

Blackfoot Swift Fox Reintroduction Project

Report on the 1998 Release

**Blackfeet Fish and Wildlife,
Cochrane Ecological Institute,
and
Defenders of Wildlife**

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Photo Credit – Peter Leon

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Background:

Canadian project

The swift fox, *Vulpes velox*, *V.v.hebes*, is North America's smallest canid and native to the Great Plains. Historically, its range mimicked that of the North American bison, from the Texas panhandle and New Mexico, USA, in the south, to the Aspen parkland of Saskatchewan and Alberta, Canada, in the north. The species was classified as extinct in Canada in 1978 by the Committee on the Status of Endangered Wildlife in Canada (C.O.S.E.W.I.C., 1978) and extirpated over 90 per cent of its historic U.S. range in 1995 (U.S. Federal Register Vol.60, No.116,1995). The causes of the extirpation of this species have been associated with the rapid and radical change of the Great Plains ecosystem from native grasslands to cultivated farmland, and the inevitable hunting, trapping, and poisoning programs which accompany such habitat transformation (Carlington, 1980; Weagle and Smeeton, 1995).

The captive breeding program of the Cochrane Ecological Institute (CEI) began in 1972 when Miles & Beryl Smeeton imported two pairs of Swift fox from Colorado. In 1977 they signed a cooperative agreement with the University of Calgary (Dr. Steven Herrero) which outlined a series of research projects to be conducted as M.Sc. thesis (Carlington 1980, Reynolds 1983, Schroeder 1985) on potential release sites and methodology. These projects resulted in the first reintroduction of Swift fox to Canada in 1983. In the mid 1980's, on the advice of the newly formed Swift Fox Propagation Committee, swift fox from the CEI captive breeding colony were sent to three Zoos (Calgary, Edmonton, and Moose Jaw) as breeding and educational exhibit animals. By 1997, none of the Zoos participating in the breeding program had swift fox, having either returned their swift fox stock to the CEI, released, or euthanized them.

Between 1983 and 1997 CEI provided **841** animals for release on the Canadian Prairies. The government supplemented these with 91 wild trapped US swift foxes translocated from Wyoming. In 1997 a winter trapping survey estimated the Canadian Swift fox population as 289 animals. Although this was substantially lower than the target population (Canadian Swift Fox Recovery Plan) of 400 animals, support for the captive breeding program was dropped and both the government of Saskatchewan and Alberta indicated they did not want any further involvement with Swift fox Reintroduction. The Federally administered and owned PFRA lands and Grasslands National Park, Saskatchewan, the center of one of the release areas, were willing to allow further reintroductions.

From 1992 to 1997 CEI conducted extensive research into the development of new release methods for the reintroduction program. This research resulted in reduced mortality in newly released animals and a quicker establishment of the species in previously uninhabited areas. This was demonstrated by a five year experiment in the West Block of Grasslands National.

Beginning of Montana project

In the early 1990's the U.S. Predator Project contacted the CEI with a request for recordings of swift fox calls to be used on radio broadcasts intended to raise the awareness of swift fox, among other endangered predators. A few swift fox from the Canadian reintroduction program had penetrated a little way into Montana, north of Havre. However, as the habitat was largely agricultural cropland it was unsuitable for them so they had not succeeded in establishing a population bridgehead there. What was needed was protected range land habitat and an active reintroduction program. Subsequently, Jonathan Proctor of Predator Project recommended to Montana Fish & Wildlife that it might be beneficial to reintroduce swift fox into BLM lands in Montana. Following this, over the summer of 1996, Mr. Mercure, from Montana visited the CEI, to see the swift fox captive breeding facility. Upon his return to the U.S., he visited Ira Newbreast, of the Blackfeet Fish & Wildlife Department, to discuss the possibilities of a reintroduction of swift fox into their original, historic range on the Blackfeet Tribal Lands. Mr. Mercure also discussed the possibilities of a swift fox reintroduction in to the State with rancher friends of his. Both the Blackfeet and the ranchers showed interest in the proposed swift fox reintroduction project. As result, Clio Smeeton of the CEI contacted Ira Newbreast. During the same period John Winnie also came up from Montana to visit the CEI and photograph the foxes for his book on the prairies. In 1998, the Canadian swift fox reintroduction program (1983-97) had resulted in the species being downlisted from extirpated/extinct in Canada to Endangered in Canada (C.O.S.E.W.I.C 1998). This resulted in the Canadian government authorities withdrawal from the program and control over the world's only swift fox captive breeding colony reverting again to the CEI. It seemed that, unlike the 1980's when Craig Knowles had approached the Canadian Government authorities (but not the CEI) with the idea of a possible U.S. reintroduction and had been rejected, now a synergistic awareness of the possibility of successful swift fox reintroduction in Montana was building up.

At the Swift Fox symposium (February 1998), Jon Sharps of S.Dakota and a major contributor to the CEI captive breeding program, Craig Knowles, Jonathan Proctor, John Winnie and Ken Weagle and Clio Smeeton of the CEI got together to discuss the ways and means of pulling off the Montana swift fox reintroduction. Craig undertook to contact Minette Johnson of Defenders of Wildlife to sound them out on the prospect of becoming the funding engine behind the Montana swift fox reintroduction. His contact was successful (see Funding). Ken and Clio contacted Ira Newbreast to give him an update on the swift foxes and the conference. With the very real possibility that the swift fox reintroduction was going to happen, Ira Newbreast then wrote to the CEI to request swift fox for the Blackfeet swift fox reintroduction program.

Permitting for Released Animals:

Captive Breeding

The captive Swift fox colony at the CEI is maintained under a Zoo Permit (# 0373GP) from the Government of Alberta. This allows for the retention, breeding, trade in and transport of wild animals. Although species other than Swift fox are maintained at CEI, the Swift fox are the primary species.

CITES

Although the Swift fox is on the endangered species list in Canada it is not covered by CITES and therefore does not require a CITES export permit from the Canadian Government or a CITES import permit from the US Government. (See letter from CWS).

Agriculture Canada

Medical care: Inspections for the Swift fox colony and all appropriate inoculations are conducted by a veterinarian from Agriculture Canada. These functions are performed during the summer months before the release. All animals in the breeding colony are inspected and inoculated. The Agriculture Canada veterinarian examines, provides Health Certification, and obtains the import permit number from the State of Montana veterinarian for all swift foxes intended for use in the Blackfeet swift fox reintroduction program.

Government of Alberta

The government of Alberta, Environmental Protection provides a Permit to Export (Wildlife) for the animals to be moved. This provides for the animals to be moved from CEI to the US border through Alberta.

US Fish and Wildlife

Although no service permit is required from the US Fish and Wildlife, a physical inspection of the imported swift foxes at the border crossing is necessary. This is arranged through the Great Falls Montana Office and is conducted by a Federal Wildlife Inspector.

Montana Department of Livestock

The State of Montana requires an Entry permit for the animals entering the State. The permit number is provided to the Agriculture Canada veterinarian at the time of the health inspection at the CEI, and the Agriculture Canada health inspection done in Canada is accepted by the State of Montana. The State also describes the vaccines to be used on imported swift foxes (the vaccine protocol required by the State of Montana differs from that required by Agriculture Canada).

Montana Fish, Wildlife and Parks

No permits are required from Montana Fish, Wildlife and Parks but they were kept informed of the project and acknowledged the information.

US Customs

Although no special permits or VISAs are needed, the Canadian volunteers must be made aware that they are only in the USA to unload the foxes and then leave. Customs said they would consider them in the same category as Truck drivers who are permitted to assist with the unloading of their truck, but are not allowed to perform any other work. In order to ensure a smooth passage through the Border, on August 27th, 1998, staff from the CEI took copies of all paperwork to the Port of Chief Mountain and the Port of Piegan for review by U.S. Customs officials prior to the arrival at the Canada/US Border of the swift foxes on August 29th, 1998.

Release Planning:

Breeding Colony

The Swift foxes in the captive colony whelp in late April to mid-May. The kits emerge from the den at approximately two weeks after their birth. (Smeeton and Weagle, 1998). The kits are first handled in mid-July when they receive the first of a series of prophylactic inoculations and are tattooed. This is the first time the true count of kits can be made. By the end of July, the number of kits and the number of sibling groups to be released in the year is determined. These foxes are chosen to provide the maximum number of animals for release and, also, to maintain the breeding colony at its present level of productive pairs and genetic heterozygosity.

Pre-Release Animal Processing

The week before the release (late -August) the kits are captured again and given their final shots. At this time, they are also examined by the Agriculture Canada veterinarian for export permit Health Certification. At this point the permits from Montana Dept. of Livestock and the Health Certificate are prepared.

The morning of the release the cubs are captured for the final time and placed in "Cloud" kennels for transport to the reintroduction site. Cloud kennels are small, plastic, transport kennels. The cloud kennels are marked with the release site, the siblings antecedents, and are color coded for sibling groups. To be at the US border by 3:00PM the convoy of volunteer vehicles carrying the foxes must leave CEI by 11:00 AM.

Cloud kennels are stacked in the vehicles so as to provide maximum circulation of air. The vehicles do not stop on their way to the border and once processed proceed immediately to the release site.

Once at the release site the cloud kennels are removed from the vehicles and animals are fed and watered while still in the kennels. The volunteers responsible for the Portable Protective Shelters (PPS) release site transport their foxes to the designated release sites. The cloud kennels are arranged near the PPS, covered, and left for the night. The volunteers set up camp 200 m from their PPS site, in a situation where they are able to clearly view the PPS, and subsequently, the released reintroduced swift foxes. The actual releases occur at dawn the next morning.

Volunteers

Successful swift fox reintroductions require a large number of dedicated volunteers. The following is the information provided to all volunteers on the releases. It describes the release process and the volunteer responsibilities.

**CEI /BLACKFEET SWIFT FOX RELEASE,MONTANA. August 29,30,31st 1998
VOLUNTEER INFO**

Our partners in this release are:

**The Blackfeet Tribe (Ira Newbreast, Blackfeet Tribal Fish & Game Department
(tel: 406 338 7207)**

Defenders of Wildlife, Minette Johnson.

