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Abstract: To date, Phinda has released 15 cheetahs (8:7) as well as 13 lions to the reserve. All cheetahs were wild-caught and originated from Namibia except for a single male captured in Botswana. In addition to radio-collars, all animals were marked with a transponder chip. The animals were soft-released. They spent 8-10 weeks in a pen. Females always dispersed after the release. Unfamiliar males bonded up during the pen period and then stayed together. The survival was fairly good although some animals died due to human activities and other predators.
THE REINTRODUCTION OF CHEETAHS INTO PHINDA RESOURCE RESERVE, NORTHERN NATAL, SOUTH AFRICA.

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INTRODUCTION

Translocation and reintroduction of animals are gaining popularity as conservation techniques used to re-establish and augment populations where a species has been reduced in its original range. When such operations involve the large carnivores, they are costly, logistically complex and have a high profile with the public, earmarking them as important conservation efforts. Despite this, many such projects which have been performed involving the large carnivores have received little post-release monitoring and those that have record little success. Accordingly, a system of procedures for the successful reintroduction and translocation of large carnivores is lacking.

At the beginning of 1992, the Phinda Resource Reserve in Natal, South Africa began a large-scale programme of re-establishing many of the species which had been extirpated from the area. Among these reintroductions were cheetahs and lions, two species which had been absent from the area since 1941 and 1928 respectively (Rautenbach et al 1980). This paper describes an ongoing research effort aimed at documenting the progress of reintroduced felids in the hope that this will contribute to our understanding of the parameters necessary for success in such manipulations of wildlife communities. Although both lions and cheetahs are presently being monitored, only the cheetahs will be dealt with here. This article presents a summary of the project's success and the management implications involved in the reintroduction of cheetahs. Greater detail of the ecology and behaviour of reintroduced cheetahs will be presented in a series of papers currently in preparation.

STUDY SITE AND SUBJECTS

Phinda is a privately owned reserve of 17600 Ha situated in the Maputaland region of Natal between Mkuzi Game Reserve, Sodwana State Forest and Lake St. Lucia (Fig. 1). Prior to Phinda's involvement, the area was dominated by small holdings, farming a combination of game, livestock and cash crops such as pineapples. Large herbivores such as elephant, rhino and buffalo had been extirpated many years ago and as a result much of the land is overgrown with dense Acacia thorn-vaal. Other
habitat types present include sand-forest, open ilala palm savanna and open grasslands. Antelope species well-represented at Phinda include nyala, impala, southern reedbuck, greater kudu, grey duiker, red duiker, steenbok and suni. Also present are elephant, white rhino (both reintroduced), giraffe, zebra, blue wildebeest, warthog and bushpig. Apart from the reintroduced carnivores, Phinda has low numbers of leopards and spotted hyaenas which are recovering from a period of persecution prior to Phinda. Also present are servals, caracals, two species of jackals, two mustelids and five viverrids.

To date, Phinda has released 15 cheetahs (7:8) as well as 13 lions into the reserve. All cheetahs were wild-caught and originate from Namibia except for a single male captured in Botswana. Most of the animals were purchased from commercial animal dealers in Namibia who had acquired them from game and livestock farms where they are trapped as “problem animals”. The two most recently released animals, a pair of males, were donated by Dan and Laurie Kraus of the Cheetah Conservation Fund.

In addition to radio-collaring some individuals (Telonics, Arizona), all animals were implanted with subcutaneous Trovan™ transponder chips (one in the neck and one in the flank) and were tattooed with the letter “P” on the gum above an upper canine tooth, ensuring positive identification should animals leave Phinda boundaries.

THE REINTRODUCTION: METHODS AND RESULTS

The first stage of the cheetahs’ reintroduction began with a period of captivity in a large holding pen. The 80m x 80m pen had a 3.5m fence high with an inner overhang and the internal perimeter had three electrified wires (average discharge 7000 volts) at heights of 30cm, 1m and 2.5m. Diamond-mesh fencing was buried in the ground to a depth of 1m. Thick existing vegetation inside the enclosure provided the animals with refuges.

