A Field Guide to the

ANIMAL TRACKS

of Southern Africa

Louis Liebenberg

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of Southern Africa

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Cape Town & Johannesburg

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Abbreviations

HB	Length of head and body
Ht	Height
T	Tail length
TL	Total length

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Introduction

The art of tracking may well be the oldest science. Yet tracking can be developed into a new science with many practical applications in nature conservation. At a time when wildlife management becomes increasingly important, the experienced tracker may be of great value in nature conservation.

Expert trackers may also be able to give valuable assistance to researchers studying animal behaviour. Trackers have, for example, been employed in studying the ecology and behaviour of Lions and Leopards in the Kalahari Gemsbok National Park (Bothma, 1986).

Most animals are very shy and tend to vanish at the slightest disturbance, while many nocturnal animals may never be seen at all. Direct observations are likely to disturb an animal, making it difficult to study its habits under natural conditions. Tracks, however, give an account of the animal's undisturbed everyday life. Much information (which would otherwise remain unknown) may therefore be obtained from tracks and signs.

To follow successfully the spoor of an animal requires an in-depth knowledge of that animal's behaviour. Learning to track is therefore a good way for zoologists and others to study animal behaviour. To study a particular animal, radio-tracking (radio-telemetry) can be combined with spoor interpretation so that not only the movements of the animal but also its activities between radio fixes can be recorded. Combining traditional tracking methods with modern technology may enable the researcher to accomplish much more than either method used alone.

Spoor interpretation can also be of great value in determining the distribution of animals, particularly rare species that may seldom be seen. I have, for example, found the spoor of a Spotted-necked Otter along the Sabi River in the Sabi Sand Nature Reserve. Pienaar *et al.* (1980) maintain that there is no positive evidence of the occurrence of the Spotted-necked Otter in the Kruger National Park. However, the fact that I have found an unmistakable Spotted-necked Otter spoor (claws and webs indicate that it could not have been that of a Clawless Otter) in the adjacent Sabi Sand Nature Reserve suggests that they may well occur in the Kruger National Park. !Xõ trackers have also pointed out the spoor of a Serval, which I identified positively, south of Lone Tree, far outside the known distribution range. They also maintain that the Hedgehog is found in the area of Lone Tree, once again outside the known distribution range.

Spoor interpretation could also enable farmers to identify and locate problem animals, in order to take effective actions to protect their crop and livestock without inadvertently killing innocent animals. The ability to identify specific problems can help farmers solve them in ways that not

only protect their economic interests but are also most compatible with nature conservation. Since farmers are the owners of the largest areas of private ground, it is important that conflicts between farming interests and nature conservation should be minimised.

Perhaps one of the most important factors in nature conservation is a general awareness of wildlife amongst the general public. Ignorance by the public at large may well be the most dangerous threat to the survival of many species posed by 'advancement' and 'progress'. Even keen nature lovers are often unaware of the wealth of animal life around them, simply because most animals are rarely seen.

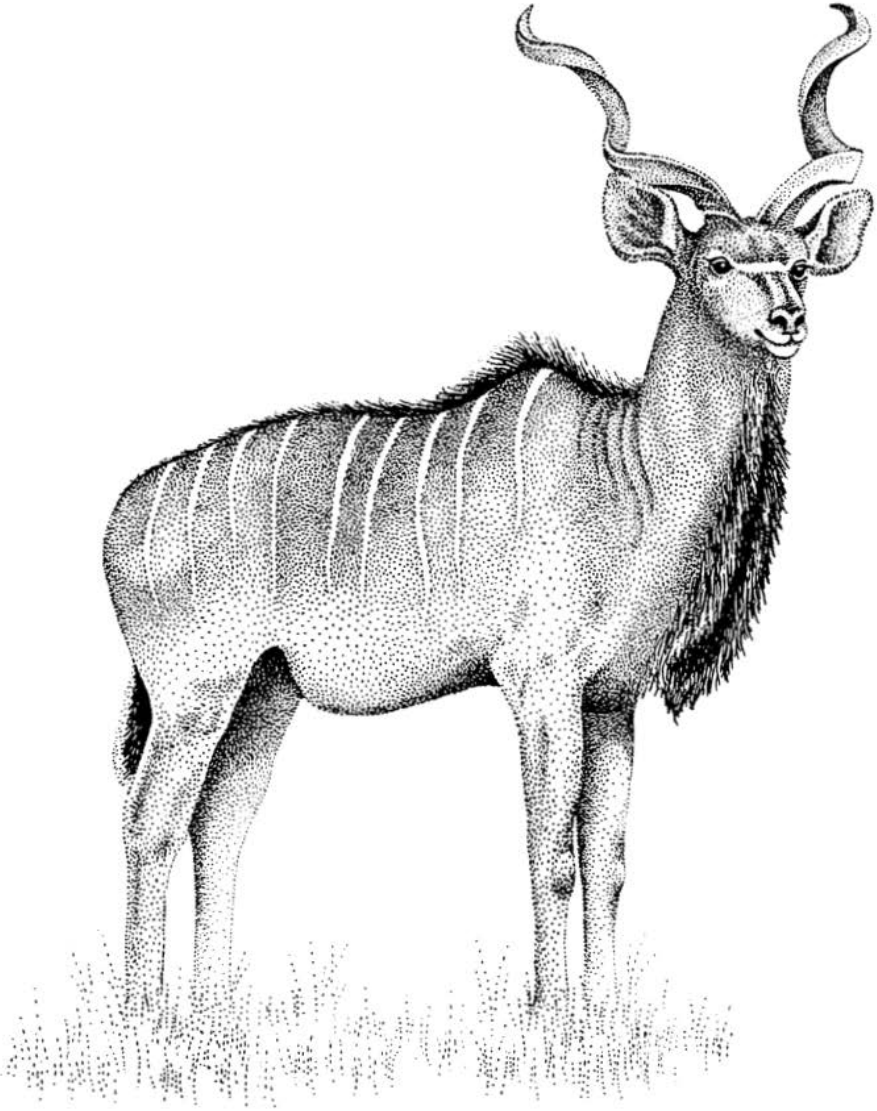
I once encountered a group of about a dozen hikers who walked right over a perfectly clear Leopard spoor. Not one of them noticed it, simply because they were not 'spoor conscious'. To them Leopard simply did not exist. Yet to find a fresh Leopard spoor in the wilderness adds an exciting new dimension to hiking in the wilds. The Leopard is a stealthy animal that is rarely seen. But its spoor tells you that it is there.

To the nature lover, spoor may reveal the activities of many animals that would otherwise never be seen. To the untrained eye the wilderness can appear desolate, but to someone who is at least 'spoor conscious' it will be full of signs of wildlife. Even if you never see the animals, the knowledge that they are there is enough. By reconstructing their movements from their footprints, you may be able to visualise the animals and in your imagination actually 'see' them. In this way a whole story may unfold – a story of what happened when no one was looking.

This field guide provides an introduction to the basics of tracking. Only footprints are dealt with in detail, since they are the easiest to identify and interpret. Once a trail has been identified, however, every other sign should be studied in detail. The details provided in this book on animal behaviour should help the reader with the initial identification and interpretation of spoor. Since this field guide covers the whole of southern Africa, it deals with more animals than a tracker needs to know in any particular locality. But although a tracker only needs to know the animals found in a particular area, tracking requires a much more detailed knowledge of those animals. Furthermore, reading this book will not make you an instant tracker. To master the art of tracking requires practical experience that can only be developed over a long period of time. The art of tracking involves an ongoing process of discovery, and even the most experienced tracker will always have something new to learn.

I

The Basics of Tracking



1

Spoor Identification

The art of tracking involves each and every sign of animal presence that can be found in nature, including ground spoor, vegetation spoor, scent, feeding signs, urine, faeces, saliva, pellets, territorial signs, paths and shelters, vocal and other auditory signs, visual signs, incidental signs, circumstantial signs and skeletal signs. In this book only footprints are dealt with in detail, as they are the easiest to identify. Footprints provide the most detailed information on the identity, movements and activities of animals, and once a trail has been identified, other signs can be studied in more detail. Footprints therefore offer a valuable introduction to the art of tracking, a science that might otherwise prove inaccessible to the inexperienced naturalist.

The examples of spoor provided are of particular individual animals which are assumed to be representative of that species. Where variations occur, several examples have been included with an indication of how many individuals that have been studied they present. Ideally one should have an indication of the percentage of a large sample population each variation represents, but that would require much more data.

The illustrations are exact studies of spoor made under ideal conditions, such as wet sand or dusty ground. A calliper was used to take measurements of every detail and its position relative to two right-angled reference lines, to ensure the highest possible degree of accuracy. Field studies were supplemented by photographs and studies of museum specimens. The feet of ungulate specimens, which are assumed to have retained the shape and size of the outer walls of the hooves, were also traced. (The fact that two groups of !Xõ trackers of the Kalahari correctly differentiated the male and female Kudu spoor based on specimens suggests that the shapes of the hoofs of specimens do not change significantly.) In some cases where the spoor of rare antelope were not found, reconstructions of what their spoor should look like have been based on specimens. Spoor reconstructed from specimens are indicated by Ⓢ. Since it is conceivable that at least some of the specimen hoofs may have changed shape, these are subject to further research.

The spoor illustrations may be regarded as generalised models which have been used to simplify spoor interpretation. In reality one will probably never find two animals with exactly identical footprints. One therefore needs abstractions to identify characteristic features of the spoor of different species.

A further advantage of using models is that it gives one a preconceived image that improves the chances of recognising spoor which may otherwise be overlooked. Preconceived images play an important role in

the recognition of patterns in nature. However, with a preconceived image in mind, one tends to 'recognise' patterns in markings that may have been made by other animals, or even random markings (like seeing faces in clouds). One must be careful not to be prejudiced and see what one wants to see.

While species may be recognised by some general characteristics, each individual animal's spoor differs in very subtle ways, and it is in principle possible to identify an individual animal from its spoor. So, for example, Kalahari trackers can identify the antelope they have shot from the rest of the herd and will track down that individual animal. Apart from the functional and environmental adaptations of the species, an individual animal's spoor may vary according to its age, mass, sex, condition, and the terrain as well as random variations. It may also have a unique way of walking or a peculiar habit that distinguishes it from other individuals.

While the spoor of most of the larger mammals and birds can be identified as belonging to a particular species, the spoor of the smaller animals may only be identified as belonging to a genus, family or order. The smaller the animal, the more difficult it becomes to distinguish its spoor from that of similar species, and while some mammal families may consist of only a few species, insect families may contain thousands of species. Some of the antelope species may have spoor characteristics typical of the species, but variations may occur that are similar to those of other species.

Steenbok spoor, for example, are usually sharply pointed with straight sides, while Duiker spoor are normally more rounded. However, some Steenbok may have spoor similar to typical Duiker spoor, and vice versa. A small antelope spoor that has a typical Steenbok shape could therefore only be identified as probably Steenbok, but possibly also Duiker, unless other evidence rules out either possibility. Kalahari trackers can, for example, distinguish a Steenbok spoor from that of a Duiker, even in soft sand where the shape of the hoof is not clear, by the way they tread. Steenbok tread with their hoofs pointing down into the ground, while Duiker tread in a more flat-footed way. Furthermore, the presence of droppings may indicate the species, since Steenbok normally bury their droppings while Duiker do not.

In the case of gregarious animals, especially ungulates, the whole group should be studied to determine the typical spoor and variations in the group. The majority of spoor in a group would probably be representative of a typical spoor characteristic of the species, while unusual variations would form a minority.

The best footprints are usually found in damp, slightly muddy earth, in wet sand, in a thin layer of loose dust on firm substrate, or in snow. Ideal wet conditions are found along streams, rivers, waterholes, dams, vleis, beaches, after rain or in the morning when the sand is still damp from the dew. Puddles that have just dried out, leaving a thin layer of mud over a firm substrate, are ideal for tracks of small animals. Dirt roads and paths may have a thin layer of very fine dust on firm ground that can reveal the finest detail of the spoor.

Usually, however, footprints are partially obliterated, and one should walk up and down the trail to find the best imprints. Even if no clear footprints can be found, one can collect bits of information by studying

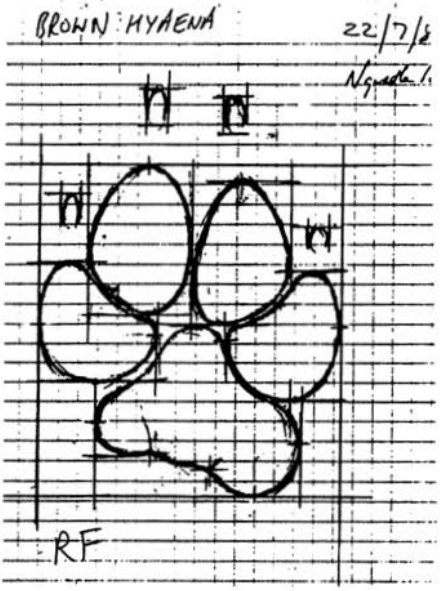


Fig. 1

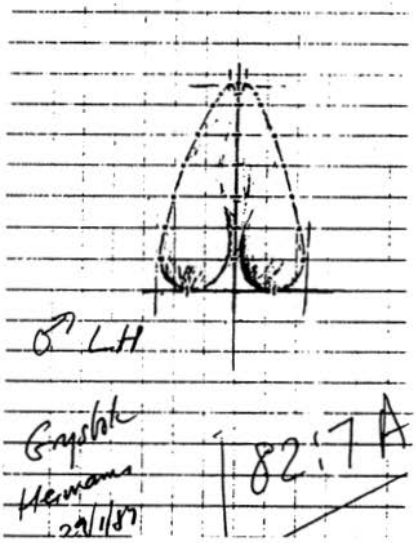


Fig. 2

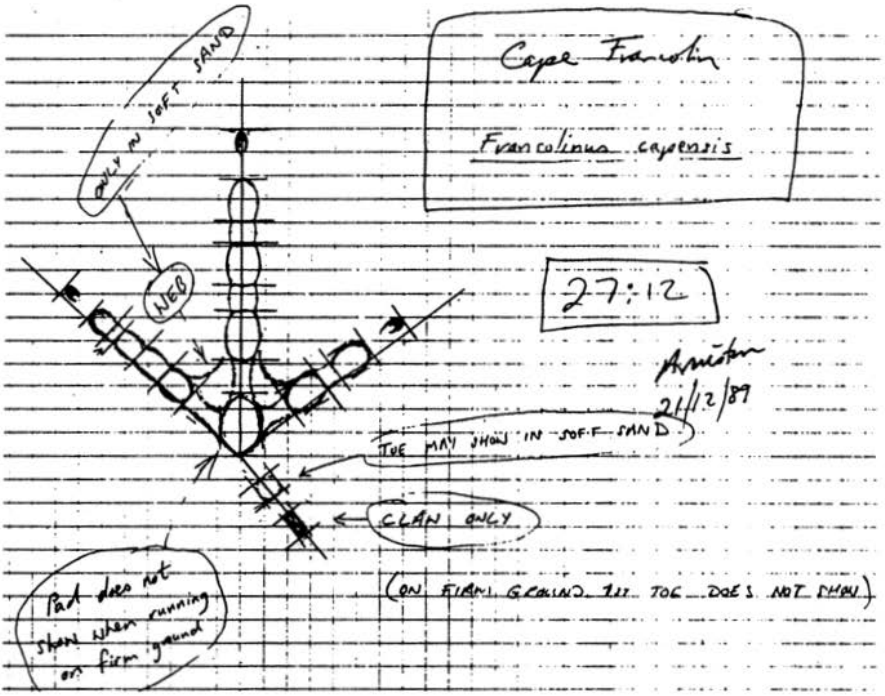


Fig. 3

several footprints and piece them together to compile an image of the complete spoor.

When studying spoor in loose sand, one should try to visualise the shape of the footprint before the loose sand grains slid together to obliterate the well-defined features. As much information may be lost in loose sand, it is not always possible to distinguish the spoor of similar species, so it would have to be considered as belonging to any one of several possibilities, until further evidence is gathered.

When loose wind-blown sand has accumulated in a footprint that was made in damp or wet sand, it is sometimes possible to carefully blow away the loose sand to reveal the features of the spoor underneath. Footprints in mud may in fact be preserved for quite a long time underneath a layer of loose sand. In blowing away the sand, great care must be taken not to destroy the footprint itself. When leaves are covering the spoor, or even when the animal has stepped on top of leaves, they can be carefully removed to reveal the spoor underneath.

It should be kept in mind that footprints may be distorted owing to slipping and twisting of the feet on the ground. When the animal is walking on a slope or running, the feet may slip, so the spoor will appear elongated or warped. If the fore and hind spoor are superimposed, it may look like an elongated spoor, or the toes of the fore footprint may be confused with those of the hind. When trotting or running, the animal's mass is supported mainly on the toes and only part of the intermediate pads may show, or, in the case of mongooses, the proximal pads may not show at all. On hard ground padded toes may not show and only claw marks may be seen.

If the spoor could be that of several possible species, the distribution maps in this field guide should be consulted to eliminate those that do not occur in that locality. Habitat and habits, such as sociability and daily rhythm, as well as feeding signs and faeces, should also be considered to narrow down the range of possibilities.

The best way to learn how to recognise a track is to prepare an accurate sketch showing its exact dimensions. This compels one to note all the details of the track and therefore to remember them better. Use a calliper to measure the dimensions and position relative to two right-angled reference lines of each detail. Care must be taken that distances measured are always perpendicular to the reference lines (see Fig. 1). A calculation pad with 5 mm squares is ideal for drawing spoor. As reference lines, place two rulers at right angles to each other next to the spoor (use a corner of your sketch book as a right angle). For ungulates it is easiest to place a thin knitting needle, with markings every 5 mm, down the middle of the spoor, and to measure the distance of the edge of the spoor from the needle every 5 mm (see Fig. 2). Note that antelope spoor are not exactly symmetrical. For bird spoor it is easiest to draw reference lines down the middle of each toe, using the arms of the calliper to measure the angles between them (see Fig. 3).

In measuring a footprint, the length is taken from the front edge of the longest toe's pad mark to the hindmost edge of the intermediate pads. If the whole footprint can be seen, a measurement to hindmost edge should also be taken. The claws are not reckoned in the total length, as they may vary in length according to wear, and are measured separately. The breadth is

measured at the broadest part of the footprint. When measuring the track left by a cloven hoof, the distance between the tips of each half of the hoof and, if possible, the length of the toe pads should be measured in addition to the length and breadth. When measuring bird tracks, the length of the central toe and the first toe should also be taken. For accuracy it is best to measure tracks made when the animal was moving slowly. In rapid locomotion the feet tend to slip and the tracks will therefore be a little too large.

When measuring a group of tracks it helps to stretch a piece of string between two pegs so that it runs through the centre of the group parallel to the direction of movement; use this as a reference line. The distance from this line to the middle of the front edge of each footprint should be measured and recorded on a sketch. Additional measurements should include the length of a single group of tracks, the stride length and the straddle width. The stride length is the distance from the front edge of the foremost footprint in a group to the front edge of the corresponding footprint in the following group. Note that the stride length is not always constant, as an animal may give a few short strides and then a long jump. The straddle width is the width of the track group, and is the sum of the distances to the reference line of the outermost tracks on both sides. The sketch should show which are left- and right-foot, fore- and hind-foot tracks. If some of the tracks are turned outwards, the angle made by their midlines with the reference line should be shown. It is convenient to use paper marked in millimetre squares so as to draw the relative positions to scale.

A quicker method, although not as good, is to take a photograph. It is essential to include a scale in the photograph and to take it directly from above so that the picture will not be slanted. Slides can be put into an enlarger, by means of which one can project a natural size image of the spoor onto paper, enabling one to make an accurate tracing. An 80–200 mm zoom lens with a macro facility is very useful for photographing spoor of various sizes (except for very large spoor such as that of Elephants).

Another method is to prepare a collection of casts in plaster of Paris. This method has the advantage that it preserves a copy of the actual spoor, which can be referred to afterwards. For demonstration purposes reproductions of the original footprint can be made by using the cast to form imprints in sand.

Compared to photographs and casts, drawing footprints has the advantage that details of several partially obliterated footprints (of the same foot of the same animal) can be collected and put together to create a composite, complete footprint. Very fine detail will also be recorded that may be lost in a photograph because of imperfect lighting or may not show up in a plaster cast. For people who cannot draw accurately, however, photographs and plaster casts will be the most accurate. Drawing footprints accurately is also very time-consuming and requires a lot of patience and considerable concentration. It usually takes me at least an hour to draw a fore-foot and hind-foot of an antelope, whose spoor is relatively simple. More complex footprints may take longer. In order to distinguish subtle variations in spoor, such as the difference between male and female animals, a very high degree of accuracy is essential.

An easy way to compare similar spoor is to trace the outline of the spoor illustrations on transparent tracing paper and to place it over similar spoor to see how they differ. In the process of tracing you will get to know the spoor's distinctive features, which will help you recognise them in the field.

Note that spoor illustrations printed natural size, or close to natural size, appear to be larger than the actual spoor on the ground. This is due to an optical illusion created by the greater contrast between the black ink and white paper, compared to the more subtle shadows in the actual spoor on the ground. This discrepancy should also be kept in mind when drawing spoor, since one tends to draw it smaller than the actual size to make it appear the same size. It is therefore essential to measure each detail of the spoor.

Spoor identification not only requires a great deal of knowledge, but also skill and experience. Although the inexperienced naturalist should in principle be able to use this book to identify near-perfect spoor in ideal conditions, the accurate identification of imperfect spoor, especially in loose sand, may only be possible after considerable experience. Furthermore, the footprints in this book should only be regarded as providing a basic introduction to spoor interpretation, and every opportunity should be taken to study all other signs in order to master the art of tracking.

2

Classification of Signs

Spoor

Spoor includes a wide range of signs, from obvious footprints, which provide detailed information on the identity and activities of an animal, to very subtle signs which may indicate nothing more than that some disturbance had occurred.

Clear footprints in soft ground supply the most detailed information on the identity and activities of an animal or person. Perfectly clear prints are seldom found, though, and usually only fragments of prints or partially obliterated prints are evident. Fresh footprints usually show up slightly darker in colour than the surrounding ground. On hard ground where there may be no definite indentations, footprints may appear as shiny patches of dirt because of the change of reflective properties of the ground. Scuff marks in the shape of scraped patches normally stand out as a different shade from the surface around them. In walking across ground and then stepping on rocks, an animal may transfer some dirt onto the rocks.

When wind and rain build up soil deposits around a pebble, a little crater is formed which becomes visible when the pebble is dislodged from its socket. A freshly turned pebble or stone will generally appear different in colour, usually darker, from surrounding stones. A pebble that has been stepped on will have been imbedded in the ground.

If a small twig or dry branch is stepped on, a depression in the ground directly beneath it will normally be visible. Dead twigs and branches on the ground may be broken or cracked. To determine if the fracture is recent or old, similar twigs can be broken and compared.

A freshly turned dry leaf will appear darker in colour as the shaded part is exposed, compared to the sun-bleached surrounding leaves. Some mud may also cling to the side that was underneath. When the ground is covered with dry leaves, a trail of crushed leaves may be left behind when an animal has passed along. Where leaves lie thick and impressions made on them do not show at all, it may be possible to scrape them aside to examine the earth underneath.

A very distinct path will be made when tall grass or similar vegetation is bent in the direction of travel. Grass trampled or flattened presents a shiny surface to the sun; this makes the route followed a lighter colour than the surrounding grass. When an animal moves through dense bush or reeds, branches or reeds will be pulled in the direction of travel and some interlacing may occur when they are released. Displaced at an angle, bent or broken vegetation may have different reflective properties and appear different in colour.

Where dew or frost occurs, or after rain, the uniform distribution of droplets or ice will present a shiny surface. In these conditions an animal will leave a distinct path that will show up as a dark line where the ice or drops have been shed.

When an animal crossing a stream had to step into the water, water or wet mud may be displaced from the stream. If the river bottom can be seen, disturbed mud or overturned rocks or stones may be detected. Close to the water's edge, soft mud may also leave clear impressions.

Broken cobwebs may indicate that an animal moved through an opening between bushes; conversely, cobwebs across an opening indicate that an animal did not move through it. Disused holes in the ground are usually indicated by cobwebs across the opening, while occupied holes will be clean.

Scent

Animals produce secretions that leave a trail perceptible to the sense of smell. Scent-marking can also be carried out with urine and faeces. All animals that track follow scent, while humans, who do not have a good sense of smell, have to use dogs.

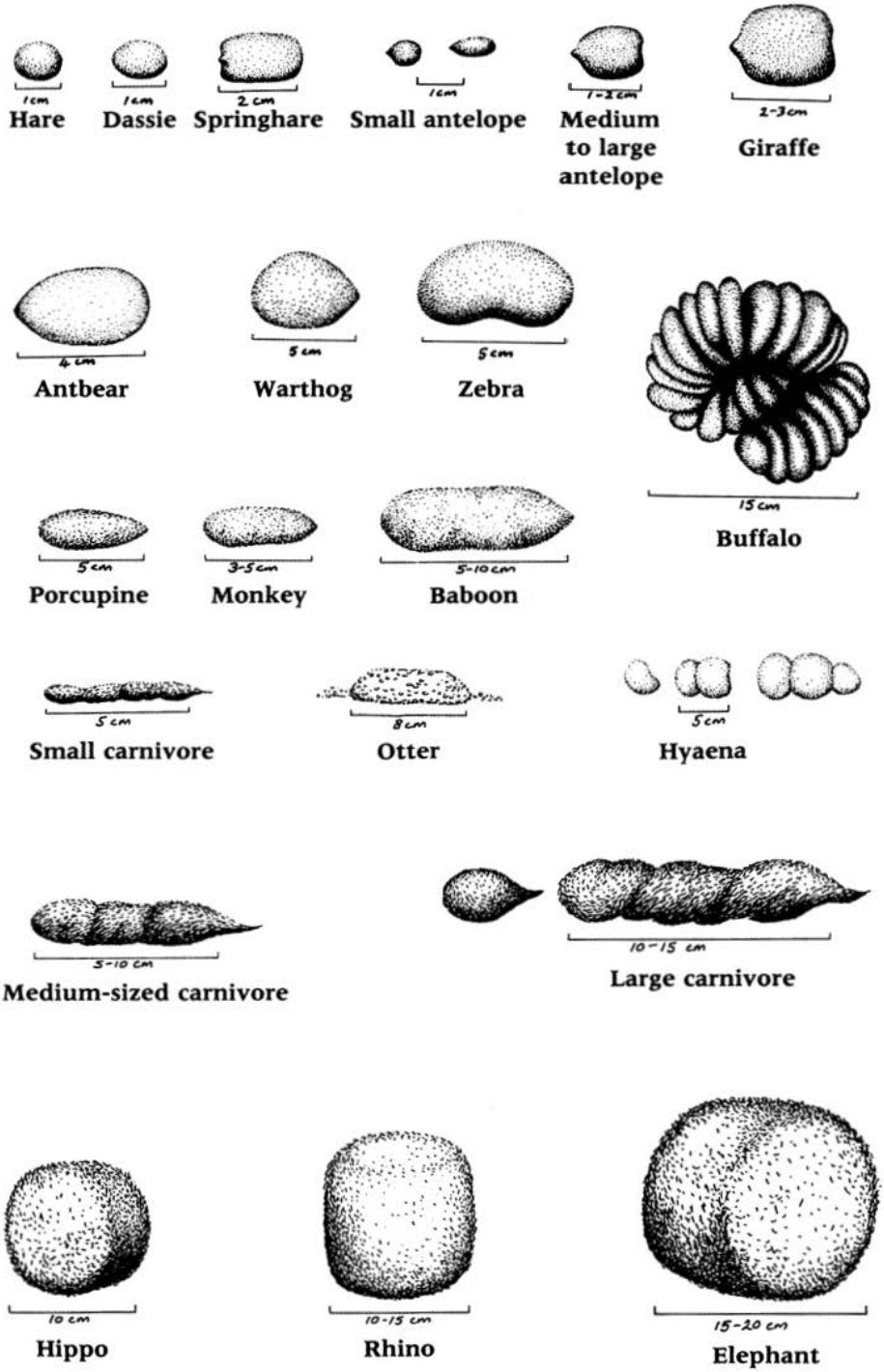
Scent is influenced by temperature and weather. Cool, calm conditions may help to preserve scent, while heat and wind may erase the scent trail. Conditions are better in the morning and evening than at midday, and also better in winter than in summer. Wet ground provides more favourable conditions than dry ground, but rain may obliterate scent. Scent also diminishes with time, so that dogs must follow a relatively fresh trail if they are to locate their prey.

When very close to them, experienced trackers can sometimes smell and identify animals such as Elephant, Buffalo, wildebeest, zebra, Waterbuck, Giraffe and Lion before they have seen them. After it has rained for a few days, when the air is very humid, a tracker may also be able to scent animals if the wind is right. Fresh droppings and urine also have a distinctive smell.

Faeces and urine

The easiest way to identify droppings is to look at fresh droppings associated with fresh footprints, since footprints are usually easier to identify than droppings. Apart from watching animals produce droppings, this is also the best way to learn how to recognise droppings. To document faeces adequately would require several colour photographs for each species, since many variations may occur for a particular species and even for a single individual, depending on what it has been eating and on its physical condition. Furthermore, many species produce droppings which have the same general shape, so the shape and size may not be enough to identify droppings as belonging to a particular species. In this section only the general characteristics of droppings are discussed.

Where the animal has already been identified by its footprints, droppings and urine may provide additional information in the interpretation of spoor. Fresh urine and faeces can give an indication of the age of the spoor, while a detailed examination of faeces may reveal what the animal has been feeding on. The position of the urine patch relative to the footprints can indicate the sex of the animal. For example, an antelope urinates with


1cm
Hare
1cm
Dassie
2 cm
Springhare
1cm
Small antelope
1-2cm
Medium to large antelope
2-3cm
Giraffe
4 cm
Antbear
5 cm
Warthog
5cm
Zebra
15 cm
Buffalo
5cm
Porcupine
3-5cm
Monkey
5-10cm
Baboon
5 cm
Small carnivore
8cm
Otter
5cm
Hyaena
5-10 cm
Medium-sized carnivore
10-15 cm
Large carnivore
10 cm
Hippo
10-15 cm
Rhino
15-20 cm
Elephant

its hind-legs straddled, thus indicating where the animal was standing. The urine patch of the male will lie between the tracks of the fore-feet and hind-feet, whereas that of the female will be between or behind the hind-feet tracks. The relative position of a urine patch to faeces deposited at the same time can also indicate the sex of the animal. If one looks at the footprints to determine the direction the animal was facing, a urine patch in front of the faeces usually indicates a male, whereas a urine patch on top of or behind the faeces usually indicates a female.

Where footprints have been obliterated or on hard ground where footprints are not clear, it is usually more difficult to interpret droppings by themselves. To identify them one needs to consider their shapes, sizes, colours, consistency, contents, the manner in which they were deposited and the context within which they are found. The shape and size of the droppings of some animals are so distinctive that they can easily be identified as belonging to a particular species, such as those of Elephants, rhino, Hippo, Buffalo and zebra. Sometimes the shape may not be distinctive, but the size may distinguish them, such as those of Lion or Giraffe which are bigger than other droppings of similar shapes. In some cases a few species may have similar droppings, such as the two hyaena species. However, the general shape and size of droppings may often be characteristic of a large number of species.

While the large, round droppings of Elephant, rhino and Hippo have the same shape, they are unmistakable. Those of the Elephant are the largest and those of the Hippo the smallest, while rhino use middens. The droppings of Black and White Rhino can be distinguished by their contents.

All the small antelope species produce droppings that have the same general shape and may vary only slightly in size. The same applies for medium-sized and large antelope. Giraffe droppings have the same shape as antelope droppings, but are larger. Antelope droppings generally consist of large numbers of small, round pellets, pointed at one end with an indentation at the other end. Sometimes they occur in clusters of pellets sticking together. Hares, Springhares and dassies also produce small round pellets, although they do not have the same shape as those of antelope.

While the droppings of zebra have a very distinctive, regular shape, those of Warthogs, which are similar in appearance, have an irregular round shape. While most vegetarians generally have round droppings, those of the Porcupine are cylindrical and pointed at one end.

The faeces of carnivores are usually cylindrical or sausage-shaped, with a point at one end. The droppings of hyaenas, however, are usually irregular round shapes, often sticking together. Omnivores, such as Baboons and Honey Badgers, also produce droppings that are generally cylindrical in shape.

In cases where the general shape of the droppings is the same, the size may vary according to the size of the individual, whether juvenile or adult, or the size of adults of a species. The size of herbivore droppings may also vary according to their liquid content. In the dry season the liquid will be less and the droppings may be much smaller than in the wet season. Droppings also shrink as they dry out, so old droppings may be much smaller than fresh droppings.

The consistency and shape of droppings may depend on the composition

of the food. Lush grass may produce soft, sometimes liquid faeces, whereas dry grass produces hard, dry droppings. The consistency may also depend on the condition of the animal. An individual that is ill or under stress may produce droppings that are runny.

The contents of droppings will reveal what the animal was eating, which may be characteristic of various species. The contents of the droppings of a grazer can be distinguished from those of a browser. The droppings of carnivores may contain hair and pieces of bone. Carnivore droppings, especially those of hyaenas, may turn white if they have a high calcium content. The droppings of otters and Water Mongooses contain bits of crab shells. Civet droppings may contain the remains of millipedes, insects, bits of fur and bone, and wild fruit pips. The droppings of Antbears and Aardwolfs consist mainly of sand which is swallowed with ants and termites.

The manner in which droppings are deposited may also help to narrow down the possibilities. Some animals scatter their droppings randomly, while others use middens. Some bury their faeces, while others use it for scent-marking their territories, in which case it may be deposited in an elevated position so that the scent is effectively disseminated.

Finally, the context within which the droppings are found may help to identify the animal. Animals that do not occur in that locality can obviously be ruled out, while it can be expected that an animal's droppings will usually be found within its preferred habitat.

Saliva

Saliva may sometimes be seen on leaves where an animal was feeding or on the ground at a salt lick. Fresh cuds may also be found on the ground.

Pellets

Many birds regurgitate those parts of their food which they cannot digest in compressed pellets. These may contain fur, feathers, chitin from insects, bones, pieces of mollusc shell and undigested plant material, and will often be covered with mucus. Some birds produce almost spherical pellets, while others produce cylindrical pellets with one or both ends rounded or pointed. Since each species has certain food preferences, the contents of the pellet may help to identify the species concerned. The location where the pellets were found would also be within the preferred habitat of the species; this will often help to narrow down the possibilities. Pellets are usually found at birds' roosting sites and nests, and sometimes in feeding areas.

Feeding signs

Depending on one's detailed knowledge of the diets of animals for a particular area and time of the year, feeding signs could help to identify spoor. Diets are very complex, however, and more than one animal can eat the same food. The remains left by large carnivores are usually also utilised by smaller carnivores and scavengers. Conversely, if the identity of the animal is already known from footprints, then feeding signs may give an indication of what that animal has been eating.

Feeding signs can also help one to follow a spoor. In the case of browsers, if it is known which bushes the antelope has a preference for, the tracker

may leave the spoor and go to the next bush where the antelope may have been feeding. Feeding Elephants may leave a trail of broken branches. Circling vultures can also help one locate feeding predators.

Most animals prefer to remain hidden when feeding, and may take their food to a special feeding place where they can be safe while feeding. Some animals may have feeding places out in the open. The larger carnivores, for example, have nothing to fear, while animals such as squirrels may position themselves in places from which they can detect an approaching enemy at a distance.

Apart from the choice of food, evidence in the form of marks left by the teeth or beak and methods of handling the food may also give an indication of the animal involved.

Vocal and other auditory signs

Vocal signs such as alarm calls can warn either the tracker or his or her quarry of danger. Since an alarm call usually alerts all other animals in the vicinity, trackers must be careful not to let other animals betray their presence. The Grey Lourie, *Corythaixoides concolor*, or 'go-away' bird, a source of annoyance to trackers, utters a loud drawn-out 'go-away' call when disturbed, and will often follow or fly ahead of intruders, thus alarming the quarry. Baboons may alert other animals by loud barks, and a Kudu may give a short bark before running off. Guineafowl may also frighten animals by rising and clacking.

A disturbance can also be indicated by the absence of vocal signs, such as the sudden silence of chirping crickets.

Other auditory signs include rustling grass or bushes, the crushing of leaves, the breaking of twigs and branches, stones and pebbles kicked in flight, splashing water or galloping hoofs. Depending on the quality of the sound, it may be possible to distinguish between a light and a heavy animal, or between one that is moving slowly and another moving swiftly.

Visual signs

Apart from actually seeing the animal itself, visual signs would include all signs of movement where the animal may be hidden from view. An animal's presence will often be betrayed by moving bushes or long grass. A fleeing animal may only be detected by the sudden movement of branches. When the slow rustling sound of a Crocodile in tall reeds is heard, its position could be indicated by the moving tips of the reeds. Or the presence of a Crocodile under water can be detected by small bubbles rising to the surface.

Incidental signs

Incidental signs are signs which may not necessarily be associated with the spoor in question. Such signs include tufts of hair, feathers or Porcupine quills. It should be noted that although tufts of hair or feathers may belong to the animal in question, they could have been blown there by the wind. Similarly Porcupine quills found next to a spoor that is difficult to identify, may not have belonged to that particular animal, but could have been lying there for some time.

Circumstantial signs

Circumstantial signs are any indirect signs in the immediate vicinity of a person or animal which may betray its presence. Such signs are usually seen in the behaviour of other animals. Birds may betray the presence of people to animals. Oxpeckers are most frequently found near large ungulates such as Buffalo, Eland and Kudu, upon which they clamber looking for ticks and blood-sucking flies. When approached, they will fly up and about, thus alarming the animals. Furthermore, animals may become restless. Baboons will move in short sprints and make a lot of noise. Antelope and Buffalo often stand and stare at intruders. Birds may also indicate the presence of snakes or dangerous animals such as Leopard or Lion.

Skeletal signs

Skeletal signs indicate the remains of animals and can be identified by the size and shape of the skull, the teeth and, if present, the horns. Skeletal signs may also provide the feeding signs of carnivores.

Territorial signs

Territorial boundaries may be scent-marked with urine, faeces or scent transferred to bushes from special scent organs. Scent will usually not be perceptible to humans, but territorial signs may be visible in the form of latrines, pawing and horning of shrubbery. Some small antelope wipe their preorbital glands on the tips of grass or twigs, leaving a black tarry secretion.

Paths

Most animals have a network of paths or runs which they follow most of the time. Paths will always take the route that is easiest to follow, going round obstacles. Several animal species may sometimes use the same path or parts of it. They may also use man-made paths and roads, incorporating these into their own network. Paths are usually most distinct in the vicinity of good feeding places and especially around waterholes. In the immediate vicinity of a waterhole, paths are most distinct as animal movement is concentrated towards it, forming a clearing around the waterhole itself. Further away from the waterhole paths become less distinct as they radiate outwards, branching off into smaller paths. In heavily wooded areas and forests, a network of paths is usually the only accessible route that animals can follow through the thick undergrowth.

Homes and shelters

Most animals continually move their sleeping quarters, and may only have a fixed home during the breeding season to protect the young. Some animals lack even this, the young being capable of leaving their birth-place soon after they are born, and continually shift the places where they sleep. Only a few animals have a permanent home which they use throughout the year. Homes are usually inconspicuous and in sheltered or inaccessible places so that they are difficult to find.

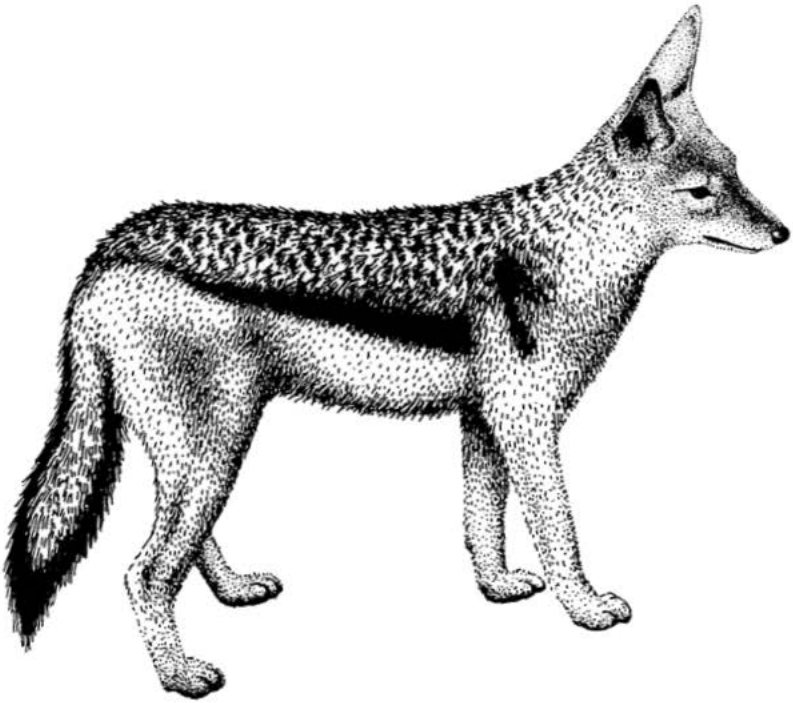
The most common homes found are birds' nests. They are usually well sheltered among the leaves of trees and bushes or in ground vegetation.

Nests of different species are characterised by their position, size, structure and materials used, and vary considerably in appearance.

Some small mammals build their homes in vegetation, which may look very much like birds' nests. Squirrels build their dreys in trees, usually close to the trunk. They are spherical and externally consist of loosely plaited twigs lined with grass or leaves.

Animals which do not construct homes or shelters, and simply lie down to rest in a sheltered place, often leave a depression with distinct impressions of the animal limbs and body. Hares create distinctive forms in sheltered places in long grass or next to bushes.

Many animals make their homes in the ground, often with a system of burrows. Underground burrows may sometimes be revealed by heaps of excavated soil. A number of creatures, such as Antbears, play an important ecological role in that their disused holes are often used by other animals for shelter. The occupant of a burrow may be identified if one looks at the size of the entrance hole, its position, and the method used to remove excavated soil, as well as tracks and droppings in front of and inside the entrance.



3

Spoor Interpretation

Apart from identifying animal tracks and being able to follow a trail, trackers must also be able to interpret the animal's activities so that they can anticipate and predict its movements.

Lying, sitting and standing

The imprints made by an animal's body and by its legs folded underneath the body will indicate when an animal has been lying down. Where an animal has been lying down in grass, the grass will be flattened out in the shape of its body. The sitting position is usually revealed by the hind-limbs showing right up to the heels, with the imprints of the fore-feet in between and the tail showing behind. When standing, the feet are usually apart and pointing slightly outwards, especially the fore-feet.

Gaits

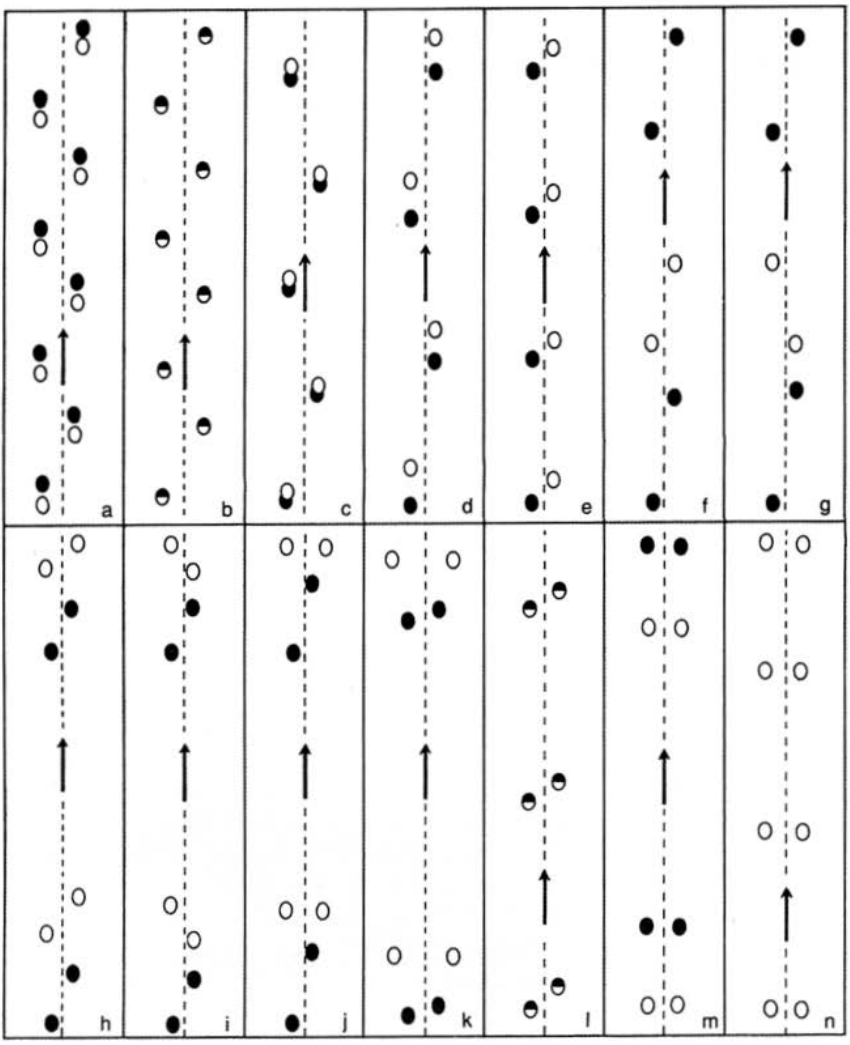
When footprints are neat and clear, showing all the fine detail that could possibly show, they usually indicate that the animal was standing stationary or moving slowly. When the animal was moving fast, the toes will have splayed, the feet may have slipped, sand may be kicked up and the footprint may be partly obliterated. The direction of movement and the length of the stride may be revealed by the depth and angle of the imprint, together with the direction in which the sand had been thrown. The length of the stride indicates the speed of the animal, while the positions of the tracks relative to each other reflect the animal's gait.

