestern Biology  University of New Mexico  Albuquerque, NM 87131-1091</p>	

## Status of Swift Fox (*Vulpes velox*) in Colorado, April 2002

Frances M. Pusateri, Colorado Division of Wildlife, 317 W. Prospect, Fort Collins, CO 80526, 970-472-4336, 970-472-4457 fax, [francie.pusateri@state.co.us](mailto:francie.pusateri@state.co.us)

### Estimates of Swift Fox Populations:

Swift fox ranges have increased in the past 25 years on the eastern plains of Colorado. Based on studies done by Fitzgerald and Kahn (1997), Finley (1999), and Covell (1992), an estimated population of 7,000 – 10,000 swift fox are found in eastern Colorado short-grass prairie habitats. In addition, swift fox are known to inhabit other areas such as mixed agricultural/prairie habitats that encompass about 30% of eastern Colorado.

### Inventory Efforts:

The last range wide inventory in Colorado was completed in 1998. Current recommendations include surveys of swift fox presence and density in key areas of eastern Colorado every 5 years. The Division of Wildlife currently has budgeted \$55,000 to resurvey Colorado's eastern plains starting in the fall of 2002 using the mark/resight population estimation methodology described by Fitzgerald and Kahn (1997).

### Proposed Regulations:

The Division of Wildlife was petitioned by the Colorado Trappers Association in spring 2001 to look at reopening the swift fox season with cage or live traps. This was discussed internally and it was determined that there was no biological reason not to allow take. Open seasons are not inconsistent with the Conservation Assessment and Strategy for Swift Fox in the United States. Kansas presently has an open season. Open seasons on swift fox in Colorado from 1982 – 1991 resulted in average harvests of 880 animals per year. If the quota of 500 swift fox was reached, it would have little or no effect on overall populations. However, there was concern about social issues and if the minimal take was worth the amount of public outcry that it could generate. At the July 2001 Commission meeting there was significant testimony against reopening the season. The Commission voted not to open the season on a 4 to 4 vote. The proposed season would have been open in all areas east of the Continental divide with a bag and possession limit of 25. A quota of 500 swift fox harvested per season was recommended for the first 3 years to evaluate the distribution and intensity of harvest. All swift fox taken would have been required to be tagged within 5 days of harvest at a Division of Wildlife office. Legal methods of take would have included firearms and live traps.

### Literature Cited:

- Covell, D. F. 1992. Ecology of the swift fox (*Vulpes velox*) in southeastern Colorado. M.S. Thesis, University of Wisconsin, Madison 111 pp.
- Finley, D.J. 1999. Distribution of the swift fox (*Vulpes velox*) on the eastern plains of Colorado. M.S. Thesis, University of Northern Colorado, Greeley 96 pp.
- Fitzgerald, J. and R. Kahn 1997. Swift fox investigations in Colorado, final report. Colorado Division of Wildlife, Project No. W-135-R-10. 8 pp.

## **Kansas Swift Fox Pelt Tagging Analysis, 1994-95 through 2001-02 seasons**

The swift fox (*Vulpes velox*) is classified as a furbearer in Kansas (K.S.A. 32-701 (e)). The first swift fox harvest season in Kansas in recent times was initiated in 1982. Since that time, harvest information has been acquired by the Kansas Department of Wildlife and Parks (KDWP) through an annual Furbearer Harvest Survey. Additionally, a pelt tagging program was initiated in 1994 to provide more precise information on swift fox distribution and harvest.

Any swift fox taken in Kansas must be presented to KDWP for tagging within seven days of the close of the season. All five KDWP regional offices as well as biologists and conservation officers within or near the swift fox range are provided with tags. The data sheet completed in conjunction with pelt tagging is provided in **Appendix 1**.

Between the 1994-95 and 2001-02 furbearer seasons, 181 swift fox were taken by 38 furharvesters in Kansas, including one swift fox taken by KDWP. The annual harvest of swift fox during this 8-season period is presented in **Figure 1**. These swift fox were taken in 16 counties in Kansas. The number of swift fox taken in each county is presented in **Figure 2**.

Swift fox may be taken using equipment authorized in K.A.R. 115-5-1. **Table 1** provides a breakdown of the methods used to take swift fox. **Table 2** shows the primary species being pursued at the time the swift fox was taken. The annual season bag per furharvester is given in **Table 3**, and the total bag per furharvester over the 8-season period is given in **Table 4**. Habitat types from which swift fox were taken are presented in **Table 5**.