1. You are going to the Blackfeet Indian Reservation in Montana. (U.S. volunteers, Minette will direct you)
2. CANADIANS: Everyone must be at the CEI before 10 a.m., Saturday August 29th,1998. As the foxes should only spend the shortest possible time in their Cloud Kennels, and given that they will have to spend one night in their kennels at the release sites in Montana, we will be catching up the foxes on Saturday morning. We can't do it really early because they are all running about then and won't go into their foxboxes until the day warms up. Given that the foxes are amenable, we will aim to leave the CEI at 11 a.m. We will load the fox groups into the vehicles of the volunteers responsible for those groups. The volunteers with the bigger trucks will also carry the fox groups that the U.S. volunteer observers (who will meet with us in Montana) will be responsible for.

Each vehicle will carry a folder of photocopied permits, site map etc. for the foxes.

CANADIANS: Take Hwy 22 South to Hwy 3, turn east onto Hwy 3 to PINCHER CREEK, then South on Hwy 6 to the PORT OF CHIEF MOUNTAIN. We want to travel in a caravan because when we get to the BORDER the Wildlife Inspection has to be undertaken. Try to stick together if at all possible. Before we leave, we'll pick a gassing-up stop on the road as a rendezvous. Once across the Border follow Hwy 17 to ST. MARY, the Hwy 89 to KIOWA and BROWNING. We will meet Ira Newbreast at the Border and will confirm with him the route to the BLACKFEET RANCH. WE WILL ALL MEET AT THE TRIBAL RANCH BUILDINGS.

3. U.S. volunteers go to the Blackfeet Tribal Ranch on Saturday, August 29th, 1998. Try to get there between 4:30 and 5:00p.m. Take a book to while away the time, if the Canadians are unexpectedly held up on the drive south.

CANADIANS: Come to the CEI between 5: 30 and 10:30 a.m. on Saturday, August 29th,1998. We will catch up all the foxes, load, and leave. We hope to leave for Montana by 11:00 a.m.

WHAT YOU WILL NEED

3. Your personal camping equipment: Tent or Bivvy bag, gas or kerosene stove (no trace camping so no campfires), matches, eating utensils, filled water bottles (one for camp and one for when you are doing the walking survey), can opener, food, cooler, toilet equipment (small spade), Alberta/Montana road map.
4. Binoculars, compass, pencils, book on tracking. Spot light (if you have, or can beg, borrow, or steal one). The CEI does have some and will provide those that they have.

WHAT WE WILL PROVIDE

CEI will provide:

1. **Paperwork** Coil bound note book. Folder containing: copies of permits, list of all foxes to be released and your particular fox group identified on it by their colour code. Photocopied map of release site, site number marked on PPS. Photocopied Topo map with all release sites marked on it.
2. **Fox “luggage”** A colour coded (the colour code is the same as the colour code of the fox group the bag is intended for) and numbered (number of PPS) garbage bag containing: A blanket to cover foxes, tin water bowl, fox food, water bottle, ziplock bags, labeling tape, two garbage bags.
3. **Swift foxes**, and marked colour coded cloud kennels.

Release Site Selection

The following two documents summarize the information used to select the release sites.

Report on the Suitability of the Blackfeet Ranch for Swift Fox Reintroduction.
Matt Carpenter
for
Cochrane Ecological Institute
July 1998

Summary

The AMS Ranch is excellent Swift fox habitat. Here is what I learned from exploring the area and from Craig Knowles of FaunaWest,

Ground Squirrels:

They are everywhere. Craig can give you a more accurate estimate using the transects he ran using the ATV¹. I made some general estimates by counting holes as I walked to each site that I described on the map. I color coded the map to give a general idea of hole concentrations. The pattern that we both discovered is that holes occur in clusters that increase in density as you approach a water source. There tends to be more holes along hillsides and ravines. A cluster can combine anywhere from 3 to 20 holes and may be separated from the next group by 10 meters in a populated area or over 100 meters in other areas. The holes tend to be smaller in the hills where the soil is rockier. Large flat areas in the uplands tend to have few holes. Colonies on the flat lowlands along the floodplains, however, have loose soil and sometimes achieve densities higher than prairie dog towns.

Badger:

Almost every cluster of ground squirrel holes contains a badger hole. These holes are the easiest to spot because of the large pile of dirt that the badger kicks up. I saw a total of four badgers, one in the uplands, one in a ravine² and two in the low meadows.

Birds of Prey:

There an amazing number of raptors here. Craig identified the following species in the four days he was here:

Red Tailed Hawk (this was the most common species with many juveniles)
Ferugineous Hawk
Prairie Falcon
Kestrel
Northern Harrier

¹ After the first day we estimated 20-40 per acre)

² Just for fun I decided to chase this badger. It tried three holes before it found one big enough to fit into. Each time it checked a hole I gained ground. Finally it backed down the hole and growled at me. It occurred to me that foxes may have the same problem on unfamiliar territory. Many ground squirrel holes appear big at the surface but narrow about ½ meter down.

Great Horned Owl
Swainsons Hawk
Golden Eagle (1)

Most of the species, especially the Red Tails, were seen hunting above the flood plain along the river. Some were seen over the ravines and the uplands. The high number of raptors probably indicates a healthy rodent population. Hopefully the fox's nocturnal habits will keep it safe from the eagles.

Rodents:

Here are the live trapping results over three nights:

Lowland Meadows: 131 trap nights - 5 deer mice, 6 ground squirrels

Ravines: 120 trap nights - 9 deer mice, 17 ground squirrels

Upland Prairie: 120 trap nights - 3 deer mice, 13 ground squirrels.

The ground squirrel results are misleading. If we had left the traps out during the day we probably would have filled them all. The ones we caught were trapped either at dusk or in the morning. They generally spend the night in their holes.

I was surprised that we caught any mice in the uplands. There seems to be nowhere for them to hide. At least in the ravines they had the thick vegetation along the bottom. Anyway it will be these mice that get the fox's through the winter. The ground squirrel hibernates and there will be no insects. Ira Newbreast did mention that the area generally blows clear of snow.

The number of mice that lived in the logs next to my campsite also made optimistic about the fox's success. They ate my food and almost carried me away.

Insects:

I didn't have a net but one was not necessary to see the abundance of insects on the ranch. Literally everywhere I stepped grasshoppers would jump away from my feet. When I drove down the dirt road that leads to the abandoned farm grasshoppers would cover my windshield. Butterflies were also abundant. At night when I tried to read I was literally attacked and eaten by moths.

In general as you approached water the number of insects increased. I was surprised, however, at the number of grasshoppers even at the top of the driest hills. As Craig said food probably won't be a limiting factor at the time of the release. Insects will be abundant and the mice population will be peaking. The problem will come from predators and the winter.

Site History:

Here is what Craig knows about the history of Swift fox in the area:

- Lewis of Lewis and Clark saw Swift fox between the junction of the Cut Branch and the Marias River (just west of here)
- foxes were collected for museums from 1903 to 1905 from a site just east of Browning
- one of the first Mamologists, Bernon Bailey reported that Swift fox lived in the foothills along the east side of Glacier National Park. He considered them common and reported to have seen them eating ground squirrel.

Habitat Descriptions:

Short Grass and Upland Prairie

This habitat is dominated by few species of grasses that grow about ankle high and scattered flowers, most native to the prairie. In drier areas lichens cover the ground between the grasses, cacti, and some species of mushrooms also inhabit the area, but they are less common. The soil is outwash from the Rocky Mountains and is generally very rocky.

Ground squirrel holes occur in scattered clusters all over the upland prairie. There are usually 5- 15 holes in the cluster. Groups are separated by as little as 20 meters or as much as 100 meters, depending on the area. In general we found more holes closer to the river or seasonal water sources, like small ponds or drainages. Nearly every group of holes has at least one hole that has been enlarged by a badger.

The most common insect in the upland areas is the grasshopper. They cover the entire area in what appears to be a uniform density. Butterflies can also be seen but in much smaller numbers. Ants and caterpillars can be found beneath cow dung.

We saw a few birds of prey, a Northern Harrier, some Redtails, and a prairie Falcon cursing the short grass uplands, but birds stuck to the flood plain and ravines. I also saw two coyotes and two badgers. The coyotes seem to pass through the highlands on the way to the drainages and the river where they like to hunt.

All of the release sites we chose were in the short grass prairie habitat, though some bordered on ravines. This is the habitat typically associated with the Swift fox. From what I hear the area resembles the release sites in Saskatchewan.

Ravines and Drainages

The ravines are the transition areas between the uplands and the floodplain. They contain species from each habitat. Short grass prairie vegetation lines the sloped sides of the ravines, but the bottoms that have water for the greater part of the year, are filled with shrubs, thick grass and flowers. The dark green vegetation of the ravines contrasts

sharply with the light yellow and browns of the uplands. Snow Berry, ___ berry, buffalo berry, wild roses, and yarrow are some typical species.

We caught the most deer mice in the ravine sites. When we let them go many ran for cover beneath the thick shrubs. Hawks often hunt there areas during the day. The ridges that line these ravines are almost always covered with ground squirrel holes. They seem to like areas with an incline. It is not hard to find badger enlarged holes as you walk along these ravines.

The number of insects, especially grasshoppers seem to be greater in the thicker vegetation. Here more flowers bring more butterflies. This habitat should provide good hunting for the foxes.

River Floodplains

This habitat holds the widest variety of plant life. It is dominated by cottonwood groves, willow thickets and small meadows. There are too many species to name. The area also holds the widest diversity of animals. Every patch of mud along the river had deer, coyotes, grouse, goose and shorebird tracks. A family of beavers lives beneath the bridge near the abandoned farm. We saw many deer both whitetail and mule. There are countless birds using the cottonwoods; woodpeckers, robins, sparrows and starlings. Craig says he has never seen so many birds of prey in one area. He identified eight species. The raptor population indicates a healthy rodent population. At least five deer mice lived in the log next to my camp.