Walking

When walking, each of the four feet is lifted and set down on the ground at a different time, each limb moving separately. The legs are moved in a definite order. The right fore-leg is followed by the left hind-leg, which is followed by the left fore-leg, which is followed by the right hind-leg, and so on. The hind-foot is always placed close to the point where the fore-foot was placed, so that its track is made a little behind, right over or just in front of the track of the fore-foot, depending on the speed the animal is walking. Where the fore-foot track is covered by that of the hind-foot, the tracks are said to register.

When the animal is walking slowly, the hind-foot track will be behind the fore-foot track, and when it is walking fast the hind-foot track will be in front of the fore-foot track. In the slow walk, only one foot is moved at a time, with three feet always on the ground. This is the normal walk of heavy animals such as Buffalo and rhinoceroses, while antelope move in this way while grazing.

In the normal and fast walk of most animals, two feet are in motion at the



Relative positions of footprints for different gaits. The fore-foot tracks are indicated by black dots and the hind-foot tracks by white dots. Where the hind-foot track registers on the fore-foot track it is indicated by a half-black and half-white dot. Key: (a) slow walk (b) normal walk (c) trot (d) fast trot (e) trot with obliquely positioned footprints (e.g. foxes, jackals and some dogs) (f) transverse gallop (g) lateral gallop (h) transverse jump or bound (i) lateral jump or bound (j) half bound (k) jump with hind-feet tracks side by side (l) jump with hind-feet tracks registered in fore-feet tracks (m) stotting (n) bipedal hops. (After Bang and Dahlstrom, 1972)

same time, each foot being followed by the next one when it is half way through its stride, and two feet are always on the ground.

In the running walk, the tempo is so fast that in some phases only a single foot is on the ground at a time. The running walk is not so speedy as the trot and few animals adopt it naturally, except the Elephant, whose only speedy gait this is.

Pacing

When pacing, the fore-leg and hind-leg of the same side move at the same time. At a walking speed, this gait is used by antelope like Springbok and Blesbok.

Trotting

When trotting, the diagonal feet are placed in pairs at the same time. For example, the right fore-foot and left hind-foot are lifted and set down at the same time, and then the left fore-foot and right hind-foot. With the slow trot, two feet are always on the ground; this is used by sluggish or clumsy animals such as tortoises and badgers. With the fast trot there is an interval of suspension, with no feet on the ground.

The trail is very similar to that produced by walking, but the stride is greater and the straddle less. The length of the stride is the distance between two successive tracks from the same foot, and the straddle is the distance, perpendicular to the direction of motion, between the left and right tracks. The faster an animal trots the greater is the stride and the smaller is the straddle, so that in a very fast trot the tracks of the right and left side almost lie on a single line. On firm ground the hind-foot usually strikes the ground in front of the track made by the fore-foot, and the faster the speed, the further in front it falls.

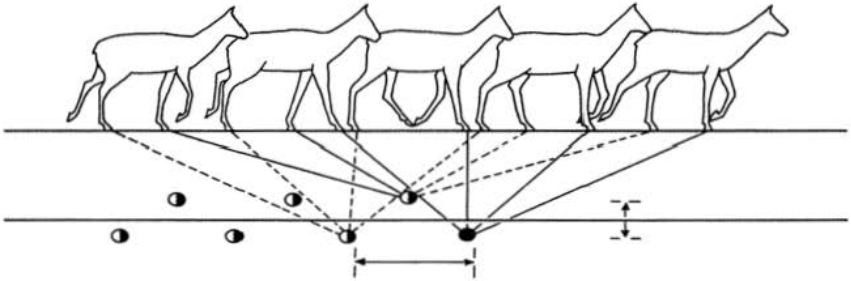
Some animals, like foxes, jackals and some dogs, leave a trotting trail in which both fore-foot tracks lie on one side and both hind-foot tracks on the other side. The trail appears as a row of obliquely positioned pairs of footprints, each of which consists of a fore-foot track with a hind-foot track placed obliquely forwards and to one side. This happens because the animal trots with its body positioned at an angle to the direction of travel so that the fore-legs are never in the way of the hind-legs. Now and again it may shift the rear part of its body to the other side.

Galloping

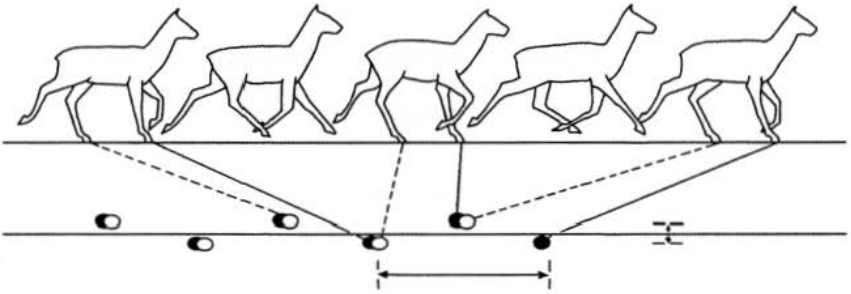
In the gallop there is a phase in which the animal is airborne. The four legs work in quick succession one after the other. The footfall sequence varies with the speed or kind of animal. In the transverse gallop, either one of the hind-feet is followed by the other and then by the diagonal fore-foot, followed by the other fore-foot. In the lateral gallop, either one of the hind-feet is followed by the other and then by the fore-foot on the same side, followed by the other fore-foot. An animal may lead with either front foot, or it may change from one to the other.

Bounding

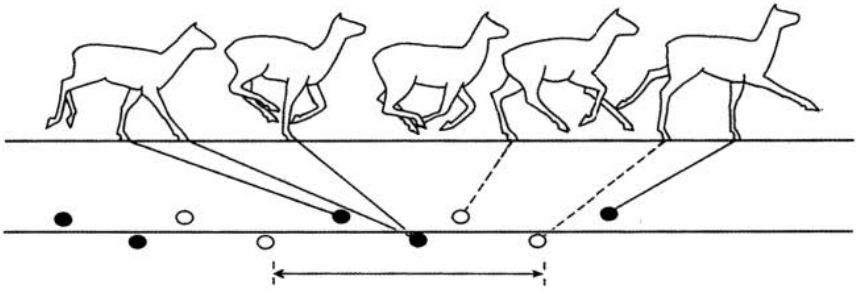
As the speed of the gallop increases, the gait becomes more like a jump. The bound is a fast gait intermediate between a gallop and a jump, in which the take-off of the hind-limb lifts it from the ground and propels it into the air.



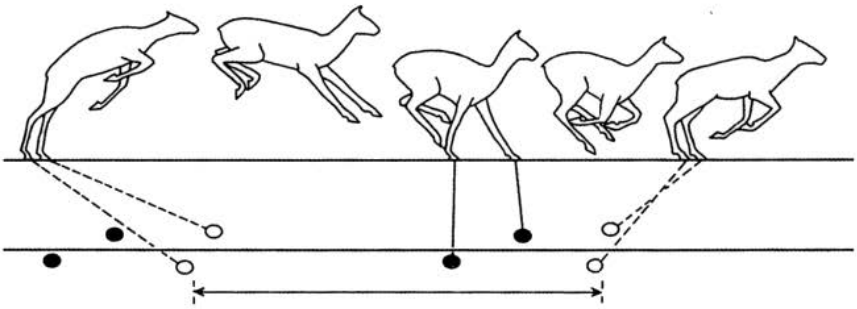
Walking: 1 The right hind-foot is placed in the track of the right fore-foot, which has just left the ground; when the right fore-foot is half-way through its stride, the left hind-foot leaves the ground, while the other two feet are on the ground. 2 The right fore-foot is placed on the ground, while the left hind-foot is half-way through its stride. 3 The left fore-foot leaves the ground just before the left hind-foot is placed in its track, while the animal is supported on the other two legs. 4 The left hind-foot is placed on the ground while the left fore-foot is moved forwards. 5 The right fore-foot is lifted, while the left hind-foot and right fore-foot are on the ground. The position is as in No. 1, but with the opposite feet. The left fore-foot will be placed on the ground, followed by the right hind-foot, and so on. (After Bang and Dahlstrom, 1972)



Trotting: 1 With the left fore-foot and right hind-foot already off the ground, the animal takes off from the right fore-foot and left hind-foot. 2 While the animal is in the air, the left fore-foot and the right hind-leg are moved forwards. 3 The left fore-foot and the right hind-foot are placed on the ground simultaneously. The right hind-foot registers approximately in the track of the right fore-foot. 4 The animal is again in the air while the right fore-leg and the left hind-leg now move forwards. 5 The right fore-foot and the left hind-foot are placed on the ground. The left hind-foot registers approximately in the track of the left fore-foot. (After Bang and Dahlstrom, 1972)



Galloping: 1 The animal is supported on the fore-legs, but is shifting its weight from the left fore-leg to its right. The hind-legs are moving forwards. 2 In the take-off the weight of the animal is supported only on the right fore-foot. 3 The animal is in the air while the hind-legs move forwards. 4 The left hind-foot touches the ground, while the other legs move forwards. 5 The animal is supported on the right hind-leg and left fore-leg, but as the right fore-foot is placed on the ground, the hind-legs will move forwards as in No. 1. (After Bang and Dahlstrom, 1972)



Jumping: 1 The animal pushes off from the hind-legs. 2 The animal is in the air with the fore-legs stretched out before landing. 3 The right fore-foot reaches the ground a fraction before the left fore-foot, after which the fore-feet leave the ground again. 4 The animal is in the air with all four legs tucked up under it. 5 The hind-legs reach the ground and start a new jump. (After Bang and Dahlstrom, 1972)

Mammals with short legs or long, limper bodies use the hind-legs close together or even employ them as a unit to accomplish the half-bound or the bound, but the fore-feet are used separately. There are many possible transitions between a jump and a gallop so that it is not possible to define any sharp boundary between them.

Jumping or hopping

In jumping or hopping, the animal is momentarily airborne, taking off with both hind-legs so that it is projected forwards in an arc, and landing on the fore-legs, which usually hit the ground one a little in front of the other. The fore-legs carry the animal a short distance forwards, and then leave the ground again. The hind-legs then land a little in front of the fore-foot tracks.

A jumping trail consists of groups of four footprints. The two fore-foot tracks will lie close to each other, with one a little behind the other, and in front of them the hind-foot tracks will lie more or less side by side. In some animals one or both of the hind-feet may register with the tracks of the fore-feet. Jumping or hopping is the commonest gait of many small animals with powerful hind-legs, such as small rodents.

Stotting

Stotting is performed by animals such as Springbok and Oribi when they are under stress or being chased. The back is arched and the legs are held stiffly downwards as the animal leaps off the ground. It lands on all four legs simultaneously and then shoots up into the air again, repeating the movement several times.

Bipedal hop

In the bipedal hop, both hind-feet are used in unison, while the fore-feet are held close to the body. A long tail usually provides balance. This gait is used by mammals with powerful hind-legs and reduced fore-legs, such as the Springhare and the Bushbaby. In the trail, the tracks occur in pairs.

Bipedal walk and run

Bipedal walking, in which the hind-legs are used alternately, produces tracks in a zigzag or sometimes in a straight line. In running, the length of the stride is greater than in walking, but the straddle is less.

Actions

Apart from specific gaits, the various actions of the animal may also be indicated by the tracks.

Signs of digging may be characteristic of the species, such as the distinctive claw-marks made by the Springhare and the Antbear, or the narrow hole dug by the Bat-eared Fox. The type of food dug out, whether roots, bulbs or termites, may also indicate the animal involved. Animals like Baboons turn over rocks to look for insects, spiders or scorpions, and pull up clumps of grass and shake off the soil before eating them.

Feeding signs of specific animals will not only indicate what they were feeding on, but also how they were feeding. The methods of handling food may be characteristic of a species.

Grooming activities will be indicated by the position in which the animal

was sitting to scratch itself. Signs of rolling on the ground may be evident where an animal had a dust bath or wallowed in mud. Animals like rhinoceroses rub themselves against logs, which often become well worn after repeated use.

Territorial male antelopes may demonstrate the presence of a threat by pawing and horning of shrubbery. Ground-horning in moist, soft ground may also be carried out by some antelope.

Virtually all conceivable actions leave distinctive markings, which may make it possible for the tracker to reconstruct the animal's activities.

Determining the age of spoor

One of the most difficult aspects of spoor interpretation is determining the age of spoor. Only a very experienced tracker can fix the age with reasonable accuracy, while absolute accuracy is probably impossible.

A reasonably accurate way of determining the age of spoor is possible if an animal was resting in the shade of a bush. The position of the marks on the ground where the animal was lying or standing indicates where the shade fell, and therefore what the position of the sun was, so it is possible to calculate from the movement of the sun when the animal rested.

If the tracks of a moving animal go under the west side of trees, the animal was catching the morning shade, while if they go under the east side, the afternoon shade, and if under either side, the animal was moving at midday.

When studying the ageing processes of spoor, a tracker can only make an intuitive estimate of the age. In some cases, where the ageing process is relatively rapid, it is possible to make a reasonably accurate estimate. However, because of the complexity of factors involved, accuracy is usually not possible, especially where the ageing processes are slow and variable.

Heat and humidity, which determine the rate at which moisture content is lost, may vary considerably depending on the time of the day, the prevailing weather conditions and the season. Spoor ages faster in the heat of the day than during the cooler part of the day or night. On a hot, dry day it will age faster than on a cool, humid day, so the rate of ageing may vary considerably from one season to another. Wind not only increases the rate at which moisture is lost, but also has an eroding effect. Tracks made in shade and shelter will also be less affected by the sun and wind.

The most accurate indications of spoor age are provided by signs that involve rapid moisture loss, since these signs change relatively rapidly in the early stages. Examples of such signs are saliva on the leaves or on the ground where the animal was feeding or licking for salt, fresh urine and droppings, and water that has been splashed on the ground next to waterholes or rivers.

In muddy ground, tracks may dry out in a very short time or may remain wet for a long time, depending on the moisture content of the ground and the weather conditions. Wet ground can be very misleading as any spoor remains visible and fresh-looking for a considerable time. Once dried out, footprints may retain their fresh, sharp appearance for a very long time, so it will be very difficult to make an accurate estimate of their age.

The rate at which the wind erodes a spoor is usually hard to estimate, because it may vary considerably depending on how strong and for how long the wind was blowing. Fresh footprints will have sharp edges which will be rounded off by the wind. Over time they will lose definition, and leaves, seeds and loose sand will gather in them. Leaf spoor, created by leaves rolling in the wind, may also be superimposed on the tracks.

The rate of discolouring of spoor is also difficult to estimate, since changes may be very subtle and the rate of change may be very slow. Fresh footprints expose the darker colour of the ground beneath the surface, which will gradually change to the colour of the ground on top as it is exposed to the sun. When stones and leaves are overturned, their darker undersides become exposed, and these will also gradually become lighter in colour.

Broken vegetation will discolour at the break, and the rate of change may differ for various types of vegetation as well as according to the prevailing weather conditions. To obtain an indication of the colour change, a new break should be made and compared with the old. Leaves may also be knocked down by a moving animal, or dropped by a feeding animal. These leaves are sometimes still green when they drop on the ground and will discolour as they dry out. Furthermore, one can sometimes determine when a flattened tuft of grass was stepped on by noting the amount of spring-back.

The activities of an animal may help provide an approximate estimate of the age of spoor if its habits are known. If an animal is either diurnal or nocturnal, the tracks would have been made either in the day or in the night. During the midday heat, an animal may rest up in a dense thicket, or at night it may sleep out in the open. Some animals go to waterholes or pans at specific times of the day, and move to their favoured grounds according to a set routine.

On the basis of a detailed knowledge of the habits and movements of other animals, one can determine the relative age of a spoor from superimposed animal spoor. If the spoor of a nocturnal animal is superimposed on the quarry's spoor, the latter was probably made during the night or the previous day. Furthermore, if the quarry is diurnal, then its spoor would have been made the previous day. If the quarry's spoor is superimposed on a nocturnal animal's spoor, the former was probably made during the night or earlier that same day, and if the quarry is diurnal, it would have been made the same day. In the process of tracking the quarry, the spoor of several animals may be found superimposed on top of the quarry's spoor, or the quarry's spoor superimposed on the spoor of other animals, so that an upper and lower limit for the age of the quarry's spoor can be determined.

Dew, mist and rain may also give an indication of the relative age of spoor. If dew has fallen on top of the spoor, the spoor was made during the night or the previous day, while spoor on top of dew would have been made earlier that same day. Dew dripping from branches may also form pock marks in spoor made during the night or early morning. Spoor through long grass, made before dew or rain, will be covered with drops. If it was made after dew or rain, the drops will be shed off. Again, if rain or mist has fallen since the track was made, there will be pock marks in the

track. Conversely, if a track was made after rain or mist has fallen, there will be pock marks around but not inside it. Heavy ground fog will also smooth down spoor and leave pock marks under leafy branches.

Although superimposed animal spoor, dew, mist or rain do not enable one to determine the actual age of the spoor, they do indicate the chronological sequence of a series of events involving the animal. As more information is gathered, the tracker may revise his or her hypotheses to recreate a more detailed sequence of events, combining information on the animal's own activities with an understanding of when these occurred relative to other animals' activities.

Reconstruction of activities

To reconstruct an animal's activities, specific actions and movements must be seen in the context of the animal's whole environment at specific times and places.

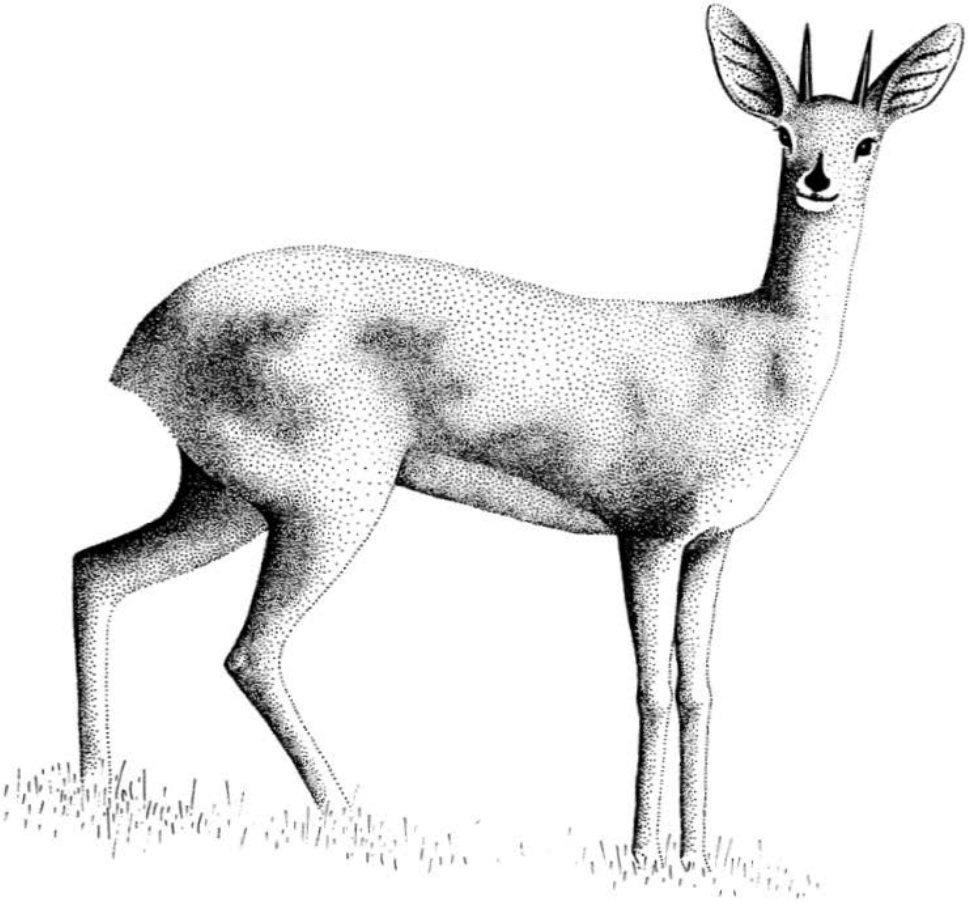
Where an animal is moving at a steady pace in a specific direction, or following the easiest route along a well-defined path, and it is known that there is a waterhole ahead, one can predict that the animal is probably going to the waterhole. A browsing antelope will move slowly from bush to bush, usually in an upwind direction, so a tracker who knows its favourite food will be able to anticipate the next bush the antelope would have gone to.

The animal's relationships with other animals also influence its actions and reactions. If a walking or trotting animal stops to look at something, this will be indicated by the fore-feet being turned towards the direction the animal was looking. There may be signs of a confrontation between a territorial male antelope and an intruder, such as pawing marks and horning of shrubbery by the one, and signs of flight by the other, or signs of fighting between two serious competitors. Signs of a sudden stampede often indicate that the animals were fleeing from danger, and the tracks of a predator may be found close by. Or tracks will show where a predator stalked its prey, and rushed up to bring down the fleeing animal. The fleeing animal may have been crashing through bushes, and its skeletal remains are sometimes surrounded by signs of its last struggle, followed by signs of feeding predators with the spoor of scavengers superimposed on those of the predators.

Since tracks may be partly obliterated or difficult to see, trackers will only have fractional evidence, and their reconstruction of the animal's activities will have to be based on creative hypotheses. To interpret the spoor they must use their imagination to visualise what the animal would have been doing to create such markings. Such a reconstruction will contain more information than is evident from the spoor, and would therefore be partly factual and partly hypothetical. As new factual information is gathered in the process of tracking, hypotheses may have to be revised or replaced by better ones.

Detailed knowledge of an animal's habits, which may partly be based on hypothetical spoor interpretation, as well as knowledge of the environment, enables the tracker to extrapolate from incomplete evidence to recreate a complete account of the animal's activities. Spoor interpretation

need not only be derived from evidence from the spoor itself, but also from activities implied by the spoor in the context of the environment and in the light of the tracker's knowledge of the animal's behaviour. A hypothetical reconstruction of the animal's activities usually enables the tracker to anticipate and predict the animal's movements.



4

Principles of Tracking

Recognition of signs

To be able to recognise signs trackers must know what to look for and where to look for them. Someone who is not familiar with spoor may not recognise it, even when looking straight at the sign. It may seem as if no signs are present at all. In order to recognise slight disturbances in nature, trackers must know the pattern of undisturbed nature. Only when they are familiar with the terrain, the ground and the vegetation in its natural state, will they be able to recognise very subtle disturbances in it.

In order to recognise a specific sign, a tracker often has a preconceived image of what a typical sign looks like. Such a typical sign will be defined by certain characteristics which enable the tracker to recognise specific patterns in signs with corresponding characteristics. Without such preconceived images many signs may be overlooked. However, with a preconceived image of a specific animal's spoor in mind, trackers will tend to 'recognise' spoor in markings made by another animal, or even in random markings. Their mind will be prejudiced to see what they want to see, and in order to avoid making such errors they must be careful not to reach decisions too soon. Decisions made at a glance can often be erroneous, so when encountering new signs, time should be taken to study them in detail.

While preconceived images may help to recognise signs, the tracker must, however, avoid the preconditioned tendency to look for one set of things in the environment to the exclusion of all others. If one goes out with the intention of seeing a particular set of things, the mind is shut off from everything else. Trackers need to vary their vision in order to see new things.

Trackers will always try to identify the trail positively by some distinguishing mark or mannerism in order not to lose it in any similar spoor. They will look for such features in the footprints as well as for an individual manner of walking. Often hoofs of antelope are broken or have chipped edges or when it is walking may leave a characteristic scuffmark. Experienced trackers will memorise a spoor and be able to distinguish that individual animal's spoor from others. When following a spoor, trackers will walk next to it, not on it, taking care not to spoil the trail so that it can easily be found again if the spoor is lost.

The shadows cast by ridges in the spoor show up best if the spoor is kept between the tracker and the sun. With the sun shining from behind the spoor, the shadows cast by small ridges and indentations in the spoor will be clearly visible. With the sun behind the tracker, however, these shadows will be hidden by the ridges that cast them. Tracking is easiest in the

morning and late afternoon, as the shadows cast by the ridges in the spoor are longer and stand out better than at or near midday. As the sun moves higher in the sky, the shadows grow shorter. At midday the spoor may cast no shadows at all, making them difficult to see in the glare of the sunlight.

Trackers will never look down at their feet if they can help it, since this will slow them down. By looking up, well ahead of themselves, approximately five to ten metres depending on the terrain, they are able to track much faster and with more ease. Unless they need to study the spoor more closely, it is not necessary to examine every sign. If they see a sign ten metres ahead, those in between can be ignored while they look for spoor further on. Over difficult terrain it may not be possible to see signs well ahead, so trackers will have to look at the ground in front of them and move more slowly.

Trackers must also avoid concentrating all their attention on the tracks, thereby ignoring everything around them. Tracking requires intermittent attention, a constant refocussing between minute details of the track and the whole pattern of the environment.

Anticipation and prediction

Although in principle it is possible to follow a trail by simply looking for one sign after the other, this may prove so time-consuming that the tracker will never catch up with the quarry. Instead, trackers should place themselves in the position of their quarry in order to anticipate the route it may have taken. They will thereby be able to decide in advance where they can expect to find signs and thus not waste time looking for them.

Trackers will often look for spoor in obvious places such as openings between bushes, where the animal would most likely have moved. In thick bushes they will look for the most accessible throughways. Where the spoor crosses an open clearing, they will look in the general direction for access ways on the other side of the clearing. If the animal was moving from shade to shade, they will look for spoor in the shade ahead. If their quarry has consistently moved in a general direction, it may be possible to follow the most likely route by focussing on the terrain, and to look for signs of spoor only occasionally. They must, however, always be alert for an abrupt change in direction.

Animals usually make use of a network of paths to move from one locality to another. If it is clear than an animal was using a particular path, the path can simply be followed up to the point where it forks, or where the animal has left the path. Where one of several paths may have been used, trackers must of course determine which path that specific animal used. This may not always be easy, since many animals often use the same paths.

In areas of high animal densities that have much-used animal paths which interlink, it may seem impossible to follow tracks. However, once tracks have been located on an animal path, it is often possible to follow the path even though no further tracks are seen. By looking to either side of the path, one can establish if the animal has moved away from the path, and then follow the new trail.

In difficult terrain, where signs are sparse, trackers may have to rely extensively on anticipating the animal's movements. In order to move fast enough to overtake the animal, one may not be able to detect all the signs.

Trackers sometimes identify themselves with the animal to such an extent that they follow an imaginary route which they think the animal would most likely have taken, only confirming their expectations with occasional signs.

When trackers come to hard, stony ground, where tracks are virtually impossible to discern, apart from the odd small pebble that has been overturned, they may move around the patch of hard ground in order to find the spoor in softer ground.

Should the trackers lose the spoor, they should first search obvious places for signs, choosing several likely access ways through the bush in the general direction of movement. When several trackers work together, they can simply fan out and quarter the ground until one of them finds it. An experienced tracker may be able to predict more or less where the animal was going, and will not waste time in one spot looking for signs, but rather look for it further ahead.

Knowledge of the terrain and animal behaviour allows trackers to save valuable time by predicting the animal's movements. Once the general direction of movement is established and it is known that an animal path, river or any other natural boundary lies ahead, they can leave the spoor and move to these places, cutting across the trail by sweeping back and forth across the predicted direction in order to pick up tracks a considerable distance ahead.

If the animal was moving in a straight line at a steady pace, and it is known that there is a waterhole or a pan further ahead, trackers should leave the spoor to look for signs of it at the waterhole or pan.

While feeding, an animal will usually move into the wind, going from one bush to another. If the trackers know the animal's favoured food, and know moreover how they generally move, they need not follow its zigzag path, but leave the spoor at places, moving in a straight course to save time, and pick up the spoor further on.

To be able to anticipate and predict the movements of an animal, trackers must know the animal and its environment so well that they can identify themselves with that animal. They must be able to visualise how the animal was moving around, and place themselves in its position.

Since signs may be fractional or partly obliterated, it may not always be possible to make a complete reconstruction of the animal's movements and activities on the basis of spoor evidence alone. Trackers may therefore have to create a working hypothesis in which spoor evidence is supplemented with hypothetical assumptions based not only on their knowledge of animal behaviour, but also on their creative ability to solve new problems and discover new information. The working hypothesis is often a reconstruction of what the animal was doing, how fast it was moving, when it was there, where it was going to and where it might be at that time. Such a working hypothesis enables the trackers to predict the animal's movements. As new information is gathered, they may have to revise their working hypothesis, creating a better reconstruction of the animal's activities. Anticipating and predicting an animal's movements, therefore, involves a continuous process of problem-solving, creating new hypotheses and discovering new information.

Stealth

In order to come close to an animal, trackers must remain undetected not only by the animal, but also by other animals that may alert it. Moving as quietly as possible, trackers will avoid stepping on dry leaves and twigs, and take great care when moving through dry grass.

If the trackers are in close proximity to the animal, it is important that they remain downwind of it, that is, in a position where the wind is blowing away from the animal in the direction of the tracker. They must never be in a position where their scent could be carried in the wind towards the animal and thereby alert it. It is also important that the animal does not have the opportunity to cross their tracks, since the lingering human scent will alert it. Most animals prefer to keep the wind in their faces when travelling so that they can scent danger ahead of them. Trackers will therefore usually be downwind from them as they approach the animals from behind. The wind direction may, however, have changed. If the wind direction is unfavourable, the trackers may have to leave the spoor to search for their quarry from the downwind side.

As the trackers get closer to the animal, they must make sure that they see it before it sees them. !Xõ trackers maintain that an animal keeps looking back down its own trail, always on the alert for danger coming from behind. When the spoor is very fresh, trackers may have to leave the spoor so that the animal does not see them first. Animals usually rest facing downwind, so that they can see danger approaching from the downwind side, while they can smell danger coming from behind them. An animal may also double back on its spoor and circle downwind before settling down to rest. A predator following its trail will move past the resting animal on the upwind side before realising that the animal had doubed back, and the resting animal will smell the predator in time to make its escape.

When stalking an animal, trackers use the cover of bushes, going down on their hands and knees where necessary. In long grass they go down on their stomachs pulling themselves forward with their elbows. The most important thing is not to attract attention by sudden movements. Trackers should take their time, moving slowly when the animal is not looking, and keeping still when the animal is looking in their direction. When stalking an animal, trackers must also be careful not to disturb other animals. A disturbed animal will give its alarm signal, thereby alerting all animals in the vicinity, including the animal being tracked down.

5

Learning to Track

For the traditional hunter, learning to track is a natural process that becomes part of his or her way of life from early childhood. Those who are not full-time hunters cannot expect to ever reach the level of skill and expertise attained by hunters whose survival depends on their tracking abilities. Any intelligent person, however, should be able to master the basics of tracking. But reading this book will not in itself make one a tracker, since tracking demands practical skills acquired only through many hours of practice and experience over a long period. Furthermore, once this skill is acquired it should be maintained through continued practice on a regular basis, since one will soon become ineffective if one does not exercise it.

The average person should by practice and experience be able to become a fair tracker, but really outstanding trackers are probably born with the latent ability. Qualities required include good senses (or good glasses for poor eyesight), acute observation, physical fitness, patience, perseverance, concentration, alertness, a good memory, an analytical mind, an understanding of nature, intuition and a creative imagination.

Apart from the tracker's own ability, the ease or difficulty of tracking depends on other factors as well. The type of ground, vegetation and weather conditions will determine the degree of skill required to recognise and interpret spoor. It is, for example, more difficult to track on hard, stony ground than in soft sand. In overcast weather, spoor lacks depth while rain may completely obliterate it. One must also consider the extent to which other similar tracks may confuse or blur spoor in areas of high animal densities.

The easiest way to learn how to track is to have an experienced tracker teach you. The tracker would point out and explain all the signs until you are able to recognise and interpret the signs yourself. Expert trackers, however, are few and far between, and even if they were available, most of them don't speak English, so you would need a good translator to communicate with them.

Teaching yourself is much more time-consuming, but it is also more exciting to make new discoveries yourself. When teaching yourself it is easiest to start studying your own tracks. This can be done with a two-phase method which should be repeated until the two phases fuse into one.

Phase one. Marking the point where you start off, lay out a spoor for yourself. Going back to the starting point, start by carefully studying every sign of your own spoor. After completing the course, which may take quite a long time at first, return to the starting point.

Phase two. The course now consists of two trails, and since you've been over it twice, you should know where it is going. The second phase simply consists of walking over the already known course at a fast pace. Looking well ahead of you, try to see as many signs as possible.

In Phase one you concentrated on recognition and interpretation, while neglecting aspects like speed, momentum, looking well ahead and anticipation. In Phase two you already know the spoor and must now concentrate on the aspects which were previously neglected. At first you will probably miss most of the signs, but after repeating Phase two several times you will start recognising more of them.

Repeating this two-phase exercise several times, you will improve the speed of Phase one, while finding more signs during Phase two. This exercise should be repeated over different types of terrain, starting with easy terrain and gradually working towards the more difficult types.

When you have developed the ability to track down your own trail you should get someone else to lay out a trail for you. This spoor will obviously be more difficult. The object of the exercise is to develop an ability to anticipate and predict an unknown trail. It is easier with another person than with an animal, because you can easily identify with that person and think where you would have gone if you were in his or her position.

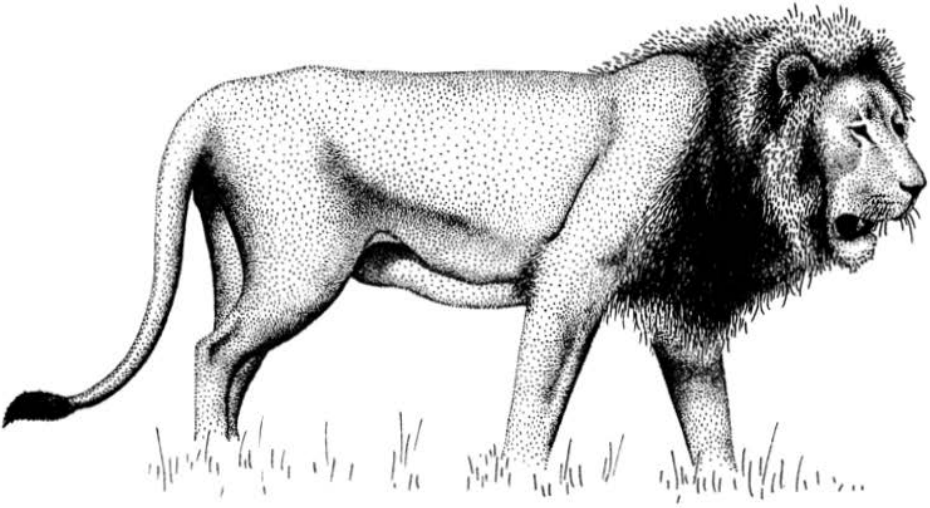
While in the previous exercise you concentrated on each and every sign, in this exercise you should try to follow the trail by anticipating and predicting the person's movements while looking at only a few signs. Looking at the terrain ahead, try to imagine the most likely route the person would have taken, and go and look for signs well ahead, neglecting those in between. A lot of time can also be saved by taking short cuts. If you know the area well, and you are able to predict where the person might be going to, you could simply go to that place and track down the trail from there. If you lose the spoor, several likely routes should first be searched for signs. Should this prove unsuccessful, work in a complete circle to look for fresh leads, working in wider circles until the spoor is found. You may also walk out in a wide perimeter around the area, using natural boundaries where tracks would be obvious, such as paths or river banks.

While it is relatively easy to anticipate and predict the movements of another person, it will be much more difficult to identify with an animal if you do not know it very well. The best way to learn how to interpret animal tracks is to watch an animal and then go and study its tracks. In learning to track an animal, it may be easiest to start by following the trail, studying all the signs in detail in order to come to know the animal's habits. Start by studying animal tracks, gaits and activities in easy terrain, such as barren dunes along beaches or in arid regions. This will help you visualise tracks and signs in terrain where footprints are not obvious. From terrain with soft substrate and sparse vegetation, move on to soft substrate and denser vegetation. Once terrain with soft substrate and denser vegetation has been mastered, first try harder, stony substrate with sparser vegetation before attempting hard, stony substrate with dense vegetation. Eventually, as you get to know the animal, you may be able to anticipate and predict its movements, so that it will not be necessary to look for all the signs. An experienced tracker who knows an animal does not have to follow it everywhere it went. Apart from anticipating its movements by looking at

the terrain ahead, the tracker may be able to predict its movements, leaving the spoor at places and picking it up further ahead to save time.

Besides interpreting the animal's activities in order to predict its movements, it is also very important to be able to determine the age of the spoor. The tracker must know whether a spoor is fresh enough to follow up, or too old, in which case he will never catch up with the animal. He should be able to tell if the spoor is so fresh that the animal may be very close, since the animal may be alarmed if he does not approach it with stealth. Only a very experienced tracker can establish the age of a spoor with any accuracy. The rate at which the sun, wind or rain may erode or blur the spoor can vary considerably. A detailed knowledge of the local weather conditions is therefore essential. A tracker must also have a thorough knowledge of animal behaviour.

The best way to acquire an ability to determine the age of spoor is to study the ageing process systematically. This can be done by laying out a succession of spoor next to each other every hour during the course of one or more days. By the end of the day you will have examples of spoor that are one hour old, two hours old, three hours old, etc. Spoor of varying ages can be compared directly, which will enable you to study the ageing process in detail. This method of study should be repeated in different soil types, types of terrain, weather conditions and seasons in order to determine the rate of ageing under different conditions.



6

Dangerous Animals

In order to study spoor, one must inevitably go to places where one will most likely encounter wild and often dangerous animals. It is therefore necessary to prepare oneself for such an encounter, so that one can avoid possible confrontations or, in the case of an accidental confrontation, know how to deal with it.

Professional conservationists, rangers, veterinarians and researchers must, given the nature of their work, expose themselves to an element of danger. Sometimes it may be necessary for them to take calculated risks, otherwise they will never get their work done. People who take unnecessary risks, however, are not 'brave' – they are simply stupid. There is no place for bravado in the wilds.

Recreational walks in the wilderness are becoming increasingly popular. In this way people gain first-hand experience of nature and develop positive attitudes towards conservation. Those going on such walks should at least know about the possible dangers involved, so that they will know what to do and not give way to irrational fears. The inexperienced naturalist should at all times be accompanied by an experienced ranger or tracker.

The shooting of dangerous animals should be left to experienced rangers who know what they are doing. Unless one is an excellent marksman and knows exactly when and where to shoot an animal, it may be better not to shoot at all, since there is nothing more dangerous than a wounded animal. Even if unarmed or armed with only a knife, the appropriate reaction may save your life. Furthermore, it is not always possible to carry a firearm. Visitors to Botswana, for example, are not allowed to carry firearms.

One's first priority should always be to avoid confrontations. The advice given in this section should be followed only as a last resort in the event of an accidental confrontation. Never test a dangerous animal, since there are always exceptions to the rule. While animals may generally conform to certain characteristic behaviours, it must be remembered that individual animals have their own 'personalities', and that some individuals may deviate from the norm. Although the author has endeavoured to ensure that the information given is as reliable as possible, neither he nor the publisher assumes responsibility for any action taken as a result of information contained here.

The inexperienced naturalist who intends spending a lot of time in the wilds may go through several learning stages. Initially you may experience irrational fears of unknown dangers because of your lack of knowledge. Such a state of mind can result in panic, which may have fatal consequences. You should avoid this at all cost by gaining as much

knowledge as possible. Over a period of time, when nothing serious happens, you may grow careless. Such an attitude is dangerous because if you do encounter a dangerous animal, you may be caught off guard at a time when you should be in full control of yourself. As you begin to encounter dangerous animals, while as yet no serious incidents have occurred, familiarity breeds contempt. And if you are at an adventurous youthful age, you may even be inclined to become slightly reckless. However, when you have reached the stage when you disregard natural fear, you are in even greater danger than ever before. At one point I had the foolish habit of picking up scorpions by their stings to put them down on smooth sand so that I could study their spoor. I thought that as long as I held a scorpion by its sting, it couldn't sting me! It seemed to work very well, until the day I was just a little too careless and was stung. Luckily it was a Scorpionid and not a Buthid.

You may be lucky enough to survive a few 'close shaves', but sooner or later recklessness may prove to be fatal. And if you are unlucky it may happen sooner rather than later. After a few 'close shaves' you will probably become increasingly cautious as you begin to appreciate real dangers for what they really are. As you gain experience, knowledge diminishes irrational fear, but you will also develop a growing respect for dangerous animals, based on rational fear of real danger. If you are well informed about the possible dangers, the appropriate cautious attitude may be adopted from the very start, and the dangerous initial learning stages can be avoided.

To minimise the chances of being killed by a dangerous animal you need to overcome an irrational fear of the unknown, while avoiding irrational fearlessness of what you think you 'know'. You should at all times maintain a rational fear of known danger. This requires an optimum combination of caution and curiosity. A healthy curiosity leads to an increase in knowledge, which diminishes irrational fear, but should always be accompanied by adequate caution.

Natural fear is important, as long as it is kept under control. It keeps you alert, and when confronted by a dangerous animal, it intensifies the senses, makes you think faster, you seem to lose your emotional feelings, you don't feel pain and the adrenalin gives you additional strength. However, you need to prepare yourself psychologically for a possible confrontation. No matter how small the chances are, always be prepared for the worst, because when it does happen, you won't have time to think about it. When you are suddenly confronted by a dangerous animal at short range and the intense ice-cold sensation of fear shoots through your whole body, it is very difficult to react in a rational way. Furthermore, every muscle in your body will be tensed up, including your vocal chords, so your voice will come out in a high-pitched squeak. In order to sound aggressive when shouting at a charging animal, you have to force your voice tonality down. A high-pitched voice that sounds like a panic-stricken scream may well encourage a wild animal to attack you. The intense fear makes the animal appear much bigger than it is, and time seems to stand still. Yet you must react instantly and intuitively, and your intuition must override your instinctive urge to flee.

To prepare yourself psychologically you should visualise an animal

attacking you and in your imagination act out the appropriate response to that particular animal. This mental exercise should be repeated until it becomes second nature. It must become part of your intuitive way of thinking so that when the worst actually happens you will be mentally and psychologically prepared to react instantly, without having to think about it.

Mosquitoes

Malaria is transmitted by the bite of an infective female anopheline mosquito. It occurs mainly in the summer and especially during years of good rainfall. Anti-malaria tablets should be taken before going into a potential malaria zone. In areas where malaria has become chloroquine-resistant, alternative drugs should be used. Pregnant women should avoid malarial areas.

Mosquitoes feed from dusk to the early hours of the morning. Camp on heights such as hills where a cool wind blows and where the grass is not very thick, away from standing water and not near densely vegetated areas at pans or rivers. Sleep under a mosquito net and use mosquito repellants. Fire and smoke help, and burning Elephant or cattle dung apparently drives mosquitoes away.

The symptoms appear approximately 12 days after the infective bite. Early symptoms include fever, chills, sweating and headache. Prompt treatment is essential even in mild cases, since irreversible complications may appear suddenly. If the early symptoms are not recognised, the victim may become critically ill with cerebral malaria.

Bilharzia

When visiting areas where Bilharzia (Schistosomiasis) is found, contact with contaminated water should be avoided. Bilharzia is found in shallow water that is stagnant or flowing slowly, along the banks of rivers, dams and pools, and especially where plants are growing in the water. If you wet yourself with contaminated water, clean yourself immediately by rigorously rubbing yourself dry with a cloth. The parasite may penetrate the skin within minutes. Contaminated water should be boiled or purified before being used for drinking or washing. Bilharzia infection can be severely debilitating and unpleasant and is not easily cured. In rare cases it can go to the brain, with lethal results. As the skin is penetrated, the first symptoms may be a skin reaction, although this may be mild or may not even show. Other symptoms include persistent fatigue, bodily discomfort, fever and vague intestinal complaints. If in doubt, a doctor should be consulted.

Tsetse-fly

The tsetse-fly, which transmits sleeping-sickness, has been virtually eliminated in southern Africa and only small populations exist. The fly can inflict a painful bite, and the symptoms of the disease, which include headache and a fever, develop after about two weeks.

Bees and wasps

With repeated exposure to stings, some people become hypersensitive, after which another sting could be much worse, if not fatal. People allergic

to bee and wasp venoms should not wear floral-scented cosmetics or nail varnish. The solvent (amyl acetate) in nail varnish is the alarm pheromone of bees and provokes aggression. Don't wear brightly patterned clothes. If bees are about, remain calm and move slowly.

Ticks

Of the more than 70 viruses and disease-carrying organisms known to be carried by ticks, tick-borne relapsing fever, tick-bite fever, Q-fever and Crimean-Congo haemorrhagic fever, and tick-bite paralysis represent the best known and most important tick-borne disease conditions in humans.

