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**Comments and revisions submitted to:**

Kenneth Weagle  
Cochrane Ecological Institute  
P.O. Box 484  
Cochrane, Alberta  
Canada T0L 0W0

Phone (403) 932-5632  
FAX (403) 932-6303  
E Mail [cei@cadvision.com](mailto:cei@cadvision.com)

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**A new release methods for captive bred Swift fox (*Vulpes velox*)**

**C. Smeeton, and K. Weagle**

Clio Smeeton  
Cochrane Ecological Institute  
P.O. Box 484  
Cochrane, Alberta  
Canada T0L 0W0

Kenneth Weagle  
Cochrane Ecological Institute  
P.O. Box 484  
Cochrane, Alberta  
Canada T0L 0W0

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**Abstract**

The reintroduction of captive bred Swift fox to the Canadian prairie began in 1983. The original release methods were found to be very labor intensive “soft release” (12 animals from 1983 to 1987) or possibly detrimental to the survival of captive bred Swift fox, “hard release” (511 animals from 1987 to 1995). The Portable Protective Shelter (PPS) release method was developed and employed in Grasslands National Park since 1993. The PPS release has been used for 58. The method involved pre-release site selection, the use of a PPS for short term (3 to 10 days) Swift fox shelter, intensive monitoring for 24 hours after the release and post-release monitoring for 10 days after the release. The PPS method keeps the released swift fox in the release area, does not deter the digging of dens, and appears to lessen the stress associated with releases.

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## Introduction

In 1971-72, a captive breeding program was set up for the reintroduction of Swift foxes (*Vulpes velox*) at the Wildlife Reserve of Western Canada, Cochrane, Alberta, Canada (now called the Cochrane Ecological Institute). In 1983 the first Swift fox were released in Southern Alberta by the University of Calgary using a 'soft release'. The soft release was developed and described by Reynolds (1983). It involved placing the animals to be released in temporary pens on the prairie feeding them for an acclimation period and releasing them after the acclimation period. This release method was used from 1983 to 1987 for the release of 12 Swift fox. The soft release method was abandoned in 1987 because it was labor intensive and the feeding of animals in the pens attracted predators.

In 1987 a 'hard release' method was first used in the releases. This method involved transporting the animals to the release sites, placing the carrying kennels (small size cloud kennels) on the prairie and opening the doors (Brechtel et al, 1993). Generally the Swift fox were allowed to leave on their own time. If they did not leave, the tops of the cloud kennels were removed or the animals were forced out of the kennels by shaking them. Unless the animals were radio collared no attempt was made to monitor them after they were released. This release method has been used by the government employees for release from 1987 until the present. A total of 511 Swift fox have been released using the hard release method. The hard release method was cost effective but was of questionable benefit to the released animals.

Observations of this hard release methods by the Cochrane Ecological Institute, in 1991, resulted in questioning the humanness of the 'hard release' method. To improve the Swift foxes survival immediately after release and to provide for more humane release methods, from 1993 onward a new release strategy was developed for the Swift fox released by the Cochrane Ecological Institute (Smeeton, 1994). This new method included pre-release site selection, use of portable protective shelters (PPS) and post-release monitoring. In 1994 & 1995 additional efforts were put into reducing the time Swift fox were kept in the cloud kennels before they were released.

This paper presents a description of the PPS release method and presents the findings of post release monitoring from 1993 to 1995.

## Method

### Release Area

The area of the Canadian Swift fox reintroduction program used for the development of the new release method was Grasslands National Park, East and

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West Block (Figure 1). Grasslands National Park, when gazetted, will contain the largest area of undisturbed short grass prairie in North America.

## **PPS Release Method**

### Release Site Selection

Release sites for the release of Swift fox using the PPS method were selected using the following five criteria: 1) evidence of Swift fox activity - old dens; 2) escape terrain (i.e. numerous badger holes); 3) supply of varied prey base; 4) activity of potential predators (i.e. coyotes, eagles); and 5) proximity to source of water. These criteria were developed from a survey of Swift fox den sites in South Dakota. Potential release sites were surveyed, on foot, before the release date and areas fitting the above criteria were selected. A minimum of 24 hours before the actual release the PPS was placed at the site. This shelter was similar to the den boxes used in the captive breeding program at CEI but modified so that it could be folded up and transported on a packboard. The PPS had two parts, an internal den box, and an external A-frame (Figure 2).

The PPS was removed from the release sites at different times in each of the years. In 1993 they were removed at 10 days, in 1994 after five days and in 1995 after three days.

### Pre-Release Animal Processing

In 1993, and prior, the Swift fox were taken from the breeding pens and placed in the cloud kennels two days before the actual release. On the first day after being caught they were given a physical check by a veterinarian and inoculated with rabies (rmlmrab3 vaccine) and Liptospira canicola, Ictohaemorrhagiae bacterin (Fort Dodge) vaccines (this was the third in a series of inoculations). After all Swift fox to be released that year were processed they were transported to the release sites. The release took place on the second day after they were taken from the breeding pens with the animals spending a minimum of 48 hours in the cloud kennel.

