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459

THE PROBLEMS ASSICIATED WITH THE CAPTURE, TRANSLOCATION AND KEEPING OF WILD UNGULATES IN SOUTH WEST AFRICA

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INTRODUCTION

In many parts of Africa there has been an alarming decline in wild animal populations during the past century. South West Africa is no exception and today the remaining large concentrations of wild animals are mainly confined to national parks and game reserves. Indeed, several species such as the Black Rhinoceros *Diceros bicornis* Linn, the Roan Antelope *Hippotragus equinus* Desmarest and the Black-faced Impala *Aepyceros petersi* Bocage have been in imminent danger of becoming extinct, because of inadequate protection. Capturing methods used in the past were on the whole primitive but nevertheless effective. However, these methods had limitations and were only applicable to common species and then only when used under ideal conditions and in suitable terrain. For example, gemsbok were captured by pursuing them at great speed in a vehicle and grabbing hold of the tail. Rare and threatened animal species are however today confined to remote areas and invariably inhabit rough terrain in which it is almost impossible to operate, using conventional capturing methods. Moreover, matters are complicated by poor road communications leading to the areas they inhabit. In addition, most of these regions are enzootic for foot and mouth disease. Therefore, before cloven hoofed species can be translocated veterinary regulations lay down strict quarantine measures for up to ninety days. This requires the provision of a large fodder bank for feeding during capture and quarantine. The black rhinoceros, the roan antelope and the black-faced impala have been in dire need of protection. Any attempt to capture these species and introduce them to a game reserve, meant the institution of a highly mechanised capture unit. During the past eighteen months the Division of Nature Conservation and Tourism of South West Africa, has launched extensive and costly catching operations to reintroduce these species to the Etosha National Park (Figure 1).

GENERAL CONSIDERATIONS IN GAME CATCHING

Climatologically South West Africa is subtropical to semiarid and arid. Excessively high environmental temperatures prevail over most of the territory for a large part of the year. For this reason the cooler months extending from the beginning of May to the end of August have been selected as the optimum months for game catching. However, even during this relatively favourable period daily temperatures can exceed 30°C and capturing therefore has to be limited to the early morning and the late afternoon.

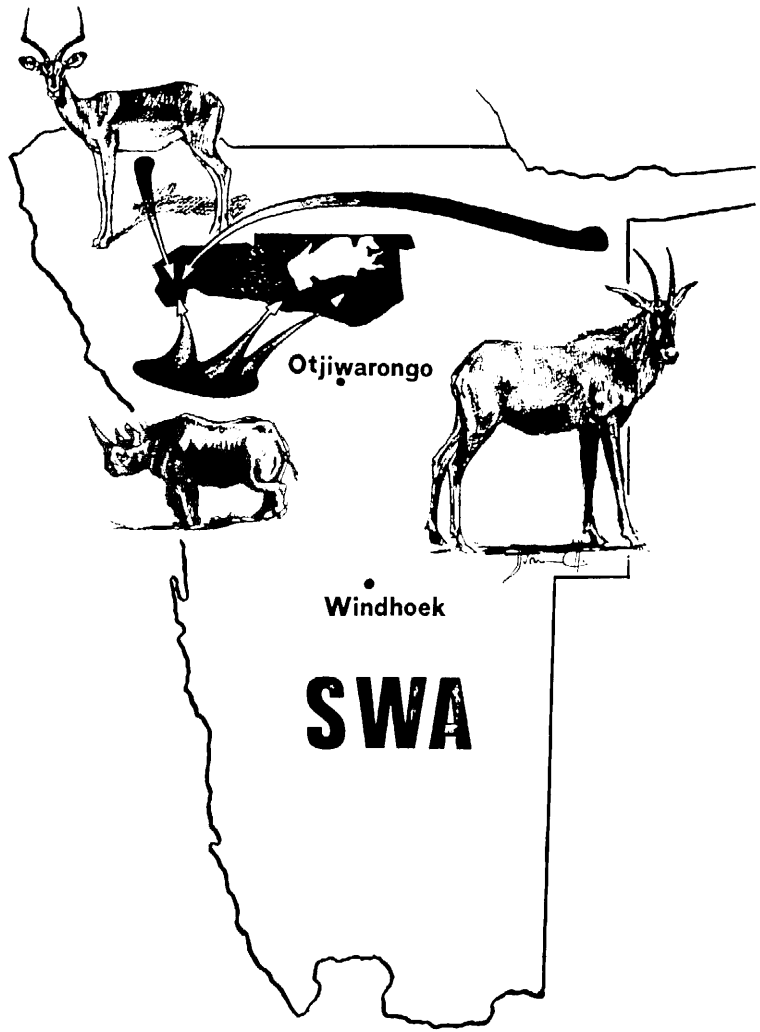

Figure 1.
The translocation of three rare species, the Black Rhinoceros, the Roan Antelope and the Black-faced Impala to the Etosha National Park.

