

# FIELD TRIALS ON POISON COLLARS FOR MAMMALIAN PREDATORS IN NAMIBIA: THEIR EFFECT ON BIRDS OF PREY

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**SUMMARY** - During four field trials on a poison collar for mammalian predators of livestock in Namibia lasting 1053 collar-use days, 12 head of smallstock (1.4%) in the target flocks (n = 838 animals) were lost to predators over an average exposure period of 10 days (range 7-13 days). Thirteen animals were poisoned, consisting of four mammalian predators (two Blackbacked Jackals *Canis mesomelas* and two Lynx *Felis caracal*), three avian predators (all Black Eagles *Aquila verreauxii*) and six scavenging raptors (four Lappetfaced Vultures *Torgos tracheliotus*, one Whitebacked Vulture *Gyps africanus* and one Tawny Eagle *Aquila rapax*). Five of the raptors are on the Red Data list in Namibia. The poison collar is known to be considerably more selective for mammalian predators of domestic stock than is the use of poison in carcasses or in small blocks of meat. However, the high proportion (70%) of non-target and especially Red Data species (40%) that were poisoned is unacceptable. Therefore, thornveld savannas with relatively high densities of scavenging raptors might not be suitable areas for the use of poison collars.

## Introduction

Scavenging birds of prey in southern Africa, as in most other parts of the world, have declined dramatically both in numbers and range (Bijleveld 1974, Newton 1979, Brooke 1984). The main cause of the decline has been inadvertent poisoning by farmers. Poi-

sons are set in carcasses or small blocks of meat for mammalian predators, but the bait is often found and eaten by scavenging birds (Tarboton & Allan 1984, Ledger 1985, 1986, Brown 1986, 1991, Brown & Piper 1988, Allan 1989). Birds are generally far more efficient at finding carrion than are the target mammals (e.g. Houston 1980, Watson 1986). In some districts farmers have estimated that for every target animal they kill, over 100 non-target animals die (Ledger 1986, Brown 1988).

The poison collar was developed in the USA as a problem animal control method in the late 1970s, and is used mainly against the Coyote *Canis latrans* (Connolly et al. 1978, Savarie & Sterner 1979). It was designed to be an effective and highly selective means of killing predators of domestic stock with little or no harm to non-target species. In this paper we describe the results of four field tests on the poison collar in Namibia.

## Methods

Predators such as Blackbacked Jackals and Lynx usually bite their prey at the throat. The poison collar consists of two rubber pouches containing poison under low pressure (an organophosphate registered in South Africa as PDB1) and two straps. The collar is fitted around the neck of the domestic animal and the pouches are positioned around the throat; the exact position depends on the expected

predator. The poison is dyed pink. Any leakage of the poison through punctures in the collar is seen easily on the hair of the domestic animal and in the mouth of the poisoned predator. A number of young domestic animals (at least 20) are fitted with collars and released with a larger flock of adult animals (target flock) into the camp where the losses are being experienced. The predator usually attacks one of the smaller animals. On biting into one of the poison pouches, a lethal dose of poison is ingested by the predator, which dies within 2 min.

Four field tests on the poison collar were carried out, two at Neudamm Agricultural College near Windhoek in November 1990 (field tests 1 and 2), and two on two farms in the Mariental district in December 1990 and January 1991 respectively (field tests 3 and 4).

## Results & Discussion

### *Field test 1*

Jackal predation was reported on adult sheep in a camp of 15 ha. The sheep were removed from the camp and replaced by 20 collared lambs and their 16 ewes on the same day. Five days later one dead lamb was found. After autopsy it was concluded that the lamb had been killed by a lynx, which had not punctured the collar. Two days later a collar was punctured. A dead jackal was found; the lamb survived the attack.

### *Field test 2*

Jackal predation was reported on sheep in a 40 ha camp. Thirty large lambs were fitted with collars and released with a flock of 96 sheep. Five days later a sheep carcass was found. The cause of death could not be determined. Two days later the carcass of a jackal was found, and a lamb was found to have a

punctured collar. The lamb survived the attack. Five days later a lamb was missing. It was located trapped and dead in a thorn bush. The collar had been punctured by the thorns, and the bodies of four Lappetfaced Vultures and a Tawny Eagle were lying nearby.

### *Field test 3*

Lynx predation on "dorper" lambs (up to 35% losses) was reported in a 490 ha camp. Collars were fitted to 30 lambs which were introduced to a flock of 206 ewes. On the third day a female lynx was found dead about 1 km from the body of a lamb. The flock was then moved to another camp which had been experiencing losses, holding an additional 400 young and adult sheep. Three large lambs were lost to lynx over the first nine days. On the tenth day a female lynx was killed. It was found 60 m from the dead lamb.

### *Field test 4*

Young lambs were reported being killed. The farmer did not know what predator was responsible. Twenty collared lambs and 20 ewes were released into the 230 ha camp. On days 2, 3, 5 and 6, a lamb was killed but the pouches were not punctured. On the ninth day a lamb was found with a punctured collar. Three Black Eagles and a Whitebacked Vulture were found dead alongside the lamb - no mammalian predators were found.

During a total of 1053 collar-use days, 12 head of domestic stock were lost to predators, two lambs survived attacks and 13 animals were poisoned. Of the last group, two jackals and two lynx were killed. It seems reasonable to assume that in field test 4, at least one Black Eagle was responsible for the lamb deaths, although the carcasses were not skinned to look for puncture marks and haemorrhages. The local farmer reported that the Rock Hyrax

*Procvavia capensis* population had declined sharply on his farm, probably because of poor rains. After the deaths of the eagles, no further stock losses were experienced. In addition to these mortalities, six non-target scavenging birds of prey were killed. If the Black Eagles are taken as non-target animals, a ratio of 1:2.25 target to non-target animals died. Five of the birds of prey killed are on the list of Red Data species in Namibia.

The density of mammalian predators such as jackals and lynx far exceeds that of scavenging raptors. Their rate of recruitment is also about three times that of large raptors (Smithers 1983). The data available from these trials in Namibia suggest that the poison collar would be considerably more effective in reducing threatened bird of prey populations than in reducing jackal and lynx populations.

Experimental tests on the poison collar over five years in the USA apparently resulted in no known cases of non-target animals being poisoned (Connolly 1983), while work in the southern Cape Province of South Africa produced similar results (J Dyer pers. comm. to SDG). The poison collar is certainly an improvement on other poisoning methods such as poisoning carcasses or small blocks of meat, because many fewer non-target animals are killed. However, in thornveld areas where domestic stock can become entrapped and the collar punctured, and in areas which have a reasonably healthy population of scavenging birds of prey, it is far from the ideal predator control method.

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