### **Notes:**

Swift fox season opens on the third Wednesday in November and runs through January 31 in the western furbearer unit and February 15 in the eastern furbearer unit. Harvest by month is as follows: November – 40, December – 61, January – 54.

During 7 of the 8 seasons, a single furharvester was responsible for at least 50% of that season's swift fox harvest.

Of the 100 swift fox taken during the past 6 seasons, 10 were harvested by furharvesters who indicated they were pursuing swift fox as the primary target species at the time of take.

Foothold traps set for coyotes accounted for 105 of the 181 swift fox.

Of the 29 swift fox that were the primary target species when harvested, 27 were trapped (21 footholds, 6 body-grippers), and 2 were shot (1 rifle, 1 shotgun).

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June 11, 2002

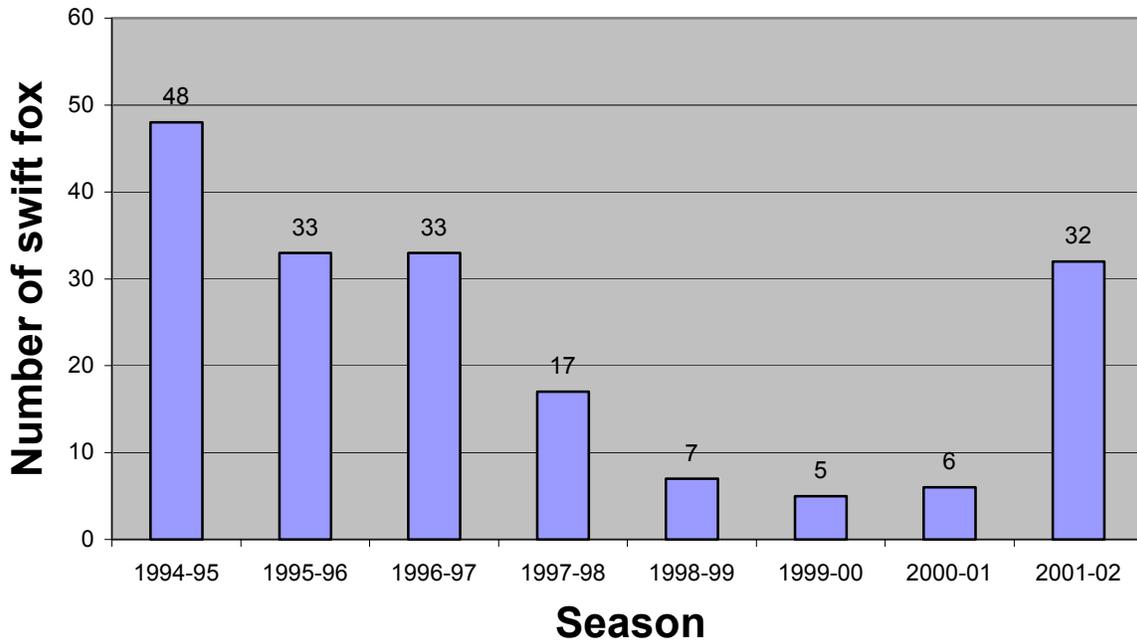


Figure 1. Number of swift fox tagged by KDWP during the 1994-95 through 2001-02 furbearer seasons in Kansas.

