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# NOTES FROM THE FIELD

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## Airlifting Immobilized Rhinos

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### BACKGROUND

The KwaZulu Natal Nature Conservation Services (KNNCS) (formally Natal Parks Board and KwaZulu Directorate of Nature Conservation) manages approximately 1,811 white rhinoceros (*Ceratotherium simum*) and 628 black rhinoceros (*Diceros bicornis*) in eight parks in the province of KwaZulu Natal, South Africa. In the past 40 years approximately 4,560 white rhinos and 400 black rhinos have been caught and relocated from these parks (McKenzie, 1993) and conventional capture methods for both black and white rhinoceros have been described (McKenzie, 1993). Because of strict adherence to wilderness principles in designated areas with no vehicle access or with inaccessible terrain, an alternative method of removing rhino from these areas was sought.

In 1992, ten black rhino and one white rhino were successfully airlifted out of the wilderness area of Hluhluwe Umfolozi Park. These animals were all crated in a fully awake state prior to being airlifted. This method although successful had limitations. The crate was severely affected by the down wash of the rotors causing it to spiral making flying unsafe. The crate, being built of robust materials, was heavy, thus limiting the size of animal to be caught, as the combined weight of the rhino and crate plus the effect of the down wash caused the load to be too heavy to lift when adult white rhino were attempted.

In 1996 a total of seven black and 119 white rhino were to be removed from the wilderness area of Hluhluwe Umfolozi Park. Because of the limitations

described above it was decided to make use of a cargo net and transport the animals while under anaesthetic. This method had been previously used on one white rhino without the lifting frame, when a single animal was relocated from an island in an inland dam in Mpumalanga province, South Africa (du Toit pers. comm., 1998). The method described below has now been successfully used in air lifting 35 black rhinos and 119 white rhinos from the KZNNCS Hluhluwe Umfolozi Park and Itala Game Reserve.

### PERSONNEL

Personnel are divided into three teams: airlift helicopter team, landing zone team and light helicopter team.

#### *Airlift helicopter team*

This team should comprise of at least 12 individuals. This team has to cope with rolling the rhino onto the cargo net. This can be a difficult situation at times.

#### *Landing Zone Team*

This team should comprise of at least eight individuals in order to crate the rhino using conventional methods.

#### *Light Helicopter Team*

This team comprises the helicopter pilot and darter. If conditions are suitable a third person may be used as an observer to assist in locating rhino. Each team should include at least one individual who is trained and competent in all aspects of rhino capture.

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## CAPTURE TECHNIQUE

The lifting helicopter is prepared for cargo swing operations and will have the lifting cables and lifting frame in place in preparation for the first rhino. The rhinos are located by means of observation posts and/or a light helicopter. In the case of the KNNCS a McDonnell Douglas 500 turbine helicopter is used.

Once a suitable animal has been located and verified by the light helicopter crew the lifting helicopter crew are instructed to start up and are given a GPS reading or a compass heading in order to locate the animal. Two types of lifting helicopters have been used namely the Oryx SA military helicopter and the MI 8 M.T.V Russian helicopter, both capable of lifting in excess of 3,000 kg. This lifting capability is necessary in order to accommodate an adult white rhino, the lifting frame, 12 capture personnel, three flight crew and sufficient fuel to lift at least one rhino.

The animal is then darted from the light helicopter. Once the animal is recumbent the darter is dropped off to monitor the immobilized animal. Eye ointment is administered, a blindfold is fitted and the animal's ears are plugged with cotton wool. Additional tranquillizer is given if the animal is not completely relaxed. The light helicopter remains airborne to guide the lifting helicopter to the animal. Once the crew of the lifting helicopter has the recumbent rhino visual, the light helicopter can land or search for the next animal.

The lifting helicopter will drop a cargo net as close to the recumbent rhino as possible. It will then land a safe distance from the rhino to allow the airlift team to disembark.

