Game capture
Part A: chemical capture

Module # 4-Component # 1

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Objective

Understand the capture methods and handling techniques involved when capturing wild animals.

Expected Outcome

- Interpret the factors involved in determining which capture method to use.
- Understand the principles for immobilising herbivores by darting.
- Discuss the problems associated with immobilising drugs.
- Understand the procedures for the plastic boma capture method.
- Understand the different net capture techniques.
- Compare the advantages and disadvantages of darting and mass capture techniques, respectively.
- Discuss the factors involved in planning a capture operation.
- Understand capture myopathy, the symptoms, and preventative measures.
- Understand the handling of immobilised carnivores.

Introduction

Game capture requires **practical** and **scientific skills**, **experience,** and the **right equipment**. For these reasons, most wildlife managers use **professional game capture teams** for this purpose. Successful game capture includes **capturing the animals** and the **effective handling, transport,** and **care in captivity**.

This **facet of wildlife management** has become its **own specialised activity**. However, **one topic** that one of the world's most experienced game capture veterinarians, Dr Ebedes, has identified as **the most important and yet almost impossible to teach or convey**: **compassion.** It is crucial to remember that you are dealing with live, sentient, cognizant and feeling animals during game capture and translocation operations.

At this point, it is necessary to break one of the fundamental rules of scientific writing, **anthropomorphism**. Wild animals under capture conditions are afraid, confused, stressed, frequently aggressive and highly agitated. Treat them with compassion.

Farm manager, **Bennie Groenewald**, prepares to tag the ear of a Roan antelope during a game capture operation. Hillcrest Game Estates Owner **John Firth** watches over his team as they safely and carefully tag, check, and relocate the animal.

Capturing of herbivores

The following factors should be considered when deciding upon the capture method.

Cost

This involves equipment such as:

- Nets
- Vehicles
- Tranquillising equipment
- Drugs
- Feed
- Bomas

The cheapest option is not always the best option though.

Type of game

Certain game species require **specialised capture techniques**. Elephant, rhino, hippopotamus, and giraffe are examples of this. Herd animals can be captured effectively in groups using a plastic boma and a helicopter.

Area of capture

The **vegetation** and **habitat** will also determine which vehicles and methods can be used.

Number of animals

A **helicopter** might be needed to capture large numbers of game in a single exercise. This adds to the cost considerably.

Administering medication by a qualified wildlife veterinarian

Planning a capture operation

The following aspects must be considered when planning a capture operation:

- The **physical condition** of the animals, number of **young** and possible advanced **pregnancy**.
- The **sexes** and **ages** of the animals.
- The time of year, specifically relating to **temperature** and **humidity**.
- The safest and **most effective capture method** for the specific type of animal.
- The necessity of using **immobilising** and **tranquillising** drugs.
- The availability of **vehicles** and single or mass **transport crates**.
- Animal **health requirements** such as the **quarantining** of animals in foot-and-mouth control areas.
- **Nature conservation permits** may be required to capture, hold, and transport animals.
- **Import and export permits** between different areas and regions.
- Available human resources both numbers, expertise, and experience.

Scanning a Sable antelope for a possible pregnancy, using a bovine ultrasound scanner

Principles for a successful capture

Wild animals that are captured are **under stress before, during and possibly even after the capture**. Although game capture operations will always contain a measure of stress, **the welfare of the animals involved is always of the utmost importance**. Therefore, the wildlife manager must ensure that the method chosen also takes this into account. Everything possible is done to **minimise the stress** on the captured animals.

A fundamental principle of successful capture is to **eliminate as many factors as possible that cause stress** in the animal.