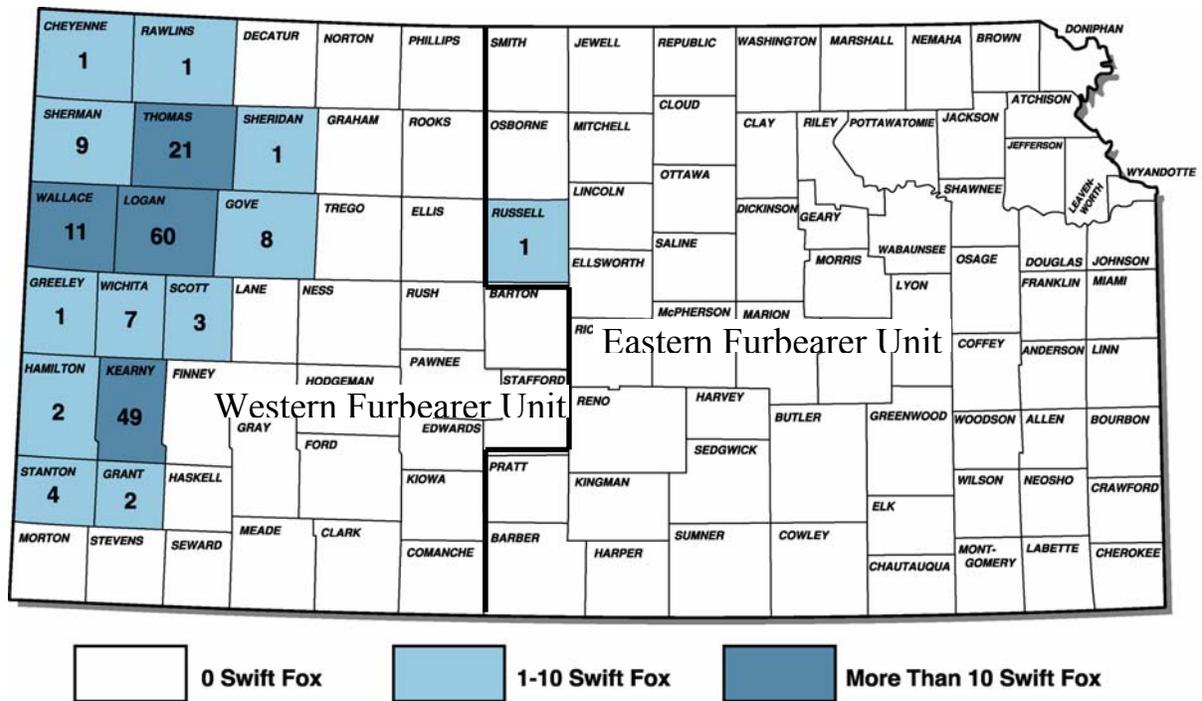


Table 1. Methods used to take swift fox during the 1994-95 through 2001-02 furbearer seasons in Kansas.

<b>Method of Take</b>	<b>Number of Swift Fox</b>	<b>Percent of Swift Fox</b>
foothold trap	146	80.7
conibear trap	6	3.3
snare	1	0.6
rifle	5	2.8
shotgun	9	5.0
salvage	14	7.7
<b>Total</b>	<b>181</b>	<b>100.0</b>

Table 2. Primary species being pursued when swift fox were taken during the 1994-95 through 2001-02 furbearer seasons in Kansas.

<b>Target Species</b>	<b>Number of Swift Fox</b>	<b>Percent of Swift Fox</b>
swift fox	29	16.0
coyote	112	61.9
badger	8	4.4
pheasant	3	1.7
salvage	14	7.7
unspecified "fox"	4	2.2
unspecified	11	6.1
<b>Total</b>	<b>181</b>	<b>100.0</b>

Table 3. Single-season bags of swift fox by furharvesters during the 1994-95 through 2001-02 furbearer seasons in Kansas.

Season Bag per Furharvester	*Number of Furharvesters	Percent of Furharvesters	Cumulative Percent of Furharvesters	Total number of Swift Fox Taken	Percent of Swift Fox Taken	Cumulative Percent of Swift Fox Taken
1	25	54.35%	54.35%	25	13.81%	13.81%
2	4	8.70%	63.04%	8	4.42%	18.23%
3	1	2.17%	65.22%	3	1.66%	19.89%
4	5	10.87%	76.09%	20	11.05%	30.94%
5	2	4.35%	80.43%	10	5.52%	36.46%
6	3	6.52%	86.96%	18	9.94%	46.41%
7	2	4.35%	91.30%	14	7.73%	54.14%
17	1	2.17%	93.48%	17	9.39%	63.54%
18	1	2.17%	95.65%	18	9.94%	73.48%
22	1	2.17%	97.83%	22	12.15%	85.64%
26	1	2.17%	100.00%	26	14.36%	100.00%
	46			181		

\*Furharvesters who harvested swift fox during more than one season are represented multiple times.

Table 4. Total swift fox bags by furharvesters during the 1994-95 through 2001-02 furbearer seasons in Kansas.

Total Bag per Furharvester	Number of Furharvesters	Percent of Furharvesters	Cumulative Percent of Furharvesters	Total number of Swift Fox Taken	Percent of Swift Fox Taken	Cumulative Percent of Swift Fox Taken
1	23	60.53	60.53%	23	12.71%	12.71%
2	2	5.26	5.26%	4	2.21%	14.92%
3	1	2.63	2.63%	3	1.66%	16.57%
4	1	2.63	2.63%	4	2.21%	18.78%
5	2	5.26	5.26%	10	5.52%	24.31%
6	3	7.89	7.89%	18	9.94%	34.25%
7	2	5.26	5.26%	14	7.73%	41.99%
9	1	2.63	2.63%	9	4.97%	46.96%
12	1	2.63	2.63%	12	6.63%	53.59%
40	1	2.63	2.63%	40	22.10%	75.69%
44	1	2.63	2.63%	44	24.31%	100.00%
	38			181		

Table 5. Habitat types from which swift fox were taken during the 1994-95 through 2001-02 furbearer seasons in Kansas. (The “immediate habitat” type is that from which the swift fox was taken, and the “general habitat” type is the predominant habitat within 2 miles of the harvest site.)