An area adjacent to the rhino is cleared of all rocks, bush etc. The cargo net is then opened and placed alongside the rhino. The rhino is then rolled onto the centre of the vertical line of the net, but with the front portion of the rhino off centre on the horizontal line. This ensures that the rhino's head will remain elevated during the flight. The rhino is placed on the net in lateral recumbency.

Once the rhino is in position on the net the lifting helicopter is summoned. It will then proceed to hover above the rhino bringing the lifting frame to within one metre above the rhino. A designated member of the airlift team will then earth the frame

to reduce static. The rest of the crew will take a hold of the frame to steady it in order that four designated staff will hook up the strops of the cargo net to the Crosby7 master links of the lifting frame. This is done by means of Crosby7 latching hooks.

On completion, the team leader will then signal to the flight engineer that lifting may commence. This is done with the utmost care. Whilst lifting commences, capture staff who are positioned around the net ensure that the net is free from obstructions and that the rhino's legs are folded in a natural position and that its nostrils are not restricted by the net. When the rhino is off the ground and the team leader is satisfied that all the above is in order, he will signal a "thumbs up" to the flight engineer to indicate that they may proceed with the rhino to the drop zone. If there are any concerns the team leader will signal "thumbs down" which will indicate that the rhino needs to be repositioned. The helicopter will then lower the rhino gently back on to the ground for the necessary adjustments to be made. The flying speed should not exceed 80 km/h (39 knts) and the helicopter should fly as low as possible whilst slinging the rhino.

The animal is then slung to the pre-selected drop zone where it is lowered gently to the ground. The frame is then moved slowly to the side of the rhino and lowered to the ground where the drop zone team will unhook the cargo net. Any spare cargo nets will be loaded into the lifting helicopter which will return to the crew where the operation may continue. The rhino is then crated in the usual manner.

## EQUIPMENT

### *Lifting frame*

The lifting frame bears no weight and it serves merely to spread the cargo net. Without the frame the net bunches, resulting in the rhino taking up unnatural postures which could result in spinal or other injuries.

Two master links are joined by a length of heavy chain (approximately 200 mm in length) by means of a Herc-alloy7 hammerlock coupling link at each end. These pass through a welded triangle on the corner of the lifting frame. The master links are large enough so as not to pull through the triangle and thus remain in place.

The lifting frame is constructed of robust steel

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tubing (50 mm x 100 mm) and weighs 134 kg. It is essential that this frame is of sufficient weight so as not to be easily affected by rotor down wash. For ease of storage the frame used by the KNNCS can be split into two halves.

### **Ropes**

The usual capture ropes ie. the head and leg ropes are secured to the rhino in the usual manner. This is done when the airlift team arrive at the rhino. A leg rope is carried in the light helicopter in case of emergencies.

### **Cargo Net**

A cargo net made from flat webbing with a length and width of approximately 5.65 m with Crosby7 latching hooks fitted to the strop ends is required. It is essential to have the centre of the net marked in order to position the rhino correctly. At least three nets are required for a continuous operation.

### **Blind Fold**

This should be made so as to fit securely to the rhino's head covering both eyes completely. It should be fitted in such a manner so as to withstand the severe down wash created by the lifting helicopter (this can be done by the use of velcro straps).

### **Sling and swing cables**

A four-leg sling with Crosby7 latching hooks and swivel is required. The legs of the sling should be approximately 4 m long. A cargo swing cable of approximately 10 m is usually adequate depending on terrain. Cargo swing cable to make up a length of at least 30 m should be available to cater for extreme situations in steep terrain or amongst tall trees.

### **Radios**

It is imperative that all teams are in radio contact with one another. Provision should be made for enough portable radios to achieve this. Provision should also be made to have ground to air communications with both helicopters. The darter should also carry a portable radio when dropped off with the immobilized rhino.

### **Antistatic Bar**

This can be made from a metal reinforcing rod (insulated) with a length of light chain of approximately

2.5 m long welded to one end. The lifting frame is struck with the rod whilst the chain is touching the ground before capture staff take hold of the frame. If this is not done the static shock can be quite severe.