Safe handling of roan antelope during a game capture operation

The following should be considered:

- The operation should be thoroughly **planned** beforehand.
- Every person involved in the operation should be briefed in detail about their task.
- **There should not be any unnecessary persons. Observers** are largely **inexperienced** in game capture and frequently **hinder operations.**
- Game capture should take place in the **colder months** of the year, as overheating of the animals can easily occur during capture.
- The condition of animals deteriorates during winter. The capture should, therefore also **not be done too late in the season**.
- In warm climates, it is advisable that the capture should start **early morning** and not stretch over the heat of the day.
- Animals must **never be chased over long distances** or for a prolonged period. This is not how animals react in nature, and it could prove fatal. If the capture boma is far away, the **animals should be given time to rest** and be **herded to the boma slowly**.
- The animals should be **handled** and **disturbed as little as possible**.
- If the animals are kept in **temporary captivity** after the capture, steps must be taken to **ensure they do not injure themselves** in the bomas.
- Bomas should be high enough that animals, especially **antelope, cannot jump over the side.**
- **Noise levels** outside the bomas and crates should be kept very low.
- **Aggressive animals** and **mature bulls** should be **separated** to avoid conflict and injury.
- There should be enough **food and water** in the bomas before the animals are brought in.
- Ensure adequate **protection** against sun, cold and rain.

Capture methods

Immobilising animals by darting

Animals may be captured by being **injected with immobilising drugs**. This method is used to capture **rare and valuable herbivores individually**. It requires great skill, scientific knowledge, and experience to immobilise wild animals. **It may only be conducted by registered veterinarians**.

Drugs are usually injected by firing a dart from a dart gun into the animal's muscle but can also be administered manually, for example, when animals are caught in a net.

A dart gun is used to inject animals with immobilising drugs during capture

A modified dart gun is used to inject animals with immobilising drugs during capture

An important distinction needs to be made at this point:

- **Immobilising drugs** are used to immobilise the animal, with the animal losing consciousness completely.
- **Tranquillising drugs** are used to sedate the animal. While the animal is conscious of its surroundings, it remains relaxed with limited movement.

In Southern Africa, the drugs most commonly used are **M-99** and **Fentanyl**. Both drugs are **hazardous to humans and are subject to very strict control**.

It is advised that the choice and handling of immobilising drugs for capture operations be left to a wildlife veterinarian with experience in this field.

A wildlife veterinarian prepares darts for a game capture operation

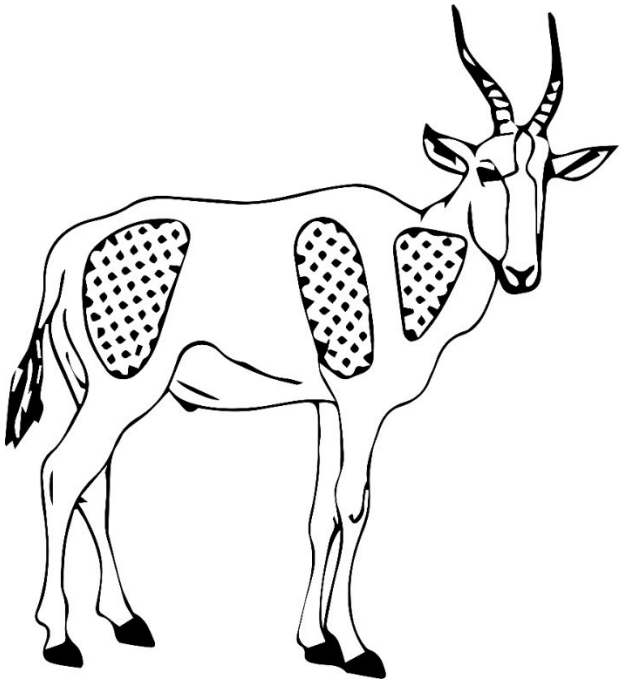
The following principles are essential in the darting of antelope and other herbivores:

Selecting equipment

The distance that the animal can be approached from, the thickness of skin, approachability of the terrain and the method of approach, being ground or air, will determine which strength the dart-gun should be. The **right choice of dart and needle** is also very important. This is influenced by the skin thickness, size of the animal and approach distance.

Darting from a vehicle

It is difficult to get the required approach distance from an animal on foot, so **animals must usually be approached in a vehicle**. Animals are often accustomed to certain vehicles, which could be an advantage. **Using roads** to approach the animals is **more successful than driving off-road**, which often scares animals. Avoid driving directly at an animal or herd, as this tends to scare them off.