<b>Immediate Habitat</b>	<b>Number of Swift Fox Harvested</b>	<b>Percent of Total Harvest</b>
<b>General Habitat</b>		
<hr/>		
<b>Short-grass prairie</b>		
Short-grass prairie	46	25.4
Dryland crop	7	3.9
Irrigated crop	2	1.1
Suburban/town	1	0.6
Unspecified	12	6.6
<b>Total</b>	<b>68</b>	<b>37.6</b>
<hr/>		
<b>Dryland crop</b>		
Short-grass prairie	20	11.0
Dryland crop	50	27.6
Irrigated crop	1	0.6
CRP	5	2.8
Unspecified	15	8.3
<b>Total</b>	<b>91</b>	<b>50.3</b>
<hr/>		
<b>Irrigated crop</b>		
Dryland crop	5	2.8
Irrigated crop	2	1.1
<b>Total</b>	<b>7</b>	<b>3.9</b>
<hr/>		
<b>CRP</b>		
Dryland Crop	1	0.6
CRP	1	0.6
Unspecified	2	1.1
<b>Total</b>	<b>4</b>	<b>2.2</b>
<hr/>		
<b>Unspecified</b>		
Short-grass prairie	1	0.6
Dryland crop	3	1.7
Unspecified	7	3.9
<b>Total</b>	<b>11</b>	<b>6.1</b>
<hr/>		
<b>Total</b>	<b>181</b>	<b>100</b>

# APPENDIX I

## 2001-2002 KANSAS SWIFT FOX PELT TAGGING DATA SHEET

TAGS \_\_\_\_\_ THROUGH \_\_\_\_\_ ISSUED TO: \_\_\_\_\_

Tag Pelt#	Name & Address of Furharvester	Furharvester Liscense #	Furharvester Phone #	County Harvested	Date Taken MM/DD/YY	Immed. Habitat	General Habitat	Method of take	Primary Target (Swift, coyotes, etc)
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

**Immediate Habitat type:**

**General Habitat within 2 miles:**

**Method of Take:**

- 1. Short-grass
- 2. Dryland crop
- 3. Irrigated crop
- 4. CRP
- 5. Suburban/ town
- 6. Other (specify)

- A. Short-grass
- B. Dryland crop
- C. Irrigated crop
- D. CRP
- E. Suburban/ town
- F. Other (specify):

- 1. Foothold trap
- 2. Conibear trap
- 3. Cage trap
- 4. Snare
- 5. Rifle
- 6. Shotgun

- 7. Archery
- 8. Hounds
- 9. Salvage (roadkill)
- 10. Other (specify)

**Primary Target Species (NOT a YES or NO column):** Bobcat, Coyote, Raccoon, Fox, Deer, Quail, Pheasant, Squirrel, Rabbit, Other (specify)  
 revised 10/19/01

## **MONTANA SWIFT FOX MANAGEMENT ACTIVITIES, 2001-2002**

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### **ABSTRACT**

Several activities were completed during the 2001-2002 period, which include a final report regarding the Canadian/Montana international swift fox census and the second year of a statewide species distribution survey. Census results confirm the improving status of the reintroduced swift fox population through an evaluation of changing distribution and population size, an assessment of biological parameters, and a population viability analysis. The statewide species distribution survey contributed new information to further indicate an expanding swift fox population. Conservation and management activities underway or in development, which relate to Montana's commitment to the national Swift Fox Conservation Team (SFCT) conservation strategy objectives (Kahn et al. 1997) are discussed.

### **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 (CACCS) (Kahn et al. 1997) since 1994 (Giddings and Knowles 1995, Giddings 1996, Zimmerman and Giddings 1997, Giddings 1998, Giddings 1999, Giddings 2000). Current management direction in Montana is to delineate species distribution and establish a relative population size for swift fox in the state to serve as baseline data to measure changes as future survey & inventory activities occur. Montana's 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 with the larger contiguous continental swift fox population.