To avoid being bitten by ticks, wear long trousers and boots, with your socks tucked up over your trousers. Rubbing paraffin on your legs or using various tick repellants may help prevent them getting on your skin. If possible, avoid long grass, or when walking along a path, avoid brushing against the tips of long grass stems as ticks usually sit on these tips waiting for an animal to walk past. When you have moved through long grass, inspect your body for ticks. Don't pull them off, since their heads may break off and remain underneath your skin. Burn them off with a cigarette, or smear them with vaseline, grease, commercial sealant, disinfectant or alcohol.

Tick-bite fever may develop about a week or two after the bite. The site of the bite may become swollen and red. The symptoms include listlessness, headache, fever and swollen glands.

The symptoms of Crimean-Congo haemorrhagic fever include a sudden onset with fever, malaise, weakness, irritability, headache, severe pain in limbs and loins, and marked anorexia. Vomiting, abdominal pain, and diarrhoea occurs occasionally.

Soft ticks

The sand tampans live in sandy areas where shade is provided by trees or rock outcrops. They burrow beneath the surface of the sand, waiting for a potential host to rest in the shade. Humans are not very susceptible to the toxin but repeated bites over a period of time can result in hypersensitivity. If bitten again, hypersensitised individuals risk anaphylactic shock, which can result in death.

Spiders

Only one local species, the Black Widow, or 'button spider', *Latrodectus mactans indistinctus*, is known to be potentially lethal. The poison is neurotoxic, with the possibility of the victim dying of respiratory failure or heart failure or both. Less than 5 per cent of untreated bites by this spider may result in death. Young children and elderly people with heart or respiratory ailments are particularly at risk.

Most accidents occur when people lift objects or plants harbouring the spiders. If the spider is hurt in the process, it will bite in self-defence. When molested in their webs, they often sham death, rolling up into a ball. If picked up (while shamming death), they will bite.

To avoid being bitten, the same precautions as with scorpions should be taken.

Scorpions

The dangerous *Buthidae* are characterised by their small pincers and thick tails, while the relatively harmless *Scorpionidae* have large pincers and thin tails. The most dangerous buthid genera are *Parabuthus* and *Buthotus*. The venom of scorpions is neurotoxic and may result in respiratory or cardiac failure. Young children and old people suffering from heart or respiratory ailments are particularly at risk. Some species of *Parabuthus* can squirt their venom for a distance of up to a metre, causing envenomation of the eyes or any open cut on the body. When aggravated, many scorpions are able to make a loud hissing noise similar to that of a small adder.

To avoid being stung by a scorpion, wear long trousers, and boots with socks tucked up over trousers. Do not put your hand into a hole, tunnel or bird's nest into which you are unable to see. Take care when picking up rocks and logs, and roll them towards you. Avoid picking up scorpions that appear to be dead, in case they are alive. Do not allow your face to come too close to a scorpion, since some can squirt their venom into your eyes. Check bedding and sleeping bags and sleep on a camp stretcher rather than on the ground. Leave boots in an upright position during the night and shake out clothing and boots before putting them on the next morning. Check loose-lying rocks and dead leaves and wood around your campsite. Never walk barefoot outside at night.

Being able to recognise scorpion spoor may also help one avoid being stung. When doing fieldwork in the Kalahari, I one morning found scorpion spoor close to where I was sleeping. Following the spoor, I discovered the scorpion underneath the spare wheel that I had been using as a seat.

Snakes

It is sometimes argued that there is greater danger in driving a car than being killed by a snake. This argument is, however, a fallacy. It may be true for the reckless driver who hardly ever goes into the field, but the careful driver who carelessly walks around barefoot in the field may be at greater risk of being killed by a snake. Furthermore, if you are a keen naturalist who spends a lot of time in the field, the chances of being bitten sooner or later are not insignificant (especially if you try to track down snakes). I myself have had more 'close shaves' with dangerous snakes than with cars. And people who handle snakes are certainly at great risk (over 90 per cent of known bites have occurred in people handling snakes). However, as long as you take the necessary precautions, the risk of being bitten can be minimised.

It is important to know snakes and to be able to identify at least all the dangerous snakes you will expect to find in a particular area. Snakes known to have killed people in southern Africa are:

— Puff Adder, *Bitis arietans*
— Gaboon Adder, *Bitis gabonica*
— Egyptian Cobra, *Naja haje*
— Cape Cobra, *Naja nivea*
— Forest Cobra, *Naja melanoleuca*
— Black-necked Spitting Cobra, *Naja nigricollis*
— Mozambique Spitting Cobra, *Naja mossambica*

— Black Mamba, *Dendroaspis polylepis*
— Green Mamba, *Dendroaspis angusticeps*
— Rinkhals, *Hemachatus haemachatus*
— Coral Snake, *Aspidelaps lubricus infuscatus*
— Boomslang, *Dispholidus typus*
— Bird or Twig Snake, *Thelotornis capensis*
— Rock Python, *Python sebae.*

Learn to recognise dangerous snakes by studying photographs, and visiting museums and snake parks. Memorise their characteristic features so that you have a visual image of what to look for. If you don't know what to look for, you may never see them, even if you are looking straight at them at close range. Once when I was still unfamiliar with snakes, I bent down to pick up a log, only to discover a Puff Adder curled up right in between my feet. Luckily it was early on a cold winter's morning, so it was still frozen stiff.

Also learn as much as possible about the habits of snakes, so that you will know what to expect when you encounter them, and what to do to avoid being bitten.

However, even when you get to know snakes, you cannot rely on your ability to see them, since most snakes are very well camouflaged. I once followed the spoor of a Puff Adder up to a bush where it went in and did not come out the other side. In spite of the fact that I knew what I was looking for (although I was unfamiliar with the different Cape colour morph), by the time I found it I realised I had almost stepped on it and must have looked straight at it several times without recognising it. One's mind tends to perceive the light colours on the snake as standing out and the dark colours as shadows receding into the background, so one doesn't recognise the shape of the snake's body. Only when one recognises the characteristic chevron pattern as being that of a Puff Adder, does the snake itself come into focus.

Snakes prefer to flee, and only molestation will cause attack. Bites usually result from unwitting disturbance or physical contact such as when they are unexpectedly surprised or when, as in most adders which rely on immobility to escape attention, they are too closely approached or stepped on. Because they rely on their camouflage to remain undetected, Puff Adders account for the greatest number of serious snakebite cases.

Most bites occur on the feet and the lower half of the legs. Suitable footwear, preferably calf-length boots, and loose-fitting trousers, will therefore provide a large measure of protection. To tread warily is not enough. An alert attitude and watchfulness will help to avoid snakes. Look ahead and scan the path. Keep to paths and avoid long grass, rank undergrowth and riverine bush, or other situations where visibility is limited. Step onto logs or rocks, not over them, because a snake could be lying on the other side. Pick up rocks and pieces of wood so that the underside faces away from you, leaving an avenue of escape for a snake. Never put an unprotected hand down a burrow or hole, as a snake may be using it as a lair.

Camps should be made on open ground. Food stores, which may attract rodents and therefore snakes, should be kept away from the sleeping area. Never walk around at night without adequate footwear and never without a good torch.

If you encounter a snake at close range, freeze. Snakes have poor vision and usually strike at moving objects. Any quick movement may precipitate an instinctive strike. Stand still and allow it to move away, or if it doesn't, back away slowly. Never run when you encounter a snake.

If a cobra or Rinkhals rears up, immediately close and cover your eyes and look away, in case it is a spitting cobra (by the time you have had a 'closer look' to identify it as a spitting cobra, it may be too late). Slowly back off to a safe distance. Some species can 'spit' up to three metres, and since the poison is ejected in a spray, some of it will invariably get into your eyes if unprotected. Wearing glasses (or sunglasses) will help to protect your eyes.

Never tamper with seemingly dead snakes, since some snakes feign death.

When someone has been bitten by a snake, a calm and confident demeanour is essential for both first-aider and victim, as emotional upset can be damaging in many ways.

Some people are allergic to antivenoms, so ensure victim receives medical supervision. Since complications may arise, it is inadvisable for the first-aider to inject antivenoms in the field. The use of a tourniquet is dangerous.

When applied immediately, suction can extract some of the venom, but it is useless later. A mechanical suction syringe, such as 'Aspivenin', may be used, but strictly as a first-aid measure only. Suction can also be applied for scorpion and spider evenomation.

For first-aid treatment, carry at least four 100 mm-wide crêpe bandages on all outings. If no bandages are taken, you will have to tear up clothing to use instead. Immediately apply the crêpe bandage over the bite and continue to wind it up the limb until you reach the groin (or armpit). Apply it as tightly as you would for a sprained ankle (just short of full stretch). Keep the bitten limb as still as possible. Do not remove clothing, simply apply the bandage over it. Apply a splint to immobilise the limb. It is believed that venom is dispersed via the lymph glands, and the application of a broad crêpe bandage inhibits the spread of the venom. In case of a bite on the trunk, neck or head, apply firm pressure to the bitten area if possible. Carry the victim to the nearest vehicle, or bring the vehicle to the victim. If the victim has to walk, he or she should do so calmly and slowly. Get the victim to the hospital as soon as possible. In the case of a cobra or mamba bite, give artificial respiration if necessary. Keep the victim's throat and air passage clear by swabbing with a handkerchief. If the snake can be killed without endangering anyone's life, it should be taken along for identification.

The use of a crêpe bandage is also effective for scorpion and spider envenomation. A crêpe bandage should, however *not* be used for adder bites, since the cytotoxic venom causes tissue destruction. Simply treat the victim for shock and get him or her to a hospital as soon as possible. In the case of a Puff Adder bite it may take up to 48 hours for the patient to develop a serious condition, so you should have adequate time to reach a hospital. In the case of a Gaboon Adder bite, which may result in sudden death, a crêpe bandage is unlikely to be of any use in any case.

If the poison of a 'spitting' snake gets into the eyes, do not rub the eyes.

Holding the eyelids open, flush eyes with water or any bland fluid. Consult a doctor as soon as possible.

Crocodile

The presence of a Crocodile under water may be indicated by small air bubbles rising to the surface. Do not go near any body of water which may contain Crocodiles if you can help it.

Crocodiles are notorious for killing humans, usually attacking people wading in the shallows. If attacked and you don't have a firearm, your only hope is to stab it in the eyes with a knife, or sharp object, or even your fingers.

Ostrich

An Ostrich may attack humans if they get too close to its nest. It does not help to run away, since one will never outrun it. The best defence is to shield yourself with a branch from an acacia thorn tree or to lie face downwards protecting the nape of one's neck with one's hands until it goes away. The Ostrich has sharp toenails and can give a powerful kick. Most deadly wounds are to the head, since it continues its attack even after the victim is on the ground.

Rabid animals

Rabid animals are often characterised by unusual behaviour, which may include attacking humans. An animal may wander around aimlessly with saliva dribbling from the open mouth. Wild animals may appear tame or aggressive, or may show signs of convulsion or partial paralysis. Someone who has been bitten by a rabid animal must be taken to a hospital as soon as possible. The bite wounds must be washed and disinfected immediately.

Baboon

Old male Baboons are very powerful and have large canines. They may have unpredictable tempers and can quickly become aggressive if suddenly frightened or thwarted in any way. In areas where Baboons have become accustomed to humans, they can be aggressive, especially if people have been feeding them.

Buffalo

In normal circumstances Buffalo are generally inoffensive and usually rather avoid confrontation. They are inquisitive, and individuals may break away from a herd to examine vehicles. If disturbed, they will race back to rejoin the herd, which is quick to stampede. Their tendency to stampede when frightened, often in unexpected directions, can be highly dangerous. Cows with small calves, old solitary bulls, bulls that have been hunted and wounded in the past, and those who are harassed can be dangerous and may charge without provocation. It is also dangerous to stumble across and startle Buffaloes resting in a thick patch of bush, since their reactions can be unpredictable. Avoid thickets and reeds in or near rivers. When you encounter Buffalo, stand still and move away slowly. If an aggressive Buffalo charges, it will complete the charge, so do not stand still. Try to climb a tree, since you won't outrun it. The alarm calls of oxpeckers or egrets and the breaking of branches may be the first sign of a

charging Buffalo, so be alert for those signs. A wounded Buffalo is extremely dangerous, and may even double back and lie in wait for its pursuer. When charging, only a fatal shot will stop it. While tracking Buffalo, remember that Lions may also be on the spoor and that you may well encounter the Lion before you find the Buffalo.

Other antelopes

Apart from the Buffalo, other antelopes that can be dangerous under certain circumstances include the Black Wildebeest, Blue Wildebeest, Tsessebe, Roan, Sable, Gemsbok, Eland and Bushbuck.

While usually inoffensive in the wilds, Black and Blue Wildebeest may become aggressive and dangerous in captivity. When cornered, they will defend themselves courageously.

Roan, Sable and Gemsbok can be aggressive and dangerous when wounded or cornered. They will charge when approached too closely. Their sharp horns can cause serious injuries, and Gemsbok may even spear to death large predators, dogs or humans.

Bushbuck can be very dangerous when cornered or wounded, and have been known to kill Leopards, dogs and even humans.

Bushpigs

Bushpigs will not usually attack humans, but can be extremely aggressive if wounded or cornered, or when they have piglets.

Honey Badger

While normally shy and retiring, Honey Badgers can sometimes without provocation become extremely aggressive. Normally docile individuals can suddenly, and for no apparent reason, develop 'fury moods', and return to docility just as suddenly.

I once encountered a Honey Badger late at night and out of curiosity wanted to have a closer look at it. As I pointed my torch at it, it suddenly and aggressively came towards me. When I intuitively switched off the torch, it turned away and disappeared into the dark. It was probably annoyed by the sharp light and intended to deal with it, but when the source of annoyance was removed its 'fury mood' dropped as suddenly as it flared up. It would appear that Honey Badgers are best left alone.

Their temperamental extremes are apparently related to their natural habits, contributing to their reputation for ferocity and fearlessness. They are courageous, and with their tough and loose hide, dangerous teeth and long strong claws, they are formidable opponents when aroused. There are accounts of a Honey Badger killing a Wildebeest, another killing a Waterbuck, and another killing a three-metre Python. An encounter between a Lion and a Honey Badger has been reported in which the Honey Badger was only killed after putting up a fierce defence. In encounters with dogs, Honey Badgers invariably come off best.

Spotted Hyaena

By day Spotted Hyaena usually avoid people. At night they will not enter a camp while people are awake, but will wait until everyone is asleep. There are many records of Hyaenas attacking sleeping people. They may sneak up as close as possible and then rush in and bite off a portion of their

victim, with which they retreat. They are also prone to enter tents if they smell food inside.

They are, however, cowardly and will run away if you make a noise or adopt an aggressive attitude. Do not sleep in the open and do not let food or dirty dishes lie about. Under certain circumstances Spotted Hyaenas have been known to attack humans during the day and in some areas apparently specialise in this type of behaviour. In Malawi there have, for example, been instances where Spotted Hyaenas have attacked humans by day.

Wild Dog

Wild Dogs usually avoid humans and are unlikely to attack. They are also easily driven off a kill.

Cheetah

In the wilds Cheetahs are not dangerous to humans. When you approach them on foot, they will only give you one look and run off. Although they are timid and retiring, they can, however, be unpredictable and aggressive in captivity. There have been several reports in the press of Cheetahs in captivity, including 'tame' Cheetahs, attacking small children. Some may even attack adults. I once made the mistake of turning my back on a captive Cheetah, at which it suddenly charged me from behind. When I turned to confront it, it stopped dead in its tracks right in front of me and darted off.

Leopard

Leopards usually shy away from humans, and are normally not dangerous if you leave them alone. They are only likely to become aggressive when threatened or provoked. If wounded, cornered or suddenly disturbed, they can become exceedingly dangerous. Stumbling across a female with cubs can also result in a dangerous situation. !Xõ trackers of the Kalahari maintain that it is dangerous to follow a Leopard's spoor, since it may ambush you if it realises you are following it to where her cubs are hidden. And following a wounded Leopard is one of the most dangerous situations a hunter can encounter.

In certain parts of Africa healthy Leopards have preyed on humans, usually killing women and children. Such behaviour is, however, atypical of Leopards in the southern African subregion. Old and sick Leopards, unable to catch wild prey, may, however, very exceptionally attack humans.

Apparently one can pass close by a hiding Leopard and as long as your eyes don't meet, it will allow one to pass. But the moment it is aware that one has noticed it, it will flee, or if cornered, may attack. !Xõ trackers maintain that you must never look a Leopard in the eyes when confronted by it, since you will infuriate it. By pretending to ignore it, it will most likely choose to avoid contact.

If you see a Leopard and you are not walking towards it, continue walking and do not look at it or stand still. If it realises that it has been seen, it may feel threatened and attack. When you encounter a Leopard at close range, and if it warns you by roaring, retreat slowly, moving sideways and away rather than directly backwards, and don't stare at it. Try not to frighten the Leopard, and don't throw anything at it. Don't feed it as this

is likely to make it bolder and possibly even aggressive.

Once committed to a full attack, only a fatal bullet will stop a charging Leopard. It charges very fast and low on the ground. It embraces its victim, with claws extended, and full use is made of the powerful dew claws. The victim is mauled with teeth and all four clawed feet, and the killing bite is directed at the back of the head or neck or the throat, the victim being throttled or has the jugular vein severed.

In one instance a Leopard attempting to attack a young Baboon was mobbed by the troop from which it fled. The noise created by the troop was sufficient to deter the Leopard. I know of one incident in a private nature reserve where a charging Leopard was shouted down, but apparently the Leopards in that area have become so used to people that they are relatively 'tame' compared to Leopards in the wilder regions of southern Africa. In the Kalahari, for example, !Xõ trackers maintain that shouting will not stop a charging Leopard, and that you will have to kill it to save your own life. It would therefore appear that the reaction of Leopards may vary in different areas, depending on the amount of contact they have had with people.

There have been cases where people successfully defended themselves against Leopards with knives and even used stones to hit them on the head. In some cases unarmed people have been able to choke the Leopard to death or make the Leopard retreat by punching it on the nose. There are probably few people capable of such feats, but since one does not always carry firearms in many of the areas where Leopards are found, one might well keep in mind that in the extremely unlikely event of being attacked by a Leopard, it is possible to defend oneself.

Lion

Lions usually move away when they become aware of approaching humans. Cases of Lions preying on humans are rare, though it is more common in some parts of Africa than others. Old or disabled Lions may take to killing humans, although healthy individuals may also turn to this practice. Unprovoked attacks on humans may also be accounted for by injuries from wire snares.

When you are moving into the wind, there is the danger of stumbling onto sleeping Lions. If suddenly disturbed, they can quickly become aggressive. Avoid thickets and dense tall grass, especially near waterholes and rivers. Lions spend the heat of the day sleeping, so you should be careful not to walk right into their midst.

Lions are particularly dangerous when you inadvertently come too close to them, if they are pursued or harassed, and when you encounter mating Lions, feeding Lions or Lions with cubs. Old or ill Lions are more aggressive. Lions are also more dangerous at night.

Avoid Lions by noting fresh spoor, vultures, the roaring of Lions and the laughing of Hyaenas. Their presence may be indicated by zebra and wildebeest that are hesitant to go near water, especially if they are staring at a thicket. Giraffes also indicate their presence by staring at a thicket.

It is important to recognise the sounds made by Lions when they are hunting, feeding, mating or have cubs with them. Feeding Lions should be approached with care (or not approached at all), since other Lions may be

lying in the thickets in tall grass in the vicinity. When mating, their growls are initially soft and something like faraway thunder, increasing in intensity and eventually erupting in one or two very loud and ferocious snarls. A Lioness with cubs may reside in the vicinity of waterholes where they hunt and stay until the cubs are big enough. Their presence may be indicated by a soft *umf* call of the mother and the cat-like *miaow* of the small cubs.

Lions are most active around dusk, with hunting done largely at night. Lions do not roar while hunting, but at night the alarm calls of plovers and dikkops may indicate danger. When camping out at night one should have a big fire going and have someone to keep watch. While Lions may enter a camp when everyone is asleep, the presence of someone who is awake will keep them away.

Getting out of a vehicle close to Lions is much more dangerous than actually coming face to face with a Lion in the bush. Suddenly appearing out of a vehicle may frighten them, which may prompt an attack in self-defence.

Never run away when you encounter Lions. If you run, they will run you down, as Lions instinctively charge and kill a fleeing animal. Stand still and slowly back away downwind until you are out of sight. If the Lion does not like the movement, stand still. The outcome of a surprise meeting is unpredictable. Male Lions usually avoid confrontation and quickly disappear. A female with young may be more aggressive. She may merely adopt an aggressive attitude, flicking the tail briskly while growling in a threatening way. At close range she may charge.

If the Lion's tail is twitching or jerking, but the ears are still cocked, it is probably just nervous or excited, but not angry. An angry Lion flattens its ears, crouches low, and whisks its tail ever more rapidly from side to side, while uttering a nerve-racking series of coughing grunts or slurring growls. As its anger mounts, its tail is jerked stiffly up and down, and it initially comes at a trot before charging.

Wounding the Lion at this critical stage can be as dangerous as turning and running. Unless you are sure you can stop it before it gets at you, it may be better not to shoot at all. There are two methods of dealing with a charging Lion (unless it is already wounded, in which case the only way to stop it is to kill it before it kills you). If you can keep your nerve, you should remain absolutely still, facing the charging Lion and not taking your eyes off it. It may then suddenly stop, only a few metres away, crouching flat on the ground while emitting nerve-shattering growls and roars. The display may last for only a few seconds, and when failing to unnerve you, it may suddenly turn and disappear into the bush. Be prepared, however, for another charge, and only back away when you are certain that it is safe to do so.

!Xõ trackers of the Kalahari maintain that if a Lion charges you, you must stand still and shout loudly and aggressively and throw sticks and stones at it. You must look it in the eyes, and not move back or try to run away. If you react aggressively towards it, the Lion will lose its nerve and back off. When it backs off, slowly move backwards. But when it charges again, once again stand still and shout at it. You must repeat this procedure, moving downwind, until you reach a safe distance.

To call a lion's bluff you need to work yourself up psychologically into an

extremely aggressive frame of mind in spite of the fear you experience. !Xõ trackers deal with their fear by combining aggression with tension-releasing humour. On one occasion, a group of trackers and I stumbled onto a lion that was busy stalking our camp. The trackers decided to chase it away, so we set out on its spoor, armed with throwing sticks, spears and clubs. As we followed the spoor, the trackers would shout aggressively, working one another up, and then hurl abusive insults at the lion, followed by laughter and joking to release the tension.

If you are charged by a Lion, it may happen very quickly, so you will not have time to think. Never be caught unprepared in such a situation. Condition yourself so that when it does happen, you will be able to react intuitively and instantly.

Rhinoceros

The White Rhino is temperamentally quieter and more placid than the Black Rhino. It usually tends to run away, often circling downwind to investigate an intruder from a distance. There are, however, the odd White Rhino that may be dangerous, and may even track you down to charge you.

The Black Rhino, on the other hand, is known for its nervous, unpredictable temperament and can be extremely dangerous. This is particularly the case with bulls associating with receptive cows and cows with calves. Its eyesight is very poor, but its hearing and scent especially are good. When disturbed, it will stand still with its ears cocked and head raised. It may either utter a few snorts and trot away, or it may come at a lumbering gallop towards the intruder. Such a 'charge' may be merely to investigate a possible source of danger. Human scent will normally make rhinos move off, but their reactions depend on whether they have been hunted or molested or left in peace. In areas where rhinos have been disturbed they can become extremely vicious and dangerous. Black Rhinos also differ greatly in individual temperament. The rhino charges with its head held high in order to give it better vision, lowering the head in the last few paces to batter or throw the object of its rage.

When you encounter rhino, do not run away, but stand still and then move downwind. Meanwhile look for a suitable tree to climb. If there is no tree, slowly walk downwind and take off some article of clothing or rucksack to throw at it. If it charges, climb the nearest tree, or if there is no time, get behind it and freeze. If there is no tree, a rifle shot (into the air) or (at close quarters) a loud shout may make it swing away from you. If it still comes at you, then throw some article of clothing or rucksack at it to divert its attention before leaping sideways at the last moment so that it charges past you. If you lie perfectly still, it may lose interest and leave you alone. Black Rhino are very fast and agile, so do not risk a charge if you can help it.

Hippopotamus

The Hippo is a placid and inoffensive animal when left alone, but if provoked can be extremely dangerous. Solitary bulls and cows with calves can quickly become aggressive and there are many reports of small boats being overturned and the occupants bitten to death. Hippos demonstrate

aggression by opening the mouth, displaying the imposing teeth and by making short charges through the water. Such charges are sometimes directed at intruders who venture too close to the edge of the water. When a grazing Hippo is disturbed, it is dangerous to be between it and the water, as it will blindly run alongs its path, trampling anything in its way. When confronted by a charging Hippo the best one can do is to dive out of the way. Avoid thickets near water and take note of their characteristic paths. Do not camp at or near Hippo paths or waterholes, since Hippos are attracted to fires and lights. During droughts when Hippo are concentrated in small waterholes, they feel threatened in the shallow water and may charge out.

Elephants

Elephants are normally quite placid and usually avoid confrontation, but may charge if approached too closely or molested and when there are small calves or ill-tempered individuals in the herd. Individuals that are sick or injured or have been wounded or hunted in the past can be aggressive and extremely dangerous. Tuskless Elephants have a bad reputation for being aggressive. Young bulls are inclined to be 'playful' and mischievous, and may demonstrate with mock charges.

When moving on foot, don't get too close on the upwind side of Elephants and be careful not to find yourself accidentally amongst members of a herd. If you encounter Elephants, don't run, but quietly move away downwind. Elephants have poor visual perception, but they have keen hearing and a highly developed sense of smell.

Mock charges, especially by old and lone bulls, are characterised by the ears spread out and a loud trumpeting display, and may end a few metres from the intruder, after which the Elephant retreats. To run away may be fatal. If it demonstrates, stand still until it stops, then slowly move away downwind.

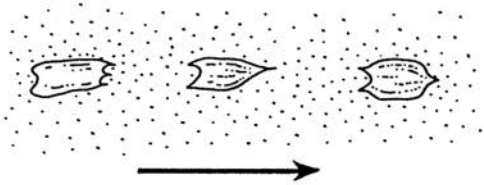
In case of a real charge, which is characterised by the ears flattened against the body with the trunk curled up, run for your life. However, running straight away from it, especially upwind, could aggravate the situation. A charging Elephant can reach a speed of up to 40 km/hour, so you won't outrun it. Start running soon enough and fast enough to stay out of its field of vision and suddenly turn sharp left or right, whichever is towards the downwind side, to run out of the charging Elephant's way, in the hope that it will rush past you. Trying to climb the highest tree will not help. Apart from being able to push down fairly big trees, an Elephant standing on its hind-legs and stretching its trunk into the branches can reach to a considerable height.

II

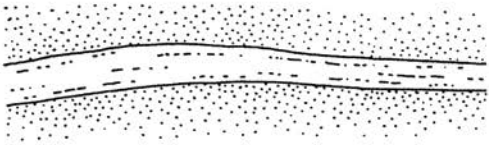
Animal Tracks of Southern Africa

INVERTEBRATES

1 Earthworm



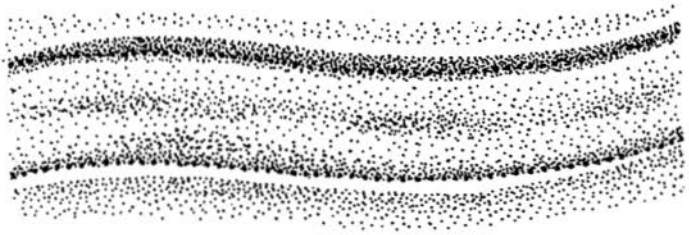
2.1 Snail



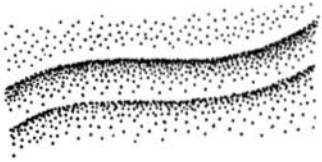
2.2 Slug

Leaf rolling in wind

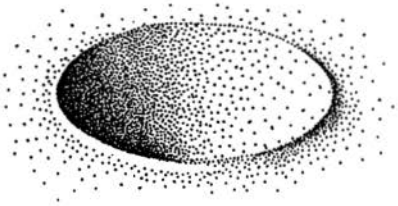
cm
Actual size



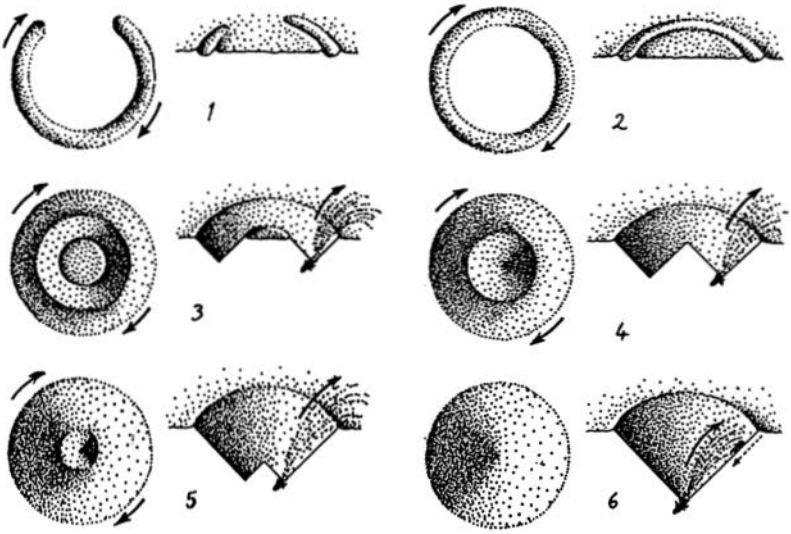
3 Millipede



4a Antlion larva spoor

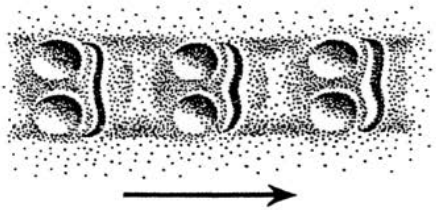


4b Antlion larva pit

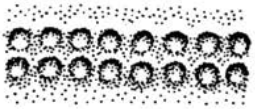


Pit construction

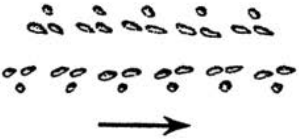
cm
Actual size



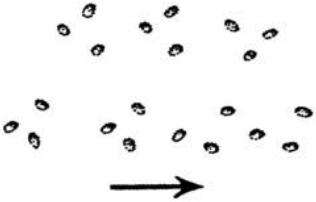
5a Caterpillar



5b Small caterpillar

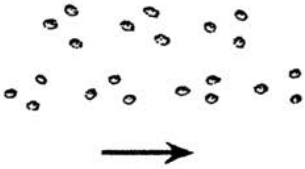


6.1 Termite



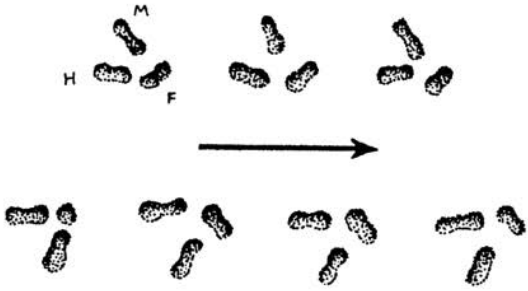
6.2a Ant

6.2b Ant

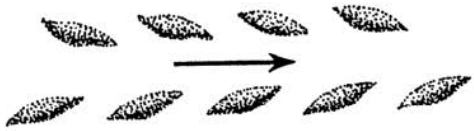


6.3 Mutillid wasp

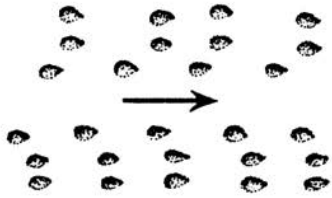
cm
Actual size



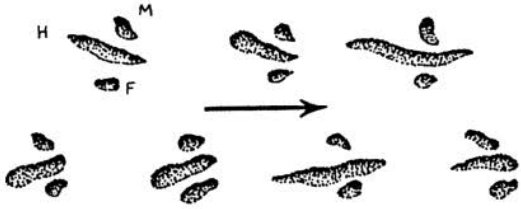
7.1a Tenebrionid beetle (typical spoor)



7.1b Small tenebrionid beetle

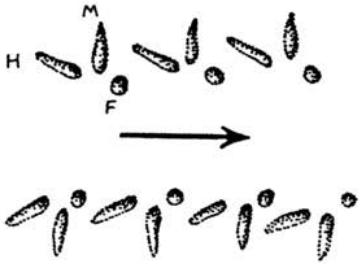


7.1c Tenebrionid beetle (variation)

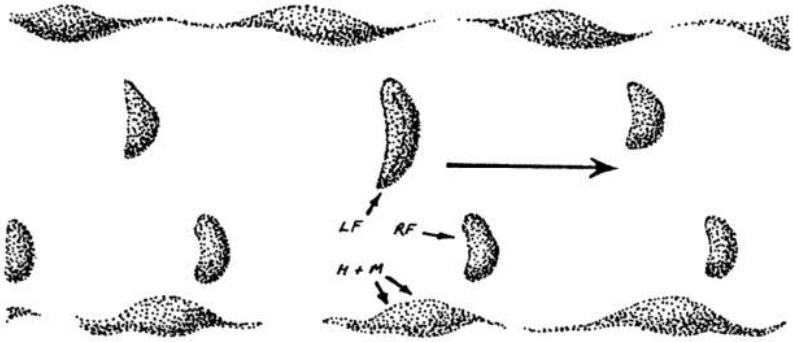


7.1d Tenebrionid beetle (running spoor)

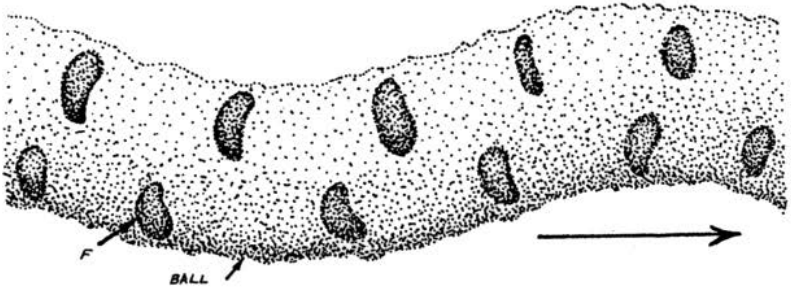
cm
Actual size



7.3d Rhinoceros beetle

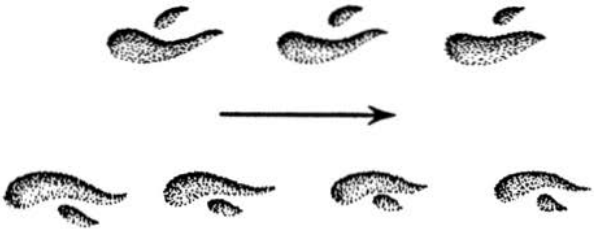


7.3a African dung beetle

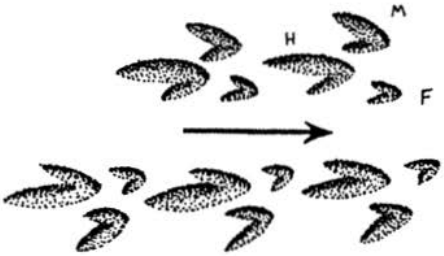


7.3b Dung beetle rolling ball of dung

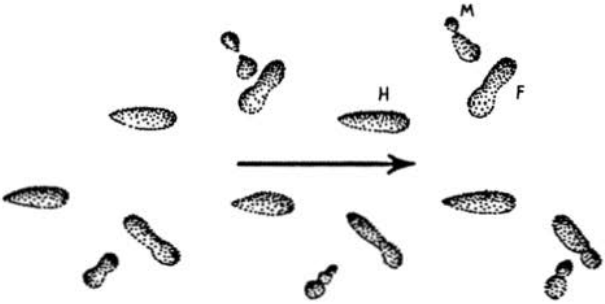
cm
Actual size



7.2b Ground beetle

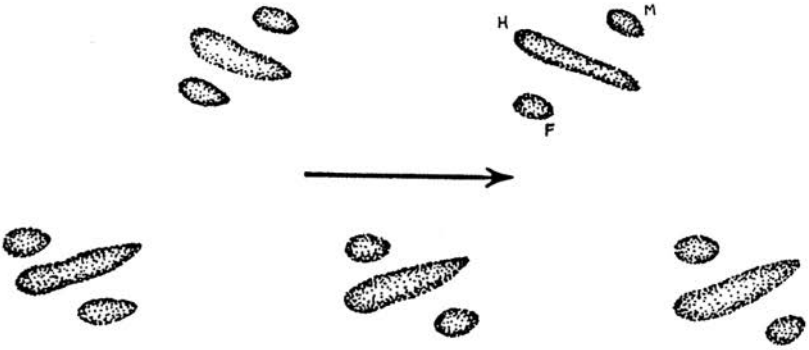


7.3c Dung beetle

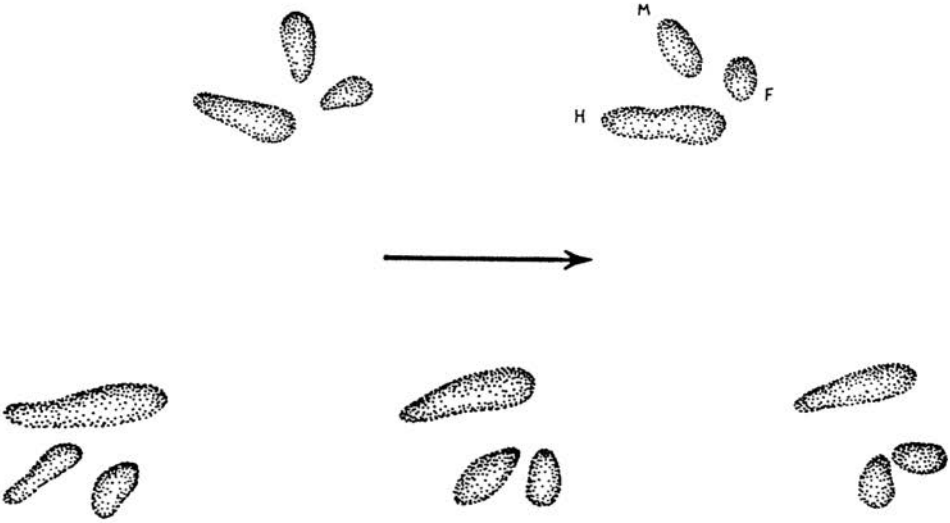


8.1 Grasshopper

cm
Actual size

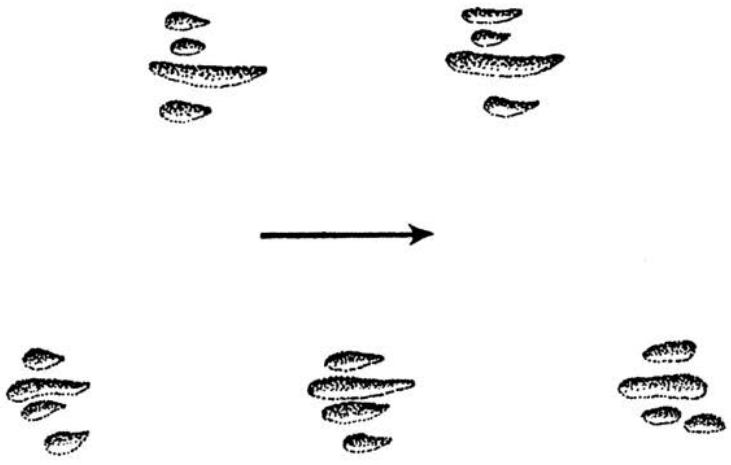


7.2a Ground beetle

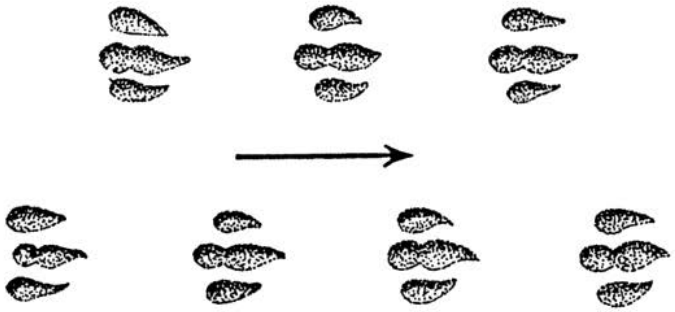


8.2 Armoured ground cricket

cm
Actual size

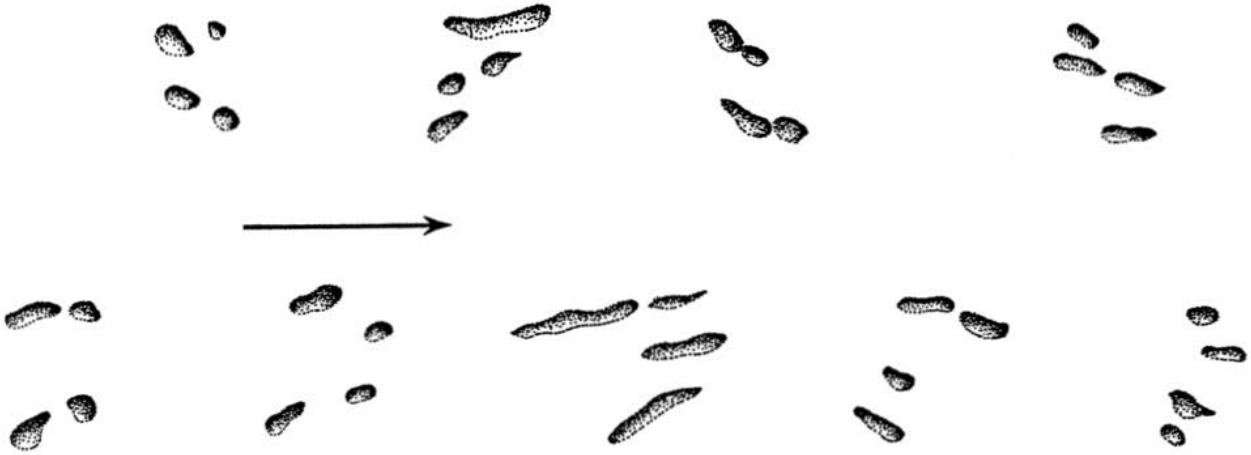


9.1a Scorpion



9.1b Scorpion

cm
Actual size



9.2a Walk

9.2b Run

9.2 Hunting spider

cm
Actual size

Phylum ANNELIDA
Class OLIGOCHAETA
Order OPISTHOPORA

Families LUMBRICIDAE & MEGASCOLECIDAE
Earthworms
Erdwurms
1

Earthworms move by waves of muscular contractions which either contract or stretch out the body. When it contracts its body, the front end is anchored by hairs that point backwards, while the rear end slides forward. When it stretches out again, the rear end is anchored by the backward-pointing hairs while the front end slides forward. To move backwards the worm points the hairs forward and simply executes the same movements.

Apart from a few species that have established a world-wide distribution, most species are highly localised. Different species are found in different types of habitat and in different regions. They spend most of their time swallowing earth, from which they obtain nourishment in the form of organic material such as decaying plant tissue, seeds, larvae, etc. These are digested, while the remainder of the soil is passed up to form the familiar castings on the surface. The castings they produce expose the soil to the air, and the burrows allow air to penetrate the soil, improving drainage and facilitating the growth of roots. Many earthworms will crawl out onto the surface when the ground is disturbed, such as by digging. They also emerge after cold and heavy rain, and may sometimes be seen crawling on the surface in the early morning.

Phylum MOLLUSCA
Class GASTROPODA
Subclass PULMONATA

Order STYLOMMATOPHORA
Land snails and slugs
Slakke en naakslakke
2.1 & 2.2

Snails move by waves of muscular contractions moving from the front to the back of the foot. The contracting muscles push against the ground, thereby propelling the body forward. The snail slides forward over the slime secreted by a gland at the front end of the foot, supported by the edge of the foot which acts like a ski. The slime is usually still visible long after it has dried, and presents a shiny surface. The trail of a snail shows up as discontinuous patches of slime, while the trail of a slug is continuous.

Snails and slugs are animals mainly of retiring habits living on green plants or on decaying vegetable debris. During the daytime they remain buried out of sight under leaves, from which they emerge at night or during rain. They require a measure of humidity, shelter from excessive heat and light, and a certain amount of lime in the soil, and moisture is necessary for their well-being. They creep about by means of a flattened foot and rely for protection on an external shell, which is usually coiled. Slugs are restricted to very moist habitats. Usually active only at night or on overcast days.

Phylum ARTHROPODA

Class DIPLOPODA
Millipedes
Duisendpote
3

Millipedes have two pairs of legs to each segment, and move slowly and steadily in an almost straight path. The legs move forward in waves, starting with the front legs, and each leg is followed by the one behind it.