Apart from climatological factors, the reproductive status and breeding seasons of the animals concerned are assessed in order to derive maximum advantage from the capture. Catching is therefore preferably done following the weaning of young and/or during the early stages of pregnancy after implantation of the embryo. In those species, such as the impala, which have a well-defined breeding season, planning is considerably simplified.

Provided these factors are taken into account, over-straining of the animals is minimised, losses are reduced and management is simplified. Moreover, the first calf or lamb crop can be expected soon after the species has been reintroduced to its new surroundings.

Before such an operation commences a detailed survey is required. The concentration, movements, water and food requirements, age and sex rations, reproductive status, general condition and social behaviour of the animal population have to be determined. A knowledge of the terrain and condition of the roads is essential to determine which methods of capture and modes of transport to use.

Following the pioneering work by Harthoorn (1962, 1963, 1965, 1966; Harthoorn & Bligh, 1965) on the use of narcotic and neuroleptic agents, the techniques of drug immobilization have been further perfected and can today be used with great success in a variety of wild ungulates. Moreover, the introduction of the butyrophenone compounds (Pienaar, 1968 a) notably Azaperone (Janssen Pharmaceutica) as a tranquillizer in the neuroleptic-narcotic mixture, has given greater scope in the use of drug immobilization procedures. It has proved particularly valuable in those species which are aggressive or nervous and in combination with Etorphine (M99) (Reckitt) or Fentanyl (Janssen Pharmaceutica), Azaperone has been successfully used in a wide variety of ungulates (Keep, 1968; Pienaar 1968 a, 1968 b). The Etosha National Park is topographically open and flat and in the vicinity of the Etosha Salina contains large concentrations of plains animals and is an ideal testing site for conducting experiments on drug immobilization. Ebedes (1969, 1971) has conducted successful experiments on the immobilisation of gemsbok and plains zebra in this area.

Immobilisation has no practical application in the capture of certain species, such as the smaller antelope when used on a large scale and other methods have to be employed. For this purpose drop nets (Visagie, Pers. comm.) are commonly employed by the Transvaal Division of Nature Conservation, to capture certain species. Drop nets were recently employed with success to catch black-faced impala in the Kaokoveld.

The "plastic material method" (Oelofse, 1970) has been used with great success in the capture of large numbers of various animal species in the Zululand game reserves of Natal. In South West Africa, plastic material has been used in the construction of bomas or enclosures required for the keeping of various antelope species. It has proved to be most effective for this purpose.

Following capture, husbandry becomes an important aspect of the operation. Every animal caught is subjected to a variable degree of stress and exertion. When chemically restrained or caught with the aid

of nets, animals must be placed in as comfortable position as possible. Furthermore, the administration of various prophylactic and antistress agents has proved invaluable in improving the chances of survival of captured animals.

THE CAPTURE OPERATIONS

The following account deals with the problems encountered in three major catching operations, the efforts which were made to overcome them and the lines of research followed to improve techniques and minimise stress.

Forty-one black rhino were captured and moved to the Etosha National Park during May and June 1970 and 1971. A more complete account appears in Hofmeyr, Fryer and de Bruine (1973). The rhino invariably inhabited almost inaccessible mountainous areas and had to be immobilised by darting them from a helicopter. In order to minimise overstraining one of the main objectives was to dart the rhino as soon as it was located. This was not always easy as the majority first had to be guided by the helecopter to more flat and accessible terrain before the darting commenced.

The drug combinations and the dosage rates used (Hofmeyr et. al., 1973), induced rapid narcosis which was required to prevent the rhino from returning to difficult country with the possibility of falling down precipices while in a semi-conscious state. However, during the 1970 operation tremendous difficulties were experienced when dart needles broke off upon penetrating the rhino's hide. This resulted in the rhino being only partially drugged and an average of 3 to 4 darts were required to induce narcosis. This problem was overcome in the 1971 operation by using fortified Kruger National Park needles.

