



Reestablishment of swift fox in north central Montana
by Amy L Zimmerman

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Fish and Wildlife Management
Montana State University
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Abstract:

Canadian wildlife agencies began a swift fox (*Vulpes velox*) reintroduction program in southern Alberta and Saskatchewan, Canada in 1983. Over the next decade, these reintroduction efforts led to a strong possibility of individuals dispersing into north central Montana and creating a resident population. This study began in the fall of 1996 in northern Blaine County, Montana to confirm the presence of a resident swift fox population. Secondary sites were surveyed in northern Phillips and Valley Counties. The study involved systematic grid trapping by township using live traps and radio collaring any swift foxes captured. Home ranges, food habits, survival, habitat comparisons by township, land ownership/management patterns by township, and the degree of topographical roughness in each township were all investigated. In the spring of 1997, radio collared swift fox were used to locate possible natal den sites and to confirm a resident population. A total of 16 swift foxes were trapped in the fall of 1996 and late summer of 1997. Five of the captured swift foxes were juveniles and 11 were adults. In the spring of 1997, 3 litters were produced in northern Blaine County. These litters were monitored through the summer. Average home range size using the Minimum Convex Polygon method was 10.4 km² and the average using the Adaptive Kernel method was 12.3 km². Survivorship was estimated at 4.6 %. Fecal samples used for food habit analysis were dominated by mammal material, with *Microtus* spp. being the highest in percent occurrence. No relationships were found in the habitat composition, land ownership/management patterns, or topographical roughness in townships with and without swift foxes. The swift fox has reestablished a population in northcentral Montana, and evidence suggests that the population is surviving and reproducing. A wider range of habitat in northcentral Montana needs to be surveyed to determine swift fox distribution and population density.

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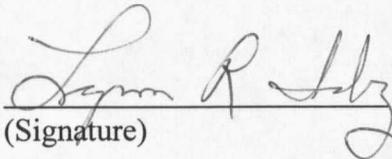
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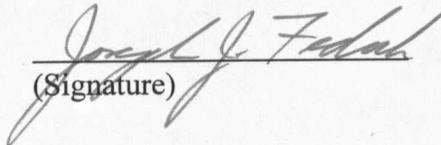
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ABSTRACT

Canadian wildlife agencies began a swift fox (*Vulpes velox*) reintroduction program in southern Alberta and Saskatchewan, Canada in 1983. Over the next decade, these reintroduction efforts led to a strong possibility of individuals dispersing into north central Montana and creating a resident population. This study began in the fall of 1996 in northern Blaine County, Montana to confirm the presence of a resident swift fox population. Secondary sites were surveyed in northern Phillips and Valley Counties. The study involved systematic grid trapping by township using live traps and radio collaring any swift foxes captured. Home ranges, food habits, survival, habitat comparisons by township, land ownership/management patterns by township, and the degree of topographical roughness in each township were all investigated. In the spring of 1997, radio collared swift foxes were used to locate possible natal den sites and to confirm a resident population. A total of 16 swift foxes were trapped in the fall of 1996 and late summer of 1997. Five of the captured swift foxes were juveniles and 11 were adults. In the spring of 1997, 3 litters were produced in northern Blaine County. These litters were monitored through the summer. Average home range size using the Minimum Convex Polygon method was 10.4 km² and the average using the Adaptive Kernel method was 12.3 km². Survivorship was estimated at 46%. Fecal samples used for food habit analysis were dominated by mammal material, with *Microtus spp.* being the highest in percent occurrence. No relationships were found in the habitat composition, land ownership/management patterns, or topographical roughness in townships with and without swift foxes. The swift fox has reestablished a population in northcentral Montana, and evidence suggests that the population is surviving and reproducing. A wider range of habitat in northcentral Montana needs to be surveyed to determine swift fox distribution and population density.

INTRODUCTION

Swift fox (*Vulpes velox*) were originally thought to occur widely on the Great Plains from northeastern New Mexico and northwest Texas to southern Alberta and Saskatchewan, Canada (Hall 1981, Johnson 1969). Swift fox were extirpated or experienced population declines in the northern part of the United States (U.S.) and southern Canada early this century, while persisting in the central and southern portions of the range (Warren 1942, Armstrong 1972, Bee et al. 1981). Causes for the decline of swift fox in their northern range (U.S. and southern Canada) were believed to be related to their vulnerability to poisoned baits and traps used for coyote (*Canis latrans*) and wolf (*Canis lupus*) control (Brechtel et al. 1996). Other factors that may have contributed to the decline included the loss of habitat to dryland agriculture, a changing prey base, and increased interspecific competition with medium sized carnivores, such as the coyote and red fox (*Vulpes vulpes*) (Brechtel et al. 1996). In the U.S., the swift fox is currently listed as a (listing is warranted, but precluded) candidate species under the Endangered Species Act of 1973. It has a listing priority of 9 on a scale of 1 (high priority) to 12 (low priority).

