TRACK PLATES BAITED WITH SCENT ATTRACTANTS AS A METHOD TO SURVEY FOR BLACK-FOOTED FERRETS – A PILOT STUDY

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INTRODUCTION

The black-footed ferret (ferret) is a *Mustelid* that was thought extinct in the mid-1970s (Black-footed Ferret Recovery and Implementation Team 1998). However, in 1981 a small ferret population was found in Meeteetse, Wyoming, and has been used to reestablish the species throughout its historical range. As part of a nation-wide effort to assist in the recovery of this species, and as part of the Arizona Game and Fish Department's (AGFD) mission to "restore Arizona's diverse wildlife resources" (Arizona Game and Fish Department 2002), ferrets were reintroduced into the Aubrey Valley Experimental Population Area in north-central Arizona in March of 1996. The goal of the national recovery effort is to establish 10 or more separate, self-sustaining, ferret populations (Black-footed Ferret Recovery and Implementation Team 1998). As of 2001, 144 ferrets have been released into Aubrey Valley, and 7 wild-born kits have been documented (Winstead and others 2002a).

In order to monitor the status and long-term sustainability of the population and to determine the location, movements, dispersal distances and survival of released and wild born ferrets, the AGFD conducted annual spotlighting surveys and occasionally used telemetry. Passive Integrated Transponder (PIT) tags are used to identify individual ferrets. Due to the elusiveness of the animals, the paucity of observations during nocturnal surveys, and the large size of the Aubrey Valley Experimental Population Area (approximately 12,144 ha for the core area) (Winstead and others 2000), investigation of other surveying techniques was initiated.

Detection surveys help determine if a target species occurs in an area where management activity is proposed (Zelinski and others 1995). Detection surveys of ferrets are important to obtain information on their movements and activity patterns, as well as assessing population status for future management considerations. Very little is known about the activity and population status of the reintroduced and wild-born ferrets in Aubrey Valley. This information is imperative for making decisions based on national and state recovery goals.

Hammer and Anderson (1982) recommended that research should progress toward the development of a scent/remote sensing technique. Track plates and stations have been used in studies of mammals of various sizes to determine occurrence and location of low-density populations, estimate population size, measure gross changes in population sizes, and locate home ranges (Drennan and others 1997). Compared to mark and recapture methods, such as transponder tags (PIT tags) which are currently used on the AGFD project, track stations are relatively inexpensive, less labor intensive, easier to display in the field, and provide minimal risks for the animals studied. In a study to detect *Sciurid* abundance, Drennan and others (1997) found that track stations had no mortality for study animals and may therefore be appropriate for studies of sensitive species and the species they depend on. Although track plates may not

provide an accurate account of the number of times that an animal visits the plate, they can provide information about what animals reside in a particular sampling region.

The current study was proposed to test the feasibility of tracking stations to attain animal tracks and to determine if scented baits attracted ferrets to the stations. It was hoped that these stations could be used along with other methods to collect valuable data on ferrets. A track station is a small area, covered or not, utilizing a soft medium that will obtain tracks once walked on or through. For this study, a track station was a plate covered by a tube. This station mimicked a tunnel or burrow, a familiar place for a ferret. Drennan and others (1997) found that a tubular design causes animals to be less wary because they can see through the tube. The medium for track collection was carpenters chalk, which sticks to the paws of animals and can be deposited easily on contact paper. Hammer and Anderson (1982) determined that odor attractant should be field tested on a seasonal basis. For the purposes of this pilot study, track plates, baited with 3 different attractants that had not previously been tested, were used during the off season and the breeding season to determine their effectiveness of surveying ferrets. As suggested in a paper by Zielinski and others (1995), the distance between the track stations was set to minimize the possibility of overlooking an occupied area within the sample site. They were set out using a systematic sampling design.