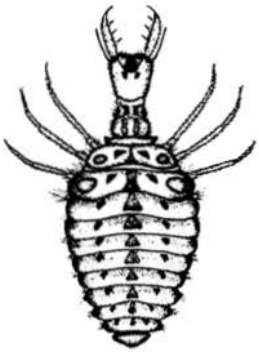
Millipedes are found in a wide variety of sizes and colours. They are long, cylindrical, many-jointed anthropods. The majority of the body segments have two pairs of legs each. Most millipedes

are reddish-brown, black, or black with yellow stripes. Some of the Kalahari species of *Triaenostreptus* are as long as 25 cm; they can usually be seen walking on the open veld after a shower of rain. As the young millipede grows by means of a number of periodic moults, more segments become interposed at a growing-point near the tail. They are not as a rule sociable or gregarious, and are usually solitary, but sometimes appear in great numbers, trekking across roads. When disturbed they may writhe vigorously or roll themselves up into tight spirals. Millipedes are normally found in moist places. They feed on wood and leaves which have been softened by decay, but certain kinds also feed on living vegetation.

Class INSECTA
Order NEUROPTERA
Family MYRMELEONTIDAE Antlions

The adults are like dragonflies in general appearance, but their antennae are clubbed at the tip. They spend the daylight hours resting among vegetation, and take to the air mostly in the evening and at night. The larvae of the various species of *Myrmeleon* and *Cueta* build pits, but the majority of antlions do not construct pits and are free-living in sand.

Myrmeleon obscurus
Antlion
Mierleeu
4



Antlion larvae always move backwards, tail first, with their bodies just beneath the surface of the sand. Their trails are visible as slightly raised ridges on the sand, winding in all directions as they search for suitable sites for their pits. To construct their conical pits, the antlion larvae move round and round in circles of decreasing diameter, tossing the sand to one side. In this way they spiral down until deep enough. The larvae then conceal themselves at the bottom to wait for their next victim.

The larvae have large heads with curved, toothed jaws, seven eyes on each side of the head at the base of the jaw, a small thorax, six short legs, and a flattened, rounded abdomen armed with bristles. They are dull brown in colour. The conical pit made by the antlion larvae is found in dry, sandy soil. The larvae lie at the bottom of the pit beneath the sand. If an unwary ant or other insect walks over the edge of the pit and stumbles down the crumbling sides, the head of the antlion at once appears. With jerky head movements, it throws sand up at the struggling insect, making it slip down the side towards the bottom. The victim is then seized with the jaws and dragged below the surface, where the antlion sucks its body dry of juices and then discards the empty skin. If the site chosen proves to be an unprofitable spot, with captives few and far between, the antlion deserts the pit and digs a new one somewhere else. Antlions tend to build their pits at dusk between 6 and 8 p.m. They are most active at this time, but the exact time of activity varies slightly from day to day. They often destroy their own pits at dusk before rebuilding them. They do this by spiralling upwards round the sides of the pits, causing the sand to collapse. Daily reconstruction of the pits is essential because continuous erosion decreases the pits' efficiency for prey capture. During the day the temperature of the surface sand may be well above the lethal limit for antlion larvae. To avoid these high temperatures, they migrate a few centimetres below the base of the pit and remain there for most of the day. At dusk the temperature drops sufficiently to allow them to come to the surface. They rebuild their pits as soon as possible after the sand has cooled at dusk so that the whole night period can be used for prey capture.

Order LEPIDOPTERA Moths and butterflies

Caterpillars
Ruspers
5

The caterpillar moves in very much the same way as earthworms, but anchors the front end of its body with its true legs and the rear end of its body with the abdominal feet. The track it leaves usually shows the prints of the pair of abdominal feet on the last segment. The Geometridae, also known as loopers or measuring worms, crawl by looping their bodies when the rear end is brought forward, and then stretching out the front end again.

Moths and butterflies begin their active lives as caterpillars. It is during this stage that they are sometimes destructive to plants. They have jaws with which to nibble off the plant part needed for food. Most caterpillars feed on the juicy parts of leaves, stems, roots or fruit, but some may feed on and live in seeds or woody stems, a few feed on wax and honey, others on wool and hair. A small number of caterpillars will eat almost any plant or plant part, but most species will eat only one particular species of plant, or at most one belonging to the same plant family.

The 'army worm' of the moth *Spodoptera exempta* moves in great numbers for long distances from the veld into farmlands, or from one farm to another, devouring crops as they go.

The Geometridae family is peculiar for the way the caterpillars walk, forming a loop with their slender bodies as if measuring the track. They stretch out and grasp the twig with their front legs, then let go with their hind-feet and move them up to the thorax, looping the body. They then let go their front legs and stretch out again.

Order ISOPTERA
Termites
Termiete
6.1

The spoor of termites may sometimes be seen in very fine, soft dust. Their trails show groups of three footprints on either side, similar to those of large ants.

Termites are social insects living in colonies numbering from a few score to hundreds of thousands of individuals. A colony is established by a male and a female reproductive which pair off during the swarming flight, shed their wings and burrow down into the wood or soil selected for resting. The eggs laid usually give rise to sterile soldiers and workers, and periodically to fertile winged reproductives. The workers construct and maintain the nest and forage for food; the soldiers defend the colony against intruders, mainly ants. Their diet is cellulose contained in dead wood, leaves, bark, grass, humus and other organic debris derived from plants.

Order HYMENOPTERA Ants, wasps and bees

Family FORMICIDAE
Ants
Miere
6.2

In very fine, soft dust it is sometimes possible to see the footprints of large ants. Their trail shows groups of three footprints on either side. The three footprints usually form a triangle of which the innermost corner points in the direction the ants crawled. The innermost footprints are those of the fore-feet, the outermost footprints the middle feet and the remaining footprints those of the hind-feet. In coarser sand, where the individual footprints are not visible, ant paths may be seen. Especially after rain or dew has compacted the sand grains, the ant path is clearly visible as a line where the ants have loosened the sand grains.

All ants are social insects and live in colonies, small or large. A colony consists of one or more queens and a number of workers which are all sterile females. Males are encountered in an ants'

nest only at certain seasons of the year when they are being reared for the nuptial flight. As soon as the wedding flight is over the males die, and the queens shed their wings. All ants go through the four stages of egg, larva, pupa and adult. Worker ants are wingless.

The subfamily Ponerinae includes the most primitive of ants. They live in small colonies, and are all carnivorous, hunting other insects such as termites. They are armed with stings and some of the larger species can inflict a painful wound. The members of the subfamily Dorylinae are commonly known as army, driver or legionary ants, and it is said that great hordes of these ants may invade homes in tropical Africa and drive every living thing out as they swarm everywhere hunting for prey. The members of the subfamily Dolichoderinae are small, soft-bodied ants and are mostly timid, inconspicuous insects living in small or moderate-sized colonies. The ants of the subfamily Myrmicinae can be recognised by their double-jointed waist. Cocktail ants, genus *Crematogaster*, also belong to this group and can be recognised by their habit of raising the abdomen over the back when agitated. The ants of the subfamily Camponotinae have no sting, but the poison-gland is well developed and some species can squirt their poison, formic acid, at their enemies.

Family MUTILLIDAE
Mutillid wasps
(Velvet ants)
6.3

In fine, soft sand the spoor of a mutillid wasp is identical to that of a large ant. Mutillid wasps look like ants, about 14 mm long, mostly with a dark red thorax, and black abdomen marked with white spots or bands. The thorax is hard and difficult to pierce. Because of their velvety, ant-like appearance they are popularly known as velvet ants. The females are wingless and may often be seen running about restlessly in hot sunshine. The males are larger and have two pairs of wings. The females are armed with a strong, curved sting and can inflict a painful wound. Many mutillid wasps are parasitic on other bees and wasps, while some attack beetles and flies.

Order COLEOPTERA Beetles

Beetles make up the largest order in the whole animal kingdom. Approximately 300 000 species have been described and named, and many more are being discovered all the time. The body is usually hard, and generally without visible wings, as the original front wings have been transformed into horned shields covering the abdomen and acting as protective cases for the transparent flight-wings.

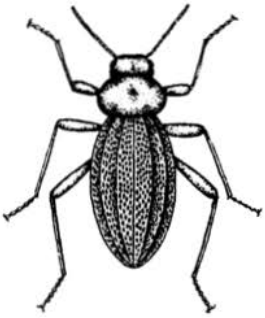
Family TENEBRIONIDAE
Tenebrionid beetles
(Darkling beetles)
7.1

The typical trail of tenebrionid beetles is characterised by groups of three footprints on either side as shown in Fig. 7.1a. The outermost footprints are those of the middle feet and the angle of these footprints indicates the direction of movement. The footprints in front of these are of the fore-feet and the remaining footprints of the hind-feet. In soft sand the spoor of small tenebrionid beetles may not show the individual footprints, but the three footprints on either side may be fused into one imprint, as shown in Fig. 7.1b. The trails of some tenebrionid beetles may vary from the typical trail as shown in Fig. 7. 1c. Tenebrionid beetles that are running may drag the hind-feet through the sand, as shown in Fig. 7.1d.

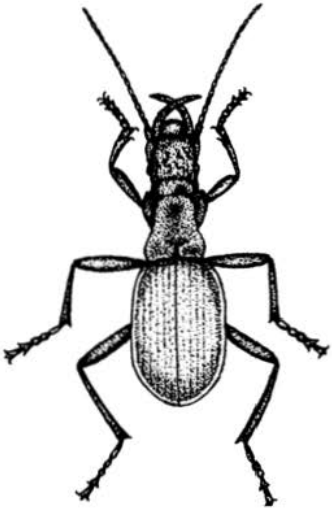
This large family, which includes the 'tok-tokkies', contains many thousands of African species whose appearance and habits are diverse and varied. May tenebrionids are brown and black,

7.1a Tenebrionid beetle

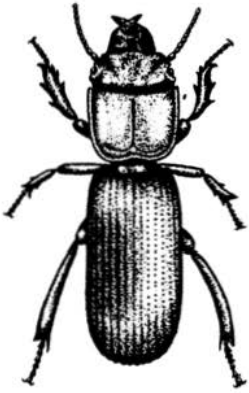
7.1c Tenebrionid beetle



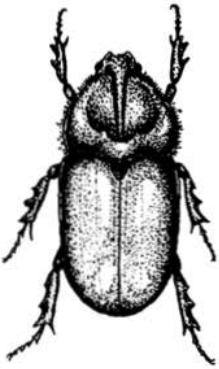
7.1d Tenebrionid beetle



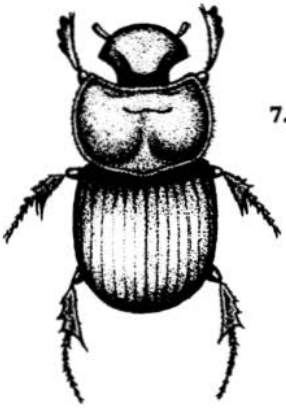
7.2a Ground beetle



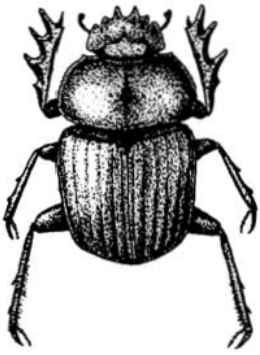
7.2b Ground beetle



7.3d Rhinoceros beetle



7.3c Dung beetle



7.3a African dung beetle

and some are unable to fly because they have lost the use of the flight-wings. They occur in all types of terrestrial habitats, but the greatest diversity of species is found in dry areas and deserts. The adult beetles are mostly nocturnal, and differ widely in appearance, size and behaviour. The wingless 'tok-tokkies' derive their name from their habit of knocking on the ground loudly at intervals, apparently to attract the opposite sex. To produce this tapping noise the beetle raises its abdomen and brings it down on the ground several times in quick succession.

Family CARABIDAE
Ground beetles
7.2

This family contains over 25 000 described species, which are divided in numerous subfamilies. Although once thought to be entirely predaceous, many groups are at least partly plant-eating. While they are called ground beetles, certain groups are largely found on plants or under the bark of trees. Ground beetles are renowned for their chemical defence mechanisms. One such group are members of the genus *Anthia* and related genera. These are large black beetles 25–50 mm in length, many with yellow or white spots on the thorax or elytra. They cannot fly and may be seen running about swiftly during the day. They are fierce hunters with strong, sharp jaws, and can inflict a nasty bite. Their main defence chemical is formic acid, which they can squirt up to 35 cm in any direction when threatened. The fluid can cause severe pain if it comes in contact with human skin, and more serious problems if it gets into the eyes. An example of the spoor of a ground beetle of the genus *Anthia* is shown in Fig. 7.2a. The innermost footprints are of the fore-feet, and the outermost of the middle feet. The angle of the hind footprints indicates the direction of movement. The swift running gait is indicated by the way the hind-feet are swept through the sand.

Species of *Scarites* and related genera live in burrows. Accordingly, their bodies are adapted for burrowing. They are elongated and parallel-sided, with large serrations on their flattened fore-tibia. They are predaceous, although some species also eat seeds and seedlings. An interesting example of a Scaratinae spoor is shown in Fig. 7.2b, where the footprints of the fore- and hind-feet are fused by a sweeping motion of the hind-feet. This example may, however, not be typical.

Family SCARABAEIDAE
Scarabaeid beetles
7.3

The family Scarabaeidae contains groups such as dung beetles, rose beetles, rhinoceros beetles, chafers and many others. The family is divided into a number of subfamilies. The most abundant of the African dung beetles belong to the subfamily Scarabaeinae. The majority of them roll their food into a ball and bury it for themselves and their larvae. The ball-rolling habit appears to have evolved to minimise competition with other beetles that also feed on the dung of large herbivores. Their front legs lack the five-jointed tarsi which would be a hindrance. The stout front legs are armed with four strong, tooth-like projections and are used as scoops and rakes in dealing with the animal droppings that form their only food. The imprints of the front legs show up clearly in the spoor (Fig. 7.3a). In soft sand the middle and hind footprints are fused. The direction of movement is indicated by the half-moon shape of the fore footprint.

The beetle makes a ball by patting and pressing the dung with its front legs. The spoor of a dung beetle rolling its ball of dung is shown in Fig. 7.3b. It pushes the ball with its middle feet and hind-feet, while walking backwards on its fore-feet. The direction

of movement is therefore indicated by the half-moon shape of the front footprints which lie opposite to normal. Another variation of dung beetle spoor is shown in Fig. 7.3c. In soft sand the legs may sink into the sand to leave the imprints of the tarsi as well as the ends of the tibia.

The 'rhinoceros beetles', subfamily Dynastinae, live in decaying wood and plants. Only the males possess the large horns, which are apparently used as weapons in fights between males. Their larvae are huge white grubs, often found in manure heaps. The spoor of the rhinoceros beetle (Fig. 7.3d) shows a round imprint of the front leg, while the tarsi of the middle leg and hind-leg may leave imprints in soft sand.

Order ORTHOPTERA Grasshoppers, locusts and crickets
Suborder CAELIFERA

Family ACRIDIDAE
Locusts & grasshoppers
Sprinkane & grassprinkane
8.1

A characteristic feature of grasshopper spoor is that the imprints of the hind-legs are parallel to the direction of motion. The outermost footprints are those of the middle feet, the angle of which indicates the direction of motion. The term 'locust' applies to those members of the family Acrididae that gather in swarms and migrate from place to place. The majority of the about 10 000 different species of this family are generally called 'grasshoppers'. Most can jump well and fly strongly. Many have well-developed spines on their powerful hind-legs that are used for self-defence. All locusts go through two phases, the solitary phase and the warm or gregarious phase. The change from the solitary to the gregarious phase arises as a result of overcrowding in the outbreak areas. They then form huge swarms and migrate in the direction of the prevailing winds. Swarms that were 30–60 km in length and 3–8 km wide have been reported. The swarms may travel for about eight months, covering hundreds of kilometres.

Suborder ENSIFERA
Superfamily TETTIGONIOIDEA
Family TETTIGONIDAE
Subfamily HETRODINAE

Armoured ground cricket
Koringkriek
8.2

The spoor of the armoured ground cricket is fairly large compared with those of other insects. These large insects are widespread, but most abundant in the more arid areas of southern Africa. They are omnivorous, feeding on plant and animal material. Nocturnal in habit, the males start singing after dark with a loud, continuous and piercing buzz. They can inflict a sharp bite with their powerful jaws.

Class ARACHNIDA

Order SCORPIONES
Scorpions
Skerpioene
9.1

The trail of scorpions is characterised by four tightly grouped footprints on either side. The direction of movement is indicated by the pointed imprints. The four footprints may be next to each other (Fig. 9.1a), or the middle footprints may be fused (Fig. 9. 1b). Note that even when two footprints are fused, it is usually possible to see that they were made by two feet, so it should not be confused with the spoor of insects. Scorpion spoor are usually in tighter groups than those of spiders, which are more spread out.

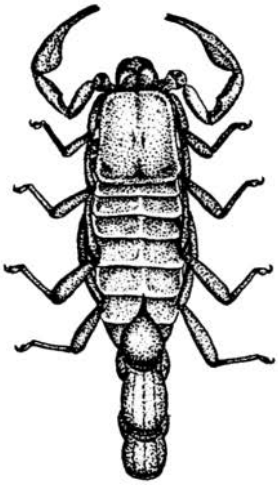
There are two important families in Africa, the Scorpionidae

and the Buthidae, which can be distinguished by looking at the pincers and tails. Scorpionidae have large, powerful pedipalps and a slender tail with a small sting. They do not have a powerful venom, and capture and subdue their prey with the pedipalps. The Buthidae, on the other hand, have slender pedipalps and a thick tail with a big sting. They have powerful venom which affects the nervous system, and they kill or paralyse their prey by stinging. A number of Buthidae are dangerous to humans, and their stings can be fatal to some individuals, unless they are treated in time with anti-venom. Fortunately most of the dangerous scorpions are restricted to very arid parts of Africa which have low human populations. Scorpions are entirely carnivorous and feed upon any other arthropod (insect, myriopod or other arachnid). They are active at night and hide during the day. They can be divided according to their habitat into burrowing, rock-dwelling or arboreal species. Some of the burrowers may dig burrows as deep as 1 m below the surface. In hard soils they dig to a depth of only 10–30 cm, and the burrows are often under stones. Members of the genus *Hadogenes* are adapted to living in narrow cracks and crevices in rocks. They are flattened and have long, slender pedipalps and tails. Arboreal scorpions generally live under the bark of trees.

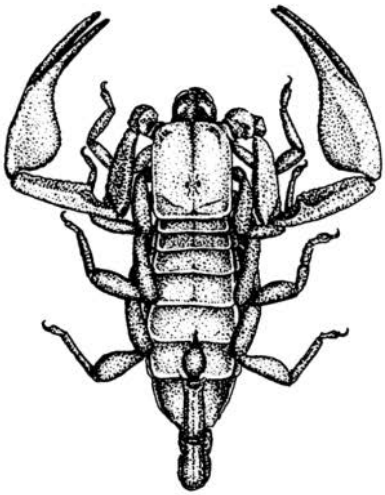
Order ARANEAE
Spiders
Spinnekoppe
9.2

The trail of a spider shows four footprints on either side. Compared with scorpion spoor, spider footprints are more spread out. When walking slowly the feet leave neat round imprints (Fig. 9.2a). When running, the feet are swept through the sand (Fig. 9.2b). Many thousands of species of spiders are known from Africa. Spiders vary in size from less than 1 mm across to more than 15 cm. Male spiders are usually tiny and are seldom seen. Males can be recognised by their clubbed and swollen pedipalps which are used for mating. Spiders have spinnerets at the posterior and at the abdomen. They use silk for constructing webs, snares, shelters and egg sacs. All spiders are carnivorous, the majority feeding on insects. Others use small webs as nets, which they fling over their prey when within range. Many spiders are free-ranging and capture their prey without a web. They hunt at night, and during the daylight hours they seek shelter under stones, the bark of trees, in tangled herbage and in holes in the ground. The large *Palystes natalius*, family Sparassidae, preys on small geckos. Although they do not spin snares they occasionally use silk to bind up their victims when the latter are too large to hold.

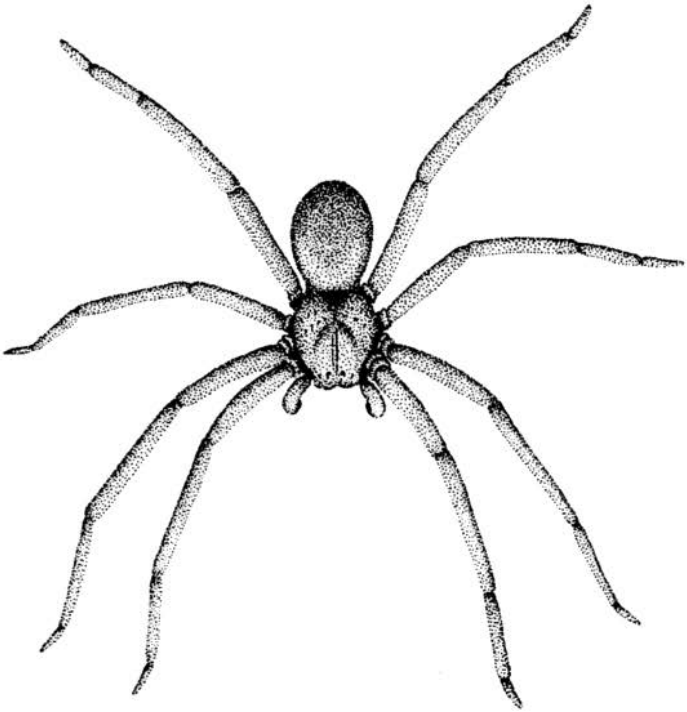
The big 'baboon spiders' which belong to the family Theraphosidae, are much feared because of their great size and hairy appearance, but they are not dangerous to humans. The only spider in Africa known to be dangerous to humans is the Black Widow Spider, or 'button spider', *Latrodectus mactans*. It has a round, shiny black abdomen with a crimson line or spot on the dorsal surface. The venom of the Black Widow affects the nervous system, and an effective anti-venom is available. The Brown Widow Spider, *Latrodectus geometricus*, is very common and may be recognised by the orange 'hour-glass' mark on the underside of the abdomen. The action of the venom is the same in both these species of *Latrodectus*, but *L. geometricus* is much less dangerous than *L. mactans*.



Scorpion, family Buthidae



Scorpion, family Scorpionidae

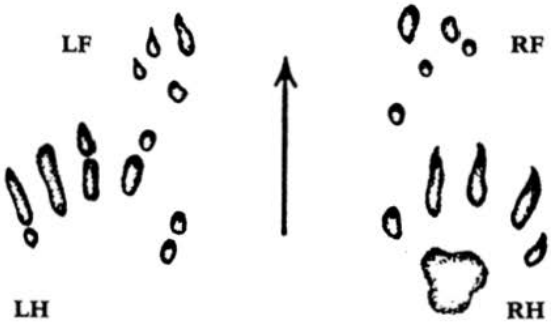


Hunting spider ***(Palystes natalius)***

Order SOLIFUGAE
Solifuges (Sun spiders)
Jagspinnekoppe
9.3

The spoor of solifuges are probably similar to those of spiders. The swift running gait may be indicated by the feet being swept through the sand. Solifuges are large spider-like creatures that can be distinguished from other arachnids by the two immense jaws at the front of the head. Although these jaws can inflict a powerful bite, they lack venom glands and are not dangerous to humans. The pedipalps are slender and leg-like, so they appear to have five pairs of legs instead of four pairs. They will eat any other arthropod which they can overcome, including individuals of their own kind. Some are active during the day in the hot sunshine and will run with a swift but erratic gait in different directions across the ground or on rocks. The diurnal forms, mostly small species, have a variegated and often striking pattern of black markings. The nocturnal forms are usually much larger and have a uniform yellow or sandy colour. **Spoor** not recorded.

AMPHIBIANS



10 Toad (hopping spoor)

cm
Actual size

Phylum CHORDATA
Subphylum VERTEBRATA
Class AMPHIBIA

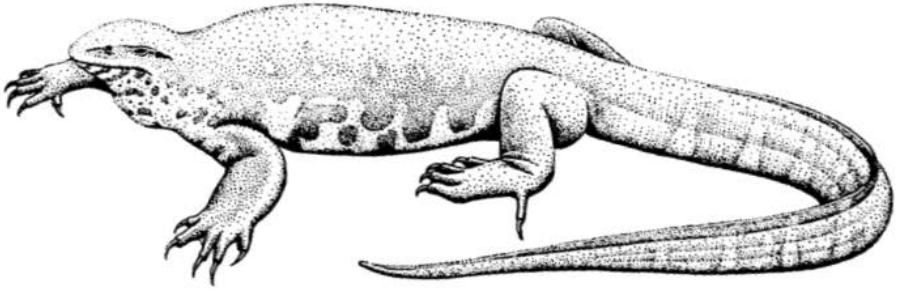
Order ANURA
Frogs & toads
Paddas & brulpaddas

10

Frogs and toads have four toes on each fore-foot and five toes on each hind-foot. In predominantly aquatic forms, which have webbing between the toes, the lever-system type of hind-limb makes them powerful swimmers. The frog is adapted to the leaping mode of locomotion, mainly for leaping to safety in water. The individual bones of the hind-limb are long, and when the frog is in the sitting position they are arranged in such a way as to form an efficient system of levers. Upon contraction of the appropriate muscles the entire limb is straightened, providing a powerful forward thrust enabling the frog to jump a considerable distance. In toads the skeletal components of the hind-limb are less elongated so that they can only hop or run, while in some the legs are so reduced that they can only walk or crawl. The hopping spoor of a toad (Fig. 10) shows the five toes of the hind-feet and the imprints of the four toes of the fore-feet. The irregular shape of the spoor is due to the hopping, which causes the toes to slip in the sand. Each hop is about 30 cm long, although the distance may vary. Some frogs, like the Platanna (*Xenopus laevis*), are wholly aquatic, living, feeding and breeding under water. Other frogs have a semi-aquatic way of life, living on marshy ground near watercourses, vleis and dams, and at the approach of danger they take refuge in water. They also breed in water. Toads in general inhabit more open country and are less aquatic than most frogs, although they are dependent on the presence of water for breeding purposes. Like most frogs, toads are crepuscular and nocturnal in habit.

The obvious differences between a typical frog and a typical toad are a smooth, moist skin devoid of glandular concentrations in the former and a dry, warty skin and usually prominent parotid glands in the latter. The frog has teeth in the upper jaw and has long hind-legs enabling it to progress by a series of leaps, whereas the toad is edentulous and has short hind-legs so that it can only walk or hop. The frog deposits its eggs singly or in clusters, while the toad deposits its eggs in long strings. The frog is more aquatic, while the toad is more terrestrial. Both frogs and toads eat insects, insect larvae and snails.

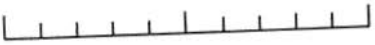
REPTILES



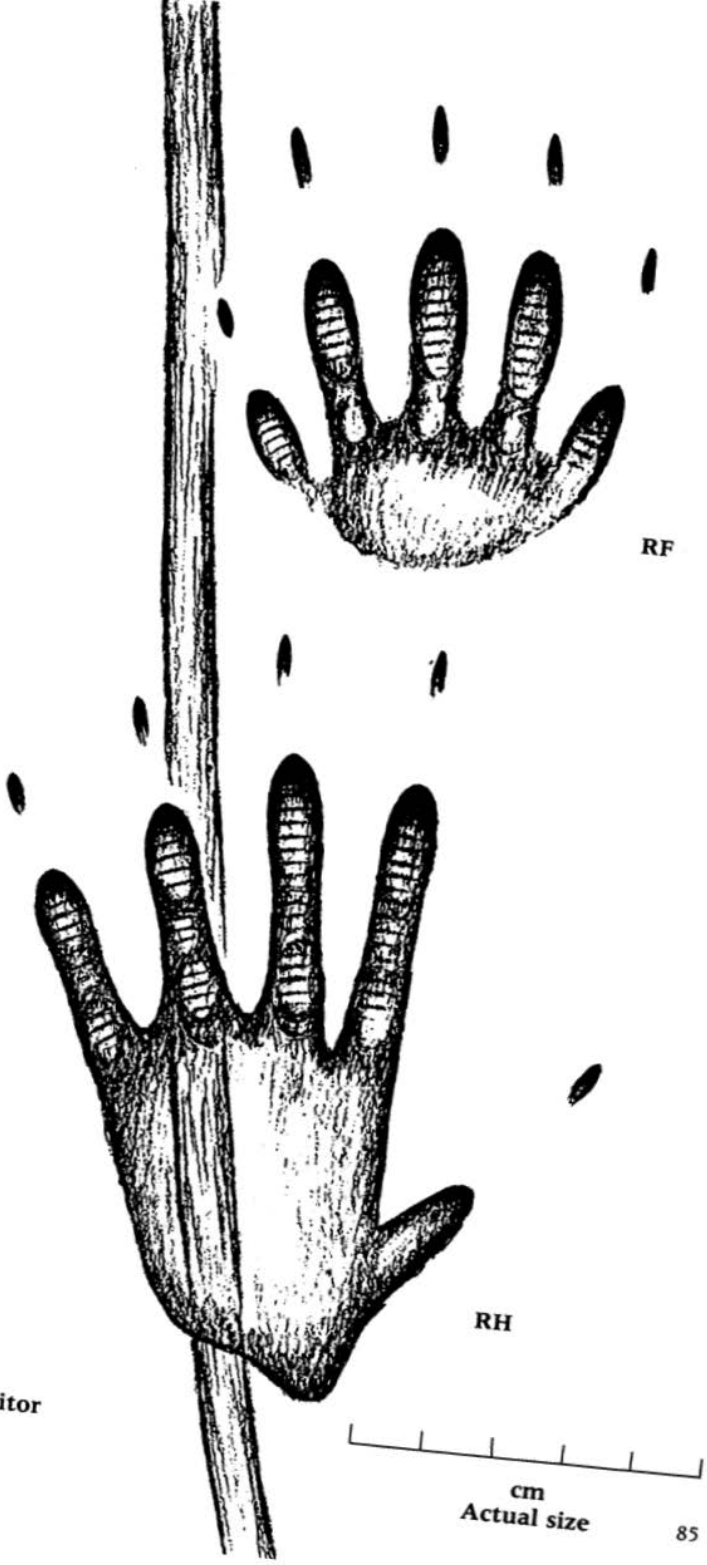
RF

RH

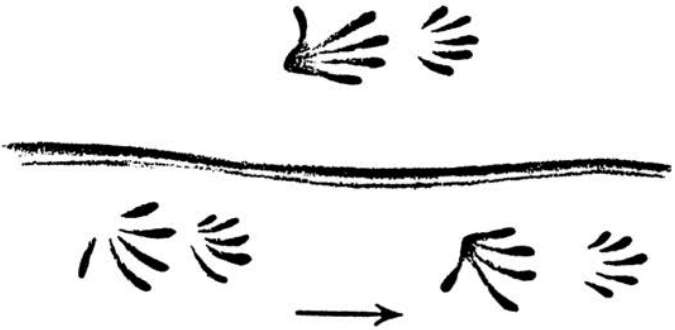
11 Nile Crocodile



cm
Reduced



12.1 Monitor

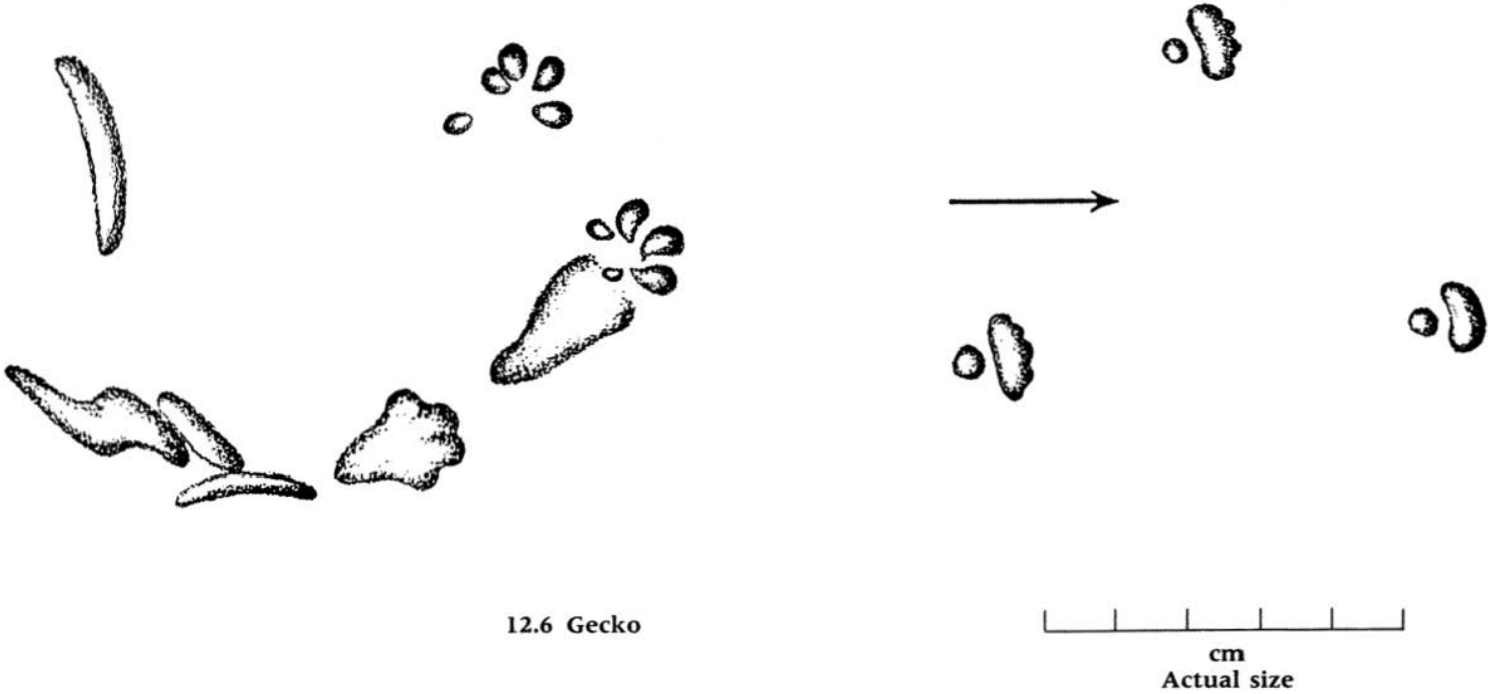


12.2a Skink

12.2b Legless Skink

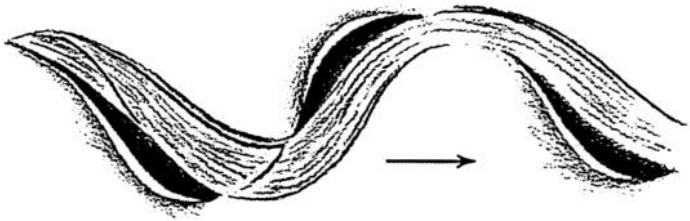
12.3 Lizard

cm
Actual size

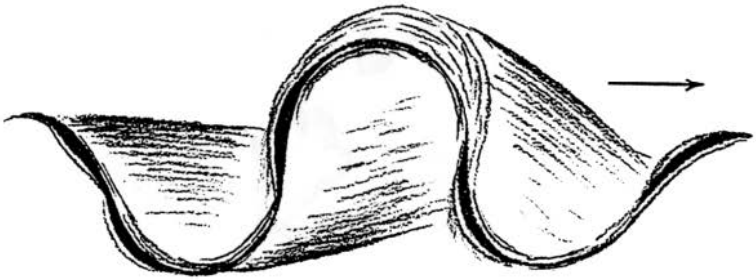


12.6 Gecko

13.1a Typical snake

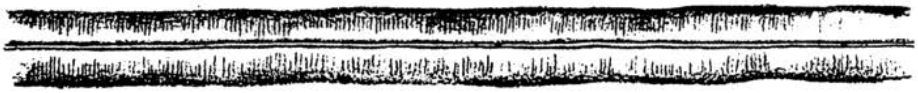


13.1b Mole Snake
13.2a Cobra



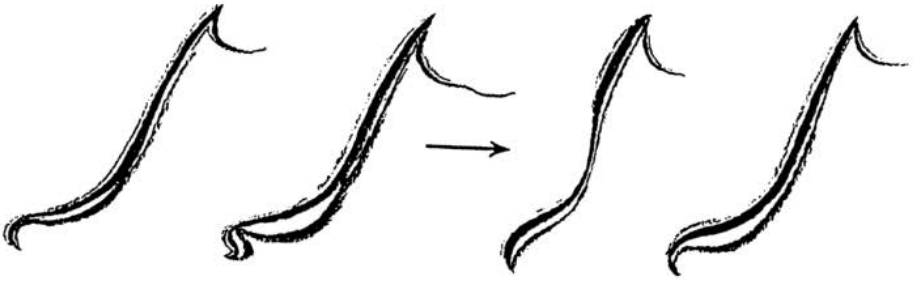
13.2b Mamba

Reduced (not to scale): size of spoor depends on length of snake



13.3a Puff Adder (rectilinear locomotion)

13.3b Puff Adder (undulatory locomotion)



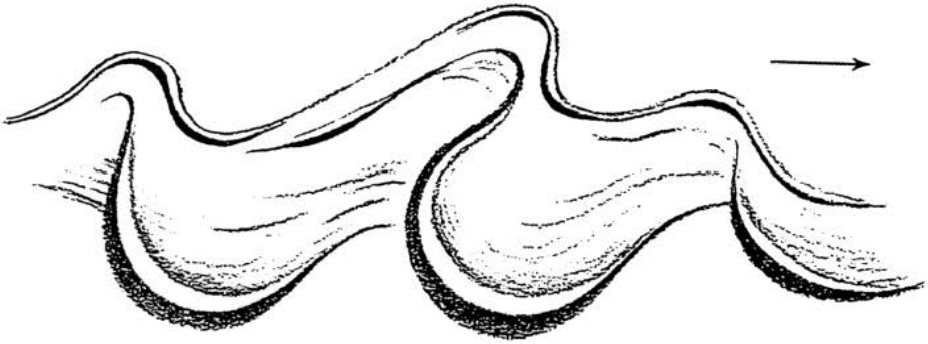
13.3c Single-horned Adder (sidewinding)

Reduced (not to scale): size of spoor depends on length of snake

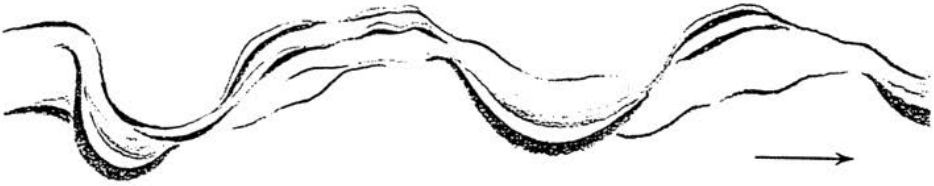
Puff Adder **Python**

Detail of markings made by ventral scales in rectilinear locomotion

13.4a Python (rectilinear locomotion)



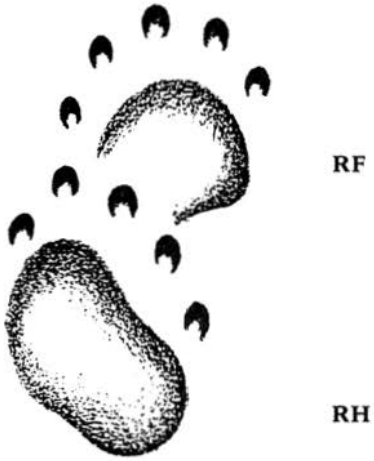
13.4b Python (slow undulatory locomotion)



13.4c Python (fast undulatory locomotion)

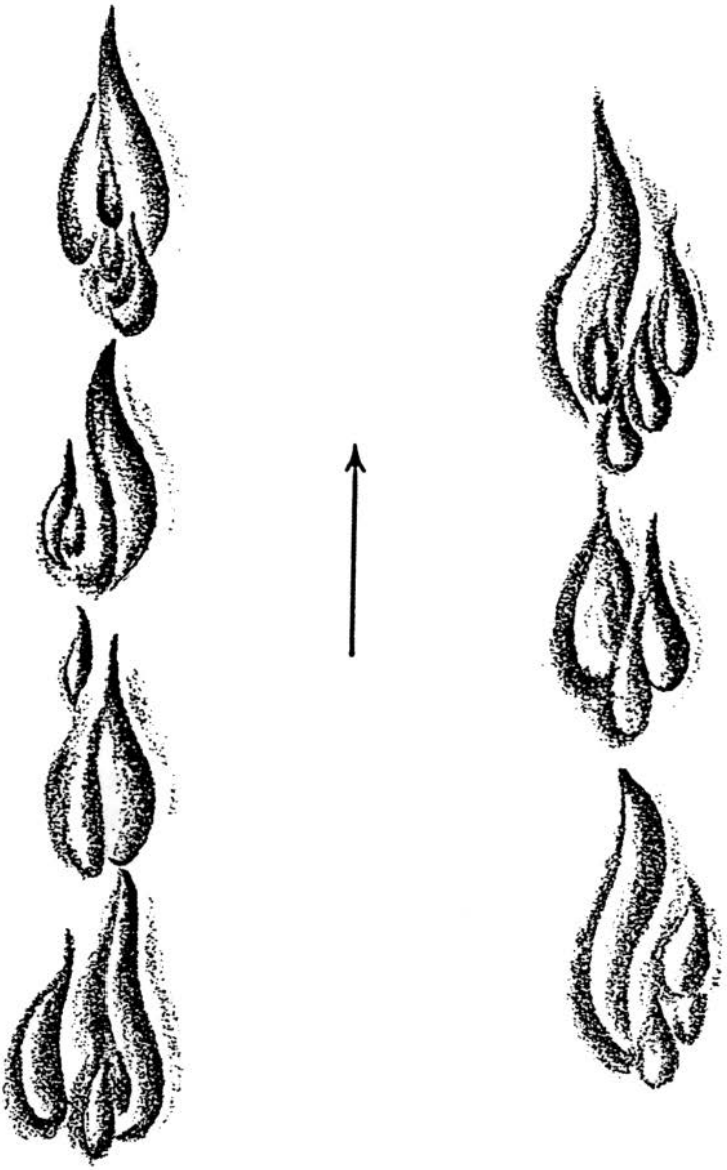
Reduced (not to scale): size of spoor depends on length of snake

14.1a Angulate Tortoise



14.5 Side-necked Terrapin

cm
Actual size



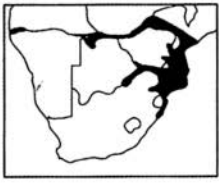
14.1b Tortoise spoor in loose sand

cm
Actual size

Class REPTILIA
Order CROCODYLIA
Family CROCODYLIDAE

Crocodylus niloticus
Nile Crocodile
Nylkrokodil

11



Nile Crocodiles may exceptionally exceed 1 000 kg. TL 2,5–3,5 m; max. 5,9 m. The nostrils, eyes and ear-openings are on the top of the head so as to project slightly when floating while the rest of the body is submerged. **Spoor:** Crocodiles have fives toes on the fore-feet and four toes on the hind-feet. Each toe has a thick claw. The hind-feet are webbed. In mud the scales underneath the feet leave clear impressions in the spoor. The drag mark of the Crocodile's tail also shows in the trail. The spoor of a young Crocodile can be distinguished from that of monitors by the fact that monitors have five toes on their hind-feet. **Habitat:** Larger rivers, lakes and swamps, as well as river mouths, estuaries and mangrove swamps. **Habits:** Amphibious and riparian, it is a strong swimmer, using only the tail for propulsion. Much time is spent basking in the sun on the banks of rivers and the shores of lakes. Eggs are deposited in shallow excavations, 45–60 cm deep, on the dry, sandy banks and are closely guarded by the mother. **Food:** Subadults feed on fish, terrapins, birds and small mammals. Adults feed on fish, as well as large mammals such as antelope and even zebra and Buffalo, which are ambushed when coming to drink. Humans are also attacked. The Crocodile tears up large prey by seizing a part of it in the jaws and then rotating the body rapidly until a piece is twisted off.

Order SQUAMATA Lizards and snakes
Suborder SAURIA Lizards Akkedisse

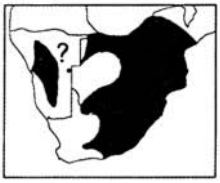
Although lizards are usually distinguishable from snakes by the presence of limbs, many lizards are limbless and resemble snakes in so many other respects that they cannot be distinguished easily. The fore- and hind-feet have five toes and although the limbs are generally well developed, many groups show a transition to complete absence of limbs. Lizards which have small limbs progress by throwing the body from side to side, thus advancing first one of a pair of limbs and then the other. As the limbs develop in size and power, they take over an increasing proportion of the function of locomotion, and the contortions of the trunk are reduced. Some lizards with large hind-legs are quadrupedal when moving slowly, but at high speed the forelegs are too small to equal the stride of the longer pair, and the animal runs only on its hind-legs, using the tail for balance. The legless skink 'swims' through loose sand with an undulating progression in much the same way as snakes swim in water. The homes of some lizards can be located by looking for their spoor and droppings around rock cracks.

Family VARANIDAE Monitors (Leguaans) Likkewane

Spoor: Monitors have five toes on the fore- and hind-feet, and each toe has a strong, sharp claw. In mud the scales underneath the toes show clearly in the spoor. The tail also leaves a clear drag mark in the trail. The spoor of the Rock Monitor and the Water Monitor may be distinguished by the difference in their habitat requirements and feeding preferences. Although the difference, if any, in the shapes of their footprints has not been recorded, it is possible that the difference in their body build may be evident in their spoor. The Water Monitor is comparatively slender in build while the Rock Monitor is smaller but more compactly built. The toes of the Water Monitor may therefore be more slender than those of the Rock Monitor.