### **METHODS**

Methods used during the international swift fox census effort are described in Giddings (2000). A more detailed description of census design and sampling protocol is provided in Cotterill (1997) and Moehrenschrager and Moehrenschrager (2001). Census methodology reflects field and analysis procedures to investigate population estimates, habitat analysis, disease and parasitology, genetics analysis, and ultimately population viability to determine if additional reintroduction efforts need to be continued.

In the fall of 2001, FWP spent \$7,100 in BLM grant funds for the second year of a statewide swift fox distribution survey. This survey area was primarily south of the 1999 survey area, encompassing approximately 300 townships in southern Hill, Blaine, Phillips, and Valley counties in northcentral Montana. Only alternate townships were surveyed for a total of 142 townships. Track (and sign) searches were conducted for up to 2 hours in each sampled township by following the survey design as outlined in Roy et al. (1998). Species detection information was incorporated with existing location data to produce GIS-generated land

ownership and cover type layers for a current swift fox distribution map. Swift fox occurrence reports (observation reports, collected specimens) were also compiled during the 2001 report period for inclusion into the FWP species database.

## RESULTS

Initial results from the winter of 2000/2001 international census were reported in Giddings (2000). Detailed analysis of this data with results is now reported in Moehrensclager and Moehrensclager (2001). For the Montana study area, 82.5% of the townships were sampled in 1,188 trap nights. The 66 surveyed townships had 21 (31.8%) with swift fox that totaled 38 individuals. Montana's estimated swift fox density was calculated at 3.0 foxes/100sq km. This relates to a population estimate of 221 individuals present in the census area for the northern portion of these four counties.

Using the Canada census sites, results indicate a 3-fold increase in captures over fox captures in 1996-97. Estimated fox densities ranged from 2.4 foxes/100 sq km for the Grasslands area to a high of 9.2 foxes/100 sq km in the Canadian border area. Population estimates for the Grassland area are 96 foxes and 560 for the border area. The total Canada/US population estimate is 877 individuals. Swift fox distribution has expanded and population connected has improved when compared to the 1996-97 census data.

Statewide species survey results from 2001 detected swift fox presence in five townships, four of which are located south of US Highway 2. The five townships are in Blaine, Phillips and Valley counties with no detections occurring in southern Hill county. These locations were entered into the swift fox database to be included in current species distribution maps.

## DISCUSSION

International census results are now reported in Moehrensclager and Moehrensclager (2001), which investigates the status of the entire biological swift fox population that straddles the international border. Both the Montana and Canada populations are a direct consequence of the Canadian swift fox reintroduction program initiated in the mid-1980s. These populations currently occupy nearly 200 townships in southeastern Alberta, southwestern Saskatchewan, and northcentral Montana. The 2000-01 census has documented that both distribution and population size of swift fox has dramatically increased, specifically in Canada, since 1996-97. The 1996-1997 census found a population size of 289 animals while the 2000-01 census provided an estimate of 877 foxes. Moehrensclager and Moehrensclager (2001) indicate that this population increase has occurred despite the absence of any reintroductions during this four year period. They also note that 98.6% of the captured foxes were unmarked, indicating the foxes are successfully reproducing in the wild and that the Canadian/Montana populations are genetically connected. Overall, evidence provided by the 2000-01 census suggest that these foxes comprise a viable, self-sustaining population and will persist without further releases.

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 2001 suggests swift fox are expanding into the southern portions of a four county area in northcentral Montana.

State working group activities will include species and habitat mapping analysis that 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. 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.