The small flat meadows between the hills and the gravelly floodplain hold incredibly high ground squirrel populations. Craig estimated over 100 per acre or 220 per mile in certain meadows. The earth in the meadows is loose and easy to dig. We saw two badgers in this area. The vegetation in the meadows varies in height from the ankle to over the knee. There are many introduced species like spotted knapweed, leafy spurge, and yellow sweet clover. One evening we watched a great horned owl catch a ground squirrel in one of these meadows. The hawks seemed to spend most of their time over these areas. Foxes that learn to exploit these small meadows cautiously will do well. The problem is that the meadows are surrounded by thick bush that may conceal large predators. The floodplain is a dangerous but productive hunting ground. It will be interesting to see how the foxes use it.

Conservation Research Project (CRP)

It is basically land that the government pays farmers not to use. It is kind of funny that the farmers get paid more than they would have made by farming the land. The government uses the land for all kinds o weird agricultural experiments.

The two CRP areas on the AMS ranch are dominated by alfalfa and one species of introduced grass. There are almost no other plants growing in these areas. The two species form thick bunches that grow just above knee height. There are almost no holes

in the CRP, but the tall plants provide cover for small mammals. I found some rabbit scat on the northern field. Twice we saw a northern harrier hunting over the CRP.

A study done in Kansas claims that CRP are a death trap for Swift foxes. While hunting in the tall grass the foxes were detected downwind by coyotes. Since the grass is too tall for the foxes to see over the coyotes were easily able to surprise them. The lack of holes in the CRP provided little chance of escape.

What the study did not mention is that the CRP land in Kansas is the only land left unplowed. Both the coyote and the Swift fox were both dependent on the CRP for food. On the AMS Ranch there are many hunting alternatives. I did see one coyote traveling along the edge of the CRP fence but I doubt its survival was depending on what it caught there.

Although the foxes probably won't be dependent on the CRP, these areas will still be dangerous. It might be worth monitoring these areas. If dead foxes start showing up in these fields, future release sites could be moved to avoid the problem.

Method of Site Survey

First I divided the area into three possible habitats that a fox could live: the uplands, Or short grass prairie, the ravines that drain water from the uplands into the rivers, the forests and meadows that surround the river. I then set out to cover as much of these areas as possible. I did not stick to a grid because I wanted to be able to check out any interesting sight along the way. The idea was to learn as I went along, narrowing my search as I learned what type of area tend to provide Swift fox habitat.

The positions marked on the map as numbers and letters, or roman numerals, are areas where I stopped to describe the surrounding area. I used numbers to denote upland habitat, roman numerals for ravines, and letters for the flood plain. Each number, roman numeral or letter corresponds to a page in my notes. On each page of the note is the latitude and longitude of the spot and a description of the area judged under the following categories:

Holes:

I estimated the number of holes in an area by counting them as I walked between waypoints. I also walked around the area where I stopped to get an idea of hole density at that particular location.

Vegetation:

I described the physical characteristics of the vegetation (short grass, dense shrubs, etc.) and then took a few guesses at the names of the plant species. As it worked out most of my guesses were wrong. What I thought was mustard was yellow sweet clover, huckleberry was service berry, silver berry was buffalo berry, and so on. I think the only

thing I got right was yarrow. So ignore these guesses and just use the category to get an idea of the type of vegetation at each location.

Insects: Insects were plentiful everywhere I went. Unless an area struck me as having an above average population I just noted it as normal or average.

Animal Sign:

I noted any tracks, scat or sightings of animals in the area.

Notes:

Then I wrote down my impression of the sight. I judged it as a possible release site or hunting ground. I commented on the number of ground squirrel or I just mentioned anything else on my mind.

I learned quickly that even though holes were everywhere, they seemed to be concentrated on hill sides. Large flat expanses of upland prairie tended to have smaller holes in widely spaced groups. I then discovered that ravines had many active ground squirrel colonies along their slopes. I began concentrating on the ravines counting holes in the uplands on my way between drainages. Eventually I stumbled onto the lower flat areas along the rivers where I saw densites of almost a hole per meter I thought these areas would be perfect release sites.

Craig Knowles of FaunaWest arrived on Saturday July 25th, my sixth day on the ranch. I showed him one of the gopher colonies on the lower meadows. He was impressed by the number of large holes, but he said the vegetation was too thick in and around the meadows. He said Jon Sharps had shown him a picture of a Swift Fox densite in such an area but it was in a prairie dog town. Prairie dogs keep the grass in their colonies shorter than ground squirrels. He said Swift fox probably have an innate preference for short grass open areas where it can detect predators more easily.

My argument was that a fox is an opportunistic predator and will go where the hunting is. I pointed out that a grizzly bear that lives in the interior mountains will eat glacier lily, sweet vetch, huckleberry and other plants while a grizzly that lives on the coast will eat mostly salmon. The same species uses different resources depending on where it lives. Every predator in the area coyotes, badger, and birds of prey exploit the floodplain why not the swift fox? There are more mice (at least in the log I slept next to), more insects, and the gopher colonies look like prairie dog towns. I said that even if you release a fox in the uplands it will discover that the floodplains contain more food. I thought it would be best to leave the foxes amongst the highest density of escape holes.

I changed my mind when I saw how easy a great horned owl swooped down on a ground squirrel from the surrounding trees. It will not matter how many escape holes there are if the fox has no time to react. The dense bush at the edge of the meadows is perfect for ambush. Every predator we saw seemed to frequent these meadows. I was convinced further when I found that our live trapping did produce mice on the uplands prairie.

Cautious foxes may learn to exploit these meadows but it may be a mistake to encourage them to live there.

For the next three days Craig ran transects on his ATV to estimate hole densities. While I returned to my more promising areas to look for release sites and to take pictures. On July 27th we went out in his truck to flag the 10 best release sites. We agreed that the best release sites would be in ground squirrel colonies on hill sides and drainages where badgers have enlarged many of the holes.

Release Sites

All release sites were chosen based on the following criteria:

1. short grass prairie habitat
2. a large cluster of ground squirrel holes
3. at least two badger holes in the cluster
4. a high density of ground squirrel in the area
5. out of sight from any dirt roads

Most sites ended up on or near drainages or small hill sides. We flagged each site and recorded its latitude and longitude. I also took a picture of each site and any landmarks in the area. If there were no land marks I just took a picture of the holes. I included site 12 in case you feel that the site we chose were spaced to close together. There are many areas along this ravine that would make good release sites.

Each site is shown as a large circled number on the map. Sites 7, 8, and 9 are off the map to the west. They should be easy to find using the GPS. Sites 2, 3, and 5 are too close together to all be used. We wanted to show that there were many sites to chose from in this drainage.

Sites A and B (described in my notes) are also good sites. They both have very high hole densities. Although they are low meadows they are not cut off from the uplands and therefore have more short grass vegetation.

Keep in mind that there are many more holes at these sites than the pictures indicate. Only the largest holes show up on film.

I recommended sites A and B after Craig left. His report may include two or three sites to the west that we felt were outside the ranch boundary. Between the two reports there should be up to 18 sites to chose from. This will give you plenty of leeway when you space out the den sites. More options also give you alternatives if you disagree with some of our choices.

Site 1-
0379995E 5373583N

The site is along the ridge across the river from the abandoned farm. The whole area is covered with holes a little to the west is a large low meadow with the highest density on the ranch.

Site 2, Site 3, Site 5

0381317E 5371840N

0381783E 5371940N

0381017E 5371540N

These sites are all located on a large drainage at the mouth of which is a CRP field. There were many groups of holes in this area, any of which would be good release sites.

Site 4

0381017E 5371540N

This is another long ridge similar to site one. I borders badger creek to the south. There are many holes on this slope and on the flat meadow just to the south.

Site 6

0379867E 5371862N

This site is at the head of the southern most ravine on the ranch. It is also the ravine with the most gopher activity. Choosing a site was just a matter of finding a flat surface for the A-Frame.

Site 7

0379496 5372532N

This is one of the few large groups of holes in the flat upland areas. The site is not isolated, there are other groups nearby, but I wasn't very enthusiastic about this one.

Site 8

0379192E 5372074N

This spot is up the ravine from site 6. There were many large holes in this area. It may be too close to site 6 but it is off my map so it is hard to tell. The dam makes this spot easy to locate.

Site 9

0378995 5373444N

This site is also off the map. It is to the northwest of site 1. There is a hose further to the west. This spot is pushing the western limits of the ranch. Both the uplands and lowland areas around this site are covered with holes.

Site 10

0384030E 5374447N

This site is near a small pond. The area is bordered by farm land to the north and to the east. Just to the south is an old windmill that the birds and mice use for cover. Just further south is a large ravine lined with ground squirrel and badger holes.

Site 11

0381815E 5373971N

This site is a small ravine just south of the CRP field. It has the highest density of holes that I saw in an upland area. We did live trapping in the area and it was here that we caught the most deer mice. I saw my first badger in this ravine. The site is near an old dumping ground used by the rancher who lived here 10 years ago. There are also many ground squirrel holes around the dump. This is one of my favorite sites. The only drawback is that it is a little close to the dirt road that leads to the farm.

Site 12

0383773E 5372875N

This hill borders a large drainage, the only drainage that holds water through the summer. Many holes line its slopes. The thick grass near the water will provide good hunting. The soil here is relatively loose for the uplands. The nearby site, B, is a low shelf by the river. It has a very high concentration of ground squirrels.