Varanus exanthematicus
Rock, Tree or White-throated Monitor
Veldlikkewaan

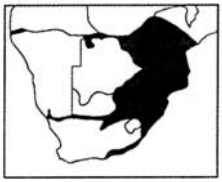
12.1a



A very large, stout lizard with strong, stocky limbs and sharp claws. Tail longer than body. Back is dark grey-brown with pale yellow, dark-edged blotches. Limbs spotted with pale yellow and tail banded in dark brown and off-white. TL 70–110 cm; max. 132 cm. **Spoor:** See above. **Habitat:** Savanna and arid, karroid areas. Often found very far from water. **Habits:** Lives in tunnel under rock overhang, disused animal burrow, hole in a tree or a rock crack. Usually solitary. Hibernates, semi-dormant in winter. **Food:** Mainly invertebrates (millipedes, beetles, grasshoppers and land snails), although it will kill and eat any animal small enough to swallow. Also scavenges on carrion.

Varanus niloticus
Water or Nile Monitor
Waterlikkewaan

12.1b



The largest African lizard, it has a stout body, powerful limbs and strong claws. Tail much longer than body. Greyish-brown to dirty olive-brown on top of head and back, with scattered darker blotches and light-yellow ocelli and bands on head, back and limbs. Belly and throat paler, with black bars. **Spoor:** See above. **Habitat:** Rivers, pans and major lakes. Always found in the vicinity of permanent water. **Habits:** Excellent swimmer. Often basks on rock outcrops or tree stumps. In temperate regions, may hibernate communally. When disturbed, it dives into the water and swims underwater to the safety of reed beds. **Food:** Diet varied. Forages in freshwater pools for crabs and mussels, as well as frogs, fish, birds and their eggs; also eggs from terrapin, sea turtle and unattended crocodile nests.

Family SCINCIDAE
Skinks

12.2

When it moves slowly on firm ground with a thin layer of dust, the footprints of a typical skink may show the five toes of the fore- and hind-feet, with the hind footprint just behind the fore footprint (Fig. 12.2a). The tail leaves a slightly wavy line. In loose sand the toes may not be very distinct. When running fast the tail leaves a more pronounced wavy line as it wriggles its body from side to side, and in places the tail may be lifted off the ground, leaving gaps of 30–60 cm. When running, the footprints of the hind-feet register with those of the fore-feet. The spoor of a legless skink, such as the Striped Blind Legless Skink (or Kalahari Blind Skink), *Typhlosaurus lineatus*, is characterised by the neat sinuous pattern created as it 'swims' through loose sand with an undulating progression (Fig. 12.2b). Although most skinks have well-developed limbs, some have only vestiges of limbs or no limbs. Their dorsal scales are usually smooth, flat and highly polished. Their heads are small and usually lack an obvious neck. The tail can be shed and regenerated.

Skinks are for the most part terrestrial, although many climb trees and rocks. They are active during the day, and most maintain a high body temperature by shuttling between sunny spots and shade. Most species are solitary and forage among loose leaves and wooded litter. They feed almost exclusively on small insects, which they seize after a short rush from cover. Legless skinks are burrowing reptiles, not being restricted to loose sandy soil or leaf litter, and feed on earthworms, beetle larvae and termites.

Family LACERTIDAE
Old World Lizards or Lacertids
12.3

The spoor of a lacertid is similar to that of a skink. In soft sand the footprints have irregular shapes as the long toes of the back feet are swept through the sand (Fig. 12.3). The long tail leaves a thin furrow. These small to medium-sized lizards have slender bodies, long tails and well-developed legs. The dorsal scales are usually small, smooth and granular. The tail has whorls of keeled scales, which may be spiny, and it can be shed and regenerated. They are active, diurnal and mainly terrestrial, although some are rock-living or arboreal.

Family CORDYLIDAE
Plated Lizards, Girdled Lizards and their relatives
12.4

These lizards have longish tails and well-developed legs. Some grassland species have reduced limbs. Body scales are usually rectangular (plates), overlapping, arranged in regular rows (girdles), often heavily keeled, and sometimes granular. **Spoor:** Not recorded.

Family AGAMIDAE
Agamas
Koggelmanders
12.5

This family is represented by a single genus on the subcontinent, namely the genus *Agama*. The agamas are plump, short-bodied lizards with thin tails and triangular heads. The legs are long, with thin toes. They are active, diurnal and territorial. Some species are rock-living, other mainly terrestrial, and a few are arboreal. They feed chiefly on ants and termites, supplementing their diets with beetles and other insects. **Spoor:** Not recorded.

Family GEKKONIDAE
Typical geckos
Geitjies
12.6

While the tail of a gecko may leave markings where it was resting, it does not show in the spoor when running. In soft sand the individual toes may not be distinct, and the hind footprints are superimposed on those of the fore-feet (Fig. 12.6). The toe-tips of many species of geckos have groups of scales with minute hairs that catch in small cracks. Many species also have claws. They usually have large eyes and most are nocturnal, although a few geckos are diurnal. They live in a large variety of habitats, including cool mountaintops and temperate regions. They are most common in deserts. Many live in colonies and communicate in the dark by means of a range of different sounds.

Family CHAMAELEONIDAE
Chameleons
Verkleurmannetjies
12.7

Chameleons are primarily arboreal and their toes are usually bound in two separate, opposable bundles of two or three toes each for grasping. The tail is prehensile to act as a stabilising aid to climbing. The protruding eyes are independent. The telescopic tongue can be shot out further than the body length to capture prey. Their colour varies to match their surroundings. **Spoor:** Not recorded.

Suborder SERPENTES Snakes

Snakes use their bodies for locomotion in either rectilinear or undulatory progression. The fastest-moving species, such as the mambas, tree snakes and some of the grass and sand snakes, do not exceed 8 km/hour. The majority of snakes cannot move more than about 6,5 km/hour, i.e. a man's brisk walking pace. Although the speed of strike appears to be very fast, it is only between 12 and 16 km/hour.

Rectilinear or caterpillar progression occurs in practically a straight line and is characteristic of heavy-bodied snakes such as pythons and adders when on an unhurried, leisurely prowl. Forward movement is brought about by the belly muscles moving the large ventral plates forward in alternate waves to enable the overlapping posterior edges of the plates to obtain a hold on any roughness of the ground so that the body is drawn forward over them. Many burrowing snakes adopt a concertina variation of the caterpillar progression for moving along underground tunnels. Certain arboreal species, such as the Spotted Bush Snake and other tree snakes, have the broad belly and tail shields strongly keeled or notched, which enables them to crawl up almost vertical

tree trunks by hooking onto the slightest projection and pushing the body upwards by caterpillar progression.

In undulatory or serpentine progression, movement occurs by means of a series of lateral undulations or waves from the front backwards, in which each outward bend or curve pushes up against an uneven or rough surface and propels the snake forwards. This method of progression is normally effected by most snakes, including pythons and adders, when moving fast, and is much faster than rectilinear or caterpillar progression. The sidewinding variation, in which the body is lifted up from the ground in undulating motions, is adopted by certain sand-living forms, such as Peringuey's Adder and other small desert-living adders.

Most snakes, except perhaps certain burrowing types, are excellent swimmers and move over the surface of the water in the same undulating, serpentine fashion as adopted on the ground. Movement for snakes depends on a rough or uneven surface or substratum, and forward movement is practically impossible on a very smooth or polished surface.

The best time to follow snake spoor is early in the morning, before the wind obliterates it. To determine the direction the snake moved, look at the way the sand has been pushed back. Also note that when a snake moves uphill, the undulating motion is more pronounced, while the spoor of a snake moving downhill is almost straight. The best time of the year for following spoor is in spring when snakes are very active searching for mates. The males find the females by tracking them down, following the scent trail left behind by the latter. Snakes are most active within their preferred temperature range of 20 °C to 32 °C. When it becomes too hot they will move into the shade. Snakes are cold-blooded and are sluggish in cold weather. In very cold conditions they may hibernate for periods.

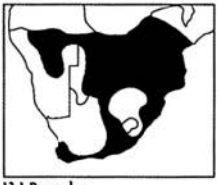
Of the 130 species of snakes found in southern Africa, 34 have fangs and venom glands. Only 14 species are known to have killed people in southern Africa.

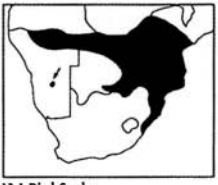
Snakes have no vocal organs, but can hiss by rapid inhalation and exhalation of air. While vision is fairly acute at short range, it is poor at a distance, and then it is only movement that attracts attention. Smell is poorly developed, but they can pick up minute scent and taste particles with the tongue, which transfers it to highly sensitive organs in the roof of the mouth. Some snakes, like pythons, have small heat receptors on the lips with which they can detect the presence of warm-blooded prey at a range of about a metre even on the darkest nights. Snakes have no eardrums, but are very sensitive to vibration, either air-borne or through the ground, and can detect the approach of humans or animals at a considerable distance. They are timid and flee whenever possible. Most snakes prefer living prey, such as mammals, birds, reptiles, amphibians, insects and other invertebrates, which are swallowed whole. They can swallow prey up to three or four times the diameter of the head.

Family COLUBRIDAE
Typical snakes

13.1

The spoor in soft sand of a medium-sized, slenderly built Typical snake is shown in Fig. 13.1a. When moving at normal speed by means of serpentine progression, it leaves a sinuous trail. The thickness of the snake can be determined from the width of the trail. Typical snakes that are more stockily built, such as the Mole Snake, *Pseudaspis cana*, leave a spoor that not only indicates the thicker body, but also pushes more sand back because of its more massive body (Fig. 13.1b). Since there are many Typical snakes with similar spoor, it is probably not possible to distinguish the spoor of different species from one another. This large family of snakes contains some of the most common snakes. Most are medium-sized and harmless, although a few are dangerous, such as the Boomslang, Bird Snake and burrowing asps.


13.1 Boomslang

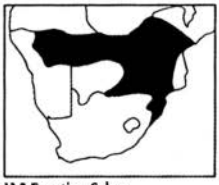

13.1 Bird Snake

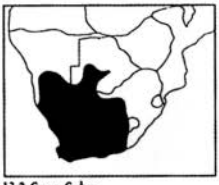
Family ELAPIDAE Cobras, mambas and their relatives

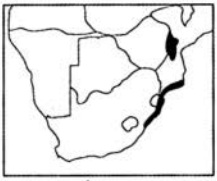
Medium to large in size, their bodies are covered with shiny, pitless scales, which are keeled in the rinkhals. With fixed fangs in the front of the mouth and venom glands, this family includes many of the most poisonous snakes, They are mostly terrestrial, with many burrowing forms, some are arboreal and others are aquatic.

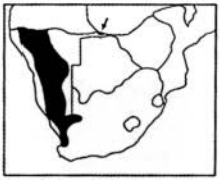
Genus *Naja*
Cobras
13.2a

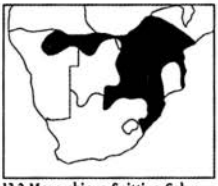
An example of a cobra spoor in soft sand is shown in Fig. 13.2a. Compared with that of a slenderly built Typical snake, the spoor indicates the thicker and more massive body of the cobra, and is similar to the spoor of more stockily built Typical snakes such as the Mole Snake (Fig. 13.1b). The cobras are large, stockily built, terrestrial snakes with smooth scales. They are active hunters, pursuing and capturing small vertebrates. All are potentially dangerous, and when threatened, they lift the forebody and spread their hood.

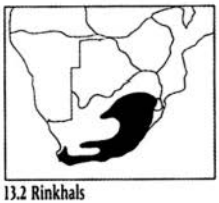

13.2 Egyptian Cobra

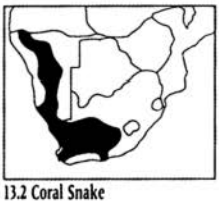

13.2 Cape Cobra


13.2 Forest Cobra


13.2 Black-necked Spitting Cobra

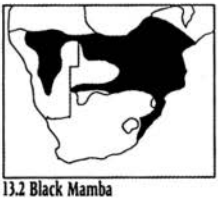

13.2 Mozambique Spitting Cobra

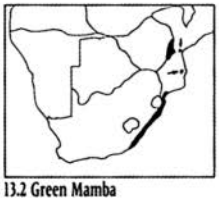

13.2 Rinkhals


13.2 Coral Snake

Genus *Dendroaspis*
Mambas
13.2b

The spoor of the Black Mamba, *Dendroaspis polylepis*, is shown in Fig. 13.2b. A characteristic feature of the mamba spoor is the indication of the wide sweeping motions of its long, slender body as it moves by serpentine progression. Two species of mamba are found in southern Africa, namely the Black Mamba and the Green Mamba, *Dendroaspis angusticeps*. These large, agile snakes have long, flat-sided heads. They are diurnal and actively pursue their prey, striking rapidly until it succumbs to the poison. They are dangerous to humans, although only the Black Mamba commonly bites. While the Green Mamba is an arboreal species, the Black Mamba is terrestrial, living on birds and small mammals.

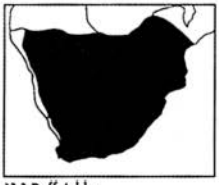

13.2 Black Mamba

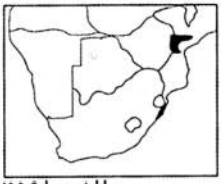

13.2 Green Mamba

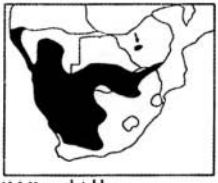
Family VIPERIDAE
Adders and vipers

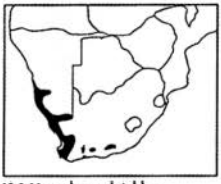
13.3

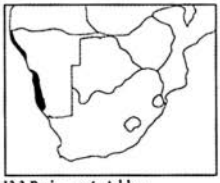
The Puff Adder, *Bitis arietans*, normally moves by means of rectilinear progression, leaving a straight trail in the sand (Fig. 13.3a). The trail usually has a thin furrow down the middle where the snake dragged the tip of its tail, and the ventral scales may leave clear markings in the spoor. When travelling faster, the Puff Adder moves by means of serpentine progression, leaving an undulatory spoor as shown in Fig. 13.3b. Peringuey's Adder, *Bitis peringueyi*, the Horned Adder, *Bitis caudalis*, the Many-horned Adder, *Bitis cornuta*, and the Namaqua Dwarf Adder, *Bitis schneideri*, adopt the sidewinding progression to move swiftly over hot, loose sand. The spoor shows a series of parallel lines at about 60° to the direction of movement, leaving gaps as the snake lifts its body in an undulating motion (Fig. 13.3c). The African adders, genus *Bitis*, are stocky snakes with distinct heads and short tails. They are terrestrial and usually nocturnal or crepuscular. They have large, erectile fangs at the front of the mouth and feed on small vertebrates, which are ambushed and killed by the venom.

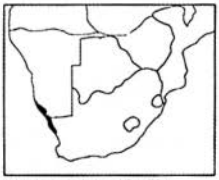

13.3 Puff Adder


13.3 Gaboon Adder


13.3 Horned Adder


13.3 Many-horned Adder


13.3 Peringuey's Adder


13.3 Namaqua Dwarf Adder

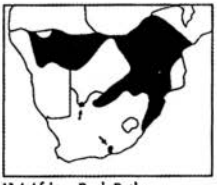
Family BOIDAE

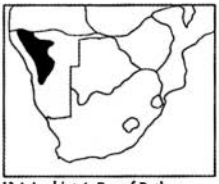
Genus *Python*
Pythons

13.4

When moving slowly, the African Rock Python, *Python sebae*, adopts a rectilinear progression, leaving a straight trail in the sand (Fig. 13.4a). The spoor of the python can be distinguished from that of the Puff Adder in that their dorsal scales differ and therefore leave different markings in the sand. While the middle row of scales of the Puff Adder are almost as wide as the spoor itself, the middle row of scales of the python is much narrower than the spoor, so that the adjacent rows of scales also mark in the spoor. When travelling faster the python moves in an undulatory progression, leaving a spoor that shows wide sweeping motions (Fig. 13.4b). When moving still faster, the undulations are not as

wide (Fig. 13.4c). Pythons are medium to large snakes with small, smooth scales. Two species occur in southern Africa — Anchieta's Dwarf Python, *Python anchietae*, and the African Rock Python, Africa's largest snake. Prey is ambushed and constricted, usually at dusk or after dark. The African Rock Python can swallow very large prey, but is vulnerable when swollen with food. It may attack humans, but such attacks are very rare.


13.4 African Rock Python


13.4 Anchieta's Dwarf Python

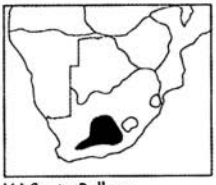
Order CHELONII Chelonians
Suborder CRYPTODIRA

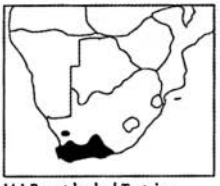
Family TESTUDINIDAE
Land tortoises
14.1

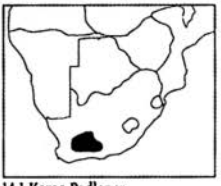
Of the land tortoises, two species of padlopers, the Greater Padloper, *Homopus femoralis*, and the Parrot-beaked Tortoise, *Homopus areolatus*, have four claws on the fore- and hind-feet. All other land tortoises, including three species of padlopers, have five claws on the fore-feet and four claws on the hind-feet. Their hind-feet are elephant-like, and they walk on the tips of their fore-feet, while the thick claws show clearly in the spoor (Fig. 14.1a). In soft sand the claws may be dragged through the sand, while on hard ground only the claw marks may show in the spoor. When walking, each foot is lifted and set down on the ground at a different time. However, the spoor of the hind-feet usually registers with that of the fore-feet (Fig. 14.1b), owing to the fact that the hind-foot is placed on the spot where the corresponding fore-foot was positioned at the previous step; i.e. it takes two steps for the hind-foot to reach the spot where the fore-foot was when the tortoise started to walk. In the slow trot, diagonal front- and hind-feet are placed in pairs, with two feet always on the ground.

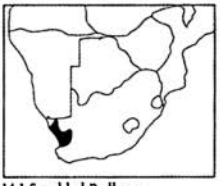
Tortoise droppings are the same shape as those of a small carnivore, being cylindrical and pointed at one end. They consist, however, mainly of vegetable matter.

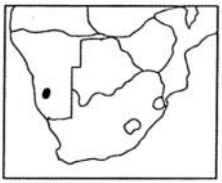
Land tortoises are cold-blooded and cannot tolerate extreme temperatures. In cold periods they shelter underground or in some other sheltered place, while in summer they will seek shade from the midday sun. For protection they withdraw into their hard, bony shell. Tortoises feed mainly on plants, although some may eat invertebrates such as snails and millipedes, or may gnaw bones and even eat hyaena droppings for calcium.

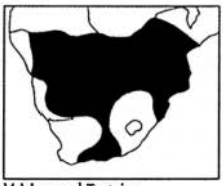

14.1 Greater Padloper

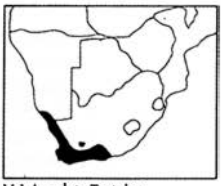

14.1 Parrot-beaked Tortoise

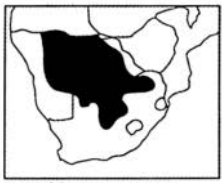

14.1 Karoo Padloper

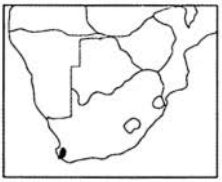

14.1 Speckled Padloper

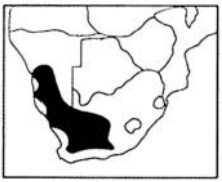

14.1 Nama Padloper

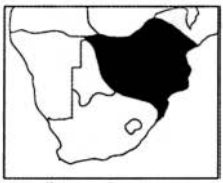

14.1 Leopard Tortoise

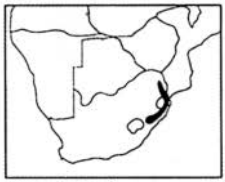

14.1 Angulate Tortoise


14.1 Kalahari Tent Tortoise


14.1 Geometric Tortoise


14.1 Tent Tortoise


14.1 Bell's Hinged Tortoise

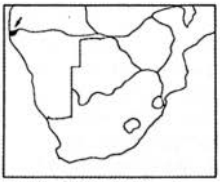

14.1 Natal Hinged Tortoise

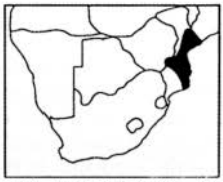
Superfamily CHELONIOIDEA
Sea turtles
14.2

Sea turtles have limbs that are modified into flippers, which retain only one or two claws. They leave distinctive spoor in the sand when they come out of the sea to lay their eggs on the beaches. **Spoor:** Not recorded.

Family TRIONYCHIDAE
Soft-shelled terrapins
14.3

Soft-shelled terrapins are characterised by having only three claws on each foot. They have soft, flat, disc-like shells and very long, extendable necks. They are shy, active and fully aquatic. **Spoor:** Not recorded.


14.3 Nile Soft-shelled Terrapin


14.3 Zambezi Soft-shelled Terrapin

Family EMYDIDAE
Pond terrapins
14.4

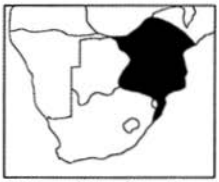
Alien to southern Africa, one North American species, *Trachemys scripta*, has been introduced to some areas of South Africa. The feet are webbed between the toes. **Spoor:** Not recorded.

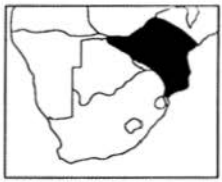
Suborder PLEURODIRA

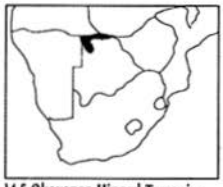
Family PELOMEDUSIDAE
Side-necked terrapins
Subfamily PELOMEDUSINAE
14.5

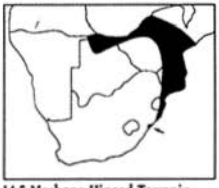
The subfamily Pelomedusinae is characterised by having five claws on the fore- and hind-feet. The feet are webbed. The spoor of the Marsh or Helmeted Terrapin, *Pelomedusa subrufa*, is shown in Fig. 14.2. Side-necked terrapins are characterised by the way they withdraw their heads, pulled to one side under the carapace. The shell is flat and hard. They are mainly carnivorous, while some, like the Marsh Terrapin, are omnivorous. They live in pans, lakes, swamps and rivers, and will bask on logs, rocks or banks. Some, such as the Marsh Terrapin, aestivate during droughts by burrowing into moist soil, and may migrate to new vleis after good rains.

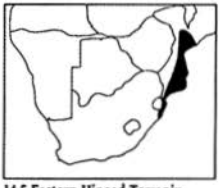
14.5 Marsh Terrapin


14.5 Serrated Hinged Terrapin


14.5 Pan Hinged Terrapin


14.5 Okavango Hinged Terrapin


14.5 Mashona Hinged Terrapin


14.5 Eastern Hinged Terrapin

BIRDS

15.1 Small passerine, family Ploceidae

26.1a Common Quail (hard dusty ground)

26.1b Common Quail (loose sand)

19.2 Laughing Dove

19.3 Cape Turtle Dove

19.4 Rock Pigeon

19.1 Namaqua Dove

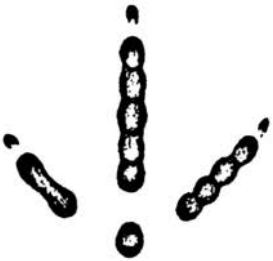
19.1 Namaqua Dove (walking spoor)

cm
Actual size

23.1a Spotted Dikkop

23.1b Spotted Dikkop (loose sand)

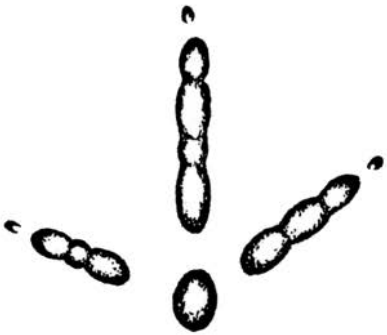
24.1 Bronzewinged Courser



22.1 Crowned Plover

30.1 Black Korhaan

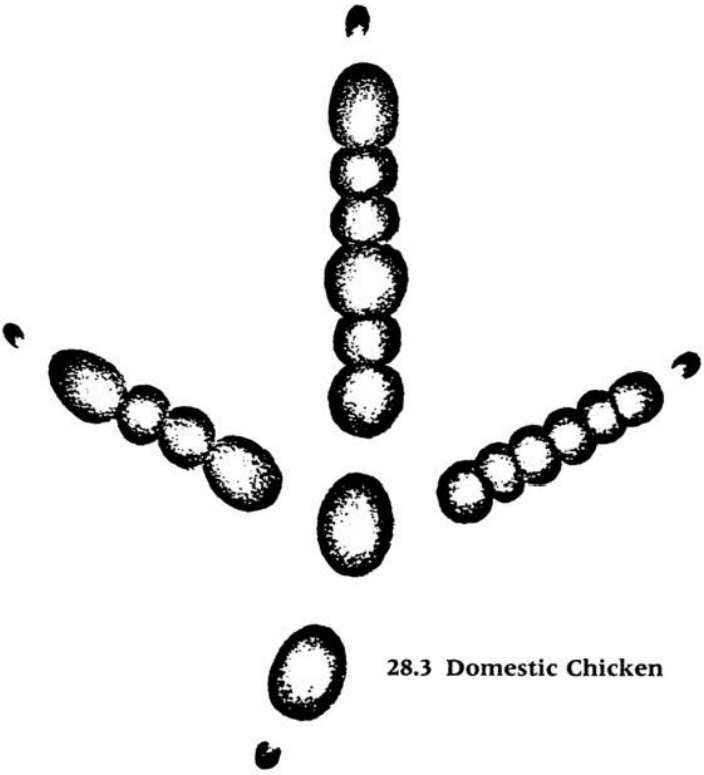
30.2 Redcrested Korhaan



22.3 Wattled Plover

22.2 Blacksmith Plover

cm
Actual size

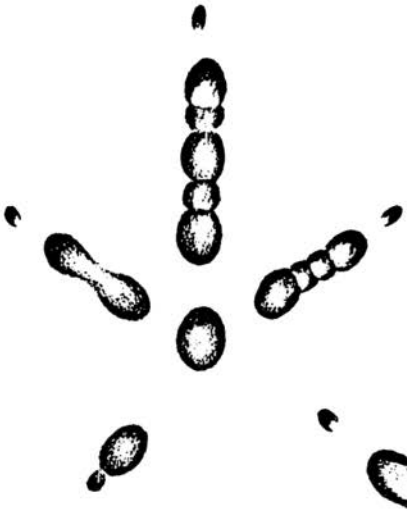


28.3 Domestic Chicken

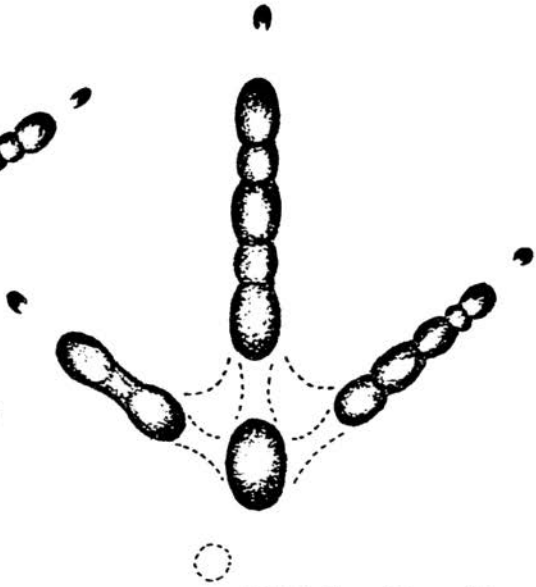
21.1a African Black Oystercatcher (firm ground)

21.1b African Black Oystercatcher (loose sand)