The loading of rhino with the aid of monkey winches and rollers had always been a laborious and time consuming process. The use of a multilift device which has a dismountable platform onto which the rhino crate was tied, greatly facillitated the loading of the rhino in this operation. The loading, from the moment the antidote was injected to when the vehicle was ready for departure could be achieved in 15 minutes.

Upon arriving in the Etosha National Park the rhino were off-loaded into holding pens and kept for an adaptation period of one to two months before they were released. The rhino captured during 1971 were released in a 24 000 hectare paddock or an area approximately the size of the Hluhluwe Game Reserve. Several rhino were involved in mortal combat 2 to 10 weeks after they were released. It was necessary to recapture one bull and move it to another area.

During 1970, seventy four roan antelope were captured and moved to the Etosha National Park. The operation was conducted in the Khaudum Omuramba in the north eastern corner of South West Africa (Hofmeyr, 1973). As was the case with the rhino, the only safe and reliable method of capture was with the aid of a helicopter from which the roan were darted.

Roan were found to be particularly susceptible to over-exertion. Of the first 6 roan darted, 4 died as a result of the irreversible white muscle stress syndrome which was characterised by the development of torticollis and general muscular weakness. Radical changes in the *modus operandi* had to be made if further losses were to be avoided.

The use of crates was found to be detrimental and it was decided to transport the roan to the plastic boma on the back of open vehicles while still immobilised. This eliminated struggling during transportation and over-heated animals were able to cool down rapidly through convection and evaporative cooling induced by the moving vehicle. In addition the administration of various anti-stress agents proved to be useful in increasing the chances of survival. The roan regained consciousness when the antidote was administered once they were delivered in the boma. Post capture care and the administration of various prophylatic agents proved to be most important aspects of the operation.

Once caught the problem was to transport the roan safely to the Etosha National Park. Experience had shown (Hofmeyr, 1973) that transportation by road, a distance over 1 000 kilometres, much of it on bush tracks, would have been disasterous. The only alternative remained for an airlift from the Khaudum Omuramba which necessitated the landing of a Lockheed Hercules Airfreighter in a dry river bed. First, a pilot experiment had to be conducted to determine the effect of prolonged immobilisation on the roan antelope. The results were favourable. The roan were thus darted a second time and while under deep narcosis they were conveyed to the aircraft and loaded. With 26 roan on board the plane was loaded to capacity. In order to transport 74 roan three flights were made. The majority of cows were in the advanced stages of pregnancy and not more than three months after their delivery a total of 26 young calves were counted.

For the capture of 127 Black-faced Impala which were moved to the Otjovasandu area of the Etosha National Park, a different capture technique was used. The impala were caught at Enyandi, a narrow strip of rugged country wedged between the Zebra Mountains and the Kunene River of the Northern Kaokoveld. Surveys indicated that the animals were very scattered and occurred in small herds up to 20 in number.

The impala were caught with the aid of drop nets 5,3 metre high and were supported by 3 metre long droppers. Twelve to 15 nets were erected and placed in the shape of an U. This method proved to be extremly safe and reliable. Upon chasing the animals into the nets, the nets would collapse and the impala became entangled. The nets could be broken down and re-erected elsewhere within two hours.

The selection of the capture site was most important and it was best placed by concealing it over a ridge or neck. A helicopter was again indispensable in the herding of the impala. However, the helicopter alone was not sufficient for the final drive into the nets and vehicles had to assist. Any attempt to herd the impala upwind into the nets was usually to no avail but where animals were reluctant to move whistling helped considerably.

Once the impala were entangled they were immediately freed and transported on the back of open vehicles, while being held, to a "plastic boma." Adult rams do a considerable degree of fighting and in order to avoid any undue injuries, their horn tips were sawn off.

Impala appear to be particularly susceptible to heat stroke. Two animals were lost after administering the tranquilliser Combelen (Bayer), which severly affected the heat regulatory mechanism. Furthermore impala have powerful Longissimus dorsi and Psoas muscles and they were found to be very susceptible to back injuries which proved fatal. Such cases showed fracture of the spinal column in the last thoracic, the lumbar and sacral vertrebrae and usually developed from the handling.

The impala were quarantined for a month. They were transported by vehicles in communal crates which were each fitted with 2 fans operated by a small Honda generator. Driving was only done at night and the journey of 430 kilometres was done in 10 hours. Each animal had to be mouthed for foot and mouth disease. The impala were prophylactically treated with BoSe (S.A. Cyanamid), Thiamine hydrochloride (Peterson), a long acting antibiotic and were tranquillized either with Azaperone of Siquil (E.R. Squibb & Sons) which was administered intravenously.