Ideal target areas for darting most game species

Be patient in selecting the animal to be darted and shoot only if the target area (e.g. the hindquarters) is not obscured. **The dart should penetrate at a 90-degree angle**, which reduces the chance of the dart bouncing off. Dart sites to use are the rump, hind leg, shoulder and occasionally the neck. The aim here is to have the dart **penetrate muscle tissue** only. Once the dart is in the animal, **the animal should be kept within sight always** but should not be chased at high speed. If, however, the animal does move out of sight, wait for the appropriate time for the drug to take effect, and then start tracking the animal.

Darting from a helicopter

Using a helicopter for darting is often worthwhile in capturing **valuable, large, or aggressive animals**. An experienced helicopter pilot is of the essence. The **pilot** should **know the habits and reactions** of different game species and be **experienced in flying low** and **turning sharply**. A strong helicopter is necessary to provide a stable platform from which to dart. **Darts should be prepared in advance**, with enough to spare. There should be effective communication between the pilot and the ground crew. The best time to fire is **when the animal and the helicopter move at the same speed in the same direction**. Once the dart is in the animal, try and herd the animal towards the recovery vehicle. The ground crew must be notified immediately.

Signs that the drug is taking effect

Some (or all) of the following symptoms may be seen:

- An ataxic, staggering gait.
- A high-stepping knee action.
- The head held high and far back, or the animal may nibble at vegetation.
- Impaired vision-the animal may collide with objects.
- Loss of sense of fear of people and strange objects.
- The animal reacts to noise.
- The ears may droop.
- Some animals stay on their feet, and others may collapse.

Advantages of immobilising through darting:

- The most effective and safest method to capture rare and valuable animals.
- It is more economical than other methods when only single animals must be caught.
- Large and aggressive animals are manageable and can be loaded and transported while immobilised.

Disadvantages:

- Approach distance to dart an animal is often not adequate.
- Ruminants that collapse on their side can bloat or choke when rumen content is vomited.
- If the drug is not injected into the right muscle or the dart does not discharge properly, the animal will not be immobilised effectively. The animal could run too far and overheat or collapse from exhaustion.
- The tracking of animals in dense vegetation or rocky areas can be difficult, and animals may not be reached in time.
- The use of a helicopter can be costly.
- Animals can injure themselves if they collide with a tree or fence.
- Overdosage could be fatal if an antidote is not administered in time.

Capturing of carnivores

Capture methods

The capture of carnivores can be done using **cage traps** or **camp traps that lure the animal with bait**. These are best constructed and operated by professional capture teams with experience in this field. It is recommended that **carnivores be tranquillised during transport** to facilitate handling and loading and reduce stress during transport.

It is imperative that an experienced person, preferably a **wildlife veterinarian**, take **full responsibility for the immobilised animal**, as any carnivore can inflict severe injury to handlers.

Lion: *Panthera leo*

Handling of immobilised carnivores

An immobilised carnivore could collapse in an unnatural and inappropriate position, which could result in injury. The **animal should be placed on its side, with its head extended**. The **tongue** should be **kept wet** during immobilisation. **Regurgitation** during immobilisation **is life-threatening to a carnivore**. Pieces of regurgitated meat should be removed from the mouth as soon as possible to avoid suffocation.

The immobilised animal **should be turned from side to side every 20 minutes**. To **prevent overheating,** the animal should be cooled down after capture and should never be left in the sun. Direct sunlight can also cause damage to the eyes. A blindfold should protect the eyes. An **immobilised animal** can still **perceive loud noises**, so every effort should be made to reduce the noise level around the animal.

The **vital signs**-respiration rate, pulse rate, blood pressure and temperature should be checked continually.

All carnivores can be lifted by 1-4 persons, depending on the species and available equipment. A **good stretcher** will be sufficient for loading and off-loading all the larger species, while smaller species can be lifted by hand. All carnivores should be fully immobilised when loading and off-loading. Animals should be loaded as soon as possible after capture.

African wild dog: *Lycaon pictus*

Elephant capture: an eye-witness account

WildlifeCampus graduate Dr Kathy Whittaker (MD) provided the concluding section of this component. Dr Whittaker was fortunate enough to attend an elephant translocation operation in the Madikwe Game Reserve and kindly supplied the narrative.