The cheetahs were housed in this pen for between 8 to 10 weeks prior to release. There were a number of reasons for this period of captivity. One of the main objectives was to attempt to settle animals down after the trauma of capture and transport. In many past translocation efforts involving large carnivores, animals have been noted to wander widely following release when no captivity period occurred. (eg, Hamilton 1981, Stander 1991): In the Phinda project, none of this wanderlust has been observed. Animals have remained in the vicinity of the holding pen for up to two weeks following release then gradually dispersed, establishing relatively stable home-ranges within the reserve (Hunter and Skinner in prep).

The entire boundary of Phinda is fenced with 2.2m high electrified fencing. Another aim of the captivity period was to condition cheetahs to electric fencing in an attempt to discourage breaches of the boundary fence. (hence the holding pen’s internal electrification). To
date, cheetahs have neither scaled nor dug under the boundary fence. Leopards and hyaenas— which have not been exposed to the captivity period— frequently climb over or dig under the fence. That the reintroduced carnivores (including lions) appear to “respect” the fence suggests that the captivity period is effective in limiting movement out of the reserve.

The final success of the holding period was to create bonds between unfamiliar animals. Not surprisingly, females always dispersed following release, although they displayed affiliative behaviour such as mutual grooming and feeding together when housed with other females. However, in all male releases, unfamiliar animals have bonded during the pre-release captivity and then remained together following release. In two cases, these animals were unfamiliar, unrelated pairs while in the third case, a new male (the Botswanan individual) formed a trio with two brothers. In all cases males have remained together until the death of the companion/s, the longest example being for slightly longer than three years. It is intriguing that unrelated males should form such strong bonds. Although one must be careful when speculating on the reasons for this bond-formation (which arises from the artificiality of captivity), it may offer clues to the process of coalition formation by male cheetahs in the wild. Not surprisingly, the captivity seems to eliminate a sense of territoriality. Initially, male cheetahs housed together tended to retreat to separate corners of the holding pen and showed no interest in conflict with the unfamiliar pen-mate/s. They did not display any signs of territoriality such as scent-marking for many weeks, nor were they possessive over females housed with them. The situation was ideal to encourage mutual tolerance which was achieved by the feeding regime in which a single carcase of an antelope (Impala or nyala) was provided to the cheetahs every three to four days. This forced them to meet and interact on the carcase and the resulting bond-formation was surprisingly swift— in some cases only a matter of days. Although this does not reveal much about the reasons unrelated male cheetahs form coalitions in the wild (probably to enhance reproductive success but data is still lacking), it suggests that individuals which are unsuccessful in establishing or maintaining a territory may be likely to team-up with an unrelated animal. This has certainly been observed with male lions (Hunter pers obs) and male cheetahs in the Serengeti (Caro 1994). Socio-behavioural implications aside, this tendency is useful from a management point-of-view. Male cheetahs in Namibia are trapped with much higher frequency than females (Laurie and Dan Kraus, pers comm) though not necessarily in the groups as they exist. The bond-formation of strange males in captivity means that wildlife managers can mix males of different origins to form coalitions for release.
MORTALITY AND REPRODUCTION.

To date, 8 of the original fifteen adults released have died. Human-mediated mortality has accounted for 3 of the deaths. Two males have been killed in wire snares, and a female with three 12 month-old cubs born at Phinda left the reserve through a gate which was inadvertently left open. These animals were never recovered and assumed dead as they moved into farming areas where they would almost certainly have been shot. Another death (a female) appeared to be a result of being hit by a vehicle but this could not be confirmed. Two deaths were individual males which were killed in separate territorial clashes with the same two-male coalition. In both cases, the victorious cheetahs fed from the carcass of the dead male (see Hunter & Skinner 1995, for a detailed account). One of these deaths was particularly unfortunate as the killed individual had been released with another male and, as a pair, had met the resident male pair without incident. The two pairs sat watching each other 60m apart for about 9 hours, after which they moved off in separate directions. Evidently, both pairs concluded it was potentially too dangerous to fight. 7 days later, one of the newly released makes was killed in a snare and when the same resident pair later encountered the remaining male, they attacked and killed him. The remaining two deaths, both of adult males, were caused by lions.