The transit journey was extremely rough. The first 100 kilometres was done on an exceedingly poor road and was covered in 6 hours. Two Sanyo fans with blades 40 cm in diameter and operated by a Honda E 300 generator, were mounted on the roof at the fore-end of the crate. The internal temperature of the crate was constant at 37,5°C. The fans were switched on at 1400 hours. The sand layer on the floor

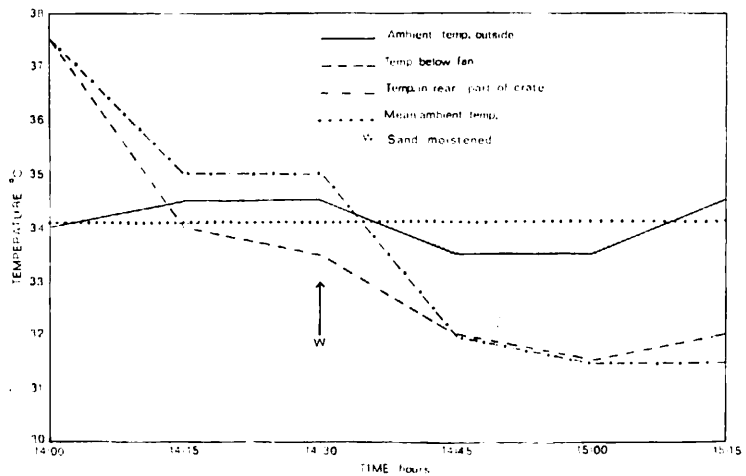

Figure 2.
The effect of forced ventilation on the internal temperature of a crate.

was 10 cm deep and the thermometers placed 40 cm above the sand. Crate measurements:– Length 4,3 m; Width 2,2 m; Height 1,5 m. However, the fans proved to be invaluable in keeping dust out, providing adequate ventilation and reducing the inside temperature (Figure 2) of the crate. An attendant remained with the animals during the entire journey and was in contact with the driver by a radio transceiver. During transit a few cases of paralysis of the peroneal nerve with permanent flexion of the fetlock occurred.

During the captivity period at Enyandi the impala consumed almost 500 bales of lucern over a period of two months. For the capture, provision of food, supervision, and translocation of 127 impala more than 40 000 kilometres were travelled by vehicles invloved in the operation. This gives some indication of the magnitude of such an operation and the time and energy spent.

CONCLUSIONS

All three capture operations clearly indicated the need for specialised equipment and the role of modern technology in capturing and translocation procedures. The helicopter was indispensable in all three operations and in each instance proved to be both time saving and economical. These capture operations are of some magnitude and require a great deal of organisation and preparation. It can probably be justly said that "Operation Roan" has been the most costly short term game catching operation ever to be launched. Expenses were in the region of R40 000.

One of the greatest problems encountered in capturing and handling wild animals is that of overstraining of the animal. A knowledge of the physiology of animals and the pharmacological actions of drugs is essential to understand more about and to overcome the problems of overstraining. Several anti-stress agents were administered during the catching operations (Hofmeyr, 1973; Hofmeyr et. al., 1973). Although they appeared to be of value, little is known of the real effect which they may exert in preventing the onset of the irreversable white muscle stress syndrome. A study in this field is today one of the greatest challenges which faces the scientist involved with the capturing of wild animals. Work has already been started in South West Africa on the blood analyses of wild ungulates in relation to stress and prophylactics.

As can be deduced, the capture unit is faced with innumerable problems in South West Africa. It operates under varying conditions in an area three quarters the size of the Republic of South Africa. During operations new techniques are evolved and old ones are improved. To bring this about effectively the capture unit needs to be well organised and versatile in its approach. However, the success of an operation is not measured by the percentage of survivals only, but to a larger degree by the successful adaptation and reproduction of the species within its new surroundings.

SUMMARY

In order to select optimum conditions and derive maximum benefit from game capture operations, climatological factors, the reproductive

status of animals and their breeding seasons are taken into account. Some of the problems encountered and the means by which they were overcome in the capture of three rare species, the Black Rhinoceros, the Roan Antelope and the Black-faced Impala, are discussed. The application of physiological principles, the importance of husbandry in captured animals, the need for specialised equipment and the role of modern technology in capture and translocation procedures, are dealt with.

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