Elephant capture - a pictorial essay

"On the **10th of October 2001**, I was privileged to watch the capture of a breeding herd of elephants for translocation.

Madikwe Game Reserve has an abundance of elephants at the moment. The Parks Board is selling off elephants to new reserves that require them. Whole breeding herds are taken in one go, with a couple of bulls captured at a different time to constitute a complete breeding unit. A new reserve in the Eastern Cape required a herd, so here we were, ready to catch them and put them on the trucks for transportation.

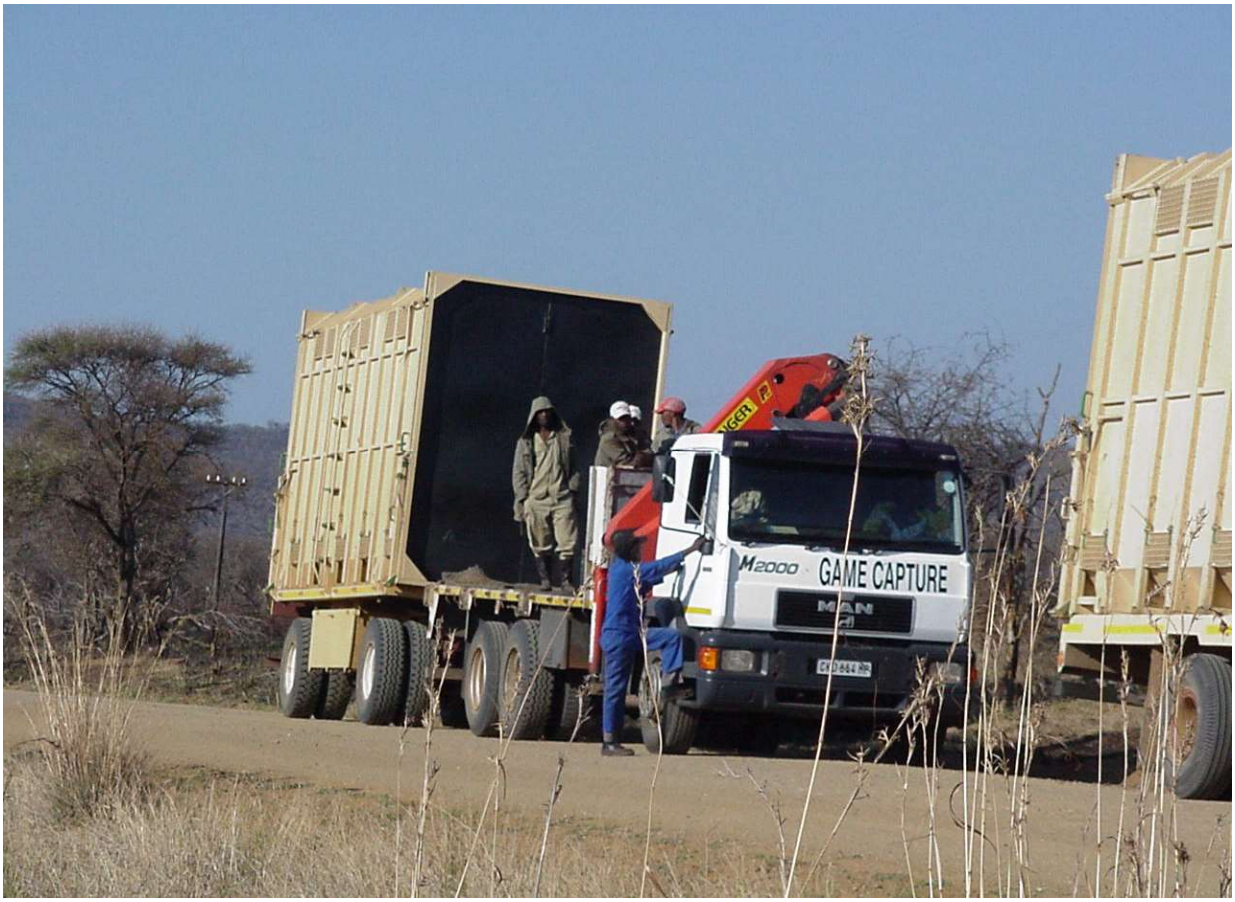
Over the previous few days, the ecologist, in conjunction with Park staff, travelled around the park looking for breeding herds of the right size and particularly of the right temperament. A breeding herd of 6 adult females with five juveniles and one baby was identified and followed over the day. When he was happy that this was a good group to translocate, a day was set for the capture.