In 1994 and 1995 during the week prior to the release the Swift fox to be released were captured in the breeding pens and given their final inoculations and a physical check. After the inoculations the animals were left in the pens. At noon, one day prior to the release the Swift fox to be released were captured in the breeding pens, put into cloud kennels and immediately transported to Grasslands National Park headquarters (the transportation distance is approximately 500 km.) arriving sometime during the night. At dawn on the morning of the release the animals were transported to their release sites and released. This reduced their time in the cloud kennels (from capture in the breeding pens to release) to less than 24 hours.

### Release

At the release sites the cloud kennels containing the Swift fox were placed in a semi circle with the doors pointing toward the PPS. Food (dead mice) were placed in the PPS and a dish of water was placed adjacent to the PPS. One member of the transportation and monitoring team for the specific release site opened the doors of the cloud kennel and retreated 100 m. from the site. The Swift fox were allowed to leave the cloud kennels at their own pace. Once all the Swift fox for the site had left their cloud kennels and no longer showed any interest in them, the kennels were removed from the area.

### Post Release Monitoring

Each release site was monitored by volunteers for the first 24 hours after the release. The monitors viewed the behavior and activity of the released animals from a distance of at least 100 meters. In 1994 and 1995 all release sites were monitored for a further 10 days on a daily basis.

## Results and Discussion

Swift fox reintroduction into south central Saskatchewan began in 1990 with releases into the east block area. The releases into the West Block area began in 1992. All releases prior to 1993 used the hard release method (Table 1).

Table 2 summarizes the Post release monitoring for the PPS releases from 1993 to 1995.

The tendency of the Swift fox to use the PPS in the first 24 hours may be related to the weather pattern during that period. In 1993 the weather on the day of the release was warm (20 C) and windy (gusts to 60 kph). In 1994 the release day was mild (15 C) with a light breeze (< 10 kph). In the evening of the release day in 1995 (from c. 7:30 pm to c. 3:00 am), there was a violent storm (25 mm of rain and wind gusts to 65 kph). The use of the PPS over the first 48 and 72 hours in 1994 was lower than other years. It is felt that this pattern reflects the response to weather patterns and the gradual adaptation of the animal to its new surroundings. The observations on the higher use of dens in the release sites on initial release days with high wind, was supported by observations in the captive breeding colony of few Swift fox being out of their den boxes on days with wind speeds over 5 kph (Weagle and Smeeton, 1995).

In all years within the first 48 hours some of the released animals had established den sites. The most dramatic example of this was in 1995 when animals at each of the five release sites had established at least one den site within this time frame.

In 1993 and 1994 the PPS were removed from the release sites 10 and five days, respectively, after the release. No Swift fox were occupying them at the time of removal in either of these years. In 1995 the PPS were removed at three

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days after the release. At this time four of the five PPS were still in use indicating that three days was too early to remove the PPS.

In 1995 one group of five Swift fox were released into the East Block without a PPS. They immediately went into existing badger holes in the area. Although the site was monitored over the following seven days no additional sign was found of the individuals. Similar attempts were made to monitor the Swift fox released without PPS in 1993 but no sign could be found of the animals after the release day.

Observations on the use of the PPS method indicate that the portable protective structure gave the newly released captive bred Swift fox a point of reference. The high frequency of use of the structures, over the first 24 hours, which appears to be related to weather patterns suggests the PPS provided shelter, in a relatively hostile environment. Animals released with PPS used the structures for temporary shelter until dens were developed. The number of animals still using the PPS when they were removed suggested that the optimum removal time was five days after the release.

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**Table 1: Summary of the Swift fox released into GNP from 1990 to 1994, inclusive.( number of brackets indicate number with PPS method)**

Year	East Block/Wood Mountain		West Block	
	Captive Bred	Translocated	Captive Bred	Translocated
1990	51			
1991	61	14		
1992	16		38	
1993	11		24 (16)	
1994	9 (9)		10 (10)	
1995	12 (7)		16 (16)	
Total	160 (16)	14	81 (42)	0

**Table 2: Summary of the post release observations for Swift fox released using the PPS method from 1993 to 1995.**

Year	No. foxes Released	Initial Reaction			Use of A frame			Swift Fox Spotted at 7 Days
		Bolted	Entered PPS	Investigate Area	24 Hr	48hrs	72hrs	
1993	16	12	4	0	11 (69%)	4 (25%)	N/D	N/D
1994	19	8	0	11	4 (21%)	3 (16%)	3 (16%)	6 (31%)
1995	23	2	17	0	21 (91%)	13 (56%)	8 (35%)	9 (32%)
Total	58	22	21	11	36 (62%)	20 (34%)	11 (19%)	15 (32%)

Figure 1