Site A

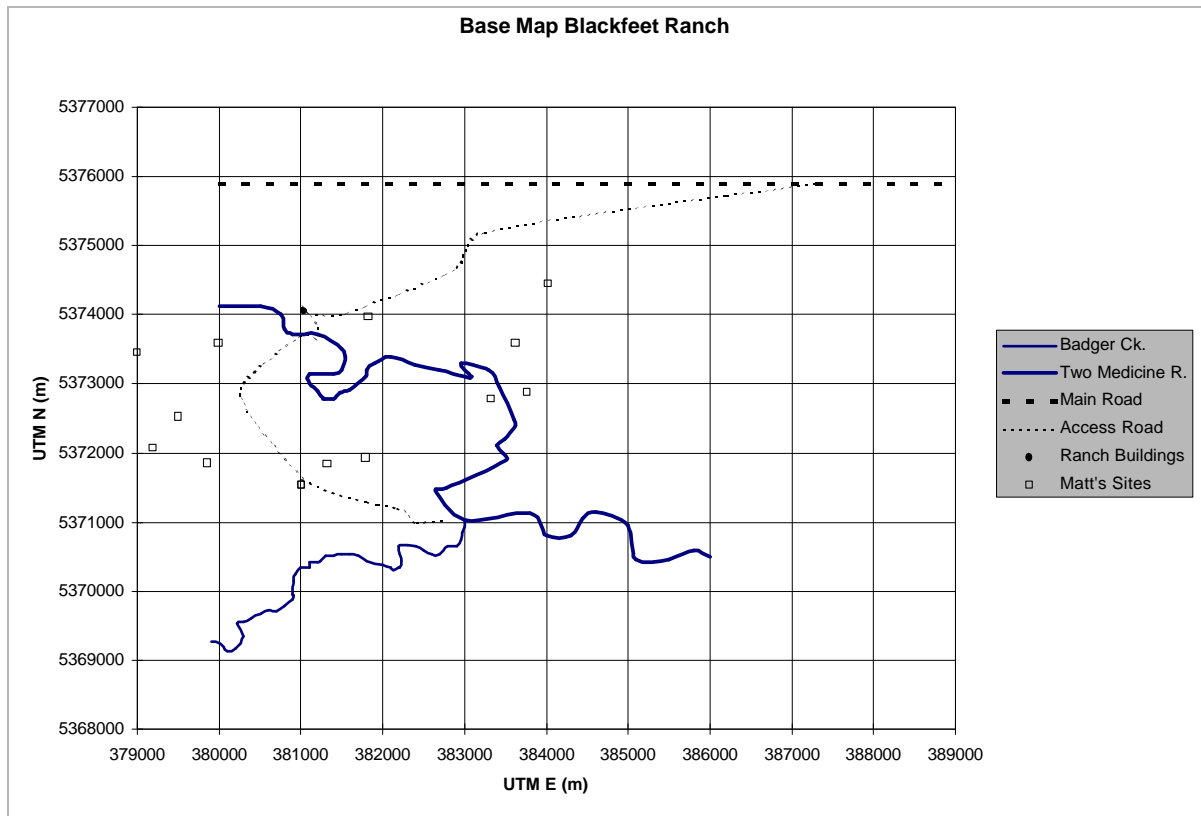
0383332E 5372783N

This was the first low shelf or meadow that I found. The vegetation is slightly taller than on the meadows but I would still call it short grass prairie. The area has a higher hole density than many of the other sites and I would really recommend it over most of them. I would have thought of it sooner had I not been biased against these lower meadows. This site is different from the other meadows because it is connected to the uplands and therefore is not surrounded by dense brush.

Site B

0383621E 5373586N

This is one of the best sites I found. It is low bench of land that borders the river, but it retains the short grass prairie vegetation. The gophers absolutely love it. There is also a small, possibly 20 m sq. wet meadow (I have no idea where the water comes from) that is home to a group of frogs. The foxes would have easy access to the ravine to the north and the surrounding uplands to the east.



Summary of the recommended release sites.

**AN EVALUATION OF THE AMS SITE
FOR REINTRODUCTION OF THE SWIFT FOX
ON THE BLACKFEET INDIAN RESERVATION**

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12 August 1998

INTRODUCTION

The swift fox (*Vulpes velox*) was once common to the eastern plains of Montana (Allen 1874, Custer 1875, Grinnell 1876, Coues 1878, Johnson 1969). Some of the best historical documentation of swift fox in Montana comes from the Blackfeet Reservation. From 1901_1906, 43 swift fox were collected near Blackfoot and Kipp located just east of Browning, MT. These foxes are now specimens at the National Museum in Washington D.C. (one is on loan to the University of Montana). In 1918, Bailey and Bailey (1918) reported that the swift fox was common on the plains immediately east of Glacier National Park. Bailey later reported to Wright (P.L. Wright, pers. commun., mammalogist Univ. of Montana _ deceased) that swift foxes inhabited mountain benches just east of the Park and that they fed on Richardson's ground squirrels (*Spermophilus richardsoni*). In addition to these observations, Lewis reported a swift fox near the confluence of Two Medicine River with the Marias River in 1806 (Burroughs 1961).

The swift fox was declared extirpated in Montana in 1969 after being absent from 16 years of fur harvest data collected by Montana Dept. of Fish, Wildlife, and Parks (Hoffmann et al. 1969). However, during recent years, there have been many reports of swift foxes in Montana (Knowles et al. 1998). Many of these observations can be credited to a long-term swift fox reintroduction effort in southern Alberta and Saskatchewan (Carbyn and Killaby 1989), and include observations of pups at dens. This reintroduction effort is now considered successful at establishing a swift fox population

in southwestern Saskatchewan, southeastern Alberta, and north central Montana (Zimmerman 1998).

The swift foxes that are now established in north central Montana inhabit what represents Montana's most extensive (1,720,000 acres (this area includes some croplands too) grassland area (Knowles et al. 1998). However, the Blackfeet Reservation and areas to the south along the Front Range contain Montana's best (relatively pristine) remaining and second largest (1,620,000 acres) grassland area. This area is typified by broad gently inclined grass covered ridges extending eastward from the base of the Front Range. Based on the historical record of swift foxes in this area and the extensive nature of the grasslands, the Blackfeet Reservation represents an excellent site for a second swift fox reintroduction on the northern Great Plains. It is important to establish a second swift fox population on the northern Plains to develop metapopulation function and reduce the likelihood of local extinction in other areas.

This report summarizes a pre-release survey of the AMS site, a Tribal Ranch, on the Blackfeet Reservation for a potential swift fox reintroduction. The purpose of the survey was to assess the site for release suitability based on habitat and relative prey abundance.

STUDY AREA AND METHODS

The AMS site is a Tribally owned ranch and is located on the southeastern portion of the Blackfeet Indian Reservation. It occupies approximately 20,000 acres of grassland habitat. Approximately 1,000 acres of parcels, has been previously farmed and is now enrolled in the Conservation Reserve Program (CRP). The area to the east and northeast of the survey area is dominated by large dryland agriculture fields. The AMS site is transected by Two Medicine River and is bordered by Badger Creek (Figure 1). Both of these drainages have well developed cottonwood (*Populus* spp.) riparian areas. Some river bottomlands in this area were formerly cleared for agricultural crops but are no longer farmed. River benches and ridges in this area are dominated by needle-and-thread grass (*Stipa comata*), blue grama (*Bouteloua gracilis*), western wheatgrass (*Agropyron smithii*), and threadleaf sedge (*Carex filifolia*). The needle-and-thread grass/blue grama habitat is Montana's least productive grassland habitat (Mueggler and Stewart 1978). Higher ridges contain moderate stands of bluebunch wheatgrass (*Agropyron spicatum*). Elevation in this area is approximately 4,000 feet.

This area was evaluated for swift fox reintroductions from 25 through 28 July 1998 by systematically searching the AMS site and adjacent lands. The survey consisted of driving 4-foot wide belt transects with a 4-wheeler and recording all Richardson's ground squirrel burrows that appeared to be active. Transects were placed in uniform habitat and topographic situations. Forty-four transects averaging 0.85 miles (37.3 total transect miles, range 0.18 miles to 2.22 miles) were placed throughout the survey area (Figure 1). In addition, presence of live ground squirrels, badger (*Taxidea taxus*) excavated burrows and other wildlife species observed along the transect were noted. Also, the topographic suitability of the area, and other factors that might influence a swift

fox reintroduction were recorded. The beginning and ending point on each transect was recorded with a GPS unit, and the GPS unit was used to calculate the transect length. The GPS coordinates presented in this report are uncorrected.

The location of small ground squirrel colonies located in potential swift fox habitat that showed extensive fresh and recent badger excavations were recorded with a GPS unit. These sites were considered to be suitable specific release sites for swift foxes and were revisited a on 28 July. Eleven specific sites showing extensive badger excavations were flagged with surveyor pen flags.

Small mammal populations were evaluated by establishing three live-trap transects, one each, in an upland site, a coulee site, and a river bottomland site. All traps were placed in grass dominated areas, although the coulee site had abundant western snowberry (*Symphoricarpos occidentalis*) in the area and the river bottomland site was bordered by cottonwood riparian habitat. The dominant vegetation in the upland area was needle-and-thread grass, blue grama, and thread-leaf sedge. In the coulee site, western wheatgrass dominated, and the bottomland site was dominated by smooth brome grass (*Bromus inermis*) and fortes.

The upland and coulee transects each consisted of 40 traps placed at 20 yard intervals. All traps were baited with rolled oats. Traps were set in pairs at the bottomland site and the transect consisted of 19 stations the first night and 24 stations the second and third night (one station only contained one trap). Traps on all three transects were set on the evening of 25 July and picked up on the morning of 28 July. In addition, all traps were sprung on the mornings of 26 and 27 July and reset in the evening of the same day to prevent ground squirrels from being caught and over-heating in the traps during the day.

RESULTS AND DISCUSSION

Ground squirrels were widely distributed and abundant throughout the survey area. A total of 583 ground squirrel burrows was recorded along 37.3 transect miles. All transects crossed at least one ground squirrel burrow, but ground squirrels were only observed along 37 of the 44 transects. Fresh and recent badger sign (excavated ground squirrel burrows) was observed along 36 of the transects.