At 6.30 the next morning, we were at the appointed meeting place, waiting for the teams to arrive. The early start was necessary as the ambient temperatures were up to 30 degrees Celsius by the middle of the day. The plan was to have the elephants waving goodbye by mid-morning. These creatures had a 30 hour, 1000 km drive ahead of them!

First, the vet arrived. He started loading up his dart guns. He used M99 (etorphine) at an estimated dose for each elephant based on body size. Each dart that he prepared was labelled, i.e. adult 1, adult 2, calf 1 etc. These darts were very interesting to see. Each dart has a propellant chamber containing acetic acid in one end and bicarbonate of soda in the other. A metal plate with an eccentric weight separates these. When the dart gun is fired, it causes the metal plate to move forward. Because the weight is unevenly distributed, it rotates slightly and allows the two chemicals to mix. Carbon Dioxide is produced, which then shoots the actual dart needle with the etorphine into the animal's hide.

He also prepared all his antidotes to the M99, i.e. M50/50 plus tranquillisers and other medications needed. He planned to fly above the herd in a helicopter with an extremely skilled pilot. The helicopter would "herd" the elephants into a reasonably open area. Then he would dart them from a height of about 10 to 15 metres above each elephant. The area aimed for would be high on the buttocks to enable ease of recovery of the dart and prevent the elephant from lying on it while unconscious.

Then arrived the vehicles – and impressive they were too!



Some of these vehicles were equipped with impressive cranes and winches.

The vet then took off in the helicopter, and the long train of vehicles followed down the road. Within a few short minutes, the herd had been gently encouraged to move into a fairly open area close to the road. With some skilful low flying, the elephants had all been darted and were gently collapsing onto the ground.

Then came the action! The team split up, and two at a time rushed to each elephant. Immediately, their eyes were covered by their ears, and a stick was used to keep their trunks from collapsing closed.

Each elephant's pair of legs were bound together with strong strapping.

One of the ecologists then took a tissue sample from the ear of each elephant for genetic studies

The dart was recovered from each elephant. These can be reused.

Each elephant was marked with a spray-painted number with a corresponding number for her calf to enable mother and calf to be loaded together.

Then each elephant was hoisted with the cranes onto the flatbed recovery vehicles to be taken off to the main loading and transport vehicles.

The matriarch was fitted with a radio collar to enable future tracking in her new home. She was too heavy to be lifted using the cranes, so she was winched up onto a special trailer to be taken to the transport vehicles.

By now, the first of the elephants were being loaded into the transport vehicles, mother and calves together.

In earlier pictures of the vehicles, you will have noticed that there was one large transport truck and a smaller "crate" that could open both sides. This enabled elephants to be loaded into the transport truck at the same time as elephants loaded into the crate. Once the elephants in the loading truck were moved backwards to the front of the truck, then the loading truck reversed up to the crate, and the elephant there was encouraged to move into the loading truck. This speeded up the process immeasurably, basically loading two elephants at a time.

Once each elephant was in the truck, the vet administered an antidote to the anaesthetic, and the doors were hastily shut. Within a few minutes, the elephant was up on her feet. Using a compartmentalised sliding door system, she was encouraged to move to the front of the truck; the sliding door was closed, and the back compartment was opened to start with the next elephant unloading. Systematically, each elephant was loaded and moved. Last to go in was the female with the smallest calf. It was so gratifying to see the baby suckling within about ten minutes of being loaded.

All the elephants were hosed down in the truck, and tranquillisers were administered by injection through small openings on the side of the truck

Within two and a half hours from the time the vet took off in the helicopter, the elephants were ready to undertake their journey to their new home. The speed and efficiency of this game capture team were incredible and extremely impressive.

My sincere thanks go to the vet and ecologist, plus the capture team, for allowing me to witness this amazing event".