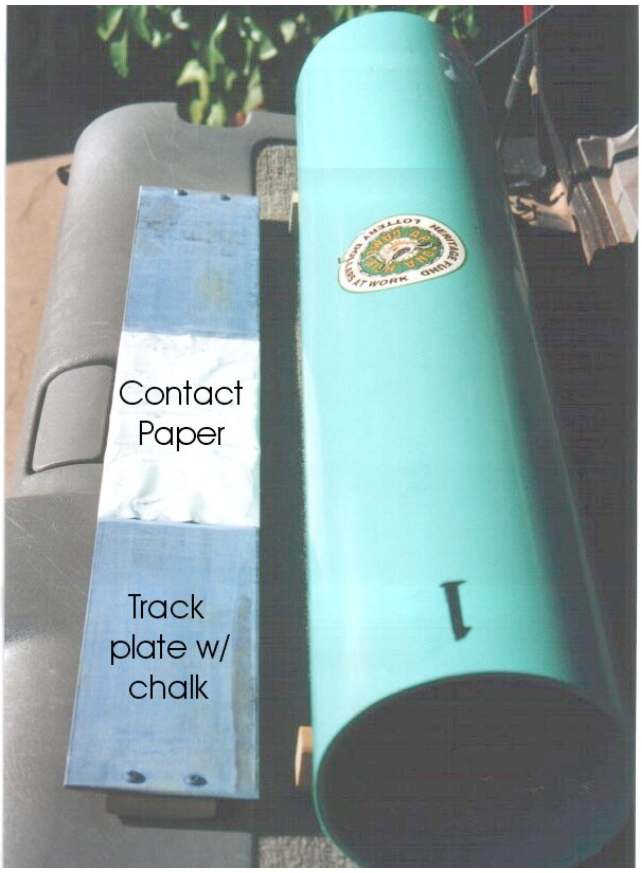
Upon ferret detection, other survey techniques could be used in these areas to obtain more accurate accounts of ferret activity and identification. Nocturnal surveys currently occur in areas with and without recorded ferret sightings in order to determine if ferrets are present. If the track stations proved effective in detecting the presence of ferrets in a sampling area, they would allow surveyors to focus on areas where animals are known to be, thus allowing for a more complete picture of population activity. Areas where track stations were not visited could then be studied for why ferrets were not present and could be revisited utilizing nocturnal survey techniques if detection on track plates later occurred. This may give evidence for dispersal patterns, daily and yearly movements, and immigration and emigration to and from an area.

METHODS

The track stations used were modified versions of rainproof track stations designed to determine *Sciurid* abundance (Drennan and others 1997). The modified design protected the track plate and bait from weather and other disturbances while still releasing scent. Track stations were constructed of UV resistant PVC pipe that measured 76.2 cm (30.48 in) long by 15.24 cm (6.1 in) in diameter. They were mounted on wooden legs that held the plate approximately 0.9525 cm (0.381 in) above the ground. The legs were constructed from pine with the dimensions of 3.81 cm (1.52 in) by 1.587 cm (0.634) by 15.88 cm (6.352 in) long. A cut was made at either end of the track tube to insert the legs so that 0.9525 cm (0.381 in) of the leg was exposed on the interior and exterior of the tube. The legs were inserted across the diameter of the tube. This design stabilized the tube and provided a protrusion on the inside of the tube on which to secure the track plate (Fig. 1).

A. Front view of plate and track station tube, legs and supports are easily seen on each.

B. Track plate secured inside of track station.



C. Track plate painted with chalk and partially covered with contact paper, along side of track station.

Figure 1. Track plate design.

The track plate, which was constructed of an aluminum plate that measured 10.16 cm (4.06 in) wide by 66.04 cm (26.42) long, was placed inside of the tube. Two pine supports that measured 1.587 cm (0.63 in) tall by 1.587 cm (0.63 in) wide by 5.715 cm (2.29 in) long were screwed onto the bottom of the plate. These supports were mounted so that they sat outside of the legs protruding through the track tube. The supports stopped the track plate from sliding out of the tube (Figure 1b.). Prior to setting the track plates in the field, the plate was painted with a mixture of 237 ml (7.11 oz) of blue carpenter's chalk to 3.785 liters (4.01 quarts) of ethanol, as suggested by Zielinski and others (1995) and Drennan and others (1997) (Figure 1c.). The foot of an animal would lift the chalk mixture once stepped on; thus leaving a track on the plate, and the chalk/ethanol coating could be refreshed in the field when needed.

Prior to field tests, it was determined that an aluminum plate without primer painted on it was most effective. Initially, the aluminum plate was painted with primer and then painted with the

chalk mixture. This did not work due to the fact that the ethanol made the primer come back into solution and the chalk mixture bonded with it. Therefore, the side of the aluminum plate without primer was painted with the chalk mixture, and no further complications occurred.

A piece of 20.32 cm (8.13 in) by 22.86 cm (9.14 in) white contact paper (Zielinski and others 1995; Drennan and others 1997) was placed around the center of the plate with the adhesive side exposed (Fig. 1c). This allowed for animals to pass through the tube, step on the chalk and leave a blue print on the contact paper. When a print was left on the contact paper, the imprinted paper was covered with clear contact paper, labeled with the plate number and date, saved for identification and for future reference, and the data was entered into a database for analysis.