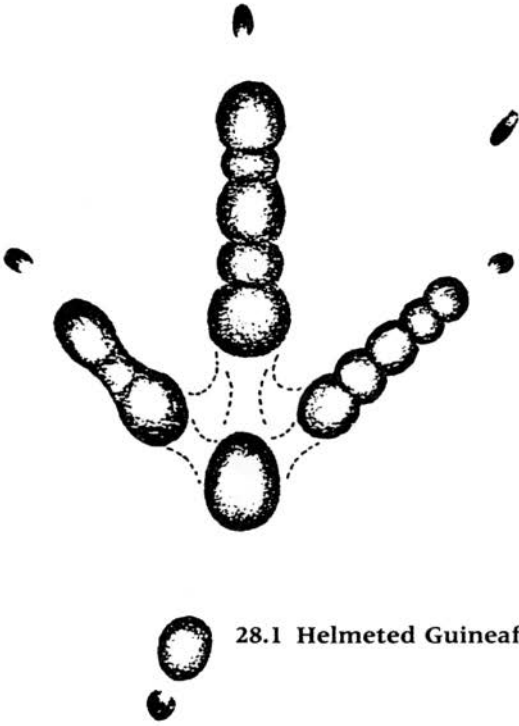
cm
Actual size



27.10 Swainson's Francolin



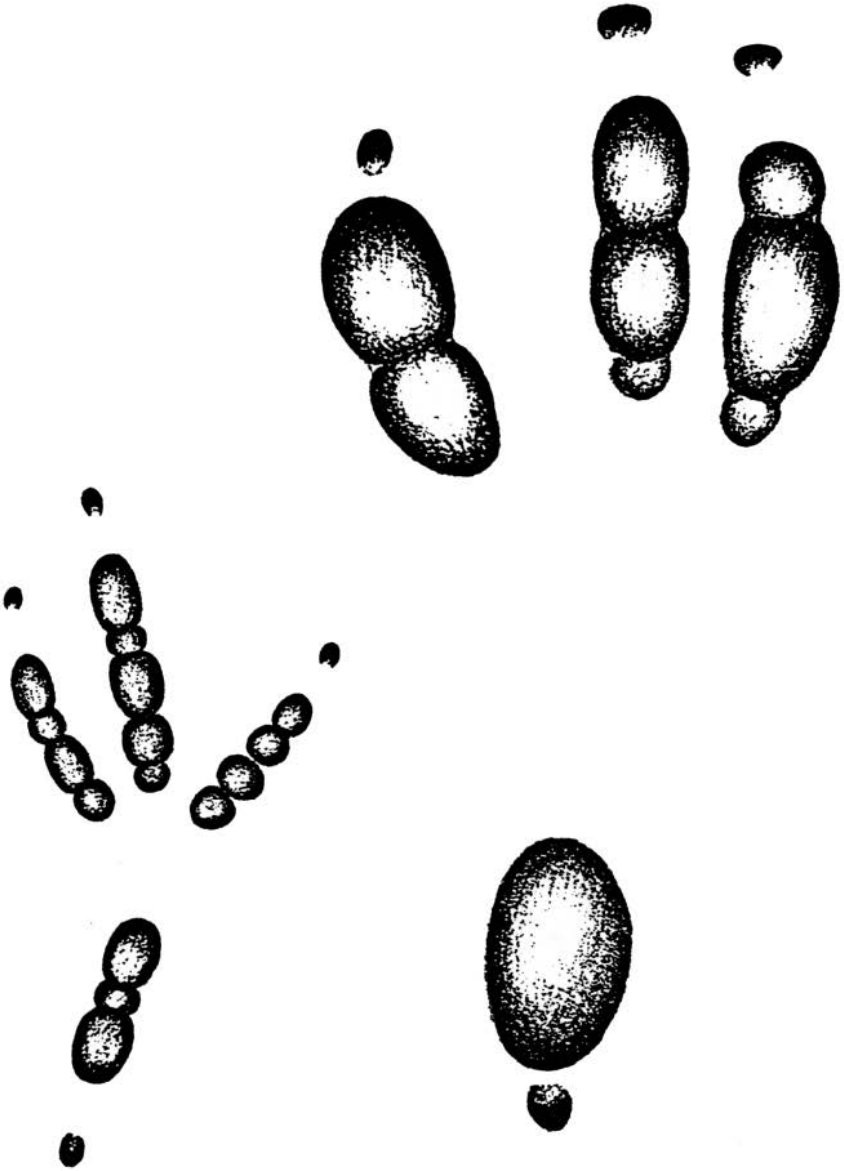
27.12 Cape Francolin



28.1 Helmeted Guineafowl

18.1 Yellowbilled Hornbill

cm
Actual size



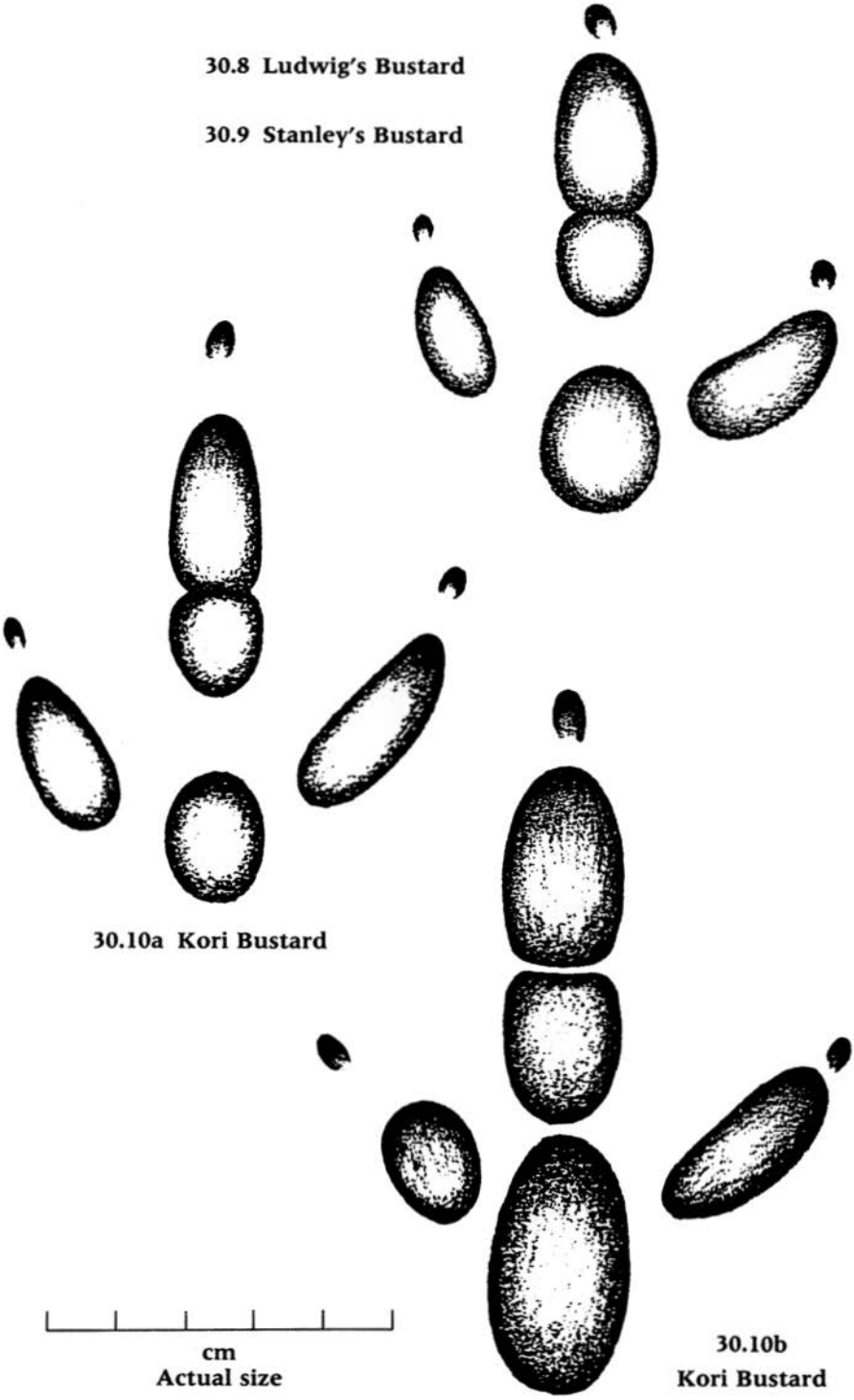
16.1 Black Crow

18.9 Ground Hornbill

cm
Actual size

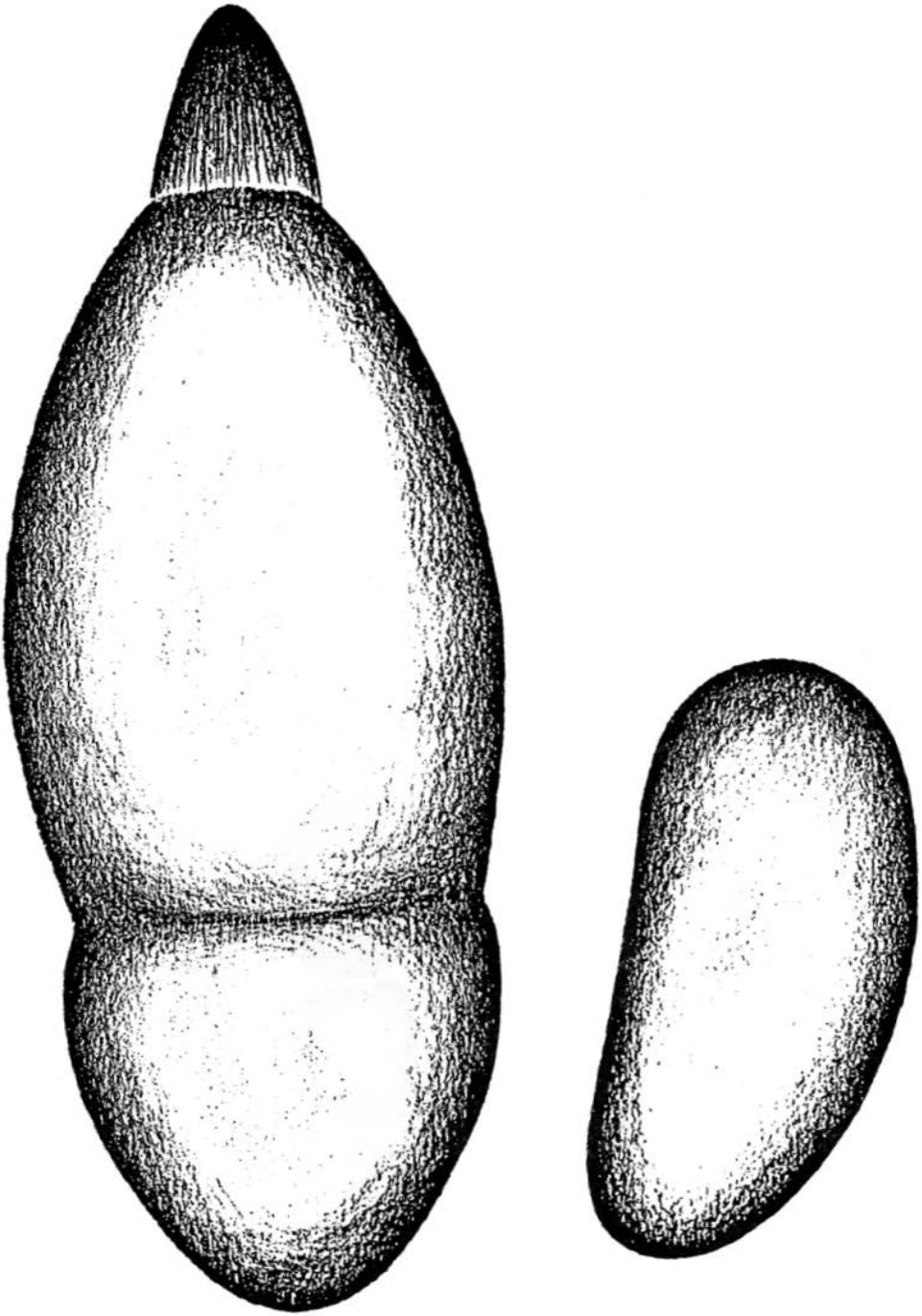
30.8 Ludwig's Bustard

30.9 Stanley's Bustard



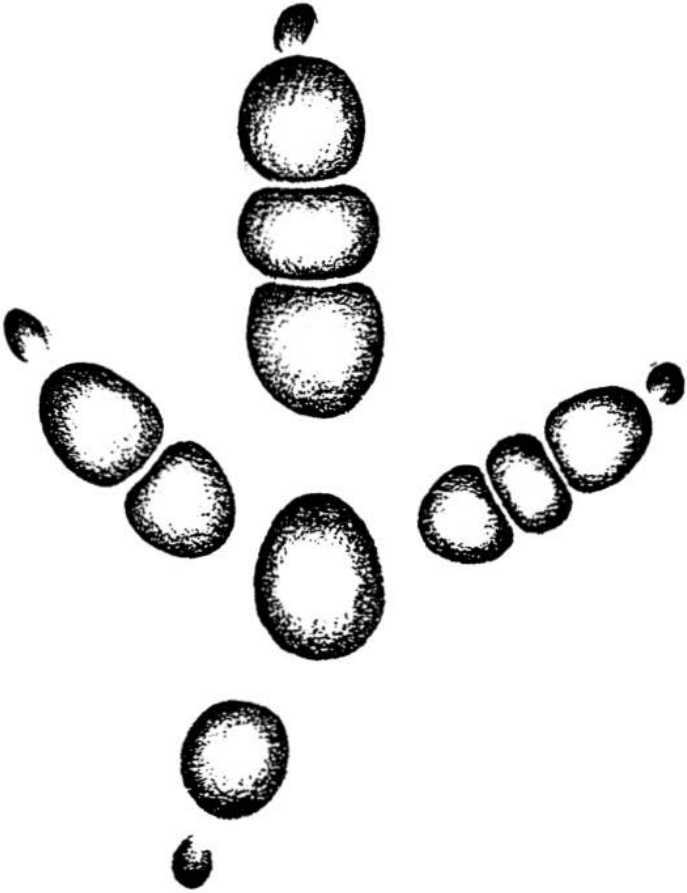
30.10a Kori Bustard

30.10b Kori Bustard



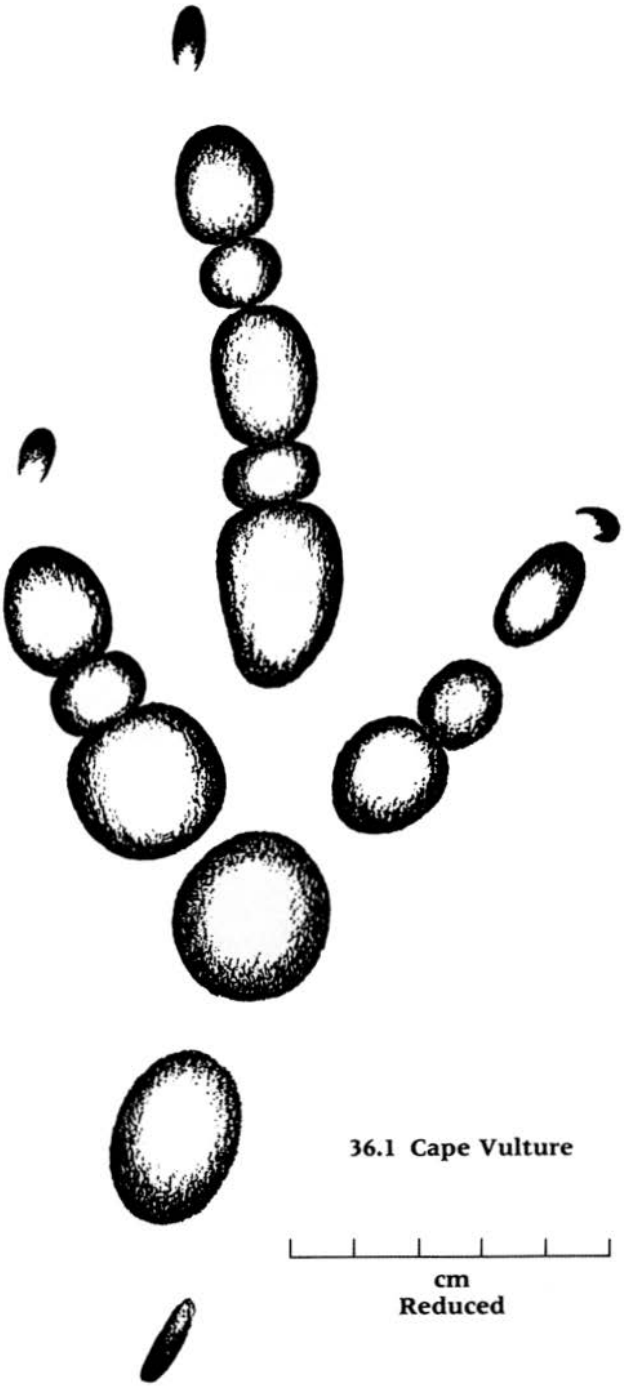
cm
Actual size

34 Ostrich

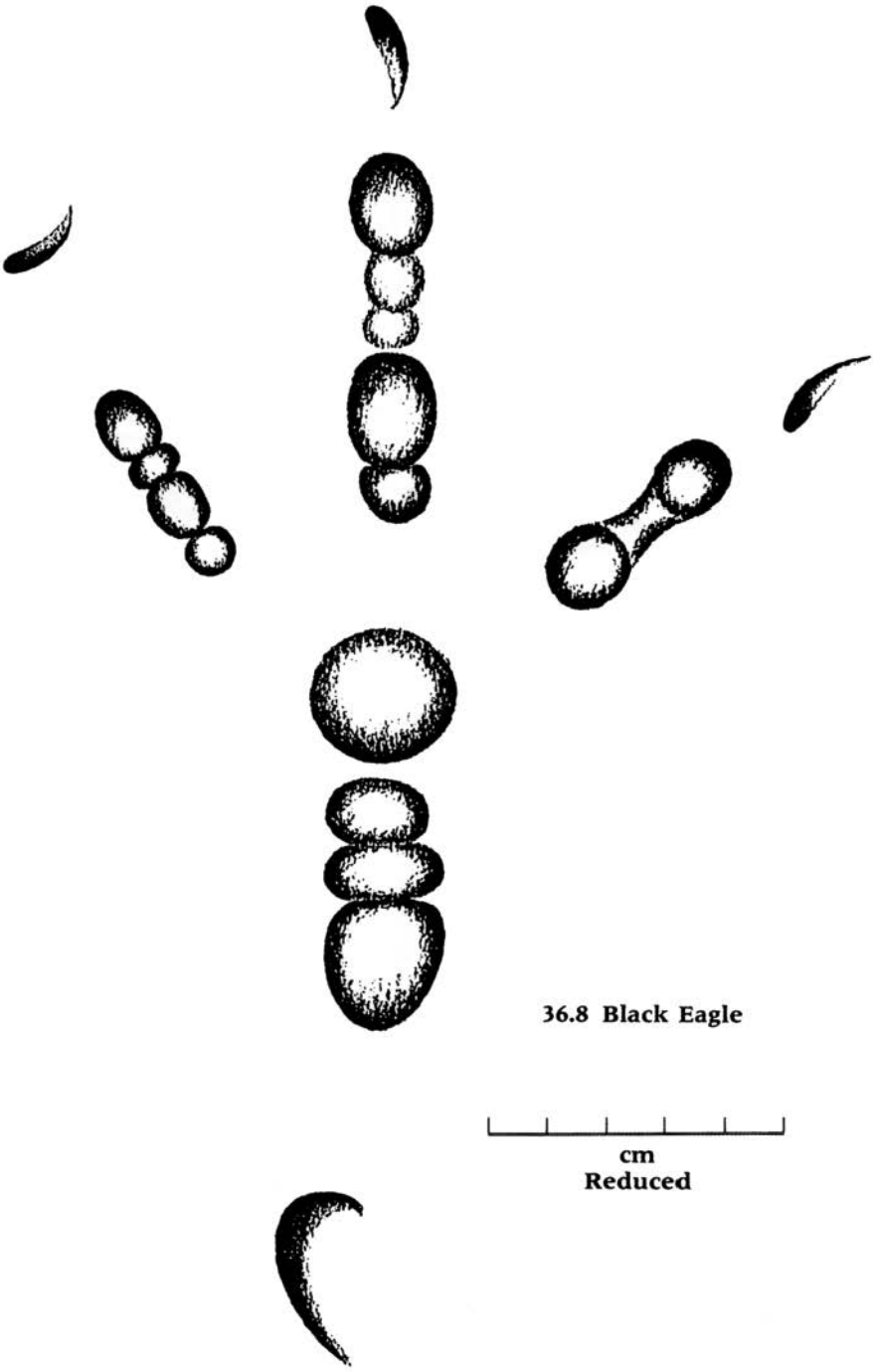


35 Secretarybird

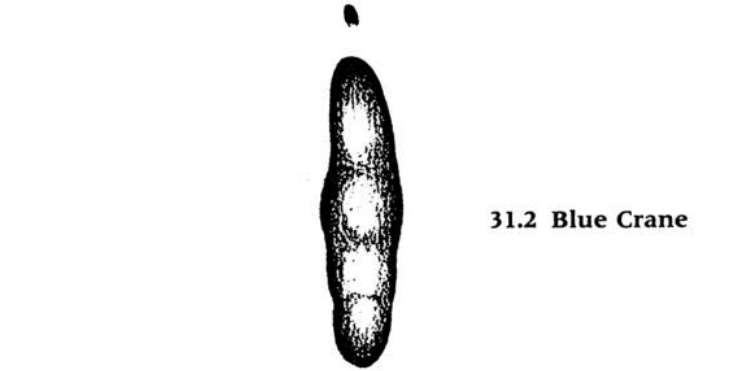
cm
Actual size



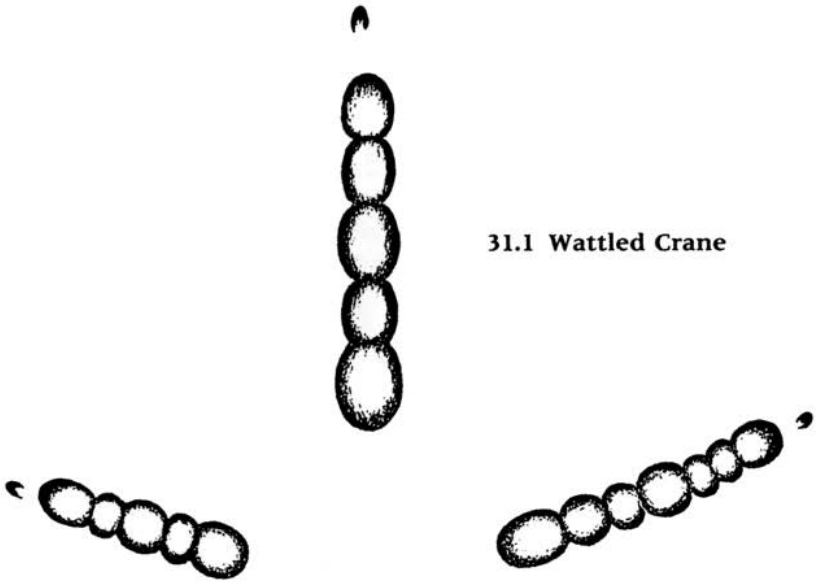
36.1 Cape Vulture



36.8 Black Eagle

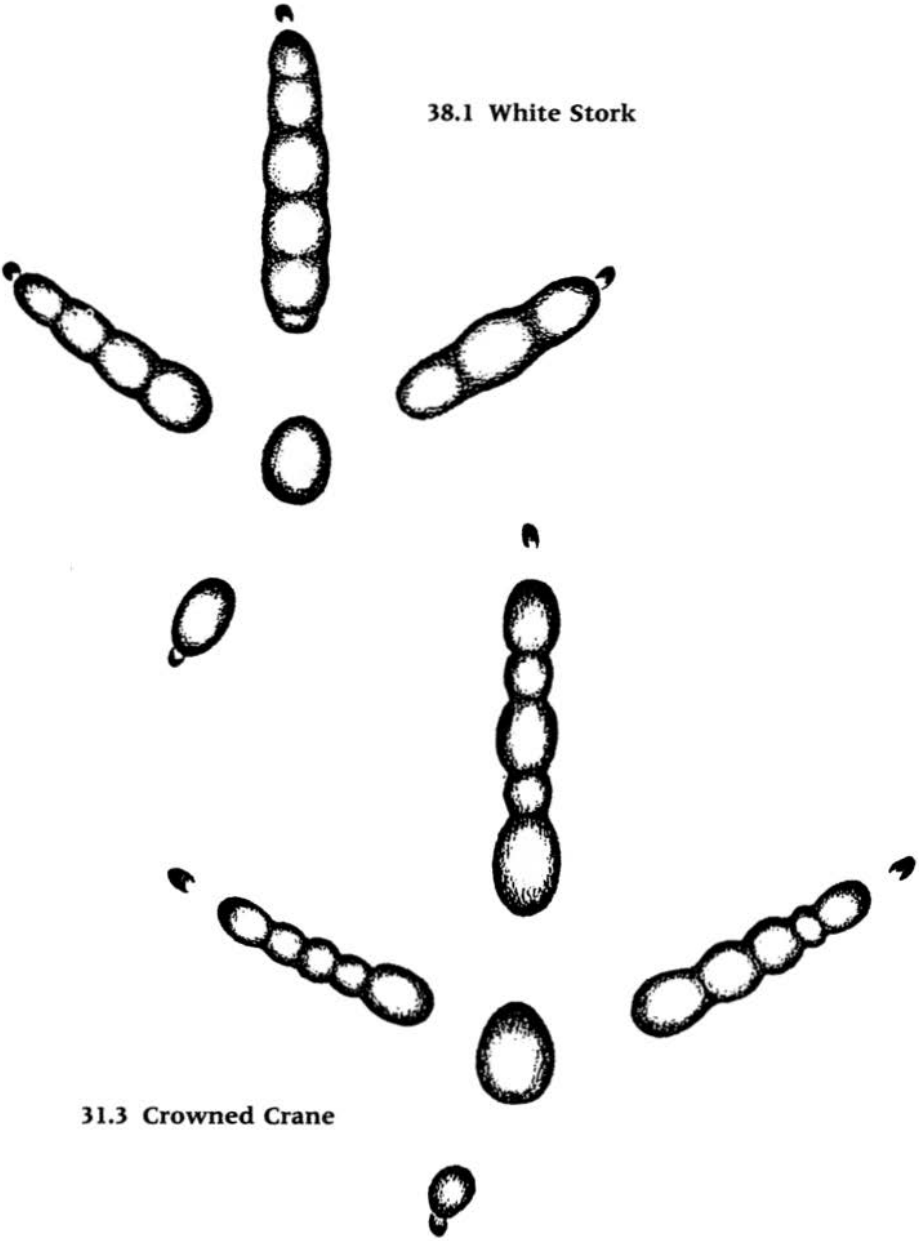


31.2 Blue Crane

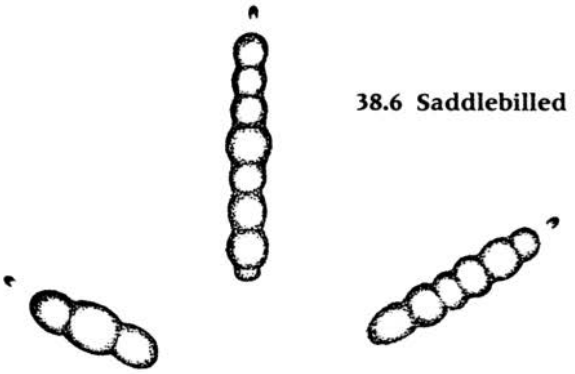


31.1 Wattled Crane

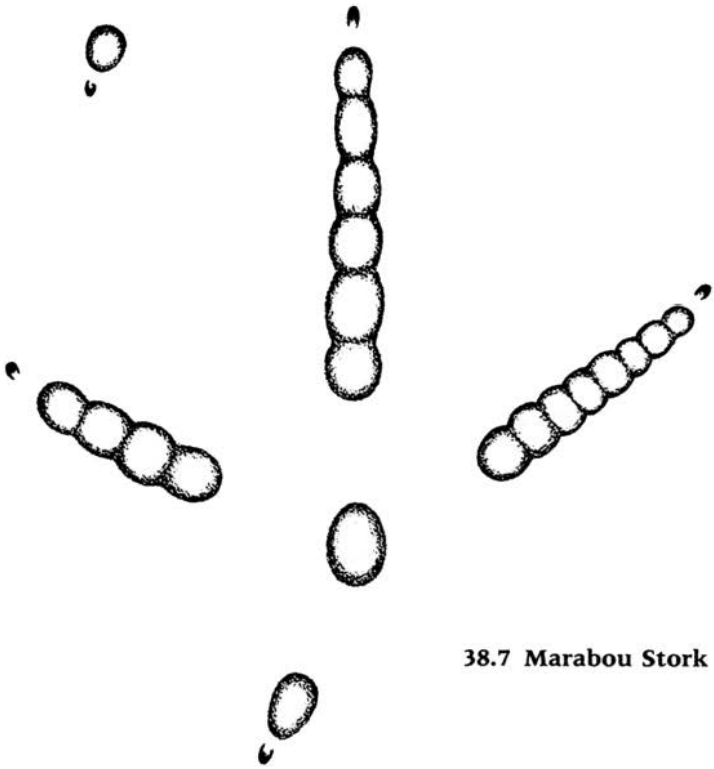
cm
Reduced



cm
Reduced

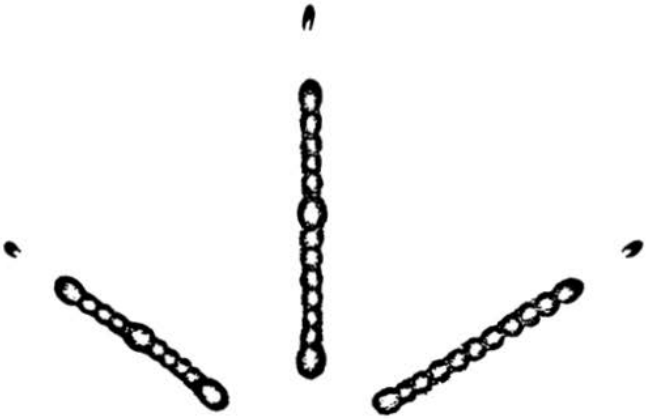


38.6 Saddlebilled Stork

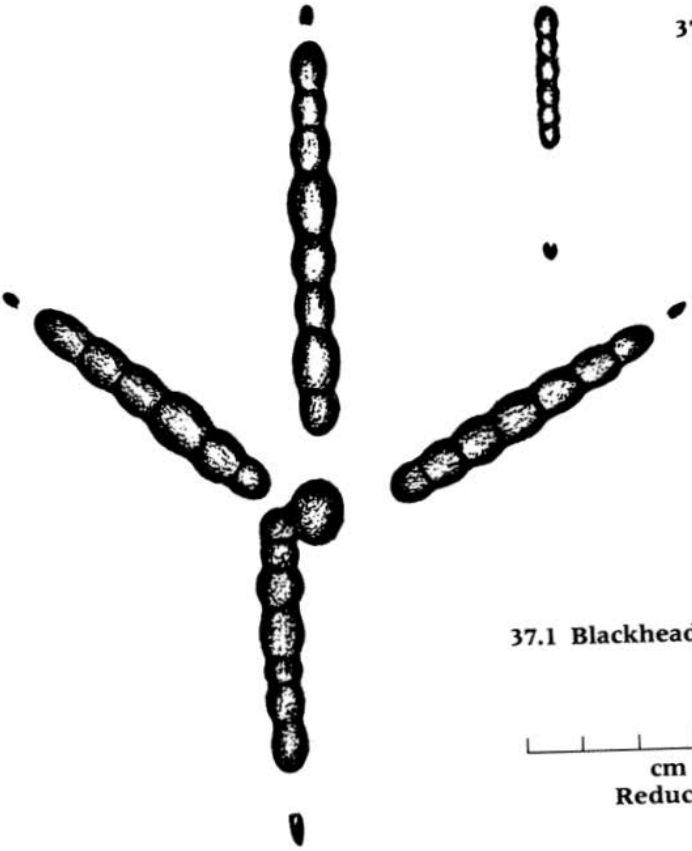


38.7 Marabou Stork

cm
Reduced

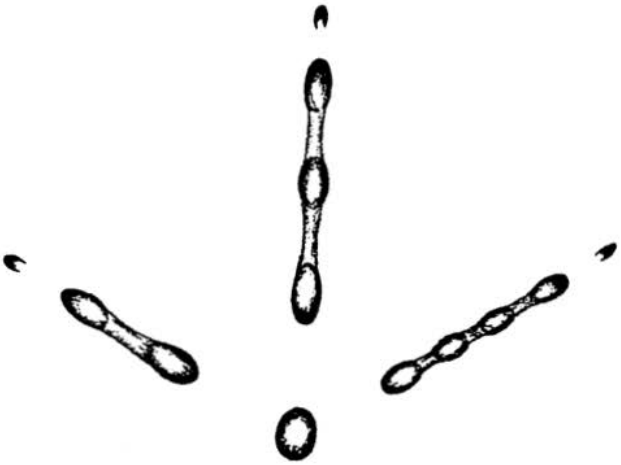


37.6 Little Egret

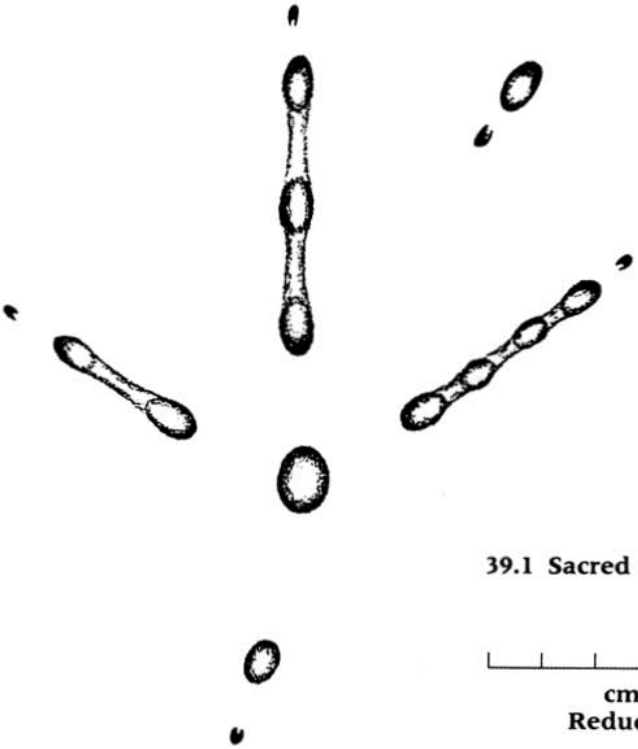


37.1 Blackheaded Heron

cm
Reduced

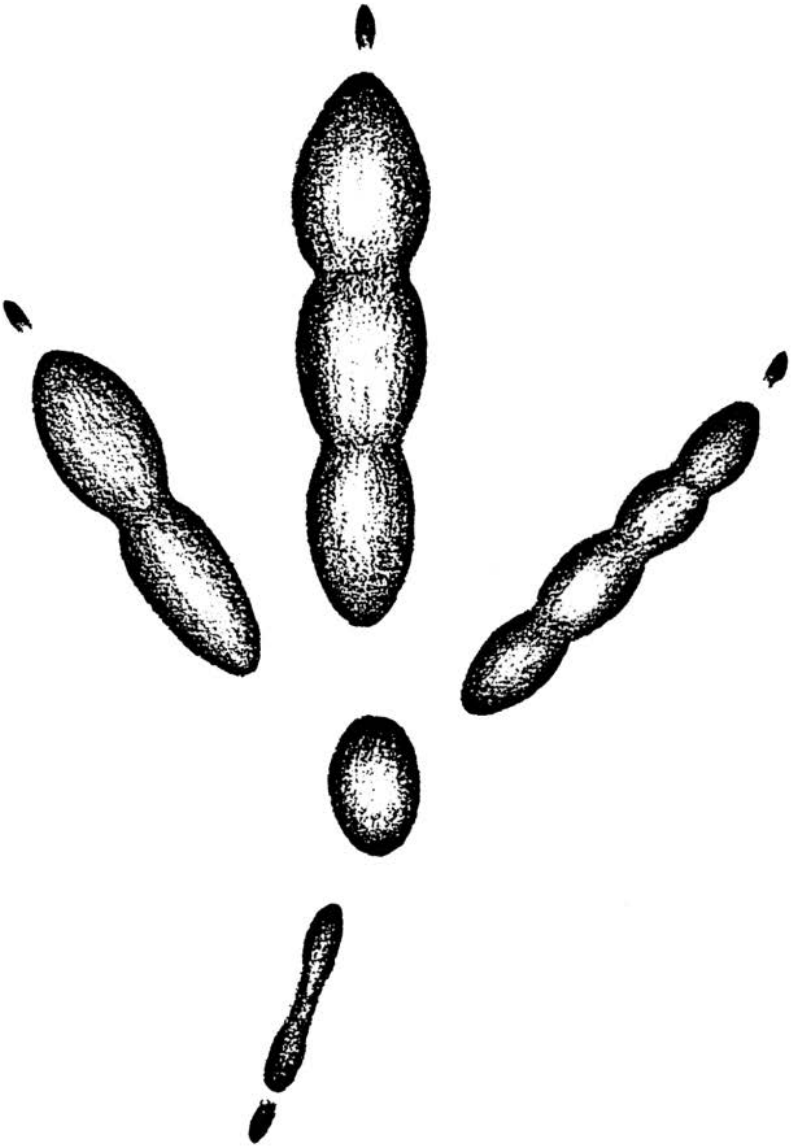


32.1 Moorhen



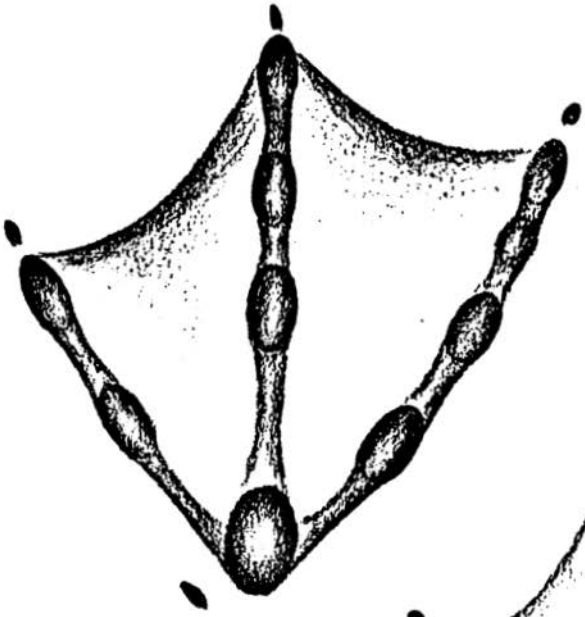
39.1 Sacred Ibis

cm
Reduced

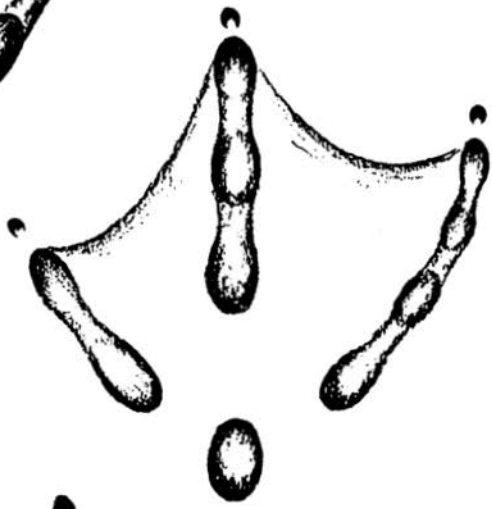


32.3 Redknobbed Coot

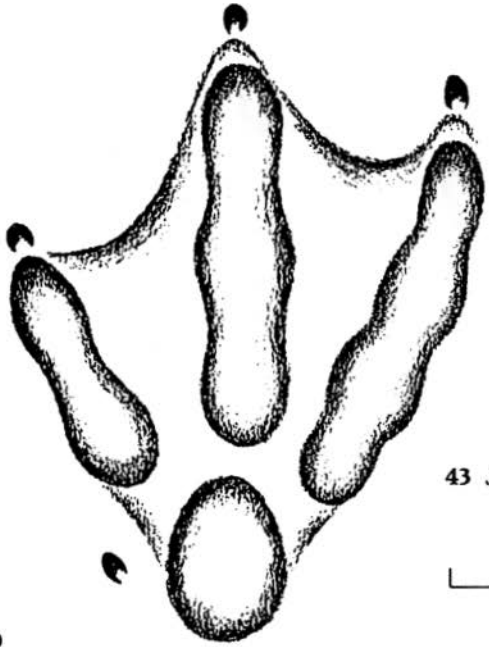
cm
Actual size



40.1 Egyptian Goose

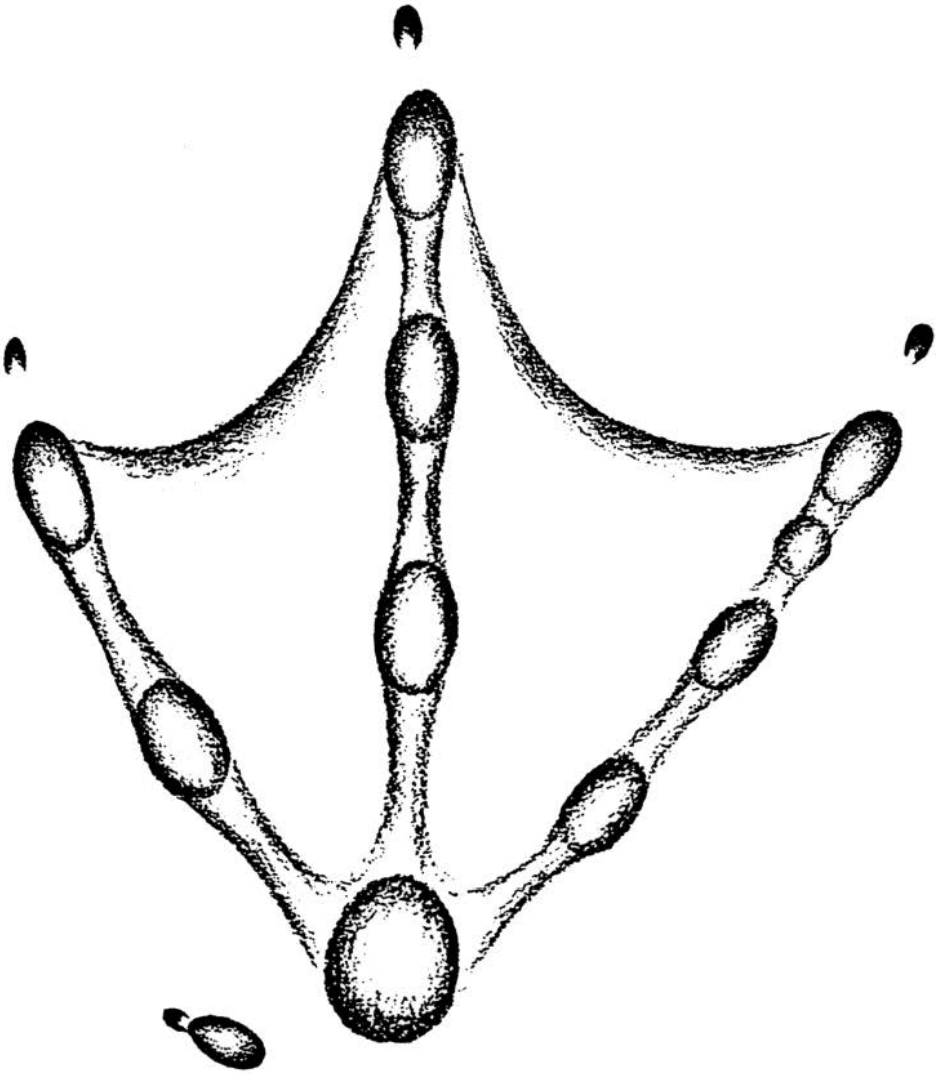


25.1 Kelp Gull

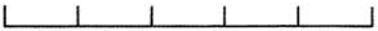


43 Jackass Penguin

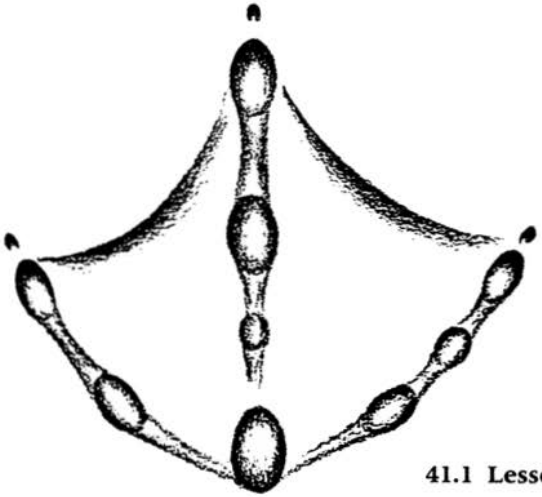
cm
Actual size



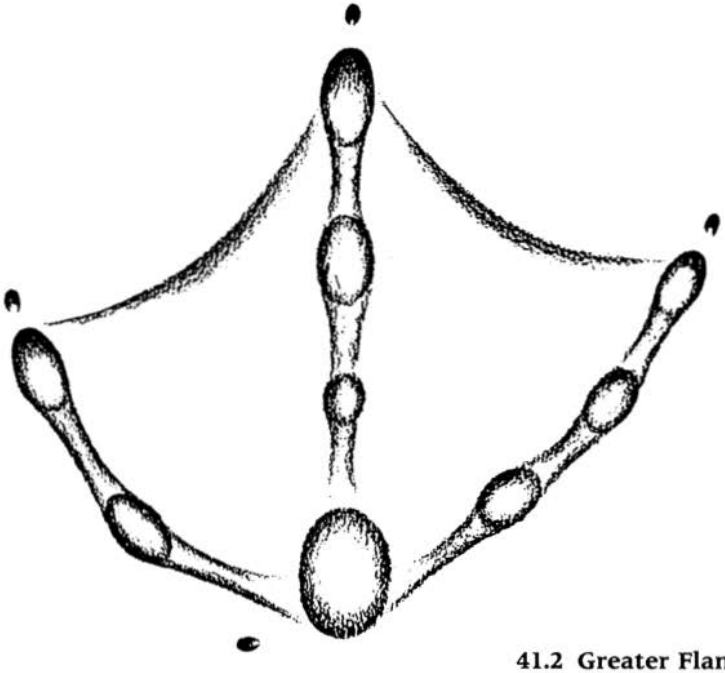
40.2 Spurwinged Goose



cm
Actual size

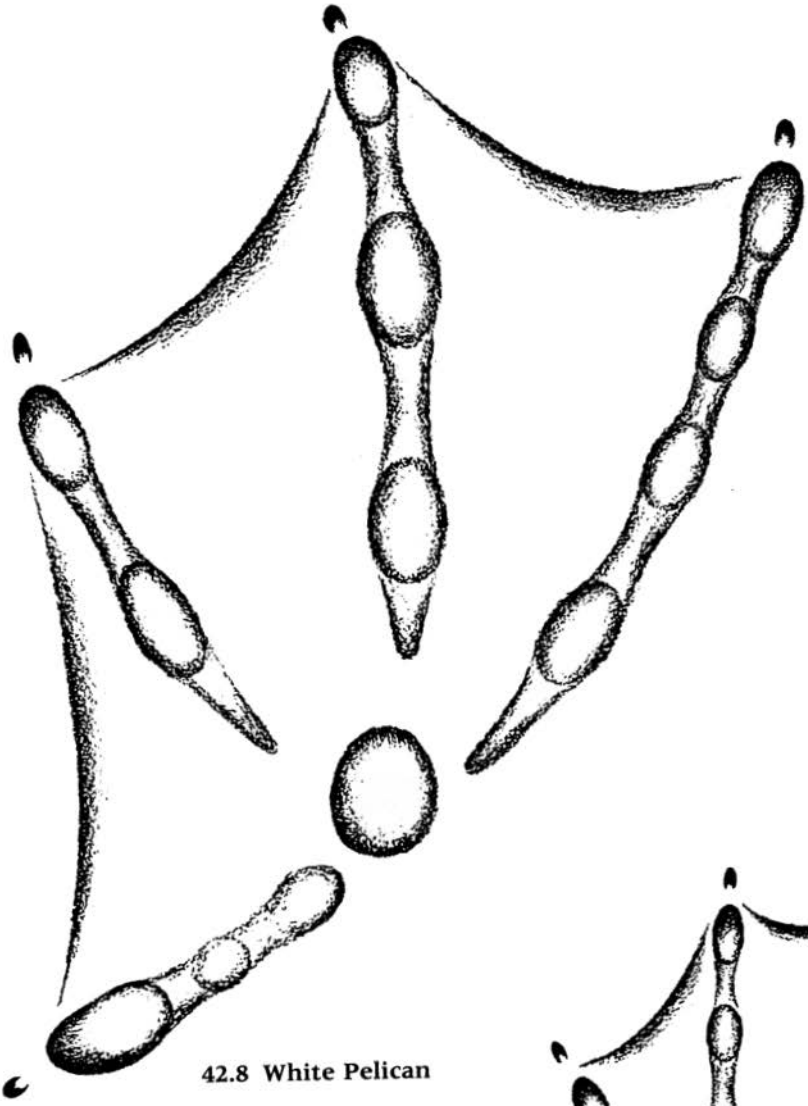


41.1 Lesser Flamingo

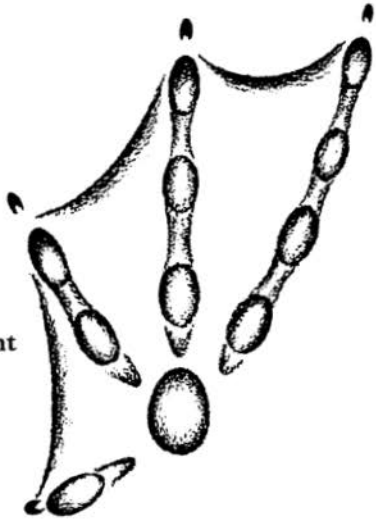


41.2 Greater Flamingo

cm
Reduced



42.8 White Pelican



42.1 Cape Cormorant

cm
Reduced

Spoor of birds

Structure of feet

A bird treads only on its toes, and the metatarsus, which is the long bone nearest to the foot, never touches the ground when it is walking. No bird has more than four toes, of which three usually point forwards and one is turned backwards. When the foot of a bird is compared with that of a mammal, it is the fifth toe which has disappeared and the first which is usually turned backwards.

Some birds, like woodpeckers, Picidae, have the first and fourth toes behind and the second and third toes in front (zygodactylous). Trogons, Trogonidae, have the first and second toes behind and the third and fourth toes in front. On the feet of swifts, Apodidae, the first to fourth toes are normally all in front, while birds like mousebirds, Coliidae, have the first toe reversible to the back or front (pamprodactylous). Some birds, like hornbills, Bucerotidae, have toes joined or partly joined at the base (syndactylous).

The third toe is usually the longest, followed by the fourth and the second. The first toe may be long, but it is often small and positioned so high that it leaves no mark on the track, or sometimes only the claw of the first toe marks in the track. In some birds the first toe is completely absent; the Ostrich, on the other hand, has two toes on each foot, the third and fourth.

The first toe consists of one phalange, the second toe of two phalanges, the third toe of three and the fourth toe of four. The outermost joint of each toe carries a claw.

The spoor illustrations are those of the right feet.

Types of feet

The feet of passerines, which live mainly in trees and bushes, are adapted for perching. They have long, pointed claws and a relatively long first toe which is opposable to the front toes, so that the foot can firmly grip a branch. They have long, slender front toes with an acute angle between the outer toes. Birds like woodpeckers have two toes at the back which act as braces to help them hold on as they peck at trees. Pigeons and doves have perching feet with long toes, but the angle between the outer toes is larger so that they are better adapted for walking. The crow has thick toes which are also suited for perching and walking. Birds of prey have powerful, sharp talons that tighten reflexively when grasping their prey. The back claws of eagles are particularly powerful, enabling them to kill their prey as they strike it.

The first toes of francolins and guineafowls are reduced so that they are better adapted to a terrestrial way of life. Since they spend most of their time on the ground, they do not need a long back toe, which is required for an arboreal way of life, but have a short back toe that is adequate for roosting. Their legs are powerful, with thick toes that are widely spread and adapted for walking and running. They have strong, blunt claws which enable them to scratch for food in the ground.

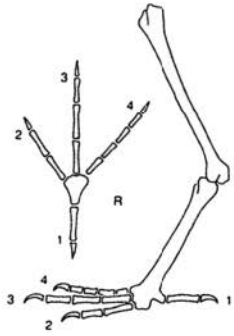
Birds that are exclusively terrestrial, like korhaans and bustards, have no back toe, since they do not need one for perching; moreover, a back toe is disadvantageous for running as it will only be in the way. The three front toes are thick and strong, and the angle between the toes is smaller, which reduces the area of contact with the ground, so that they are better adapted for running. They have strong, blunt claws which provide traction when running and also enable them to scratch for food in the ground. Coursers and dikkops also have toes adapted for running. The Ostrich, which is the fastest runner of all birds, has only two toes. While the small fourth toe helps it balance when walking slowly, it is the large third toe with a thick, strong claw that enables it to run.

Some birds, like plovers, have feet that are adapted for either terrestrial foraging or wading on shorelines. The hind-toe is either reduced or absent, and the three front toes are long and slender and widely spread to give them support in soft mud. While a number of them, like the Crowned Plover, are mainly terrestrial, others, like the Blacksmith Plover and Wattled Plover, forage on dry land as well as on shorelines, and yet others, like the Threebanded Plover, forage mainly on shorelines. Cranes and storks are also adapted to terrestrial foraging or wading. Their hind-toes are reduced and elevated, and the three front toes widely spread to give support and balance in soft mud.

Wading birds have long, slender toes which are widely spread and therefore well adapted for walking on a soft substrate without sinking in. The first toe is usually small, as in the Moorhen, but may be large as in herons, or completely absent as in the oystercatchers. The herons' long first toe is adapted for their arboreal habits, as it enables them to grip branches. The jacanas have very long toes with long, almost straight claws, especially on the hind-toe, to distribute their weight over floating vegetation.

The feet of the coot, finfoot and grebes are intermediate between those of waders and swimming birds. Their feet are very large with long front toes, each of which has a series of lobate webs for swimming. Their hind-toes are reduced.

In swimming birds the surface of the foot is enlarged by a web which joins the three front toes in birds like ducks and gulls, and all four toes in birds like cormorants and pelicans. While swimming, the toes are held apart so that the foot presents a large surface area when pushed backwards through the water. The toes are then folded together as the foot moves forward, so that it presents a minimum surface area and little resistance to the water.



Bone structure of bird feet

Order PASSERIFORMES Passerines

This order is represented by over 5 000 species of small to large birds. Most of the commoner small birds that one sees from day to day are passerines, which have also been called 'perching birds' or 'songbirds'. They are represented in southern Africa by 29 families. Most of these, about 80 per cent, are largely arboreal, but some have terrestrial habits. **Spoor:** Their feet have three toes in front and one behind, adapted for perching. The toes are not syndactylous, except in Broadbills. The hind-toe is at the same level as the front toes, and the toes are never webbed. An example of the spoor of a small passerine of the family Ploceidae is shown in Fig. 15.1.

Family PLOCEIDAE
Sparrows, weavers, bishops, widows, queleas
15.1

Small to medium-sized birds with short to medium, strong legs, strong feet, and longish toes. Arboreal or terrestrial in a wide variety of habitats. Forage on ground by walking or hopping. Food includes seeds, fruit, insects, nectar, etc. Represented by 35 species in southern Africa.

Family VIDUIDAE
Whydahs and widowfinches
15.2

Small birds, some having long tails, with short and slender legs and small feet. Arboreal, but forage and sometimes display on ground. Scratch for food in sand by jumping backwards with both feet together. Food is mainly seeds as well as insects. Inhabit mainly savanna and are gregarious. Represented by 8 species in southern Africa.

Family ESTRILDIDAE
Waxbills, mannikins, twinspots, firefinches, etc.
15.3

Small birds with short, slender legs and toes. Forage on ground, often in open clearings, from standing grass tops, or in low vegetation. Food includes seeds and insects. Represented by 27 species in southern Africa.

Family FRINGILLIDAE
Canaries & buntings
15.4

Small birds with legs and toes short to medium in length. Arboreal or terrestrial, they forage on the ground by hopping or walking, or in bushes and trees. Food mostly seeds. Represented by 20 species in southern Africa.

Family PITTIDAE
Pittas
15.5

Small to medium-sized birds with long, strong legs and large feet. Terrestrial in forest habitats, feeding on small vertebrates and invertebrates. Represented by 1 species in southern Africa.

Family MOTACILLIDAE
Wagtails, pipits, longclaws
15.6

Small to medium-sized birds with medium to moderately long, slender or stout legs. Toes medium to very long with extremely long claws in longclaws (genus *Macronyx*). Hind-claw typically long. Primarily terrestrial on shorelines, streams, grassland or semi-desert. Walk and run on ground, feeding mostly on small invertebrates. Represented by 20 species in southern Africa.

Family STURNIDAE
Starlings
15.7

Small to medium-sized birds with moderately long, strong legs and large, strong feet. Arboreal or terrestrial, most feed on the ground. Forage by walking or running. They are omnivorous, their food including fruit, seeds, fallen grain, insects, spiders, worms, molluscs, lizards, young mice, small frogs, offal. Represented by 14 species in southern Africa.

Family PYCNONOTIDAE
Bulbuls
15.8

Small to medium-sized birds with short legs, and medium toes that are strong in terrestrial species. Mostly arboreal, some have terrestrial habits. Live in forest or open woodland, feeding on fruit, insects and nectar. Represented by 10 species in southern Africa.

Family TURDIDAE
Thrushes, chats, robins
15.9

Small to medium-sized birds with moderately long, strong legs and often fairly long and strong toes. Usually solitary. Arboreal or terrestrial in wide variety of habitats from forest to desert (mostly forest or woodland). Some run on ground, stopping and pecking at ground or leaf litter, others hop on ground. Food varied, both plant and animal. Represented by 43 species in southern Africa.

Family ALAUDIDAE
Larks
15.10

Small to medium-sized birds with medium to longish legs, and longish toes, with long and often straight hind-claw. Terrestrial in desert, grassland and savanna, walking or running when foraging, sometimes digging in soft soil. Food mainly insects and seeds. Represented by 26 species in southern Africa.

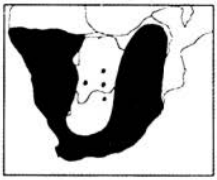
Family TIMALIIDAE
Babblers
15.11

Small to medium-sized birds with moderately long and strong legs and toes. Arboreal or terrestrial, usually in undergrowth, in forest or open woodland. They hop on the ground, and feed on arthropods and other small animals, as well as some fruit. Represented by 6 species in southern Africa.

Family CORVIDAE Crows and ravens

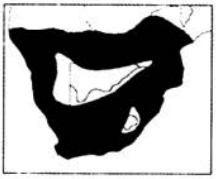
Large birds with strong, moderately long legs, and large, strong feet. The spoor of a Black Crow is shown in Fig. 16.1. The spoor of the other crow species are probably similar. Represented by 4 species in southern Africa.

Corvus capensis
Black Crow
Swartkraai
16.1



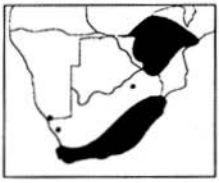
A large bird, glossy black all over, with a slender bill. TL 48–53 cm. **Spoor:** Fig. 16.1. **Habitat:** Open grassland, alpine meadows, cultivated fields, exotic plantations, *Acacia* savanna, riverine trees in desert. **Habits:** Usually in pairs with permanent territory, sometimes solitary or in flocks of up to 50 birds. Forages on ground, walking with long strides. Non-territorial birds may roost in flocks of up to 600. **Food:** Omnivorous, including insects, frogs, fallen grain, fruit; also carrion, but less of a scavenger than the Pied Crow.

Corvus albus
Pied Crow
Witborskraai
16.2



A large bird, shiny black with white breast and broad white collar on hindneck. TL 46–52 cm. **Spoor:** See 16.1. **Habitat:** Savanna, farmland, urban areas, verges of roads and railways, rubbish dumps. **Habits:** Usually in pairs or small flocks, sometimes in flocks of up to 300 birds. Forages mainly on ground. Walks on ground, but hops when moving fast. Largely scavenger. Flocks roost in trees. **Food:** Primarily plant material, such as seeds, fruit, roots; also arthropods, molluscs, frogs, reptiles, fish, birds, eggs, small mammals, ectoparasites from game mammals, carrion.

Corvus albicollis
Whitenecked Raven
Withalskraai
16.3



A large bird, glossy black with white collar on hindneck. Bill massive, arched, with white tip. TL 50–54 cm. **Spoor:** See 16.1. **Habitat:** Mainly mountains, gorges, cliffs. Forages in more open country at times. **Habits:** Usually singly or in pairs, sometimes in flocks of up to 150 birds at good food source, often in company with other scavengers (crows, kites, vultures). Usually arrives first at carcass. **Food:** Carrion, insects, birds' eggs, fruit, grain, birds, mammals, reptiles.

Corvus splendens
House Crow
Huiskraai
16.4

A large bird, shiny black with grey breast, nape and mantle. TL about 43 cm. **Spoor:** See 16.1. **Habitat:** Urban. **Habits:** Usually gregarious, in flocks of up to 50 birds; in pairs when breeding. Forages on ground. Roosts in trees. **Food:** Omnivorous, including grain, fruit, nectar, birds, small mammals, lizards, fish, insects, crabs, carrion, scraps, offal.

Order PICIFORMES

Small to large birds with short legs and zygodactyl toes, the first and fourth toes behind, the second and third toes in front. First toe absent in a few species. Claws sharp and curved. Mostly arboreal, a few are terrestrial.

Family CAPITONIDAE
Barbets
Houtkappers
17.1

Small to medium-sized birds with short, strong legs, fairly long and strong toes. Mostly arboreal, some terrestrial. The Crested Barbet, *Trachyphonus vaillantii*, forages in bushes, trees and on the ground. It hops on ground, feeding on insects, worms, fruit, snails and birds' eggs. **Spoor:** Not recorded.