The largest and densest ground squirrel colonies were located along the bottomlands of Two Medicine River and Badger Creek. Burrow densities at two such bottomlands sites ranged from 243 to 515 burrows per acre (Figure 1 _ numbers in Figure 1 are reported as burrows per mile, multiplying by 2 gives approximate burrows per acre). Benches immediately above these river bottomlands tended to have higher densities of ground squirrel burrows than adjacent uplands. Densities in these areas ranged from 32 to 88 burrows per acre. Burrow densities in upland areas between Two Medicine River and Badger Creek ranged from 19 to 42 burrows per acre. However, a ridge in this area adjacent to Two Medicine River and badland like topography had very low burrow density (9 to 15 burrows per acre). A survey of a long ridge forming the divide between

Two Medicine River and Mission Lake generally showed moderate burrow densities (14 to 31 burrows per acre). However, much of this area contained rolling topography and taller vegetation (bluebunch wheatgrass). The area between this high ridge and Two Medicine River generally contained a higher burrow density (15 to 52 burrows per acre) except for a small area in the southeastern portion of survey area (4 to 17 burrows per acre).

Richardson's ground squirrels occur at the AMS site and surrounding grasslands in high numbers. The burrow densities along the grassland dominated river bottomlands and river benches are actually comparable to blacktailed prairie dog colonies (*Cynomys ludovicianus*), and in some areas much greater than found in prairie dog colonies. Except for river bottomlands where ground squirrels occur at extremely high densities, at most other locations ground squirrel burrows tended to be clustered as small colonies in localized areas. These clusters tended to be at 1/8 to 1/4 mile intervals and usually had one or more burrows excavated by a badger (Table 1).

The small mammal live trap effort resulted in the capture of 17 deer mice (*Peromyscus maniculatus*) in 371 trap nights of effort (4.6 captures/100 trap nights). The deer mouse was the only nocturnal small mammal captured. The coulee trap line produced the greatest number of captures with 7.5 captures/100 trap nights. This was followed by the bottomland site (3.8 captures/100 trap nights) and the upland site (2.5 captures/100 trap nights). In addition, 37 Richardson's ground squirrels were captured at all three sites, but because traps were closed in the early morning and not reset until late evening, this number does not reflect their true abundance. One northern grasshopper mouse (*Onychomys leucogaster*) was heard calling in an upland grassland site after sunset on 28 July. No voles (*Microtus* spp.) or vole runways were observed during any of the survey work.

The small mammal population in this area appears to be typical for a needle-and-thread grass/blue grama habitat. Generally deer mice in Montana are broadly distributed through grasslands in low numbers. Deer mice normally occur at higher densities in areas with considerable shrub and tree cover, or in special habitats such as areas with rock outcrops. The northern grasshopper mouse normally occurs in grassland habitats at low densities but is not easily captured without adding fat to the bait. Vole populations typically vary greatly from one year to the next and may in fact be cyclic in Montana.

The Richardson's ground squirrel and its burrows are a dominant feature on the landscape in this area. Ground squirrels are probably as common in this area as anywhere within their range in Montana. Two badgers were observed during this work and numerous badger excavated ground squirrel burrows were also observed. It appears that this area supports a viable population of ground squirrels and badgers.

A variety of other wildlife was observed during the survey period. Redtailed hawks (*Buteo jamaicensis*) were common along Two Medicine River and Badger Creek. Other raptor species observed in the area were the ferruginous hawk (*Buteo regalia*), Swainson's

hawk (*Buteo swainsoni*), golden eagle (*Aquila chrysaetos*), prairie falcon (*Falco mexicanus*), American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), and great horned owl (*Bubo virginianus*). No burrowing owls (*Athene cunicularia*) were observed during any of the survey work. Badgers were observed on two occasions at Richardson's ground squirrel colonies on river bottomland habitat along Two Medicine River. Soils in the bottomlands tended to be finer textured, and may account for the higher density of ground squirrels and greater badger activity. One coyote (*Canis latrans*) den with three half grown coyote pups was found in a western snowberry patch located in a small coulee in an upland area. Although many of the grassland birds in this area had already completed their nesting, the avifauna community appeared to be characteristic of this type of grassland habitat. Bird species observed included horned larks (*Eremophila alpestris*), lark spurs (*Calcarius* spp.), longbilled curlews (*Numenius americanus*), vesper sparrows (*Poocetes gramineus*), and Sprague's pipit (*Anthus spragueii*). No rabbits (*Sylvilagus* and *Lepus* spp.) were observed during any of the survey work.

SUMMARY

This area appears to be suitable swift fox habitat. The area contains broad gently sloping ridges with short and midgrasses, and has high Richardson's ground squirrel numbers with a typical small mammal population. The area is slightly more dissected by drainages than what would be optimal, and there are two CRP fields in the AMS area and numerous small grain fields to the east and north. These agricultural areas detract somewhat from this area as a swift fox reintroduction site. Studies in Kansas show that coyotes selectively use CRP fields and that swift foxes entering these fields are frequently killed by coyotes (Lloyd Fox, Kansas Fish and Game, pers. commun.). However, the AMS site is located on the margin of one of Montana's best grassland sites. Reintroduced foxes dispersing south or west of the AMS site would travel into excellent swift fox habitat.

During the survey, specific upland sites with numerous ground squirrel burrows and several badger excavated burrows were flagged with orange surveyor pen flags. These specific sites are shown in Table 1 and Figure 2.

Table 1. Specific sites that would be suitable to place portable protective shelters for the reintroduction of swift foxes.

Site #	UTM Coordinates	# Badger Burrows	
1	0379995	5373583	3
2	0381317	5371840	5
3	0381783	5373583	4
4	0381754	5371058	1
5	0381017	5371540	5
6	0379867	5371862	3
7	0379496	5372532	3

8	0379197	5372071	3
9	0378972	5373464	3
10	0384031	5374435	5
11	0381816	5373984	*

* This point represents a high density ground squirrel area but no specific site was selected.

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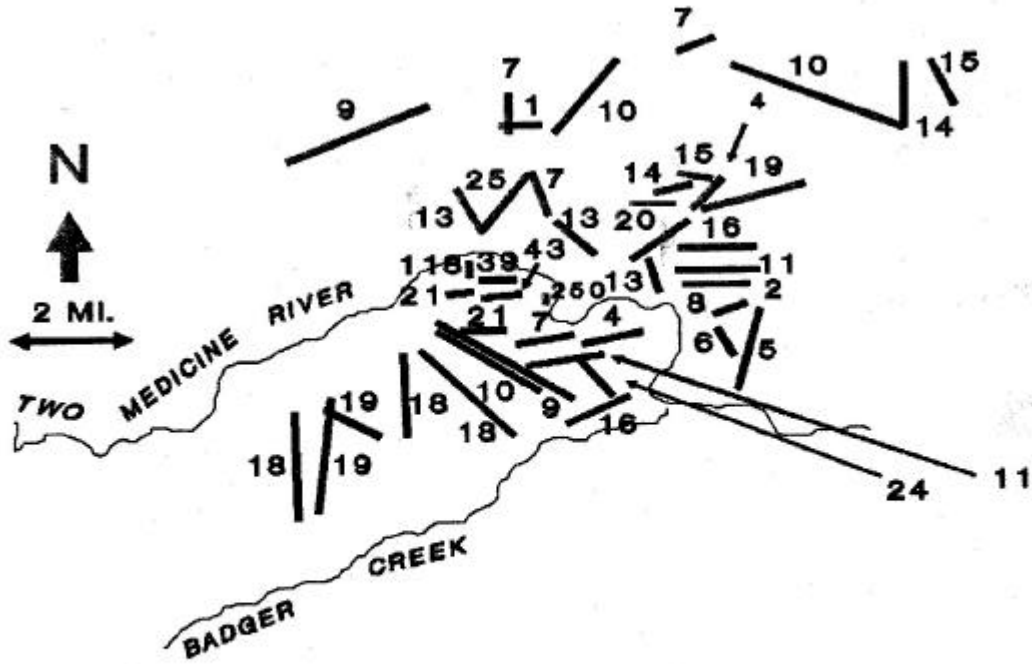


Figure 1. Richardson's ground squirrel burrows per mile in the proposed swift reintroduction area.

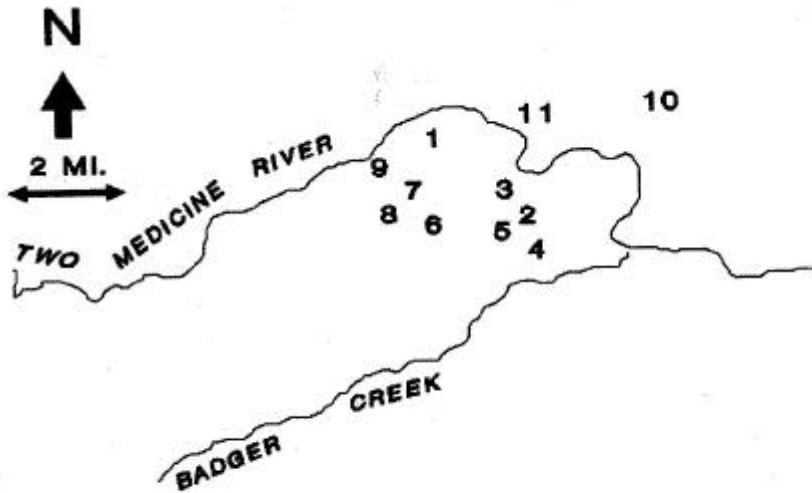


Figure 2. Specific swift fox release sites. Numbers correspond to site numbers in Table 1.

PPS Installation

The week prior to the release the PPS were put in place after the final selection of the release sites. The release site were based on the above reports and were as follows:

Site No.	UTM E	UTM N
Site 1	380354	5373513
Site 2	380199	5373666
Site 3	380980	5371490
Site 4	381712	5371750
Site 5	382148	5371644
Site 6	382500	5370860
Site 7	380405	5373088
Site 8	379935	5373530

The decision on sites selection was made jointly by Ira Newbreast, Blackfeet Fish and Wildlife, Minette Johnson, Defenders of Wildlife and Clio Smeeton and Ken Weagle, Cochrane Ecological Institute. PPS were installed on August 27th, 1998. Figure 1.