There have been 5 litters of cubs born at Phinda, details of which are summarised in the table below.

<table>
<thead>
<tr>
<th>LITTER</th>
<th>BORN</th>
<th>NUMBER</th>
<th>WHEN COUNTED</th>
<th>SURVIVING</th>
</tr>
</thead>
<tbody>
<tr>
<td>1⁴</td>
<td>Nov 92</td>
<td>3</td>
<td>emerged</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>July 93</td>
<td>5</td>
<td>in lair</td>
<td>3</td>
</tr>
<tr>
<td>3⁵</td>
<td>May 94</td>
<td>5</td>
<td>emerged</td>
<td>4</td>
</tr>
<tr>
<td>4⁴</td>
<td>June 94</td>
<td>5</td>
<td>emerged</td>
<td>5</td>
</tr>
<tr>
<td>5⁵</td>
<td>Oct. 94</td>
<td>5</td>
<td>in lair</td>
<td>3</td>
</tr>
</tbody>
</table>

*: Left reserve with mother at 12 months of age.

⁵: Still dependent upon mother at time of writing.

Two litters (#2 and #5) were counted while still in the natal lair and probably represent the number of cubs at birth. The other three litters were counted after they emerged from the lair at 8-9 weeks. The three cubs of litter #1 survived to a year of age and then moved out of the reserve (see section on mortality). The 3 surviving cubs of litter #2 were left by their dam at 13 months of age after she conceived again (litter #5) while they were still dependent upon her. This is not unusual (see Laureneson 1992) though their age at parting is atypically young. Despite this, they have survived and are 25 months of age at the time of writing. The two losses to this litter occurred when the litter was 5 months old and 11 months old. In the former case, it
neams the cub was separated from the mother and never reunited. It survived for at least 21 days on its own after which it disappeared. The other loss was to a lioness which caught and killed the 11 month old cub. The only other known mortality of cub was of two cubs from litter #5 at age 10 and 14 weeks respectively, both for reasons unknown.

CONCLUSIONS AND RECOMMENDATIONS.

At the time of writing, cheetahs at Phinda number between 25-30, including cubs. The project can be considered highly successful in its aim to begin re-establishing the species in the area and, as a tourism destination. Phinda is one of the finest reserves in southern Africa in which to see cheetahs. However, initial losses were high and the experience at Phinda illustrates a number of areas in which future improvements can be made.

The role of human activity in and around such reserves in influencing the success of such projects cannot be underestimated. The issue of reserve security is important if released animals are to survive. Wire-snare poaching and poorly controlled traffic in and out of Phinda contributed to the deaths of three (and possibly four) adults as well as three cubs close to independence, deaths which may have been reduced or avoided with improved security. Experience from a recent attempt to re-locate three male cheetahs to the lower Zambezi National Park in Zambia confirms this factor as a widespread problem as two of the animals were found dead in snares within two months of release (Laurie Marker-Kraus, pers comm.). This is clearly an area in which reserve managers need to allocate resources wisely if reintroduction of large carnivores is to be attempted.

The other main threat to reintroduced cheetahs seems to be competing predators, in the case of Phinda, lions and other cheetahs. Of course, these are natural problems which cheetahs in established populations also face. However, the advantage in a reintroduction scenario is that these threats can be managed in the vital, early stages of the project to give the greatest chance of success. In reclaimed conservation areas such as Phinda, reintroductions can be staggered in a way which maximises the survival chances of all individuals. Ideally, cheetahs should be reintroduced in an area before restocking of their competitors such as lions or hyenas. It is with this sort of careful planning and ongoing management that projects such as this have the potential to become effective and successful conservation efforts.
REFERENCES