Family PICIDAE
Woodpeckers
Spegte
17.2

Small to large birds with strong, straight, chisel-like bills. Their legs are short, toes zygodactyl, first toe sometimes absent. Claws are strong, hooked and pointed. Mostly arboreal, a few are terrestrial. The Ground Woodpecker, *Geocolaptes olivaceus*, forages mainly on the ground, pecking, probing and flicking with bill. It hops on ground and rocks. Usually in pairs or small groups, they feed mainly on ants, including their larvae, pupae and eggs. Bennett's Woodpecker, *Campethera bennettii*, forages about 70 per cent of time on ground; also forages on branches and trunks of larger trees. Solitary, in pairs or in small groups, it feeds on insects. **Spoor:** Not recorded.

Family JYNGIDAE Wrynecks

Represented by 1 species in southern Africa.

Jynx ruficollis
Redthroated Wryneck
Draaihals
17.3

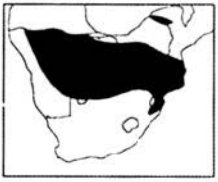
A small bird with short, slender, pointed bill. Legs short, toes zygodactyl. Forages mostly on ground, walking with short steps, hops when moving fast. Solitary or in pairs, feeds mostly on ants, including their larvae, pupae and eggs, as well as termites and caterpillars. **Spoor:** Not recorded.

Order CORACIIFORMES

Family BUCEROTIDAE Hornbills

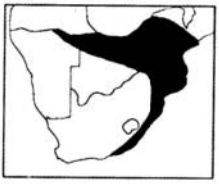
Medium to very large birds with large, stout, curved and pointed bills, usually with a horny casque on top. **Spoor:** Their legs are very short (except in Ground Hornbill) and stout. The toes are short, the third and fourth joined at the base, and the claws short, curved and with sharp edges. The spoor of a Yellowbilled Hornbill is shown in Fig. 18.1 and that of a Ground Hornbill in Fig. 18.9. Represented in southern Africa by 9 species.

Tockus flavirostris
Yellowbilled Hornbill
Geelbekneushoringvoël
18.1

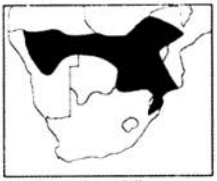


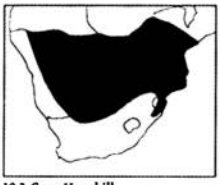
A medium-sized bird with a large, deep yellow bill and yellow eyes. Wings boldly mottled black-and-white. TL 48–60 cm. Mass ♂ 211 g, ♀ 168 g. **Spoor:** Fig. 18.1; other hornbills probably have similar spoor. **Habitat:** Bushveld, woodland, savanna, arid thornveld. **Habits:** Solitary, in pairs, or in small groups. Forages mostly on ground, but also in trees. Runs on ground. Similar to Redbilled Hornbill. **Food:** Rodents, insects, scorpions, solifuges, centipedes, seeds, fruit.

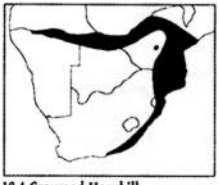
Bucorvus leadbeateri
Ground Hornbill
Bromvoël
18.9

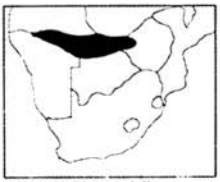


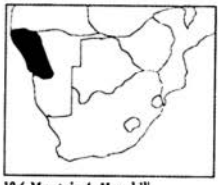
A very large turkey-like bird, mostly black with distinctive red wattles. In flight primaries are white. TL 90–129 cm. Mass ♂ 3,67 kg, ♀ 2,23–2,3 kg. **Spoor:** Fig. 18.9. **Habitat:** Any woodland, savanna, open grassveld, agricultural land. **Habits:** In pairs or groups of usually not more than 8 birds. Forages on ground, walking with stiff rolling gait on terminal phalanges of toes. Digs with bill for food. Vocal mostly early morning, also late afternoon. Flight powerful with deep wingbeats. Roosts in groups at ends of branches. **Food:** Entirely carnivorous, including reptiles (including tortoises), frogs, snails, insects; also mammals up to size of hare.

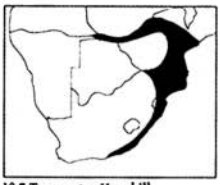

18.2 Redbilled Hornbill

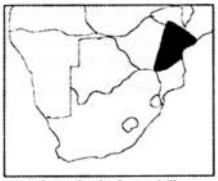

18.3 Grey Hornbill


18.4 Crowned Hornbill


18.5 Bradfield's Hornbill


18.6 Monteiro's Hornbill


18.7 Trumpeter Hornbill


18.8 Silverycheeked Hornbill

Family UPUPIDAE Hoopoe

A medium-sized bird with short and slender legs. The toes are longish, the third and fourth joined at base. Represented by 1 species.

Upupa epops
Hoopoe
Hoephoep
18.3

A medium-sized bird, with head, back and underparts bright rufous ♂ or dull rufous ♀. Wings boldly barred black-and-white or cream. Tail black, white at base. Bill long and thin. Pointed crest can be erected into fan shape when alarmed. TL 25–27 cm. Mass 57 g. **Spoor:** Not recorded. **Habitat:** Savanna, open woodland, Kalahari thornveld, riverine woodland in arid areas, gardens, parks. **Habits:** Usually solitary or in pairs, sometimes in small

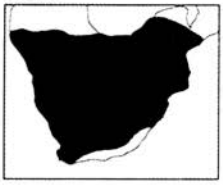
groups when not breeding. Forages by walking on ground with short quick steps, often probing with bill. Flight heavy on broad floppy wings, like butterfly. Usually perches in tree when calling. **Food:** Insects (especially larvae, like cutworms), earthworms, small snakes, frogs.

Order COLUMBIFORMES
Family COLUMBIDAE Doves and pigeons

Small to medium-sized birds with short legs and strong toes for walking and perching. Represented by 14 species in southern Africa, 1 introduced.

Oena capensis
Namaqua Dove
Namakwaduifie

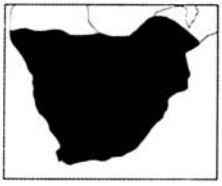
19.1



A small dove with a long graduated tail and two dark bands enclosing pale band across lower back. The face and breast of the male are black. TL 24–27 cm. Mass 40 g. **Spoor:** See Fig. 19.1. Note the walking spoor in soft sand showing the drag marks of the middle toes. **Habitat:** Dry bushveld, *Acacia* thornveld, arid scrub, semi-desert, riverine bush in desert, rural gardens, farmyards, fallow lands. **Habits:** Solitary or in pairs, except at waterholes where large numbers come and go all day, even in midday heat. Takes off with rattling burst of wings. Flight fast and direct with quick irregular wingbeats. Forages on open ground, often on gravel roads. Walks hunched with tiny steps. **Food:** Small seeds.

Streptopelia senegalensis
Laughing Dove
Rooiborsduifie (Lemoenduifie)

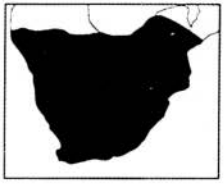
19.2



A smallish dove. Chest deep rufous, spotted with black. Head pinkish grey, back cinnamon, wings mixed cinnamon and blue, belly mostly white. No black ring on hindneck. TL 25 cm. Mass 102 g. **Spoor:** See Fig. 19.2. **Habitat:** Open woodland, savanna, Kalahari sandveld with trees (but not arid country as with Cape Turtle Dove), parks, gardens, city centres. **Habits:** Solitary, in pairs or in flocks at water or feeding places. Tame. Forages on ground in hunched posture, walking with small steps and nodding head. **Food:** Seeds, fallen grain, termite alates, other insects and their larvae, small snails.

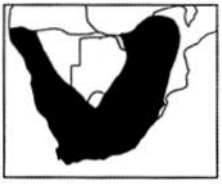
Streptopelia capicola
Cape Turtle Dove
Gewone Tortelduif

19.3

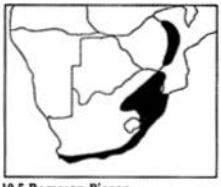


A medium-sized dove, clear grey, darker on back. Black collar on hindneck. TL 26–28 cm. Mass 153 g. **Spoor:** See Fig. 19.3. **Habitat:** Woodland (not forest), savanna, riverine bush, farmland, urban and rural gardens, city parks. **Habits:** Solitary, in pairs or in flocks, sometimes of several hundred birds, especially at waterholes or good food supply. Forages on ground, walking with small steps and bobbing head. Rests in tops of trees. Drinks mainly in morning. Flight swift and direct. Vocal throughout day and often at night. **Food:** Seeds, insects, fallen grain, termite alates.

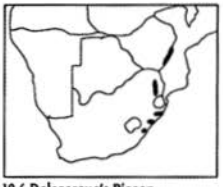
Columba guinea
Rock Pigeon
Kransduif (Bosduif)
19.4



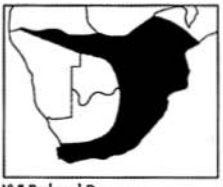
A large pigeon. Neck, breast, back and upper wing deep maroon-brown, speckled with white on neck, spotted with white on wings. Head, rump and rest of underparts grey. Red eyepatch around yellow eye. TL 33 cm. Mass 347 g. **Spoor:** See Fig. 19.4. **Habitat:** Mountains, cliffs, gorges, koppies, boulder hills, buildings. Feeds in open country, especially cultivated lands. **Habits:** Solitary or gregarious, flocks usually of 10–20 birds, at times several hundred at food concentrations. Usually roosts on cliff ledges, in caves or on buildings, less often in trees. Roosting ledges characteristically splashed with white droppings. Flies out to agricultural lands to feed by day. **Food:** Seeds, fallen grain, green shoots.



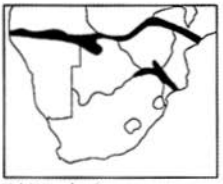
19.5 Rameron Pigeon



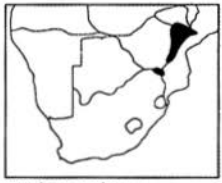
19.6 Delegorgue's Pigeon



19.7 Redeyed Dove

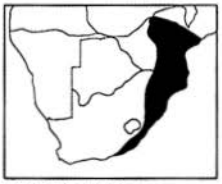


19.8 Mourning Dove

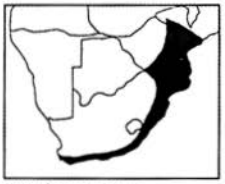


19.9 Bluespotted Dove

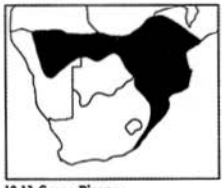
19.10 Greenspotted Dove



19.11 Tambourine Dove



19.12 Cinnamon Dove



19.13 Green Pigeon

Order PTEROCLIFORMES

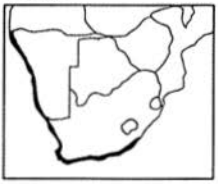
Family PTEROCLIDAE
Sandgrouse
Sandpatryse
20

Medium-sized birds with pigeon-like appearance. Legs very short, toes short, hind-toe rudimentary or absent. Plumage camouflaged, elaborately patterned in dull shades of yellow, green, rufous, brown, black and white. Gregarious. Inhabit open areas from desert to dry savanna. Dry seeds for food. Represented in southern Africa by 4 species. **Spoor:** Not recorded.

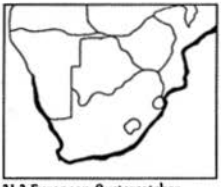
Order CHARADRIIFORMES
Suborder CHARADRII Waders
Family HAEMATOPODIDAE Oystercatchers
Represented by 2 species in southern Africa.

Haematopus moquini
African Black Oystercatcher
Swarttobie

21.1



A medium-sized bird, plumage all black, and red eyes, bill and legs. TL 41 cm. Mass ♂ 668 g, ♀ 730 g. **Spoor:** Fig. 21.1. **Habitat:** Rocky and sandy shores of mainland and coastal islands. Less often, coastal vleis and lagoons. **Habits:** In pairs or small groups, roosting flocks of up to 120 birds when not breeding. Forages along waterline, probing in sand or rock crevices, prising molluscs from rocks, or picking food from surface. Rests in flocks on rocks or beach at high tide. Often calls in flight. **Food:** Mainly mussels and limpets; also whelks, periwinkles, crustaceans and annelids.

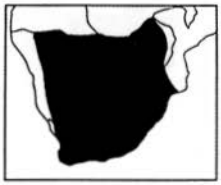


21.2 European Oystercatcher

Family CHARADRIIDAE Plovers
Small to medium-sized birds, with long legs and short toes, the hind-toe reduced or absent. Represented by 17 species in southern Africa.

Vanellus coronatus
Crowned Plover
Kroonkiewiet

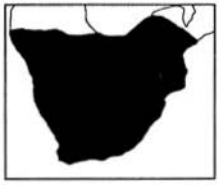
22.1



A fairly large plover with long red legs. The face, chest and upper parts are greyish brown, the crown black, ringed with white. A dark breastband separates brown chest from white belly. TL 30 cm. Mass 167 g. **Spoor:** Fig. 22.1. **Habitat:** Short dry grassland, burnt veld, lightly wooded savanna, semi-desert. Also airfields, playing fields, city parks with large lawns. **Habits:** Gregarious, especially when not breeding. Flocks number up to 40 birds. Wary, it runs in short bursts, stopping to peck at food with short jabs of bill. Digs for food in soft soil. Often active and vocal at night. Commutes in flocks between feeding areas. Birds with young or hatching eggs attack intruders by dive-bombing with noisy screams. **Food:** Insects.

Vanellus armatus
Blacksmith Plover
Bontkiewiet

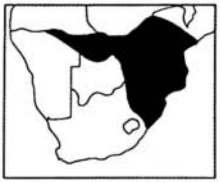
22.2



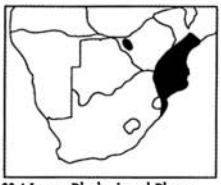
A medium-sized plover, boldly pied black-and-white with greyish back and wings. The underparts are black from chin to upper belly. TL 30 cm. Mass 157 g. **Spoor:** Fig. 22.2. **Habitat:** Shorelines of dams, pans, vleis, sewage ponds; also wet pastures, short grassy verges of inland waters, large lawns, playing fields. Less often, tidal flats in bays and lagoons. **Habits:** Often solitary or in pairs. Non-breeding birds may gather in loose flocks of 20–30, sometimes more. Silent when foraging or resting, usually calling only in flight or when alarmed. Forages in short grass or on shorelines, stepping quickly in short bursts, stopping to peck suddenly at food. Rather wary. At rest, stands with head hunched into shoulders. **Food:** Insects, worms, molluscs.

Vanellus senegallus
Wattled Plover
Lelkiewiet

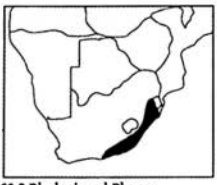
22.3



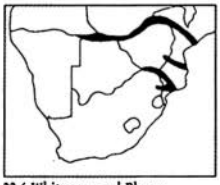
A fairly large plover with long, greenish-yellow legs. It has a white forecrown, red-and-yellow wattles and streaked neck. The rest of the body is greyish brown, darker on belly, and white undertail. TL 35 cm. Mass 197–277 g. **Spoor:** Fig. 22.3. **Habitat:** Upland grassveld along streams and vleis; also rocky slopes and burnt grassveld. On coastal plain, mainly on exposed areas around lakes and pans. **Habits:** Solitary or in pairs. Non-breeding birds in larger groups or flocks. Walks slowly and deliberately while foraging. Squats on ground if danger threatens, then flies up calling. Active at night. **Food:** Insects and some grass seed.



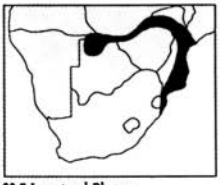
22.4 Lesser Blackwinged Plover



22.5 Blackwinged Plover



22.6 Whitecrowned Plover



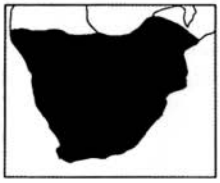
22.7 Longtoed Plover

Family BURHINIDAE Dikkops

Medium to large birds. Legs long, toes short, slightly webbed at base, hind-toe absent. Spoor shown in Fig. 23.1.

Burhinus capensis
Spotted Dikkop (Cape Dikkop)
Dikkop

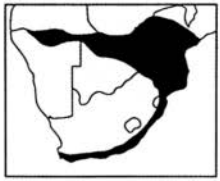
23.1



A medium-sized plover-like bird with conspicuous, large, yellow eyes and yellow legs and feet. Spotted dark brown on buff above, below white, faintly washed cinnamon and streaked brown on chest. TL 43–44 cm. Mass 450 g. **Spoor:** Fig. 23.1. **Habitat:** Open grassland near trees or bushes, savanna, stony semi-desert with scrub (less often), wide marine beaches; also agricultural land, large lawns, playing fields, airfields. **Habits:** Solitary or in pairs when breeding, otherwise may be gregarious in flocks of 40–50 birds. Mainly crepuscular and nocturnal, but also active on cloudy days. By day stands or crouches in shade of bush or trees. When disturbed, runs off with head low. Flies strongly with shallow erratic wingbeats. Vocal at night and on heavily overcast days, especially after rain. **Food:** Insects, crustaceans, molluscs, grass seeds, frogs.

Burhinus vermiculatus
Water Dikkop
Waterdikkop

23.2



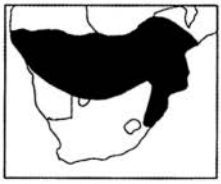
Medium-sized plover-like bird with pale greenish iris and legs. Streaked dark on light brown above, with conspicuous grey wingbar at rest, dark above whitish below. Underparts white, faintly washed cinnamon and streaked brown on chest. TL 38–40 cm. Mass 304 g. **Spoor:** See 23.1. **Habitat:** Rivers, dams, lakes, pans, estuaries, mangrove swamps; also beaches in east Cape and Transkei. **Habits:** Solitary or in pairs when breeding, otherwise in loose flocks of 20–30 birds. Mainly crepuscular and nocturnal, but more active by day than Spotted Dikkop. Often vocal in full daylight. Groups usually stand hunched around edge of water, or squat in cover of bushes and trees by day. Prefers to run than to fly when disturbed, but flies strongly with irregular wingbeats. **Food:** Insects, crustaceans, molluscs.

Family GLAREOLIDAE Coursers and pratincoles
Subfamily CURSORIINAE Coursers

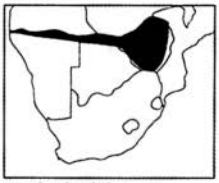
Small to medium-sized birds with long legs and short toes, hind-toe absent. Most species have a basal web between the middle and outer toe. Their wings are long and pointed. They are solitary, gregarious, or occur in small flocks. Inhabit open places such as large rivers, grasslands, deserts, savanna. They are partly or wholly crepuscular. Cursorial feeders, feeding mainly on insects and some seeds. This subfamily is represented by 5 species in southern Africa.

Rhinoptilus chalcopterus
Bronzewinged Courser
Bronsvlerkdrawwertjie

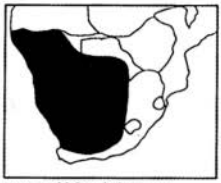
24.1



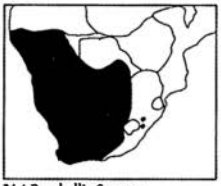
Medium-sized bird with long legs. Bold brown and white facial markings. Upper parts and breast dull brown, white belly, dark brown breastband, red legs. TL about 25 cm. **Spoor:** Fig. 24.1. **Habitat:** Woodland with scrub layer, *Acacia* savanna. At night moves to open grassland, roads, tracks, and clearings. **Habits:** Solitary, in pairs or small groups. Mainly nocturnal, spends day among small bushes in woodland. **Food:** Insects.



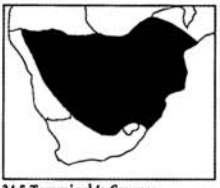
24.2 Threebanded Courser



24.3 Doublebanded Courser



24.4 Burchell's Courser



24.5 Temminck's Courser

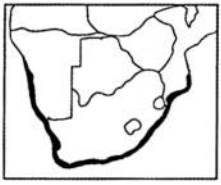
Suborder LARI Skuas, gulls, terns, skimmers
Family LARIDAE Skuas, gulls, terns

Medium to large birds, mostly marine, some freshwater. Short legs, front toes fully webbed, hind-toe rudimentary. Gregarious, usually breed colonially on ground, cliffs, trees or islands. Good fliers. Food mainly animal matter obtained by piracy (skuas), scavenging (gulls) or by diving into or plucking from water (terns). Three subfamilies: skuas (Stercorariinae), gulls (Larinae) and terns (Sterninae). Represented by 36 species in southern Africa.

Subfamily LARINAE
Genus *Larus* represented by 8 species in southern Africa.

Larus dominicanus
Kelp Gull
(Southern Blackbacked Gull)
Swartrugmeeu

25.1

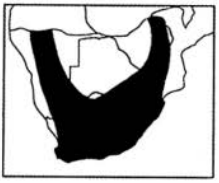


A large bird, mostly white with black wings and back. The bill is bright yellow with a patch of scarlet near tip of lower jaw. TL 56–60 cm. Mass 924 g. **Spoor:** Fig. 25.1. **Habitat:** Estuaries, coastal beaches, offshore waters, rubbish dumps. Rare inland. **Habits:** Solitary or gregarious. Forages on beaches, over water or on dumps, walking or flying. Flight slow and leisurely with much gliding. Drops molluscs from air onto rocks to break them. **Food:** Fish, offal, sandmussels, limpets, insects, birds' eggs and young.

Order GALLIFORMES
Family PHASIANIDAE Francolins, quail, pheasants, partridges

Coturnix coturnix
Common Quail
Afrikaanse Kwartel

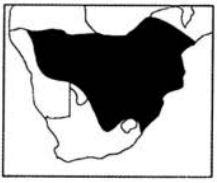
26.1



A small bird, mottled fawn, streaked with white. TL 16–18 cm. Mass ♂ 92 g, ♀ 102 g. **Spoor:** Fig. 26.1. **Habitat:** Open grassland, lightly wooded savanna, cultivated fields. Non-breeding birds also occur in karoo, Kalahari sandveld and semi-desert. **Habits:** Usually singly or in pairs. Sits close in grass, and when flushed does not fly far, pitching suddenly into cover. Calls mainly morning and evening, as well as at night. Roosts on ground in coveys. **Food:** Seeds, buds, tubers, flowers, leaves, arthropods, worms, snails.

Coturnix delegorguei
Harlequin Quail
Bontkwartel

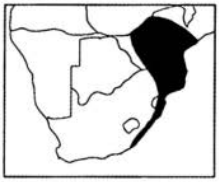
26.2



A small bird. Female similar to that of Common Quail, but has a blackish collar. Male has bold black-and-white facial pattern, black breast, and bright chestnut flanks. TL 16–18 cm. Mass ♂ 49–65 g, ♀ 63–82 g. **Spoor:** See 26.1. **Habitat:** Rank grass in moist grasslands, borders of vleis, fallow lands. **Habits:** Usually gregarious. Flushes reluctantly, especially when grass is wet. When flushed, flies low and not far. Migrates in large flocks. Vocal morning and evening, often several males together. **Food:** Seeds, shoots, leaves, insects, snails.

Coturnix adansonii
Blue Quail
Bloukwartel

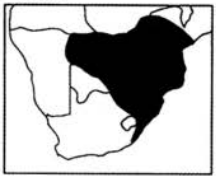
26.3



Smaller than other quails. Male has bold black-and-white facial pattern, dark slate above, slate blue below, with chestnut flanks and wings. Female similar to other quails, but distinctively barred below. TL 15 cm. Mass 44 g. **Spoor:** See 26.1. **Habitat:** Seasonally moist grassland, vleis, edges of fallow lands, grassy plains, rice fields. **Habits:** Usually in pairs or small groups, never in large coveys. Flushes reluctantly. Flight fast and direct for 20–40 m. Moves about according to rainfall. **Food:** Mainly seeds; also insects and snails.

Francolinus coqui
Coqui Francolin
Swempie

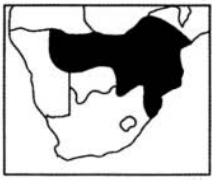
27.1



A smallish bird with a yellowish head and heavily black-and-white barred belly. The female has a white eyebrow and throat. TL 28 cm. Mass ♂ 227–255 g, ♀ 218 g. **Spoor:** Not recorded; see 27.10. **Habitat:** Savanna and woodland with grass. Sometimes open grassland with few trees. **Habits:** Usually in pairs or coveys of up to 12 birds. Crouches when disturbed. Flies reluctantly, but far and fast once flushed. Roosts on ground, sometimes in small groups. **Food:** Seeds, shoots, insects and other invertebrates.

Francolinus sephaena
Crested Francolin
Bospatrys

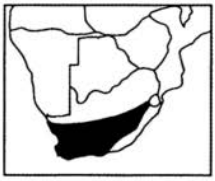
27.2



A medium-sized bird with a black bill, reddish legs, finely barred belly, streaked chest and dark-and-light striped head. TL 30–35 cm. Mass ♂ 387 g, ♀ 225–352 g. **Spoor:** Not recorded; see 27.10. **Habitat:** Bushveld, riverine forest, dense woodland, especially around rocky koppies; also cultivated lands near woodland. **Habits:** Usually in pairs or family groups. Very noisy at dusk and dawn. Keeps to matted vegetation, escapes by running into dense grass rather than by flying. Does not fly far when flushed. Roosts in trees. **Food:** Bulbs, seeds, berries, insects, molluscs.

Francolinus africanus
Greywing Francolin
Bergpatrys

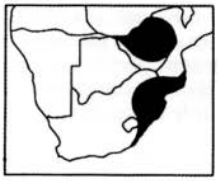
27.3



A medium-sized bird with a black bill, grey throat and finely barred belly. In flight the wings are grey. TL 30–33 cm. Mass ♂ 423 g, ♀ 359 g. **Spoor:** Not recorded; see 27.10. **Habitat:** Montane scrub and grassland, karoo, stunted fynbos. **Habits:** Usually numbering 5 to 8, coveys number up to 18 birds, When flushed, covey scatters with loud squealing, flies strongly, ending with stiff-winged glide. Roosts on ground. Calls dawn and late evening from top of rock or stone. **Food:** Monocotyledonous bulbs, insects, and other plant food like potatoes and fallen grain.

Francolinus shelleyi
Shelley's Francolin
Laeveldpatrys

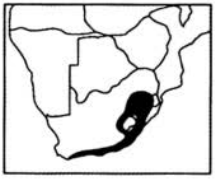
27.4



A medium-sized bird with a white throat narrowly bordered with a black collar. The boldly black-and-white bared belly is surrounded by chestnut breast and flanks. TL 33 cm. Mass ♂ 497 g, ♀ 482 g. **Spoor:** Not recorded; see 27.10. **Habitat:** *Acacia* savanna with good grass cover, edges of cultivated lands, often on stony ground. **Habits:** In pairs or small coveys of 6–8 birds. Shy and elusive. Sits very tight when alarmed. Runs fast, or takes off with shrill calls; does not fly far. Calls briefly early and late in day, one bird often answered by others. Roosts in groups on ground in thick grass. **Food:** Seeds, grain, fruit, shoots, bulbs, roots, insects. Digs for food, making cone-shaped hole 3–5 cm deep, 2–3 cm across top.

Francolinus levaillantii
Redwing Francolin
Rooivlerkpatrys

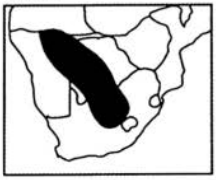
27.5



A medium-sized bird, throat white in centre, tawny round edge, with broad black-and-white collar. The belly is buff, heavily streaked chestnut, becoming almost solid chestnut on breast. TL 33 cm. Mass ♂ 463 g, ♀ 401 g. **Spoor:** Not recorded; see 27.10. **Habitat:** Moister montane grassland, usually at somewhat lower elevations than Greywing Francolin, though overlapping. Low-lying grasslands in southern Cape. **Habits:** In pairs or coveys numbering up to 10 birds, usually 3–5. Sits tight when alarmed, flushing suddenly with whistling wings, flying quite far, then gliding stiff-winged before landing. Seldom flushes a second time. Calls early morning and late evening. Roosts on ground in coveys. **Food:** Monocotyledonous bulbs, insects; also grain, shoots, berries, molluscs.

Francolinus levaillantoides
Orange River Francolin
Kalaharipatrys

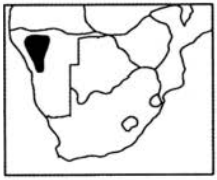
27.6



A medium-sized bird, with a white throat, bordered by a narrow black band. In flight, a large rufous patch on the wing. TL 33–35 cm. Mass ♂ 370–538 g, ♀ 379–450 g. **Spoor:** Not recorded; see 27.10. **Habitat:** Open grassland, dry savanna, grassy mountain slopes with low scrub, croplands, edges of pans. **Habits:** Usually in pairs or coveys of up to 12 birds. Sits very close, difficult to flush. Flies higher than most francolins when flushed. Shy and elusive. Calls morning and evening, often several together. **Food:** Bulbs, corms, seeds, shoots, berries, insects.

Francolinus hartlaubi
Hartlaub's Francolin
Klipfisant

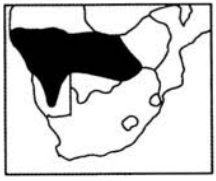
27.7



A small bird. Male is mottled dark brown and buff above, below buffy white, heavily streaked dark brown, with black forehead and eyestripe and white eyebrow. Female is above like male, below almost uniform light-cinnamon brown, faintly mottled whitish. TL ♂ 28 cm, ♀ 25 cm. Mass ♂ 245–290 g, ♀ 210–240 g. **Spoor:** See 27.10 and 27.12. **Habitat:** Rocky koppies and mountain slopes in arid country. **Habits:** Usually in pairs, apparently territorial. Hard to flush among rocks, runs fast along ledges and through narrow clefts. Flies fast. Roosts on ground among rocks or under bushes. Vocal about ten minutes before sunrise, calling from top of koppie. **Food:** Seeds, berries, shoots, bulbs, insects, snails.

Francolinus adspersus
Redbilled Francolin
Rooibekfisant

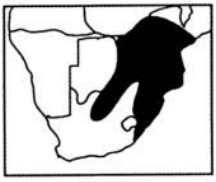
27.8



A medium-sized bird, finely barred all over. Bill and legs are red, and yellow eyepatch is diagnostic. TL ♂ 38 cm, ♀ 33 cm. Mass ♂ 465 g, ♀ 394 g. **Spoor:** See 27.10 and 27.12. **Habitat:** Dry scrub thickets, edges of Kalahari woodland, riverine thornbush. Usually near water. **Habits:** In pairs or coveys of up to 20 birds. Runs into cover when disturbed. Flies reluctantly but well, sometimes perching in trees or bushes. May be quite tame, feeding in clearings and old cultivated lands. Very noisy morning and evening. Drinks late afternoon. **Food:** Seeds, fallen grain, shoots, leaves, aquatic plants, bulbs, berries, insects, molluscs.

Francolinus natalensis
Natal Francolin
Natalse Fisant

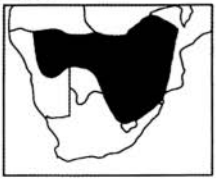
27.9



A medium-sized bird, it looks uniform dull brown above, below black, barred and scaled with white. The bill and legs are orange-red. TL ♂ 38 cm, ♀ 30 cm. Mass ♂ 606 g, ♀ 426 g. **Spoor:** See 27.10 and 27.12. **Habitat:** Dense thickets along watercourses, on hillsides and mountains, and in *Acacia* bushveld; also coastal dune forest, edge of evergreen forest. Often in rocky terrain. **Habits:** In pairs or coveys of up to 10 birds. Covey separates when flushed, individuals do not fly far, and run into dense cover on landing, or may settle in tree. Calls at dawn and dusk. Roosts on branches up to 4 m above ground. **Food:** Molluscs, insects, roots, bulbs, fruit, seeds.

Francolinus swainsonii
Swainson's Francolin
Bosveldfisant

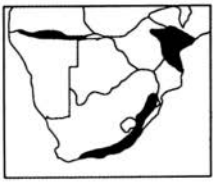
27.10



A medium-sized bird, brown above and below, streaked with black. Bill dark above, red below. Face and throat red. Legs black. TL ♂ 38 cm, ♀ 33 cm. Mass ♂ 706 g, ♀ 505 g. **Spoor:** See Fig. 27.10. **Habitat:** Bushveld, edges of woodland in grass and thickets, cultivated lands, savanna, grassveld with scattered woody vegetation, riverine bush, rank vegetation around vleis. Generally in more open country than Rednecked Francolin. **Habits:** Solitary, in pairs or in coveys of up to 8 birds, sometimes in the company of Rednecked or Redbilled Francolin. Feeds in clearings and open fields, seeking cover in dense vegetation when disturbed. Shy and wary. Runs with head down, body sleeked, weaving through grass. Flight fast and manoeuvrable. Calls from tree or termite mount at dawn and dusk. Roosts in trees at night. Drinks morning and evening. **Food:** Seeds, berries, shoots, roots, bulbs, insects, molluscs.

Francolinus afer
Rednecked Francolin
Rooikeelfisant

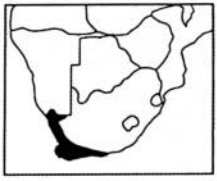
27.11



A fairly large bird, variable in plumage with geographical race. Combination of red bill, face, throat and legs is diagnostic. Upper parts brown, streaked black, underparts black, streaked white, or white, streaked black. TL ♂ 38 cm, ♀ 33 cm. Mass ♂ 907 g, ♀ 564 g. **Spoor:** See 27.10 and 27.12. **Habitat:** Wooded gorges, edges of upland evergreen forests, riverine scrub. Feeds in clearings and cultivated lands. **Habits:** In pairs or small coveys. Flies reluctantly, taking refuge in dense trees. Shy and wary. Runs fast into dense cover when disturbed. Calls at dawn and dusk. Roosts in trees or dense bushes. **Food:** Seeds, fruit, shoots, roots, bulbs, snails and insects.

Francolinus capensis
Cape Francolin
Kaapse Fisant

27.12

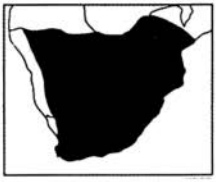


A large bird, it looks uniformly dark at a distance. The base of the bill and legs is dull orange. The belly broadly streaked white. TL 40–42 cm. Mass ♂ 600–915 g, ♀ 435–659 g. **Spoor:** Fig. 27.12. **Habitat:** Dense riverine scrub in drier areas, coastal and montane fynbos, exotic *Acacia* thickets. **Habits:** Usually pairs or coveys of up to 20 birds. Very noisy morning and evening. Often tame, feeding in clearings at edge of bush and in farmyards. Flies reluctantly but well. Prefers to run into cover. May land in trees when flushed. Roosts in trees. **Food:** Seeds, shoots, leaves, bulbs, corms, berries, insects, molluscs.

Family NUMIDIDAE Guineafowl

Numida meleagris
Helmeted Guineafowl
Gewone Tarentaal

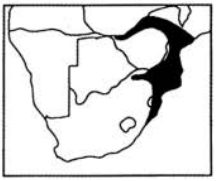
28.1



About the size of a domestic chicken, slate grey, finely spotted white. Head blue and red with conspicuous horny casque on top. TL 53–58 cm. Mass 1,35 kg. **Spoor:** See Fig. 28.1. **Habitat:** Open grassland, vleis, savanna, cultivated lands, edge of karoo scrub, bushveld. **Habits:** Highly gregarious, especially when not breeding, flocks may number several hundred birds. Usually in pairs when breeding. Forages in flocks in open ground, scratching for food with feet or bill. Runs fast when disturbed. Flies well, taking to trees when hard pressed, uttering cackling alarm notes. Roosts communally in trees at night. Walks in single file to waterhole. **Food:** Seeds, bulbs, tubers, berries, insects, snails, ticks, millipedes, fallen grain.

Guttera pucherani
Crested Guineafowl
Kuifkoptarentaal

28.2



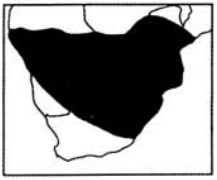
Similar to Helmeted Guineafowl, but head topped by curly black crest. No red on head. TL 50 cm. Mass 1,13–1,5 kg. **Spoor:** See 28.1. **Habitat:** Matted thickets and tangles at edge of lowland evergreen forest, gallery forest, bushveld. **Habits:** In pairs when breeding, otherwise gregarious in flocks of 10–30 birds. May come out into open places to feed. Follows troops of monkeys to feed on fallen fruit. Forages by scratching in leaf litter and debris, also gleans fruit in trees. Shy and wary, and flies readily when disturbed, landing in tall trees. Roosts communally in trees. **Food:** Fruit, berries, leaves, stems, seeds, roots, corms, insects, spiders, millipedes, snails.

Order GRUIFORMES
Family TURNICIDAE Buttonquails

Small, quail-like in appearance. Legs short and strong, front toes moderately long, hind-toes absent. Represented by 2 species in southern Africa.

Turnix sylvatica
Kurrichane Buttonquail
Bosveldkwarteltjie

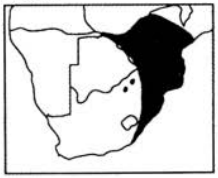
29.1



Smaller than the Common Quail, the sides of the head are whitish. It has large, brown, heart-shaped marks on the flanks. TL ♂ 14 cm, ♀ 16 cm. Mass 42 g. **Spoor:** Not recorded. **Habitat:** Drier grasslands, fallow lands, light savanna or woodland. **Habits:** In pairs or small groups. Flushes reluctantly. Does not usually fly far before landing, then walks slowly with jerky steps, the body rocking back and forth. **Food:** Seeds, insects, other invertebrates.

Turnix hottentotta
Blackrumped Buttonquail
Kaapse Kwarteltjie

29.2



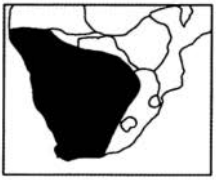
Similar to Kurrichane Buttonquail, but distinguishable in flight by black rump. Sides of face rufous; flanks with small spots. TL ♂ 14 cm, ♀ 15 cm. **Spoor:** Not recorded. **Habitat:** Open grassland 25–50 cm tall, montane grassland, edges of vleis, scrubland with thin grass cover, fallow lands. **Habits:** Hard to flush. Flies straight and fast, but not far. On landing it runs into cover, seldom flushes a second time. **Food:** Seeds, insects, other invertebrates.

Family OTIDIDAE Korhaans and bustards

Medium to very large birds with robust bodies, long necks and large heads. Long legs with short, thick toes. Hind-toe absent. Represented by 10 species in southern Africa.

Eupodotis afra
Black Korhaan
Swartkorhaan

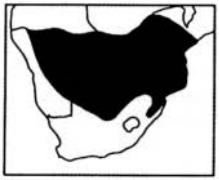
30.1



A medium-sized bird with yellow legs. Male: head, neck and belly black, with large white patches on sides of head. Back finely barred buff-and-black. Female: inconspicuous and secretive. Head, neck and breast buff, paler on breast. Belly black. TL 50–53 cm. Mass ♂ 716 g, ♀ 670 g. **Spoor:** Fig. 30.1. **Habitat:** Open dry grassland, karoo, Kalahari sandveld, arid scrub, semi-desert, fallow lands, coastal dunes in southwestern Cape. **Habits:** Usually solitary, sometimes in pairs. In display, the male flies up calling, cruises around, then slowly descends with rapidly flapping wings and increasing tempo of call. On landing it stands still or runs into grass. Up to 5 males may display to female. Runs with head down. **Food:** Mainly plant material, including seeds; also insects.

Eupodotis ruficrista
Redcrested Korhaan
Boskorhaan

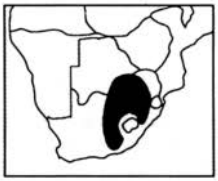
30.2



A medium-sized bird with creamy white legs and feet. Back finely mottled black and buff with bold buff chevrons, belly black, neck uniform greyish. TL 50 cm. **Spoor:** Fig. 30.2. **Habitat:** Savanna, semi-desert grassland (Kalahari), bushveld. **Habits:** Usually solitary or in pairs. Standing quite still, it relies on camouflage for concealment. When flushed, it flies fast, weaving through bush until out of sight. Male performs spectacular flight display, and shows brick-red crest on nape only in courtship display. Silent in normal flight. **Food:** Arthropods, seeds, fruit, gum.

Eupodotis cafra
Whitebellied Korhaan
Witpenskorhaan

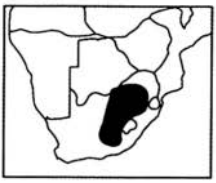
30.3



A medium-sized bird with yellowish legs and feet. The belly is white, hind-neck golden tawny, sides of head white with black line around crown and on throat. Fore-neck blue-grey in male, pinkish buff in female. TL ♂ 50–53 cm, ♀ 48 cm. **Spoor:** See 30.1 and 30.2. **Habitat:** Open grassland, sometimes in sparse *Acacia* thornveld. **Habits:** Usually in pairs or small family groups. Shy and wary, keeps to cover of taller grass. Male displays by raising crown and throat feathers, and extending neck horizontally. **Food:** Insects and other invertebrates; possibly also plant material.

Eupodotis caerulescens
Blue Korhaan
Bloukorhaan

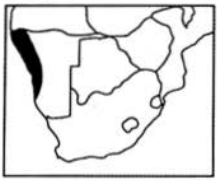
30.4



A medium-sized bird, entirely blue below and on the neck, above brown. Sides of head white surrounded by black. Legs and feet yellow. TL 50–58 cm. **Spoor:** See 30.1 and 30.2. **Habitat:** Open grassveld, karoo scrub, cultivated lands. **Habits:** Usually in pairs or family groups of 3 to 4, sometimes up to 6 or 7 birds, rarely up to 11 at water or on burnt veld. Breeding groups usually 3 birds. When disturbed usually crouches flat, if closely approached creeps or runs away with head lowered. Flies quite far when flushed. Drives large mammals from nest with spread wings. Calls mostly morning and evening. **Food:** Insects, small lizards, seeds and other plant material.

Eupodotis rueppellii
Rüppell's Korhaan
Woestynkorhaan

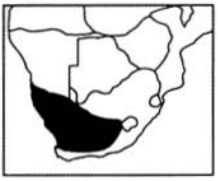
30.5



A medium-sized bird with pale, sandy pink body and dull pale yellowish-grey legs and feet. Neck and sides of face light blue-grey, bordered narrowly with black, with white on upper neck. TL 50–55 cm. **Spoor:** See 30.1 and 30.2. **Habitat:** Barren stony and gravelly semi-desert to desert. Usually associated with pale-pinkish gravel flats or true Namib Desert. **Habits:** Usually in pairs or threes. After breeding, parties of up to 7 birds may form. Runs when disturbed, but flies readily when hard pressed, and usually flies far before landing. Even on open desert plains they are very hard to see. **Food:** Insects, seeds, succulent leaves.

Eupodotis vigorsii
Karoo Korhaan
Vaalkorhaan

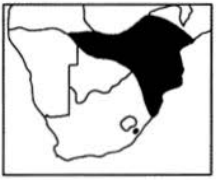
30.6



A medium-sized bird, plain greyish brown to sandy with black and pearly grey blotching above. The throat is black, and it has a small black patch at the nape. Yellowish legs and feet. TL 56–60 cm. **Spoor:** See 30.1 and 30.2. **Habitat:** Karoo, semi-desert, desert edge, usually on stony ground with scattered shrubs and grass stubble. **Habits:** Usually in pairs, threes or small groups, even when breeding. Walks slowly over veld while foraging. Prefers thin cover of shrubs or grass, just high enough to look over. Drinks at pools morning and evening. When disturbed, squats rather than runs away. Flies reluctantly but fast, usually some distance before landing. Most vocal early morning and late evening. **Food:** Insects, other invertebrates, small reptiles, seeds and other plant material.

Eupodotis melanogaster
Blackbellied Korhaan
Langbeenkorhaan

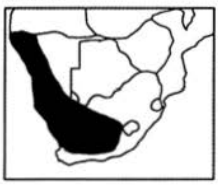
30.7



A fairly large bird with a long thin neck and long legs. Male: back heavily blotched black on mottled buff, belly black contrasting with white on wing. Black line down fore-neck and black-and-white patch at nape. Female: inconspicuous and secretive. Above similar to male, belly white, no black-and-white nape patch or neck stripe. TL 58–65 cm. **Spoor:** See 30.1 and 30.2. **Habitat:** Bushveld, savanna, grassland, vleis, cultivated lands. **Habits:** Usually singly or in pairs. Will stand still, relying on camouflage, or may crouch with neck stretched out on ground to avoid detection. Walks with exaggerated sinuous neck movements and cautious small steps. In display flight, male flies for several hundred metres. **Food:** Insects and plant material.

Neotis ludwigii
Ludwig's Bustard
Ludwigse Pou

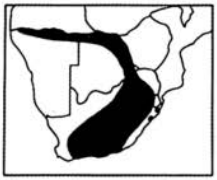
30.8



A large bird, very similar to Stanley's Bustard, but slightly smaller. Crown, face and fore-neck sooty brown, hind-neck bright chestnut. Wing coverts brown-and-white, belly white. TL ♂ 78–95 cm, ♀ 76–85 cm. Mass 3,4 kg. **Spoor:** Fig. 30.8. **Habitat:** Dry open plains, from grassland to desert. **Habits:** Solitary or in groups of up to 6 birds. Shy and wary. Flies readily when disturbed, usually until out of sight. Sometimes squats to avoid detection. Male displays with inflated neck, raised tail and fanned undertail coverts. **Food:** Insects, seeds, small vertebrates, plant material.