## CONSERVATION STRATEGY ACTIVITIES

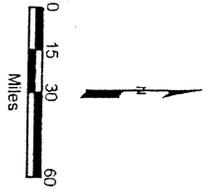
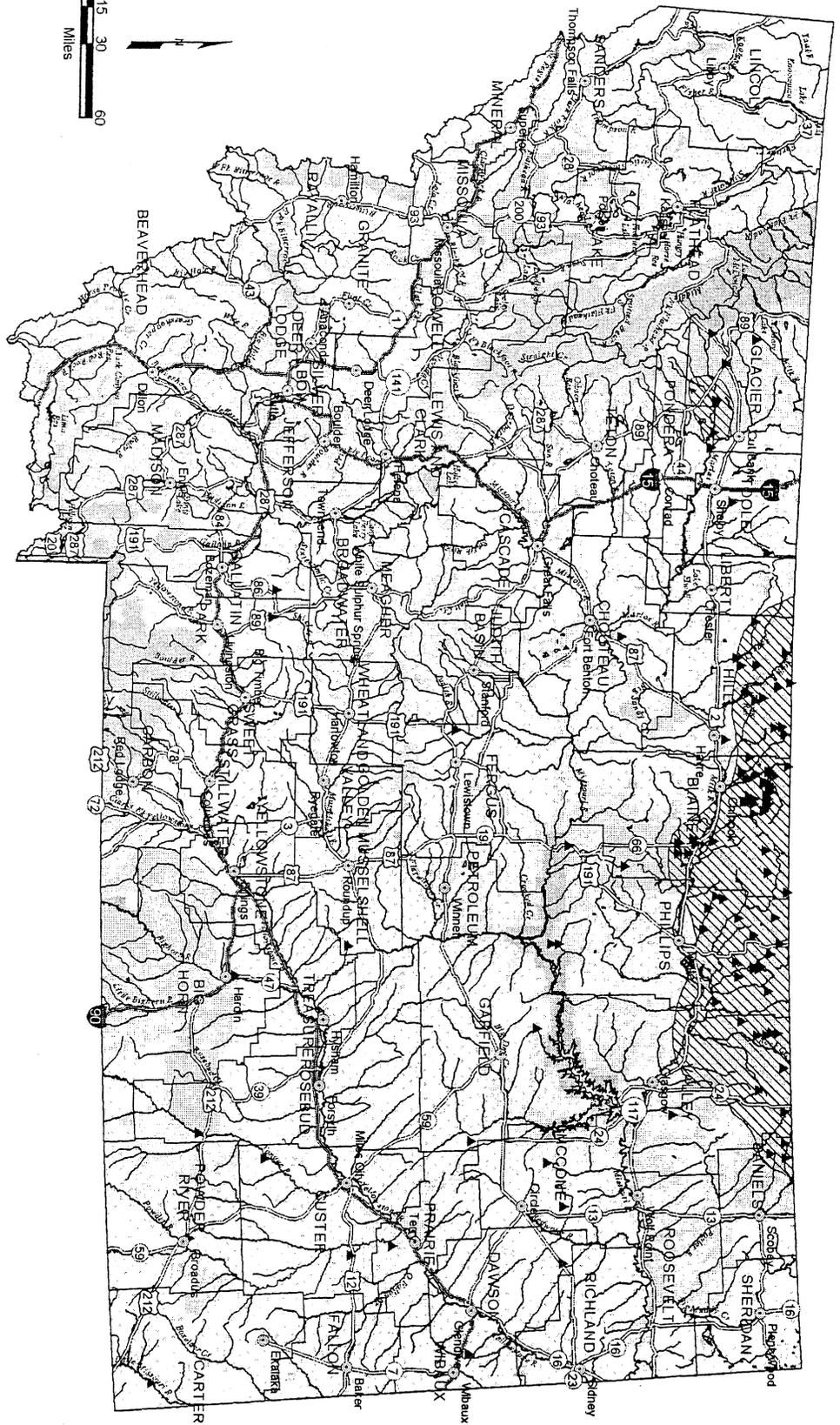
Status of swift fox conservation strategy action items scheduled for completion in 2002:

6.1.1, 6.1.2, 6.1.3, 6.2.1, 7.2.3, 9.1.1, 9.1.2 are ongoing, to be initiated, or completed by 2002.

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Map produced by:

Montana Fish, Wildlife & Parks  
 Information Services Unit  
 490 N. Meridian  
 Kalispell, MT 59901

c:\workspace\maps\fy02\su-134\own.mxd - LB - 3/26/02  
 Swift fox information from Montana Fish, Wildlife & Parks  
 Helena, MT. All other layers from the Natural Resource  
 Information System, Montana State Library, Helena, MT.  
 All other layers digitized at 1:100,000

- |   |                                |   |                                |
|---|--------------------------------|---|--------------------------------|
| ▲ | Swift Fox Occurrence           | ▨ | US Bureau of Land Management   |
| ▨ | Swift Fox Current Distribution | ▨ | US Bureau of Reclamation       |
| — | County Boundary                | ▨ | US Fish & Wildlife Service     |
| — | Interstate Highways            | ▨ | National Park Service          |
| — | US and Montana Highways        | ▨ | US Forest Service              |
|   |                                | ▨ | Montana State Trust Lands      |
|   |                                | ▨ | Montana Fish, Wildlife & Parks |
|   |                                | ▨ | Tribal Lands                   |
|   |                                | ▨ | Plum Creek Timber Company      |
|   |                                | ▨ | Wilderness - Tribal            |
|   |                                | ▨ | Wilderness - All Agencies      |