Three separate baits were tested at different times throughout the study. The first 2 baits tested were urine-saturated paper bedding from male and female ferrets at The Phoenix Zoo. The first bedding bait was taken from non-breeding ferrets. The second bedding bait was taken from females that were in estrus or males that were in breeding condition; these ferrets were proven breeders. Bedding from both sexes was used because both male and female ferrets in Aubrey Valley seek out each other during the breeding season (Winstead and others 2002b; McIntire, pers. comm.). Moreover, a previous experiment on mink (a cousin of the black-footed ferret) showed that urine from female mink in estrus elicited a significant amount of scratching behavior from Siberian ferrets (Hammer and Anderson 1982), a behavior believed to indicate attraction. The third bait was prairie dog parts. Prairie dog parts are successfully used to trap wild ferrets in Aubrey Valley (Winstead, pers. comm.). Captive ferrets are also preconditioned using prairie dog parts as well as live prairie dogs.

Bait was placed in the space between the plate and the bottom of the tube. Approximately two handfuls of bedding were placed into a nylon stocking, which emitted scent while containing the bedding. Dampening the bedding with water refreshed the scent. The bedding remained moist for up to 4 days before needing to be reconstituted. The scent lasted approximately 2 to 4 months before the bedding had to be changed. The prairie dog bait was only used for 3 nights before it began to attract flies and smell unusable.

Twelve track stations were placed 200 meters (660 ft) apart from each other in a grid. The stations were set in an area of highest ferret abundance as determined by nocturnal spotlighting surveys (Winstead, pers. comm.). GPS coordinates were taken on each plate. The stations were numbered and labeled with the gender of the ferret that provided the urine-soaked bedding. Male and female stations were placed in an alternating pattern. Once the bait was changed to breeding-season urine, the gender delegation remained the same for simplicity and to avoid contaminating gender scent. The stations were covered with burlap to decrease their visibility, then staked into place with 2 pieces of rebar crossed over the top and pounded into the ground. To ensure field personnel could see them easily, a flag was placed into the ground next to the tube.

The plates remained stationary for the entire length of the study. The survey duration lasted a total of 155 nights. The bait of urine-saturated bedding prior to the breeding season was used from 22 January 2002 to 03 April 2002 for a total of 72 track plate survey nights. The bait of urine-soaked bedding from breeding adults was used from 03 April 2002 to 19 June 2002 for a

period of 77 survey nights. Prairie dog parts were used from 21 June 2002 through 24 June 2002 and from 28 June 2002 to 01 July 2002, a total of 6 survey nights.

The stations were checked during the day to avoid disturbing them when ferrets would most likely be visiting them. Track plates were checked at least once a week and often every other day. Since the goal of the pilot study was to determine if certain baits would attract ferrets to the tube and thus tracks could be obtained, it was only necessary to check the stations before weather conditions or time would disturb the integrity of the bait and plate. Once prints were made on the contact paper, or often in the chalk on the plate, they remained valuable for up to a week before field conditions disturbed them.

The track plates were checked and interpreted by different field personnel. Luce and others (2000) recommended preserving track plates from different species for comparison because prints appear different on track plates than on softer surfaces, such as mud, sand and snow. To ensure proper comparison of tracks, male and female prints were obtained at The Phoenix Zoo. Tracks were also obtained from a Gunnison's prairie dog for reference. All field biologists on the project concurred upon any questionable tracks. Prints were measured from the example track plates and from the field trial plates to determine accurate print widths and lengths. Moreover, Peterson Field Guides, Animal Tracks (Murie 1982) was consulted for track identification.

RESULTS

No definite ferret tracks were found using the off-season urine-soaked bedding. During this time frame, 13 instances revealed what seemed to be *Peromyscus* tracks, 6 instances revealed an unknown smudge and 2 instances revealed cottontail (*Sylvilagus floridanus)* tracks (Table 1). Some of the unknown prints looked similar to rabbit tracks. In February, 1 possible ferret track was detected on the plate but had not been transferred to the contact paper and could not be saved. On 2 instances, large smudges were found on the plates, and the plates had been moved out of the station tube, most likely by the animal that left the smudge. The prints on the moved plates appeared to be nose smudges, and the plates were probably pushed out of the tube as the animal tried to reach the bait.

No ferret tracks were obtained using urine-saturated bedding from breeding adults. During this time frame, 18 plates revealed *Peromyscus* prints, 2 revealed Gunnison's prairie dog (*Cynomys gunnisoni)* prints, 5 revealed cottontail prints, and 9 revealed unknown prints (Table 1). In 1 instance, a juvenile cottontail ran out of the tube where it had been sheltering.