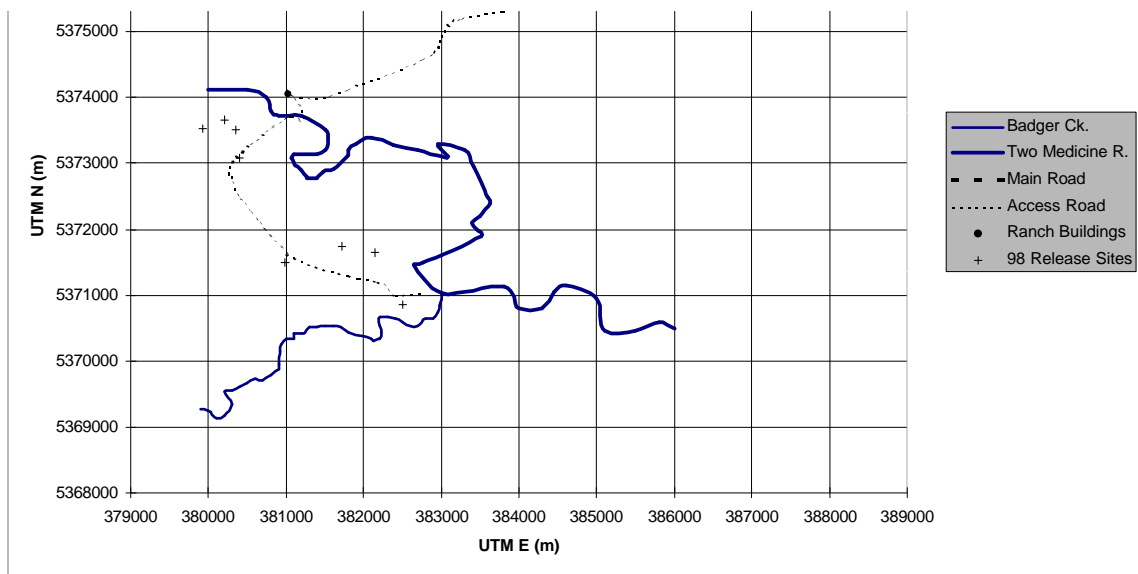


Figure 1: Location of the PPS release sites on the Blackfeet Ranch in 1998.

Release:

Publicity

All publicity arrangements for the release were made by Defenders of Wildlife. This included a professional photographer, a video cameraman, and a professional writer. These individuals were at the release on the morning of August 30th, 1998 and the photographer met the animals at the US border and followed the release from that point forward.

Agreements on funding give the Defenders of Wildlife the sole right to release publicity material on the 1998 release.

Release Protocols

SWIFT FOX RELEASE PROTOCOL

All release sites will be marked by numbered Portable Protective Shelters (PPS).

Each team of volunteers has previously been allocated a sibling group of foxes, which will be their responsibility. Each volunteer team has previously received numbered “fox luggage” consisting of a folder of paper work, and a colour coded and numbered bag of fox feed, blankets, waterbottle, etc (see Volunteer Info). Each sibling group of swift foxes has a unique colour code, this code is on the bag of fox luggage and the folder of paper work. The number marked on the PPS at the release site is also marked on the folder of paperwork and the bag of fox luggage.

At the Meeting Place (Blackfeet Tribal Ranch buildings), after being fed and watered, the swift fox groups will be transferred to the vehicles of the volunteer teams responsible for them.

We will feed the foxes at the meeting place.

The volunteer teams and their foxes will then move out to their designated release sites.

AT THE RELEASE SITE:

Park some distance from the PPS (at least 200m).

Take the foxes in their kennels to the PPS and arrange the kennels in a row, facing the PPS. Cover the kennels with the blanket provided, and put rocks on the blanket to stop it flapping about or blowing away.

Leave the foxes **in their kennels**. Do not let them out.

WATERING THE FOXES. Using the watering bottle provided pour water into the little dish attached to the bars of the cage gate. If they have removed the dish, don't worry about replacing it, they will get sufficient liquid from the feed we will have given them at the Meeting Place

Go back to your vehicle and leave the foxes alone for the night.

Set up your camp. If you have a spotlight: it is useful, should you be awake, to sweep the area and jot down what you see, if you see anything. Jot down what you hear as well, if able to identify it (i.e. coyote, great horned owl).

At first light the following morning, (Sunday, August 30th) go over to the foxes and remove the blanket. Fill the tin dish provided with water and place it in front of the row of kennels, between the kennels and the PPS.

Take the blanket back to your camp and have breakfast. Prepare yourself and your equipment for a day of observation.

Go back to the foxes and open the kennel gates. Be sure to use a rock to keep the doors open. If it is windy, put a rock on top of each kennel. The foxes will emerge in their own time.

Go back to your observation site and stay there. Do not disturb the foxes at all any more that day. If taking photographs use a long lens. If the foxes are spooked by you at this time they will run and run, and as result, will stand a much greater chance of being killed. They are extremely curious, if undisturbed, they are likely to come closer to you.

Do not be disheartened if they run away and do not reappear, they will come back (**if they have not been spooked by you**). Over the six years that we have been using this release method a proportion of the swift foxes will run off after coming out of their kennels, but all the foxes released using this method have always returned to the site within 24 hours after release. If the foxes are spooked by something other than you (hawks, owls, eagles, coyotes) their inclination is to run back to the PPS for protection.

Therefore, all information gathered at the site, if the foxes are there at the time or if they are not, is valid and important.

Take notes in the coil bound book provided, fill out the forms provided. All information is of interest. Please put any scat/ raptor castings in ziplock bags provided and label clearly.

At midday, if the foxes no longer show any signs of interest in the plastic Cloud kennels take them away and dismantle them. Put the dirty paper, etc. in the garbage bag provided, and the screws in a ziplock bag.

Those volunteers who have to return Sunday night

On Saturday, at the meeting place, we will designate one team who will take the all cloud kennels, note books & other paperwork, ziplock bags of scat, etc. from those volunteers who will be returning to Calgary/Cochrane on Sunday night. Please drop off your CEI equipment, if any, dismantled Cloud Kennels, paperwork, etc. with that designated person before you return to Canada.

Those volunteers that can stay over Sunday night.

Take turns to observe during the night. Use the spot lights provided. Just sweep the area, do not focus directly on the animal you pick up with the light. In the morning, note tracks and any sign of digging. Please do this as precisely as possible, for the sake of the people doing the follow-up monitoring and it will make the job much easier for them.

When you leave, please go to the identified person's site (identified Saturday afternoon at the Meeting Place) and leave the information with them and discuss with them what you have seen etc.. You will each be provided with a topo map photocopy of the release sites, with your site and everyone else's marked on it.

I will see if Peter can take your dismantled cloud kennels and any other stuff that has to go back to the CEI, back with him when he returns. Depending upon what sort of transport we (Ken & Clio) end up with we might be able to take the stuff. All that will be settled on Saturday afternoon.

Monitoring

In an attempt to document the initial behavior of the Swift fox when released, each of the release sites was monitored for the first 14 hours after the release. Notes on the fox movement and activity were taken to assist with future releases. The following are the notes from each release site.

Site: 1

Monitors: Minette Johnson

Time of Observation: 08:00 Aug 30 to ???

Time Kennels Opened: 8:15 AM

Time Kennels Picked Up: AM

Weather: Temperature: ~7C Wind: light

Cloud Cover: None

Initial Behavior:

Time	No. of Foxes Observed	Behavioral Activity
8:15	2	The animals left the kennels and explored the area, both drank some water. One entered and explored the PPS. Both explored nearby burrows. They both explored the hills to the west
9:00	2	Left the area on the track to the east.
9:15	2	Returned to area of PPS
9:24	1	Left area to west on truck track
9:25	1	Fox began digging in the area of the doorway to the PPS
9:30	1	Vocalization (whining, groaning) heard from PPS and more digging
10:04	1	Last fox left kennel and headed up to west, one remained at PPS
10:10	2	Hawk flies over one on the hill, one still digging at PPS
10:15	3	One fox in burrow, two disappear to the east
12:35	1	Comes out of burrow to dig
2:15		Put chicks out near PPS
2:20	1	Fox came out of burrow, collected chicks, looked around and disappeared down burrow with chicks
2:24	1	F0x came loping by from northwest, continued past heading south
3:15	1	Fox out of burrow investigating PPS, kept within 20 ft of burrow, tried for a grasshopper and missed, returned to the burrow at 3:42

Site: 2

Monitors: Thomas Wharton Time of Observation: 7:50 Aug 30 to 7:50
 Aug 31, 1998
 Peter Leon

Time Kennels Opened: 07: 50
 Time Kennels Picked Up: 16:30

Weather: Temperature: ~ 5C Wind: none Cloud Cover: Minimal

Initial Behavior: Foxes remained in their cloud kennels for an extended period of time, appeared to be quite comfortable in their kennels. IRIS appeared to be quite angry.

Time	No. of Foxes Observed	Behavioral Activity
8:20	3	Remained in their kennel and not venturing out
8:50	3	IRIS peering outside the kennel door, interested in what the others were doing.
9:30	3	Still no real interest in exiting the kennels. IRIS will be the first to leave when they do.
9:31	1+2	IRRIDECENCE peered out of the kennel and exited, she's free. Disappeared to the north
10:00	2	IRIS and INGA remained in the kennel, INGA peering out the side.
10:30	2	Sleeping uninterested in exiting the kennels
11:00	2	INGA clawing at the bottom of the kennel
11:30	2	INGA and IRIS resting, being defiant and uncooperative
12:00	2	Continued to rest not stirring or exploring
12:30	2	Continued to rest not stirring or exploring
13:00	2	INGA making his bed once again clawed at the kennel
13:30 to 15:00	2	Left kennel and proceeded up the hillside away from the PPS.
20:00	1	Fox appeared at PPS Some digging behavior and cashing of chicks
21:00		PPS Checked but no sign of foxes
9:00 next day		A PPS checked but no sign of activity. There was some fresh digging in the area and some tracks were noticed.

Site: 3

Monitors: John and Janet Winnie

Time of Observation: 6:45 AM to ??