### **Water**

Two 25 litre containers of water are carried in the lifting helicopter to cool the rhino when necessary.

### **Cane knives**

Each of the airlift crew should carry a sharpened cane knife to assist in clearing bush etc. A cane knife is also carried on the light helicopter in case of emergencies.

### **Saws**

A chainsaw is carried in the lifting helicopter for clearing large trees or shrubs. A bow saw is carried for back up.

### **Safety Equipment**

Ear muffs and goggles are necessary because of the serious noise and wind caused by the lifting helicopter. It is essential that all staff wear these items when working in the vicinity of the lifting helicopter.

## **DRUG DOSAGES**

### **White rhino**

It is not unusual for adult animals not to be completely relaxed when recumbent. This can be easily rectified by injecting additional Azaperone (I.V.) 40 mg. Recommended dosages are listed in Table 1.

### **Black rhino**

Relaxation problems seldom occur in black rhino. Hyalase is added to the cocktail to achieve quick knock down times (usually between three and four minutes, Table 2). Additional Azaperone is given to animals five to ten minutes before crating.

**Table 1. Dosages for white rhino [mg].**

	<b>Adult</b>	<b>Sub-Adult</b>
<b>Etorphine</b>	3-4	2-2.5
<b>Reversal (Diprenorphine)</b>	6 - 8	2-5
<b>Azaperone</b>	100-150	50-100

N.B. These drug dosages are merely a guide. Condition, size of animal etc. should all be considered before dosages are decided.

**Table 2. Dosages for black rhino [mg].**

	Adult	Sub-Adult
Etorphine	4	3
Reversal (Diprenorphine)	8	6
Azaperone	200	100
Hyalase	5,500 IU	5,500 IU

## PRECAUTIONS

### *Legal Requirements*

It should be noted that lifting machines and lifting tackle should comply with the Occupational Health and Safety Act, Act 85 of 1993 (Regulation 18 Sub. Reg. 1-9 Lifting Machines and Regulation 18 Sub. Reg. 19 Lifting Tackle).

### *Immobilized rhino*

It is essential that the rhino's vital signs are closely monitored as animals may be under anaesthetic for up to an hour. Before lifting, it is also imperative to check the depth of anaesthesia and if the animal is showing signs of recovery, it should be "topped up" before being lifted. If breathing is not satisfactory (laboured) 10 mg of Nalorphine can be administered shortly before lifting commences. To prevent neuromuscular damage to its hind legs it is important that the rhino's position be changed if it is immobilized for longer than 20 min.

It is essential to acquire complete relaxation before the rhino is lifted. In male rhinos the

penis is often relaxed and protruding. Care should be taken that it is not constricted and damaged by the net.

### *Personnel*

All personnel should be fully briefed in helicopter safety precautions and procedures before lifting commences.

### *Drop Zone*

The drop zone should be a large flat area free of trees and shrubs. It should preferably be well grassed to reduce dust. Because of the high costs involved in running the lifting helicopter, it is advised that all dehorning, marking etc. take place at the landing zone and not at the place of capture.

### *The lifting helicopter*

When slinging, flying speeds should be kept below 80 km/h. This is to avoid hypothermia through the wind chill factor. It also prevents too much tension/pressure in the net. If the flying speed is excessive and the head of the animal is facing the direction of travel, difficulty in breathing may be experienced. When dropping the cargo net from the lifting helicopter avoid the net getting entangled in the lifting frame. Do not approach the recumbent rhino and ground team with the lifting frame swinging out of control. Steady the frame by lowering it to the ground or steadying it against a tree away from the team and rhino. Plan approaches so that the minimum amount of dust is blown up. During the drop off, attempt to fly a long straight final approach so as not to cause a swing. The rhino should be lowered slowly to the ground.

## REFERENCES

McKenzie, A. (1993) *Capture and Care*. Wildlife Decision Support Services, 1993.