Presently, viable populations of swift fox occur in areas of suitable habitat in Kansas, Colorado, and Wyoming (Allen et al. 1995). Kansas classifies the swift fox as a state furbearer with an open harvest season (Roy 1996). Wyoming classifies the swift fox as a nongame species and Colorado has a closed season on swift fox (Kahn and Beck 1996, B. Luce, pers. comm.). South Dakota has listed the swift fox as a state threatened

species, and the swift fox is listed as a state endangered species in Nebraska (Andelt 1995, Dateo et al. 1996). The swift fox is considered a species of special concern in Oklahoma, with a closed season on harvest (Whitaker-Hoagland 1996). Texas and New Mexico classify the swift fox as a furbearer with an open harvest season, but harvest is reported to be minimal due to low trapping intensity (Horner 1995, Schmitt 1995). Closed seasons for swift fox harvest exist in Montana and North Dakota (Allen 1995, Giddings 1996).

The species was declared extinct in Montana in 1969 because of a 16-year absence of swift fox in fur harvest records (Hoffman et al. 1969). No swift foxes were recorded in Montana until 1978, when a male was trapped in Custer county (Moore and Martin 1980). This animal, however, may have been dispersing from northeastern Wyoming or southwestern South Dakota. In Canada, the last known swift foxes in Saskatchewan and Alberta were collected in 1928 and 1938, respectively (Soper 1964, Banfield 1974). The swift fox was designated as extirpated by the Committee on the Status of Endangered Wildlife in Canada in 1978 because of the lack of observations since 1938 (Brechtel et al. 1996).

A reintroduction program began in southern Alberta and Saskatchewan in 1983-1984, with annual swift fox releases planned through 1998 (Brechtel et al. 1996). The Canadian National Recovery Plan for the Swift Fox has three main objectives. The first is to establish two geographically distinct, yet genetically connected core populations with an average spring density of 5 adults per township. Other objectives are to ensure the long term security of key swift fox habitat in two main areas of the Canadian prairie

and to establish swift foxes in at least 50 percent of the suitable habitat remaining on the Canadian prairies (Brechtel et al. 1996). The plan's overall goal is to establish a target population of 420 foxes by the year 2000.

Three main release areas were established in Alberta and Saskatchewan. One of the release areas lies south of the Cypress Hills along the Alberta-Saskatchewan border, and a second site is on the Wood Mountain Plateau in Grasslands National Park, Saskatchewan (Fig. 1). A third release site is located along the Milk River ridge south of Lethbridge, Alberta (Fig. 2). The population along the Alberta/Saskatchewan border is currently the largest. Releases are a combination of Canadian captive-reared foxes and wild foxes obtained from Wyoming. Seventy to 100 foxes have been released annually since 1983 (Brechtel et al. 1996). In 1993, the wildlife directors of Alberta, Saskatchewan, and the Prairie and Northern Region of the Canadian Wildlife Service decided that the reintroduction effort would continue for another five years (Brechtel et al. 1996). A population assessment carried out in the winter of 1996-1997 estimated the Canadian swift fox population at 289 foxes, with a 95% confidence interval of 179-412 foxes (Cotterill 1997).

Recent observations of swift foxes in Montana have been recorded in northcentral and southeastern Montana (Fig. 3). Observations of swift foxes in portions of northcentral Montana have been increasing in recent years, presumably the result of the Canadian reintroduction program (Giddings and Knowles 1995). Canadian swift foxes dispersed into northcentral Montana throughout the late 1980s and early 1990s (Brechtel et al. 1993). It was not known, however, if these dispersing foxes were surviving and

establishing a resident population in Montana.

The goal of my project was to verify and document the presence of the species in portions of northcentral Montana. One study objective was to document reproduction in Montana by locating and documenting natal den sites. Additional study objectives included an investigation of relative distribution, home range size, reproductive success, survival, and food habits of radio collared swift foxes. Habitat composition, land ownership/management, and the degree of topographical roughness of areas that swift foxes currently occupy in northcentral Montana were also analyzed to determine if these attributes affected the probability of swift fox presence.