Time Kennels Opened: 7:25 AM

Time Kennels Picked Up: 8:40 AM

Weather: Temperature: ~7C Wind: light

Cloud Cover: None

Initial Behavior: Exploring around the PPS and surrounding area, one went into PPS

Time	No. of Foxes Observed	Behavioral Activity
7:30	3	Left kennel, explored the PPS, kennels and immediate area (holes). Two immediately began digging in a badger hole about 100 yds from the PPS. Two then left to the south stopping often to look around
7:45	2	Returned to the area along road and went back to the burrow about 100 yds from PPS and disappeared into it
7:50	1	Returned on road. Other two explored fence line
8:00	1	In view on rise near fence
8:05	1	Fox spotted to the north-east, this is presumed to be from another release site.
8:15	1	Near a rosebush clump near PPS it chased a ground squirrel
8:20	1	In view near fence line SW of PPS
8:30	2	One staying near rose bush and one on fence line
8:45	1	Fox appears on road and gradually goes to first badger hole, then rose bush. Greets other fox at rose bush, very casual greeting Two begin digging at Rose bush
9:00	2	Digging at rose bush
9:07	2	Exploring away from rose bush together
9:12	2	Back to rose bush digging
9:20		Heard a "Yelp" (warning bark) as a hawk flew over, then heard another one from the west. The two foxes at the rose bush heard it
9:30	2	Marsh hawk flew directly over the foxes and they spooked into the burrow for a short time, then continued digging
9:40	2	Still digging dirt flying out the burrow
9:50	3	Two still at rose bush, one ran from road across fence line
10:00		Digging at both ends of the rose bush
10:15		Digging at new area at the end of the brush area
10:30	2	Digging again temp in shade is 82F
11:00		Foxes quiet at rose bush

12:15	2	Digging again
1:00	1	Out of hole and very dirty from digging
2:00	2	Heads appear from hole 90F in shade
2:45	1	Looks out of hole again
3:30	1	Looks out of hole again
3:45	2	Came out of burrow and checked out first badger hole, both took turns going into hole and came out head first so there is a big chamber. One pounced toward a grasshopper and returned to rose bush burrow
4:00	1	Looked out of burrow
4:24	2	Out of hole and one caught a grasshopper, checked out badger hole again, they started down road to south and then came back to their burrow at rose bush
5:00	1	Caught an insect at burrow
5:15	2	heads popped out cooling at 80F
5:30	1	Out walking around for a few minutes
5:40	1	Out and back into hole
5:55	1	Pouncing and cashing near the rose bush
6:10	1	Appeared nervous of something out of our view in the coulee
6:20	2	Returned cautiously to the PPS, sniffed around before eating one chick each. One fox grabbed a third chick and the second chased it for a little ways but not aggressively. They stayed in area of PPS
6:35	2	Both have been in and out of PPS now lying in shade of the PPS
6:40	1	Came up the draw toward us within 100ft. Stared at us and then trotted back to the PPS. Looks at us often (possibly thinks we have more chicks)
6:50	2	One at PPS and the other hid on the fence line when a truck came by. Stayed there until truck out of site. This is the first time the two have been separated since 9:00AM
7:10		Coyote howls and yips in distance
8:10	2	Fox out of PPS and rosebush and head off together at sunset, to east
6:30A M	1	Sleeping on a rock near the rose bush den
8:00	1	At PPS
8:10	2	At rose bush burrow
8:30	1	Stalked and nearly got a ground squirrel
9:30	1	Out exploring in coulee and made way to PPS
9:10	1	Fox at the PPS went inside

Site: 4

Monitors: John Godley Time of Observation: 07:30 Aug 30 to 11:30 Aug
30/98

Kathy McCormick

Time Kennels Opened: 7:55 AM

Time Kennels Picked Up: 11:30 AM

Weather: Temperature: ~7C Wind: light Cloud Cover: None

Initial Behavior: ¼ into PPS and stayed for 1 hr, ¾ ran off almost immediately

Time	No. of Foxes Observed	Behavioral Activity
7:55	1	Came out of kennel and went up hill toward tent
7:55	1	Went into PPS
7:57	2	Both slowly moved away from the PPS and the first fox followed them.
8:40	1	Fox appears on the hill opposite the PPS
9:00	1	Fox emerges from PPS and eats a chick, notices the observers
9:20	1	This fox heads up the hill after the other 3. Seems to be following their scent
6:30 AM Aug30	?	All chicks are gone from PPS

Site: 5

Monitors: Craig Knowles
Aug 30, 1998
Lee Blackcrow

Time of Observation: 19:30 Aug 29 to 12:00

Time Kennels Opened: 08:00
Time Kennels Picked Up: 10:15

Weather: Temperature: 50 F. Wind: Calm Cloud Cover: Clear

Initial Behavior: 1 of 4 entered the PPS, the other 3 looked at the PPS but did not enter. The 3 moved off as a group within 5 minutes of release. 1 stayed in the PPS for about 5 minutes more before leaving.

Time	No. of Foxes Observed	Behavioral Activity
0830	3	Traveling
0845	1	Came out of burrow
0845	2	Chased horned larks during travelling

Site: 6

Monitors: Emile Roessingh Time of Observation: 07:30 Aug 29 to 11:30 Aug 30/98

Time Kennels Opened: 7:45 AM
 Time Kennels Picked Up: 11:30 AM

Weather: Temperature: ~7C Wind: light Cloud Cover: None

Initial Behavior:

Time	No. of Foxes Observed	Behavioral Activity
7:45	1	Left kennel, sniffed a hole, and laid down 6 ft from kennel
7:47	3	Slowly emerged from Kennel, took a drink and circled the PPS
7:55	2	Exploring about 100 yd from kennels
7:56	2	Other two foxes leave PPS followed by two other foxes
7:58	1	Fox remains at PPS, three run off towards creek
8:05	1	Remaining fox reenters kennel, exits and heads toward me, stops and is startled at about 30 ft. leaves in opposite direction following the ridge enters the valley and heads in the same direction as the other 3
8:15	2	Appear on bench, one heads for the river and one for the PPS
8:20	1	Fox leaves the PPS and explores the area, reenters the kennel, leaves and checks out a burrow about 40ft north of the kennel and digs it out.
8:25	1	Fox leaves burrow because of movement on my part and leaves fast along the lower bench
8:50	2	One fox sited on river trail, one observing me from the bench I am on
9:00	1	Appears from river trail and joins the one observing me. Then one heads to river and one to a brush to the south.

Site: 7

Monitors: Michael Black Wolf
Aug 30/98

Time of Observation: 07:30 Aug 29 to 11:30

Time Kennels Opened: 8:00 AM
Time Kennels Picked Up: 11:30 AM

Weather: Temperature: ~7C Wind: light Cloud Cover: None

Initial Behavior:

Time	No. of Foxes Observed	Behavioral Activity
8:02	4	All four foxes left kennel. They examined the PPS from the outside and then one went inside. All moved very low to the ground and cat like.
8:05	3	Moved away from release site and out of sight.
8:07	1	Takes two chicks into PPS and appears to eat one.
8:10	1	Leaves PPS follows trail of the three others and proceeds close to ground as the others did.
7:58	1	Fox remains at PPS, three run off towards creek
8:50	3	Moved obser4vation point saw three foxes on ridge. One appears to go toward Release site 6. The others play along the ridge chasing birds
09:15	1	Appears to come out of a burrow in a snowberry patch.
9:30	1	Watch fox from another release site travel along the river bottom.
11:40	2	Foxes were playing around the snowberry patch observed at 9:15. Both entered burrow and did not reappear.

Site: 8

Monitors: Clio Smeeton Time of Observation: 07:00 Aug 29 to 11:30 Aug
 30/98

Ken Weagle

Time Kennels Opened: 7:00 AM

Time Kennels Picked Up: 12:00 AM

Weather: Temperature: ~7C Wind: light Cloud Cover: None

Initial Behavior:

Time	No. of Foxes Observed	Behavioral Activity
7:30	3	Three foxes left their kennels. They examined the PPS from the outside and then one went inside. All of them moved slowly around the PPS.
7:45	3	Moved away from the PPS. 1 examined the nearest hole to the PPS, the other 2 moved north wards
8:00	3	2 moved south, uphill, and 1 joined them
8:10	3	Spooked by photographers all 3 flee uphill, south.
10:00	1	Fox in kennel left kennel and entered PPS.
11:22	1	Fox came out of PPS, gathered chicks, returned to PPS.
11:45	1	Fox came out of PPS, and dug in nearest hole, returned to PPS
16:00	1	Fox came out of PPS, hunted grasshoppers, 5 min. returned to PPS
00:40	1	Fox seen outside PPS, Ken using spotlight

The observations on the use of the PPS and the digging of burrows for the 1998 releases are summarized in Table 1.

Total Foxes	Used PPS	Dug Burrows	Left PPS site
30	6	7	17
%	20%	23%	57%

The use of the PPS immediately after release was found, in Saskatchewan, to be directly related to the weather at the time of release (Smeeton and Weagle, 1998). This means that in years of poor weather (wind and rain) during the release the PPS is used at a higher rate than in years when there is clear and calm weather. Weather conditions during the 1998 releases were warm and calm with clear skies that would lead to reduced use of the PPS.

On the morning of the first day after the release (August 30, 1998) a visual survey was conducted of the release area. At that time a total of eight (8), Swift fox den sites were found (Figure 2). This indicates that there was extensive den selection and digging during the first 24 hours after release. These sites were noted by the freshly excavated earth at the site and the presence of Swift fox tracks in the earth. The high number of dens, assuming some were not located, indicates that the released Swift fox found the area highly suitable for den site location. Further monitoring will be necessary to confirm this conclusion.