The bait of prairie dog parts also revealed no ferret tracks. During these time frames, 2 plates revealed prairie dog tracks, 5 revealed unknown tracks, and 7 revealed *Peromyscus* tracks (Table 1). On 3 occasions, the contact paper had been chewed, and on 1 occasion it had been scratched.

Table 1. Number of animals detected using various baits.

NAME OF SPECIES DETECTED	BAIT USED					
	OFF SEASON MALE URINE	OFF SEASON FEMALE URINE	BREEDING MALE URINE	ESTRUS FEMALE URINE	PRAIRIE DOG PARTS	TOTALS
Peromyscus sp.	4	9	10	8	7	38
Sylvilagus floridanus	0	2	0	5	0	7
Cynomys gunnisoni	0	0	0	2	2	4
Unknown	4	2	3	6	5	20
TOTAL	8	13	13	21	14	69
TOTAL # TRACK PLATES	6	6	6	6	12	12
NUMBER OF DAYS SET	72	72	77	77	6	155

DISCUSSION

The results of this study show that prints can be obtained using this design of track plate, but the approach is not suitable for wild ferrets. Prints were obtained from numerous animals in the field. Additionally, ferrets at The Phoenix Zoo readily ran through the track plate design and left prints on the contact paper. However, the tracking stations failed to attract ferrets in the wild.

Track stations have been used successfully in studies that detected the presence of canids, felids, sciurids, mustelids, lagomorphs, mice, and lizards (Zielinski 1995; Zielinski and others 1995; Drennan and others 1997; Luce and others 2000). Zielinski and others (1995) used a box design with a carbon-blackened medium to study marten and fisher. In another study on the same species, Zielinski (1995) used a plastic sheet bent in a semi-circle, creating a domed roof to cover the plate. Drennan and others (1997) utilized chalk-covered aluminum plates that were placed in a plastic rain gutter to obtain the tracks of *Sciurids*. As in the current AGFD study, contact paper was used to collect track imprints and was kept for future reference. In a study by the State of Wyoming, track plates were used effectively to detect swift fox (*Vulpes velox*) (Luce and others 2000). The study utilized jack mackerel bait and plates covered with an ethyl alcohol and talc mixture; prints were lifted from the plate with clear tape.

The medium used in the current study did not cause the lack of success. Zielinski (1995) stated that tracking quality using a medium of carpenters chalk and alcohol can be poor under moderately damp conditions. However, in Aubrey Valley, moderately damp conditions do not occur often; therefore, the chalk produced quality track imprints (Hoss, pers. observ.).

Lack of success of the track stations to detect ferrets was probably not due to site selection. Ferrets are most commonly found in prairies consisting of mixed grasses, short vegetation and little to no heavy shrub coverage and inhabited by prairie dogs. Selection of the pilot study area took into account habitat and ferret observations made during nocturnal spotlighting surveys in Aubrey Valley (Winstead and others 2002b). On 17 occasions throughout the study, ferrets were sighted during spotlighting surveys on the perimeter of or in the track plate survey area. Some were seen within 5 meters of the plates. However, no definite ferret tracks were obtained. The 1

possible ferret track found on the plate was smudged and could not be confirmed or saved. This observation occurred early in the study and was not repeated.

Lack of successfully obtaining ferret tracks was most likely not due to the duration of the study. Although survey duration continued beyond sufficient effort as suggested by Zielinski and others (1995), no tracks were obtained. Zielinski and others (1995) stated that 8 days are sufficient detect mammalian carnivore diversity at a site, but surveys should extend between 11 and 22 days. A survey that extends beyond 22 days may cause a decline in statistical merit. For the purposes of this pilot study, the survey duration was longer than 22 days for the urine bait and 6 days for the prairie dog parts. The duration was lengthened to account for uncertainty of the Aubrey Valley ferret population dispersal patterns, abundance and movements. Moreover, the duration for the urine bait was prolonged due to the presumption that ferrets might be more difficult to attract in summer (RIC Homepage, 2002). Since the trial took place during summer months, it is possible that ferrets could follow the patterns of their marten cousins, thus being difficult to attract.

Lack of success for obtaining ferret tracks in the tracking stations may have been due to station design. Ferrets may not explore foreign objects in the field, despite a round opening and attractive scent. The track stations might attract ferrets if they were buried underground, leaving only the entrance and exit to the station exposed. This may more accurately mimic a burrow, thus increasing its attractiveness of the track station.

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