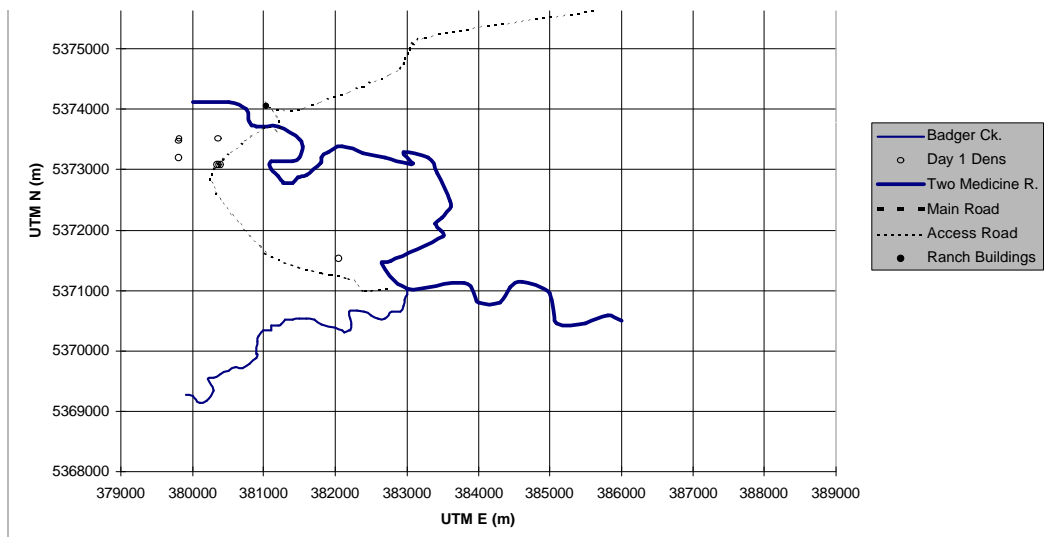


Figure 2: Location of the Day-one den sites on the Blackfeet Ranch in 1998.

Funding:

Philip Seddon, The International Union for the Conservation of Nature(IUCN), Reintroduction Specialist Group(RSG) Bird Section Chairperson, has made it clear that one of the Key aspects of successful reintroduction is “full and prior commitment to funding”. The IUCN’s other Key aspects of successful reintroduction are; sufficient suitable protected habitat, a large captive colony of wide genetic heterozygosity, support from the people of the area, the of the environmental agencies which hold jurisdiction over the area, research scientists to monitor the swift fox in the release sites, and a proven reintroduction design.

The reintroduction of the swift fox into the Blackfeet Nation’s tribal lands complies with all but one (Funding) of the of the IUCN RSG Reintroduction Criteria. This makes this reintroduction effort unique.

The Blackfeet swift fox reintroduction program has sufficient suitable habitat for the swift fox reintroduction. The Blackfeet swift fox reintroduction program can draw for reintroduction upon the world’s largest, and longest established, and only swift fox captive breeding colony, the Cochrane Ecological Institute (CEI), for large numbers of healthy young animals of known genetic heterozygosity. The design of the swift fox reintroduction program is based upon the lessons learnt and the successes achieved in the Canadian swift fox reintroduction program (1983 –1997). The Blackfeet Tribal Fish and Wildlife Department’s mandate is ecosystem restoration, swift fox are an integral part of the prairie ecosystem. Swift fox are also an integral part of the cultural landscape of the Plains Tribes. The people are behind this reintroduction. This swift fox reintroduction has the commitment of the Tribe for the next 3 –5 years. The program has confirmation from the CEI that they are prepared to commit all the progeny of the CEI’s captive breeding colony, over the next 3 –5 years, toward the successful attainment of a self sustaining swift fox population on the Blackfeet Reservation. The CEI and the Blackfeet Tribal Fish & Wildlife Dept. have undertaken to ensure that released swift fox will be monitored. Unfortunately the program does not yet have “full and prior commitment to funding.”

Initially, it was the understanding of the Blackfeet Fish & Wildlife Department and the CEI that Defenders of Wildlife were prepared to fill the funding role, the Key aspect of “full and prior funding”. In June 1998, Defenders signed a preliminary agreement with the CEI which reinforced their understanding that Defenders would provide \$20,000 towards funding the captive colony in 1998, and for the next 3-5 years would undertake the funding role of ensuring the provision of \$65,000 annually for the captive colony; thus enabling the colony to continue to provide swift fox for the Blackfeet release, Defenders would also provide funding for the releases. For their part, as well as provision of swift fox for reintroduction, arranging releases and coordinating volunteers, the CEI would also undertake to provide an educational seminar on swift fox monitoring for the

Blackfeet community college (which has been done), and post graduate students prepared to undertake monitoring in the field, (also done). The Blackfeet Fish & Wildlife Department would build PPS (done) would ensure protection for the released foxes on Blackfeet tribal Lands (also done).

Unfortunately, bound by a Board Directive that forbids long term financial commitments, Defenders of Wildlife has not been able to commit to “full and prior funding “for 3 – 5 years. Committed long term funding is a significant consideration when dealing with living wild animals belonging to an endangered species. However, Defenders has provided the CEI with \$20,000, as agreed, towards the costs of the captive colony in 1998. The other funding for the captive colony in 1998 was provided by a number of individual and Corporate Canadian donors, among them Amoco, PetroCanada, Rigel Oil.

Apart from the International Wildlife Coalition (IWC), which has consistently contributed towards funding the CEI’s captive breeding colony over the last several years, most of the Canadian funding for the captive breeding colony ceased in 1998 as swift fox have ceased to be released into Canadian release sites and all future swift fox reintroductions, using CEI stock, will now take place in the US.

Defenders has given the CEI a Letter of Intent to provide a further \$20,000 on January 1st, 1999, contingent upon the agreement of the Board of Directors of Defenders of Wildlife, who will be meeting in November 1998. Robert Ferris, Director of Species Conservation for Defenders of Wildlife, in conjunction with Minette Johnson, has undertaken to “develop funding resources for this program as long as the project remains viable”(26 August, 1998). The costs of release (CEI, vehicle rental, volunteer costs), and pre release site selection (Matt Carpenter/Craig Knowles) have not yet been paid. Fortunately, it is Bob Ferris’ hope that “once the project is up and running and more momentum is generated around the US Swift Fox Conservation Strategy that funding interest on the part of the states and foundations will greatly increase.”

The cost of the captive colony, which has not changed since the 1980’s, is \$65,000 per annum. Cost of releases will vary (\$2,500 – \$5,000), depending upon the number swift foxes, of volunteers, and the amount of pre release field work that needs to be done. Blackfeet Fish & Wildlife Department will cover the costs of the provision and construction of PPS, the release site, protection, and a certain amount of monitoring, of the released swift foxes. Post graduate students from the CEI undertaking monitoring of the swift fox in Montana will be self funded.

Lessons from 1998 and Recommendations:

The release of 30 swift fox for the 1998 Swift fox Reintroduction into the Blackfeet Tribal Lands, Montana, USA, was a success. It is a success that will have to be built upon by further releases, over the next 3 – 5 years, of significant numbers of animals into

the Blackfeet release sites in order to achieve a scientifically acknowledged self sustaining swift fox population in the Blackfeet Tribal Lands. This is the first time that significant numbers of swift fox have been released into one large contiguous site, rather than being scattered over a huge area of fragmented habitat.

Research over the last five years has shown that swift fox released repeatedly into the same area of proven suitability will establish a consolidated and expanding population. In contrast, swift fox reintroduced in small numbers scattered over a large area have shown that they will contract their range and numbers.

Sibling groups of captive bred swift fox from the CEI captive colony were released in Montana. Of the 36 swift fox cubs born at the CEI in 1998, 30 were used in the reintroduction and 6 cubs retained for new breeding pairs within the captive colony. Should these new pairing be successful in 1999, there will be a significant increase in the number of swift fox reintroduced as part of the Blackfeet Swift Fox reintroduction program in 1999. All the captive bred swift fox are the 1st or 2nd generation progeny of wild trapped animals imported into Canada, to the CEI, from the U.S. The CEI maintains the International Swift Fox Studbook on ISIS software.

The release site provided by the Blackfeet, on the Blackfeet Tribal Ranch, was superb. It was best release site that CEI personnel had examined in over 15 years of swift fox reintroduction experience. This initial estimate on the suitability of the Blackfeet Ranch site for the release of swift fox was reinforced by the findings of the pre release surveys of the site undertaken by Matt Carpenter, for CEI, and Craig Knowles, for Defenders. The findings of the surveys and the suitability of the site for the released swift fox was confirmed when the released animals were shown to have remained in the release sites and established dens there. Ira Newbreast of the Blackfeet Tribal Fish and Wildlife Department, organized construction of PPS. In spite of the PPS falling off the back of the trailer several times while we were setting them up, all the PPS were so beautifully and toughly built that none of them came apart.

Government agencies on both sides of the Border were significant contributors towards the success of this program and the Canada/US Border Crossing was effected smoothly as result.

Minette Johnson, of Defenders of Wildlife, kept the spirits up of the scientists doing the pre release survey (particularly Matt's) when she visited them. She was a strong contributor in patience, time, and coming out to help both in siting the PPS and during the releases.

Last but not least, we could not have done this so smoothly, successfully, and inexpensively without a huge core of volunteers. THANK YOU ALL

In short; with a continued Blackfeet swift fox reintroduction we have the chance at a resounding, internationally acclaimed conservation success. The swift fox is a small non

aggressive species, beneficial to farmers. It is too small to take farm animals of any description. Therefore, the reintroduction of the species will not be a cause for controversy within the agricultural community. The Blackfeet requested the swift fox release and the animal is a cultural icon for the Tribe indicating that the repatriation of the swift fox to their historic Blackfeet range is supported by the Tribe. The captive breeding colony providing the swift fox for this release (the CEI) is a proven expert in breeding and reintroducing swift fox. Released captive bred swift fox, reintroduced in the Canadian release sites over the past 15 years, have demonstrated their ability to survive, breed, and successfully raise their young after release. This is a strong indication that CEI swift fox from the same blood stock, released in greater numbers into superb habitat, have a greater chance at attaining a self sustaining population within a comparatively short time.

All we need for assured success is the money to carry on.

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