Neotis denhami
Stanley's Bustard
Veldpou

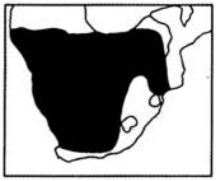
30.9



A large bird, brown above with deep rich rufous hind-neck and mantle, fore-neck grey and white below. Black-and-white area on wing. Crown black with narrow white median streak. TL ♂ 100–110 cm, ♀ 80–87 cm. Mass ♂ 9 kg, ♀ 4 kg. **Spoor:** Fig. 30.9. **Habitat:** Montane and highland grassveld, savanna, karoo scrub. **Habits:** Solitary or in pairs when breeding, otherwise in groups of up to 10 birds. Shy and wary, walking away quickly when disturbed. Flies strongly, usually at some height. In courtship male inflates neck, raises tail and fans undertail coverts. **Food:** Mainly insects; also millipedes, grass, seeds, flowers, lizards, small rodents.

Ardeotis kori
Kori Bustard
Gompou

30.10



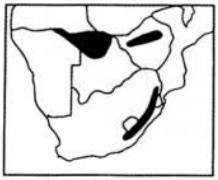
A very large bird, greyish brown above, white belly, neck and breast finely barred (looks grey at a distance), head slightly crested and with longish bill. Walks with bill angled slightly upwards. TL ♂ 1,2–1,5 m, ♀ 1,05–1,2 m. Mass ♂ 13,5–19 kg. **Spoor:** Fig. 30.10a and Fig. 30.10b show two variations of Kori Bustard spoor. **Habitat:** Open plains of karoo, highveld grassland, Kalahari sandveld, arid scrub, Namib Desert, lightly wooded savanna, bushveld. **Habits:** Solitary or in pairs when breeding, otherwise gregarious in flocks of up to 40 or more birds. Walks slowly and sedately when foraging. When disturbed walks quickly. Flies reluctantly, but powerfully. Normally runs before take-off, but can take off from standing position. Male displays with neck inflated, tail raised over back, and undertail coverts fanned. **Food:** Insects, small vertebrates, seeds, carrion, gum.

Family GRUIDAE Cranes

Very large birds with long necks, large heads and long bills. Long legs with short toes, the hind-toe reduced and elevated.

Grus carunculata
Wattled Crane
Lelkraanvoël

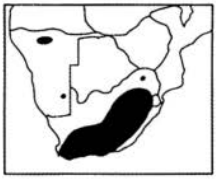
31.1



A very large bird with long legs, a white neck, grey back and black belly. It has two whitish wattles below the chin. TL 1,2 m. **Spoor:** Fig. 31.1. **Habitat:** Midland to highland marshes, vleis and moist grasslands; seasonal floodplains in tropics. **Habits:** Usually in pairs or small flocks of up to 40 birds. Shy and wary, but reluctant to fly, usually walking slowly away from danger. Forages by wading in shallow water or walking through adjacent grassveld. **Food:** Small reptiles, frogs, insects, grain, tubers, rhizomes, small mammals.

Anthropoides paradisea
Blue Crane
Bloukraanvoël

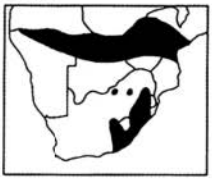
31.2



A very large bird with long legs, plain blue-grey all over, with long slate-grey tertails curving to the ground. TL 1 m. **Spoor:** Fig. 31.2. **Habitat:** Midland and highland grassveld, edge of karoo, cultivated land, edges of vleis. **Habits:** Highly gregarious when not breeding, otherwise in pairs or family groups. Flocks usually 30–40 birds, sometimes up to 300. Flies strongly and soars well. Roosts on ground or in shallow water. Wary when breeding, otherwise fairly tame. Often performs display dances in groups or pairs. **Food:** Frogs, reptiles, insects, fish, grain, green shoots, grass seeds.

Balearica regulorum
Crowned Crane
Mahem

31.3



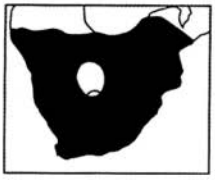
A very large bird with long legs, a spiky straw-coloured crest, grey body and distinctive large white wing patch. Head black with white cheeks and red wattles. TL 1 m. Mass 3,6 kg. **Spoor:** Fig. 31.3. **Habitat:** Marshes, vleis, moist grasslands, cultivated fields. **Habits:** Gregarious unless breeding, flocks may number 30–150 birds. Tame when not molested. Often performs dancing displays in pairs or groups. Roosts on ground or in trees. **Food:** Frogs, reptiles, insects, fallen grain.

Family RALLIDAE Rails, crakes, gallinules, moorhens, coots, etc.

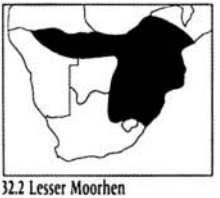
A highly diverse family of small to large birds. Their legs and toes are long, with the hind-toe reduced and elevated. In coots the toes are lobed for swimming. Represented by 19 species in southern Africa.

Gallinula chloropus
Moorhen
Waterhoender

32.1



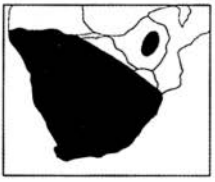
A medium-sized bird, slaty black all over, except for white undertail and white streaks on flanks. It has a red shield and bill with yellow tip. TL 30–36 cm. Mass 247 g. **Spoor:** Fig. 32.1. **Habitat:** Reedbeds, marshes, marginal vegetation of lakes, rivers, pans and sewage ponds. **Habits:** Solitary or in small family groups. Non-breeding birds loosely gregarious. Spends most of the day swimming in green water, wading in shallows or walking over nearby wet grasslands. Flicks tail when alarmed, and swims or runs for cover if disturbed, sometimes fluttering and pattering over water. Roosts in reeds or low bushes. **Food:** Water plants, seeds, berries, molluscs, worms, arachnids, insects, tadpoles, offal, carrion.



32.2 Lesser Moorhen

Fulica cristata
Redknobbed Coot
Bleshoender

32.3



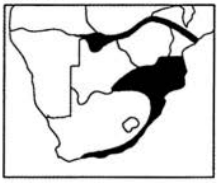
A medium-sized bird, all black with white bill and frontal shield, backed by two dark red knobs. TL 43 cm. Mass 737 g. **Spoor:** Fig. 32.3. (See also 33.1) **Habitat:** Almost all inland waters, especially with floating water plants. Less commonly on rivers and coastal lagoons. **Habits:** Usually in pairs or large flocks of over 1 000 birds. Highly gregarious when not breeding. Spends most of time swimming in open water. Patters across water when disturbed, seldom taking full flight. Flies strongly once airborne. Forages in water from surface or by diving. Also grazes on shoreline, running to water when disturbed. May stand on shoreline to preen. **Food:** Mainly water plants and grass; also insects and seeds.

Family HELIORNITHIDAE Finfoots

Medium to large birds with short, stout legs. There is 1 species in southern Africa.

Podica senegalensis
African Finfoot
Watertrapper

33.1

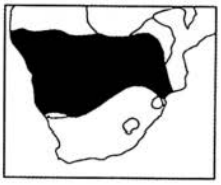


About the size and shape of a large cormorant, its bill, legs and feet are bright red. It has large lobed toes. The head is greyish and the back dark brown, spotted white. TL ♂ 51–65 cm, ♀ 45–56 cm. **Spoor:** The toes are long and lobed for swimming, the hind-toe reduced and elevated. Spoor similar to 32.2? **Habitat:** Quiet reaches of streams, rivers, pans and lakes, fringed with dense trees and bush drooping into water. **Habits:** Usually solitary or in pairs. Shy and retiring. When disturbed splashes into water and flutters pattering along surface. Also flies strongly if pursued. Swims and dives well. Hides in marginal vegetation. Forages by working along bank of stream, picking food off plants and water surface. Will preen itself on a log, rock or shoreline. Roosts at night on branch overhanging water. **Food:** Insects, crabs, snails, frogs, fish.

Order STRUTHIONIFORMES
Family STRUTHIONIDAE

Struthio camelus
Ostrich
Volstruis

34

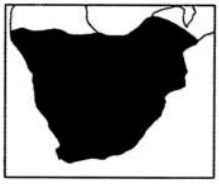


The largest living bird. Males are black with white wings, females brownish grey. TL ♂ up to 2 m. Mass 68 kg. **Spoor:** Legs very long with only two toes, the third and fourth (Fig. 34). **Habitat:** Bushveld to desert. **Habits:** Occurs in flocks of 30–40 birds when not breeding. In desert regions up to 600 birds may gather at waterholes. Can run at speeds of 50–60 km/hour. Males may perform elaborate displays in courtship and distraction when breeding. **Food:** Grass, berries, seeds, succulent plants, small reptiles, insects.

Order FALCONIFORMES
Family SAGITTARIIDAE

Sagittarius serpentarius
Secretarybird
Sekretarisvoël

35



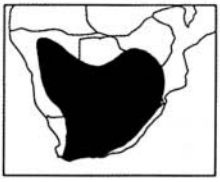
A very large bird, about 1,3 m tall, with long legs and tail. Body mainly pale grey, with belly, tibial feathering, rump and crest feathers black. The long crest is erectile. TL 1,25–1,5 m. Mass 3,9 kg. **Spoor:** Long legs. Short toes, webbed at the base, with strong claws (Fig. 35). **Habitat:** Semi-desert, grassland, savanna, open woodland, farmland, mountain slopes. **Habits:** Usually in pairs, sometimes in groups of 3 or 4. In arid areas groups of up to 50 may gather at waterholes. Strides slowly across veld at about 2,5–3 km/hour. Catches prey on ground with bill or sometimes by stamping on it. Flies seldom but well, taking off with a run. Roosts at night on top of a bush or tree, usually a pair together. **Food:** Insects, rodents, amphibians, lizards, snakes, young hares, birds' young and eggs.

Family ACCIPITRIDAE

Mainly large to very large diurnal birds of prey, including vultures, eagles, kites, buzzards and hawks. Their toes and claws are strong and used for grasping, except in vultures. They are strong fliers, and the larger species tend to soar, especially vultures. Altogether 52 species occur in southern Africa.

Gyps coprotheres
Cape Vulture
Kransaasvoël

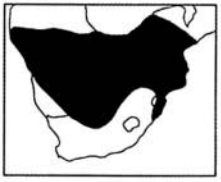
36.1



A very large vulture, pale whitish to buffy with strongly contrasting blackish wings and tail. Paired blue bare patches on either side of crop. TL 101–120 cm. Mass 8,6 kg. **Spoor:** Fig. 36.1. Spoor of other vultures probably similar. **Habitat:** Mostly mountainous country, or open country with isolated hills or mountains and escarpments. Less common in savanna or desert. **Habits:** Highly gregarious. Roosts and nests on precipitous cliffs. Some 2–3 hours after sunrise it soars out to forage over a wide area, often far away from mountains. Aggressive at carcasses. **Food:** Carrion and bone fragments.

Gyps africanus
Whitebacked Vulture
Witrugaasvoël

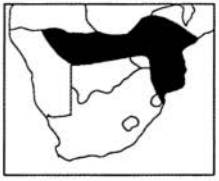
36.2



A large vulture, generally brown, faintly streaky. Blackish face, pink neck, white lower back. TL 90–98 cm. Mass 5,4 kg. **Spoor:** See 36.1. **Habitat:** Savanna and bushveld. **Habits:** Gregarious. Roosts in trees at night. Soon after sunrise it soars out to forage. To locate food it follows other vultures, crows, kites, Bateleur and hyaenas or Lions. Often rests on ground by day. Drinks and bathes regularly at waterholes. Aggressive at carcass. **Food:** Carrion and bone fragments.

Necrosyrtes monachus
Hooded Vulture
Monnikaasvoël

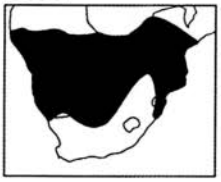
36.3



A medium-sized vulture. Dark brown body. Pink head with sparse white down. TL 65–75 cm. Mass 2,1 kg. **Spoor:** See 36.1. **Habitat:** Open woodland and savanna. **Habits:** Solitary. Cannot compete with larger vultures at carcass. Picks up scraps that bigger birds leave or drop. Scavenges, but also feeds on insects dug from dung and soil with bill. Roosts in trees at night. **Food:** Carrion, offal, insects, bones.

Torgos tracheliotus
Lappetfaced Vulture
Swartaasvoël

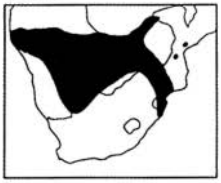
36.4



A very large vulture. Generally black with large pinkish head and black-and-white streaked underparts. TL 98–105 cm. Mass 6,6 kg. **Spoor:** See 36.1. **Habitat:** Savanna to desert. **Habits:** Solitary or in pairs; sometimes several birds at a carcass in company with other vulture species. Roosts in trees at night. Soars out well after sunrise to forage over wide area. Dominant over all other species at carcass, feeding until satisfied and retiring to periphery of group. **Food:** Carrion; can eat tougher material (skin, ligaments) than other vulture species. Also kills small mammals and nesting flamingoes and eats flamingo eggs.

Trigonoceps occipitalis
Whiteheaded Vulture
Witkopaasvoël

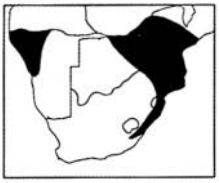
36.5



A medium-sized vulture. Mainly black with white belly and whitish head. TL 78–82 cm. Mass 4 kg. **Spoor:** See 36.1. **Habitat:** Woodland to semi-desert scrub. **Habits:** Solitary or in pairs. Roosts in trees at night. Flies out early to forage within restricted area. Usually arrives first at carcass, but cannot compete with larger vultures as they arrive; later, pirates chunks from them. **Food:** Carrion, also smaller prey down to size of hares, flying termites, lizards, guineafowls, and nestling flamingoes, and eats flamingo eggs.

Neophron percnopterus
Egyptian Vulture
Egiptiese Aasvoël

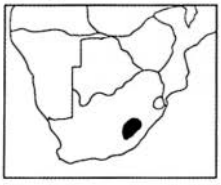
36.6



A large vulture, mainly white or buffy with bare yellow face and black flight feathers. TL 64–71 cm. Mass 1,6–2,2 kg. **Spoor:** See 36.1. **Habitat:** Semi-desert and open plains; abattoirs, refuse dumps, seashore; absent from woodland. **Habits:** Usually solitary, rarely in small groups. Roosts gregariously at night on cliff or tree. Subordinate to other vultures at kill, eating scraps. Hurls stones held in bill onto ostrich eggs to break them. **Food:** Carrion, birds' eggs, offal, refuse, insects.

Gypaetus barbatus
Bearded Vulture (Lammergeier)
Baardaasvoël (Lammergier)

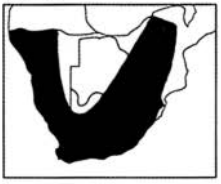
36.7



A very large vulture, dark above with whitish head, black face mask, bristly beard, and rusty, yellowish or whitish below. TL 110 cm. Mass 5,8 kg. **Spoor:** See 36.1. **Habitat:** Drakensberg massif and foothills down to about 2 000 m. **Habits:** Solitary, but small groups may gather at carrion, often in company of other vultures and birds of prey. Roosts on cliffs, often on or near nest site. **Food:** Carrion and bones. Bones dropped on flat rocky ossuaries to break them into pieces small enough to swallow.

Aquila verreauxii
Black Eagle (Verreaux's Eagle)
Witkruisarend

36.8



A very large eagle, jet black except for white lower back and white V on upper back. TL 84 cm. Mass 4 kg. **Spoor:** Fig 36.8. Spoor of other eagles probably similar. **Habitat:** Rocky hills, mountains and gorges, especially where Rock Dassie and Yellowspotted Dassie are plentiful. **Habits:** Usually seen gliding swiftly along rock faces, or soaring on thermals. Almost invariably in pairs, or pair with juvenile. Hunts by surprise attack on prey as it swoops around corner of cliff. **Food:** About 90 per cent dassies; also hares, monkeys, small antelopes, squirrels and other mammals, guineafowls, francolins and other birds; less often reptiles and carrion; rarely domestic stock.

Order CICONIIFORMES Wading birds

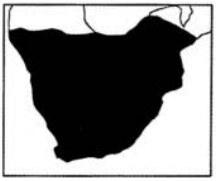
Medium to very large wading birds of freshwater or marine shores. They have long legs and all four toes are present, the front toes long, but the hind-toe sometimes slightly raised. Represented by 5 families.

Family ARDEIDAE Herons, egrets, bitterns

Medium to very large birds with long, straight and pointed bills. The long neck is held folded in flight. The legs and toes are long. Most feed by wading in shallows. Altogether 19 species occur in southern Africa.

Ardea melanocephala
Blackheaded Heron
Swartkopreier

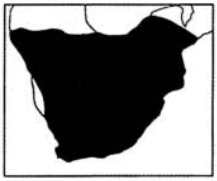
37.1



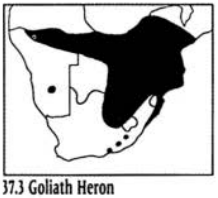
A fairly large, slender bird. Head black above, white below. The long neck is black on the hind-neck, white on the fore-neck. The underwing is white in front, black behind. TL 97 cm. Mass 1,1 kg. **Spoor:** Fig. 37.1. **Habitat:** Open grassland, fallow field, edges of inland waters, forest clearings. **Habits:** Solitary when feeding, either standing and waiting for prey, or stalking slowly. Roosts colonially in trees, reedbeds and on islands up to 30 km from feeding grounds. **Food:** Frogs, fish, crabs, insects, rodents, small birds, small reptiles, worms, spiders.

Ardea cinerea
Grey Heron
Bloureier

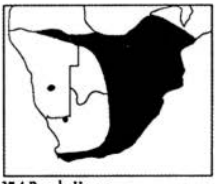
37.2



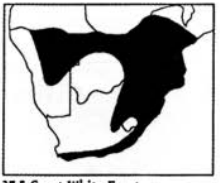
A large grey bird with a white neck, yellow bill, black stripe above eye, black patch at shoulder. Underwing uniform grey. TL about 1 m. Mass 1,5 kg. **Spoor:** See 37.1. **Habitat:** Mostly shallow inland waters. Also coastal pans or lagoons. Sometimes open grassland near water. **Habits:** Wades in shallow water, may swim in deeper water. Usually solitary. Roosts communally on trees, cliffs or islands. Stands for long periods waiting for food. May feed at night. **Food:** Fish, frogs, crabs, insects, spiders, centipedes, reptiles, small mammals and birds, molluscs and worms. Rarely plant material.



37.3 Goliath Heron



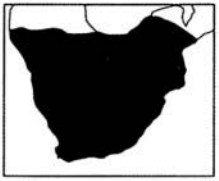
37.4 Purple Heron



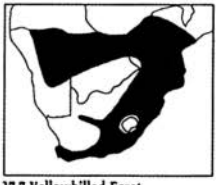
37.5 Great White Egret

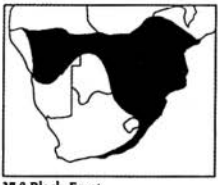
Egretta garzetta
Little Egret
Kleinwitreier

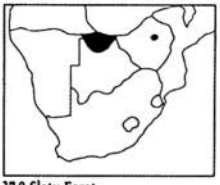
37.6

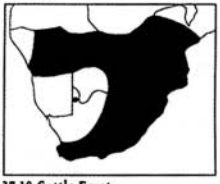


A smallish, slender white bird with a slim black bill and black legs with yellow feet. TL 64 cm. Mass 280–614 g. **Spoor:** Fig. 37.6. **Habitat:** Shores of inland and marine waters. **Habits:** Usually solitary when feeding, but may gather in hundreds at a good food supply. Roosts gregariously. Active hunter, sometimes stands and waits for prey. May fish cooperatively in groups. **Food:** Fish; also frogs, insects, crustaceans, molluscs, small lizards.


37.7 Yellowbilled Egret


37.8 Black Egret


37.9 Slaty Egret

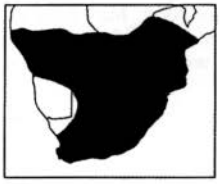

37.10 Cattle Egret

Family CICONIIDAE Storks

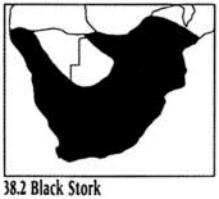
Very large birds with large, long, straight, pointed bills, long necks and long, broad wings. They have long legs and long toes that are webbed at the base. There are 8 species in southern Africa.

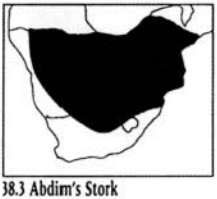
Ciconia ciconia
White Stork
Witooievaar

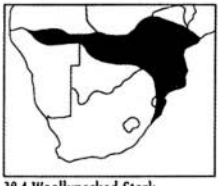
38.1

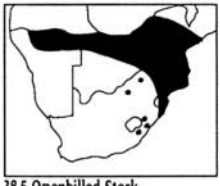


A large bird with white body and tail, and black wings. The bill and legs are red. The bill is straight and pointed. TL about 1,2 m. Mass ♂ 3,6 kg, ♀ 3,3 kg. **Spoor:** Fig. 38.1. **Habitat:** Highveld grasslands, mountain meadows, cultivated lands, marshes, karoo. **Habits:** Usually gregarious in loose flocks of a few to several hundred birds. Forages by walking slowly across veld or wading in shallow grassy marshland. Roosts communally in trees. May gather in groups near water around midday. **Food:** Mainly large insects, like locusts, as well as other arthropods, small reptiles, mammals, young of ground-nesting birds, frogs, tadpoles, molluscs.


38.2 Black Stork

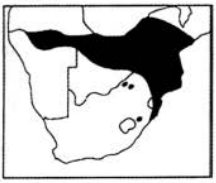

38.3 Abdim's Stork


38.4 Woollynecked Stork


38.5 Openbilled Stork

Ephippiorhynchus senegalensis
Saddlebilled Stork (Saddlebill)
Saalbekooievaar

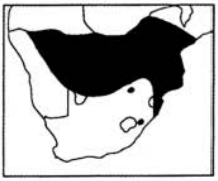
38.6



A huge black-and-white bird with very large red and black bill that has a yellow saddle. The long legs are black with red tarsal joints, and the feet are red. TL about 1,5 m. **Spoor:** Fig. 38.6. **Habitat:** Larger inland waters, rivers, dams, pans, floodplains, swamps, usually in open or lightly wooded country. **Habits:** Solitary or in pairs. Usually shy and wary. Forages in shallow water by walking slowly and jabbing at prey with bill, sometimes stands and waits for prey. May stir mud with foot. Roosts in trees, but not gregarious. **Food:** Mainly fish; also frogs, small mammals and birds, crustaceans, reptiles, molluscs.

Leptoptilos crumeniferus
Marabou Stork
Maraboe

38.7



A huge bird, blackish above, white below with head naked, pinkish. The very large bill is dirty greyish, and the long legs are white. TL 1,5 m. **Spoor:** Fig. 38.7. **Habitat:** Open to semi-arid woodland, bushveld, fishing villages, rubbish tips, lake shores. **Habits:** Usually gregarious, especially around carcasses of large mammals, often with vultures. Spends most of the day standing still or squatting. Mainly a scavenger, but may forage in grassveld for insects or wade in shallow water. Takes off running with lowered head. **Food:** Carrion, refuse, rodents, insects, birds, fish, young crocodiles, lizards, snakes, frogs.

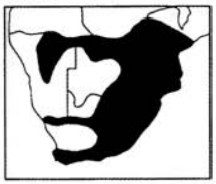
38.8 Yellowbilled Stork

Family PLATALEIDAE Ibises and spoonbills

Large to very large birds with long legs and toes. The toes are partly webbed at the base. In all, 5 species occur in southern Africa.

Threskiornis aethiopicus
Sacred Ibis
Skoorsteenveër

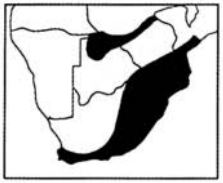
39.1



A large bird, mainly white with black head, neck and plume-like feathers on back. The bill is long and decurved. TL about 90 cm. Mass 1,3 kg. **Spoor:** Fig. 39.1. **Habitat:** Very varied, including inland waters, cultivated lands, sewage works, open grassveld, rubbish dumps, coastal lagoons, tidal flats, offshore islands. **Habits:** Gregarious, flocks may number hundreds of birds. Scavenges and forages. Roosts in trees, reedbeds or on islands. Flies in V-formation. **Food:** Very varied. Arthropods, small mammals, nestling birds, eggs, molluscs, frogs, small reptiles, carrion, seeds.

Bostrychia hagedash
Hadeda Ibis
Hadeda

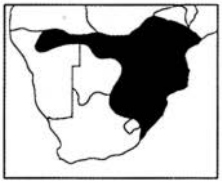
39.2



A large, plain, dark greyish bird with a black bill and short, black legs. In good light it has a metallic purple on the wings. TL about 76 cm. Mass 1,3 kg. **Spoor:** See 39.1. **Habitat:** Grasslands, savanna, bushveld, forest edges, large gardens, playing fields, airfields, marshes, shores of inland waters. **Habits:** Usually gregarious in groups of 5–20 birds, or flocks of up to 100 or more when not breeding. Takes off with loud calls when disturbed. Roosts in trees, usually in small groups. Forages on ground. **Food:** Mainly insects; also crustaceans, myriapods, spiders, snails, small reptiles, earthworms.

Plegadis falcinellus
Glossy Ibis
Glansibis

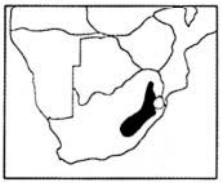
39.3



A smallish, dark bird with a slender decurved bill. Looks chestnut with purplish gloss, back and wings metallic green. TL about 70 cm. **Spoor:** See 39.1. **Habitat:** Shallow inland waters and neighbouring wet grasslands. **Habits:** Solitary or gregarious in flocks of up to more than 40 birds. Roosts communally in trees or on ground, sometimes with other wading birds. Forages by probing in mud while walking slowly. **Food:** Insects, crustaceans, worms, molluscs, fish, frogs and small reptiles.

Geronticus calvus
Bald Ibis
Kalkoenibis (Wilde Kalkoen)

39.4



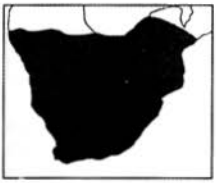
Medium-sized, dark glossy green with red head and bill, whitish neck and relatively short legs. TL 79 cm. **Spoor:** See 39.1. **Habitat:** High grassveld (especially after burning), heavily grazed pastures, cultivated lands. Breeds in mountainous or highly dissected country. **Habits:** Gregarious in flocks of up to 100 birds. Forages by probing and turning over leaves and dung. Roosts communally on cliffs or in trees. **Food:** Insects, snails, worms, frogs, small mammals and birds; also carrion.

Order ANSERIFORMES
Family ANATIDAE Ducks, geese and swans

Mainly aquatic birds that swim well. Their front toes are webbed, while their hind-toes are reduced. They occur in marine or inland waters, where they dive or dabble for aquatic food. They are mostly gregarious. Altogether 20 species occur in southern Africa.

Alopochen aegyptiacus
Egyptian Goose
Kolgans

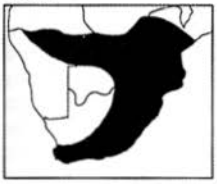
40.1



A large goose, brown above, greyish below, with dark brown patches around the eyes and on the centre of the breast, and a dark brown collar on the neck. In flight the wings are white with black primaries and green trailing edge. TL 63–73 cm. Mass ♂ 2,4 kg, ♀ 1,9 kg. **Spoor:** Fig. 40.1. **Habitat:** Most inland waters, such as rivers, dams floodplains, pans, marshes. Also estuaries, coastal lakes, cultivated fields. **Habits:** Highly gregarious when not breeding, otherwise mainly in pairs. Swims high in water. Spends much of day on shoreline or sandbank. Flies early morning and evening to grasslands and farmlands to graze, returning to water to roost on shoreline or in trees by day and after nightfall. **Food:** Grass, leaves, seeds, grain, crop seedlings, aquatic rhizomes, tubers.

Plectropterus gambensis
Spurwinged Goose
Wildemakou

40.2



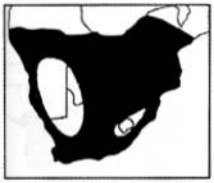
A very large goose, mainly black with a variable amount of white on face and belly. Forehead, bill and legs red. TL ♂ about 1 m, ♀ about 88 cm. Mass ♂ 5,4–10 kg, ♀ 4,1–5,4 kg. **Spoor:** Fig. 40.2. **Habitat:** Mainly larger inland waters, such as floodplains, pans, dams, sewage ponds. **Habits:** Highly gregarious when not breeding, flocks numbering up to 2 000 birds. Shy and wary. Rests on shorelines and sandbanks. Forages in flooded grasslands, pastures, cultivated fields in early morning, evening or at night. Flocks fly in staggered lines or V-formation. When disturbed they fly to nearest water, settling far from shore. **Food:** Grass shoots and seed, grain, lucerne, tubers, fruit, aquatic plants.

Order PHOENICOPTERIFORMES
Family PHOENICOPTERIDAE Flamingoes

Flamingoes have very long legs with short toes. The three front toes are webbed, the hind-toe is rudimentary.

Phoenicopterus minor
Lesser Flamingo
Kleinflamink

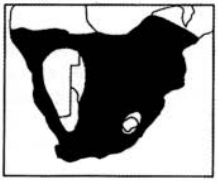
41.1



Large (but smaller than Greater Flamingo), tall, long-legged and long-necked bird, the body appears pink at a distance and the bill very dark. The wings are red-and-black in flight. TL about 1 m. Mass 1,7 kg. **Spoor:** Fig. 41.1. **Habitat:** Larger brackish or saline inland and coastal waters. **Habits:** Highly gregarious in flocks of hundreds or thousands, often mixed with Greater Flamingoes. Forages in calm water, walking or swimming with head swinging from side to side, filtering food from surface of water with bill upside down. Commonly forages at night. Flies in V-formation. **Food:** Mainly microscopic blue-green algae and diatoms.

Phoenicopterus ruber
Greater Flamingo
Grootflamink

41.2



A large, very tall, long-legged and long-necked bird, the body appears white at a distance and the bill very pale with black tip. Conspicuous flame-red wing in flight, with feathers black. TL about 1,4 m. Mass ♂ 4 kg, ♀ 3 kg. **Spoor:** Fig. 41.2. **Habitat:** Large bodies of shallow water, both inland and coastal. Prefers saline and brackish waters. **Habits:** Highly gregarious, flocks often numbering hundreds of birds, sometimes mixed with Lesser Flamingoes. Feeds by wading with bill upside down in water, filtering out small organisms. May stir mud with foot. Swims well in deep water. Flies in V-formation. **Food:** Small aquatic invertebrates, detritus, microscopic algae.

Order PELECANIFORMES

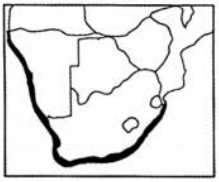
Represented by 6 families of large to very large birds with short legs and long toes, all four toes joined by webs, adapted for swimming. They are mostly adapted for diving from the air or from the surface of the water.

Family PHALACROCORACIDAE Cormorants

Medium to large birds found in marine and inland waters. Legs are short and stout, the feet are large, and all four toes joined by webs. Mostly gregarious. They dive from the surface of water for fishes, frogs and crustaceans. Altogether 5 species occur in southern Africa.

Phalacrocorax capensis
Cape Cormorant
Trekduiker

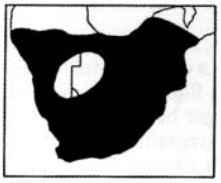
42.1



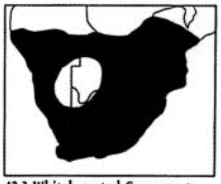
A medium-sized black bird with a long and slender bill and short tail. Face yellow, and bill, legs and feet black. TL 61–64 cm. Mass ♂ 1,3 kg, ♀ 1,2 kg. **Spoor:** Fig. 42.1. **Habitat:** Coastal waters and brackish estuaries. **Habits:** Highly gregarious. Flies in long waving lines low over the sea. Settles in large flocks to feed, diving from surface and submerging for up to 30 seconds. Roosts in large numbers on islands and cliffs. **Food:** Fish, as well as crustaceans, mussels, molluscs.

Phalacrocorax africanus
Reed Cormorant
Rietduiker

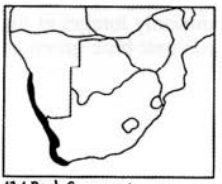
42.2



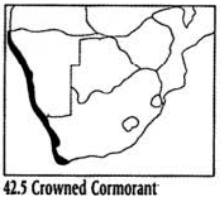
A small, dark bird with a short bill, short neck and a longish tail. The bill and bare skin of the face are yellow, the legs and feet black. TL 60 cm. Mass ♂ 570 g, ♀ 510 g. **Spoor:** See 42.1. **Habitat:** Inland waters of any size, from tiny dams and ponds. **Habits:** Usually solitary when fishing. Roosts gregariously in trees or reedbeds in water. Flies high between feeding waters. Swims low in water. Flies when alarmed. **Food:** Frogs and fish; also insects, crustaceans, rarely small birds.



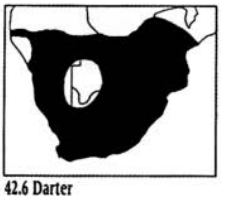
42.3 Whitebreasted Cormorant



42.4 Bank Cormorant



42.5 Crowned Cormorant

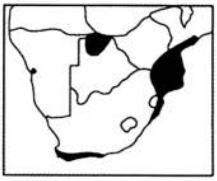


42.6 Darter

Family PELECANIDAE Pelicans

Pelecanus rufescens
Pinkbacked Pelican
Kleinpelikaan

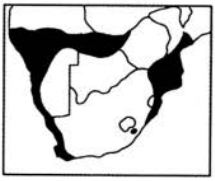
42.7



A large bird with a very long, straight bill and long, broad wings. Greyish with pink tinge on back, rump, belly and undertail coverts. Legs short and stout, yellow in colour. The large feet have long toes, all four joined by webs. TL 1,3–1,5 m. Mass ♂ 6 kg, ♀ 5 kg. **Spoor:** See 42.8. **Habitat:** Coastal bays and estuaries, seldom inland on large rivers, marshes and floodplains. **Habits:** Gregarious, sometimes in company with White Pelicans. Forages singly. **Food:** Fish.

Pelecanus onocrotalus
White Pelican
Witpelikaan

42.8



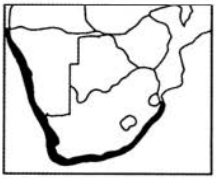
A huge white bird with a very long, straight bill and long, broad wings. Legs are short and stout, pink or yellow in colour. The large feet have long toes, all four joined by webs. TL 1,4–1,8 m. Mass ♂ 11,5 kg, ♀ 7,6 kg. **Spoor:** Fig. 42.8. **Habitat:** Coastal bays, estuaries, lakes, larger pans and dams. **Habits:** Solitary or gregarious. Forages in coordinated groups. Flies in V-formation. **Food:** Fish and some crustaceans.

Order SPHENISCIFORMES
Family SPHENISCIDAE Penguins

Large, flightless marine birds with wings modified for swimming. Three front toes stout and joined by webs, hind-toe rudimentary. Feet used as rudders. Represented by 4 species in southern Africa.

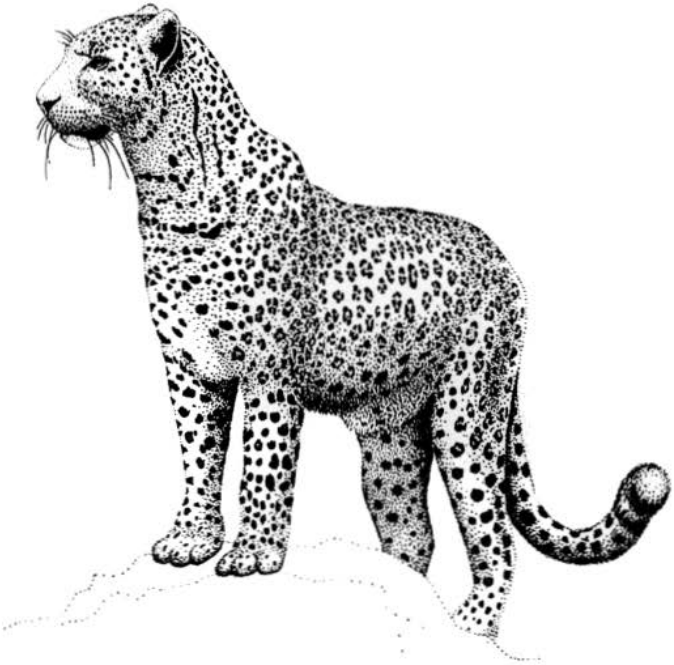
Spheniscus demersus
Jackass Penguin
Brilpikkewyn

43

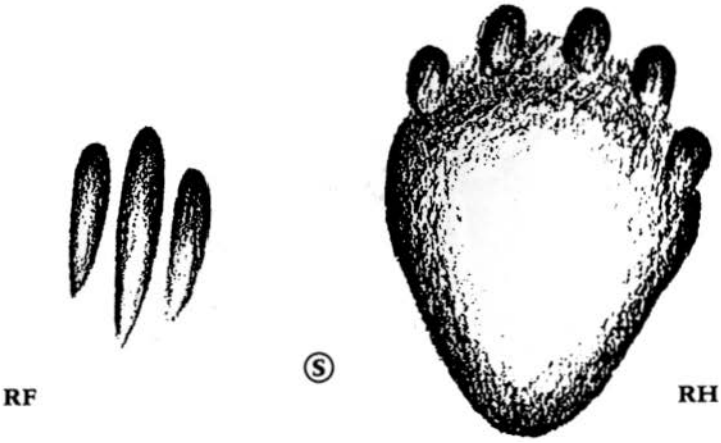


A small penguin, black above, white below. Face black with white band around face. Black band across chest and down flanks. TL about 60 cm. **Spoor:** Fig. 43. **Habitat:** Marine. **Habits:** Forages underwater at sea. Roosts and breeds on land. Walks with waddling gait on land. **Food:** Fish, squid.

MAMMALS



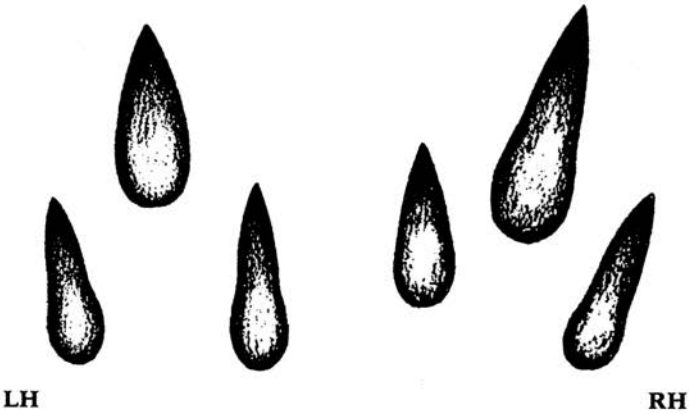
57.1 Rock Dassie



58 Pangolin

cm
Actual size

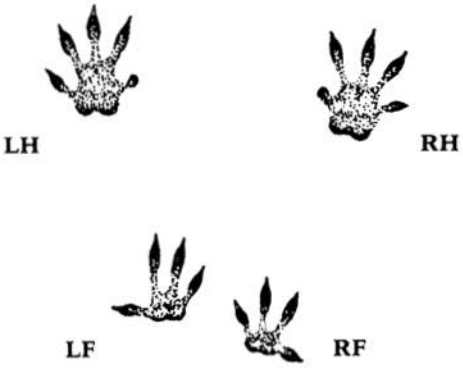
54a Springhare (right fore footprint)



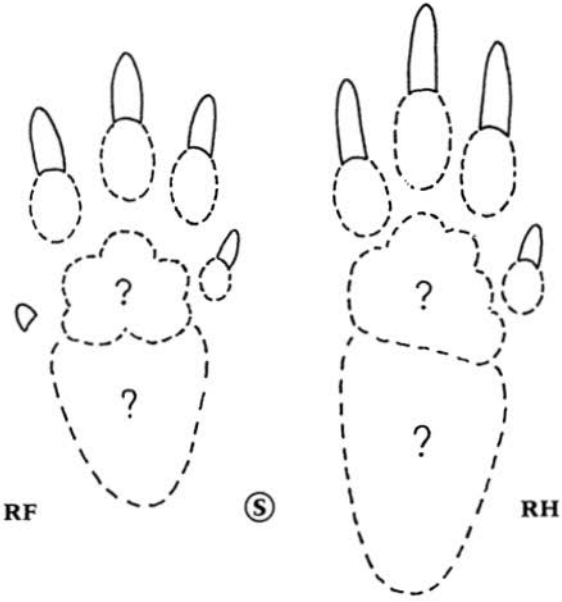
54b Springhare (left and right hind in bipedal hop)

cm
Actual size

44 Shrew

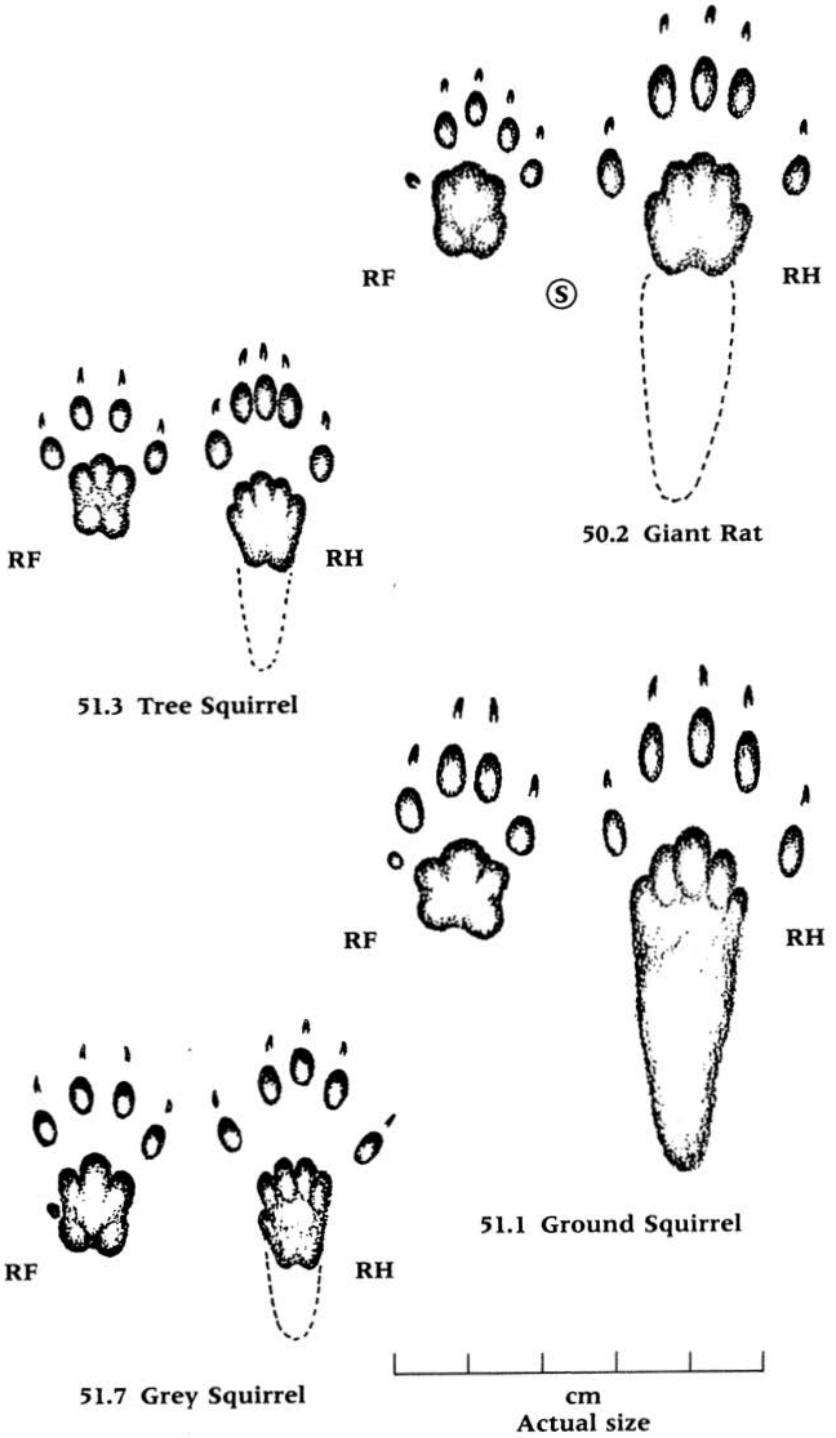


50.1 Murid



53.1 Greater Canerat

cm
Actual size

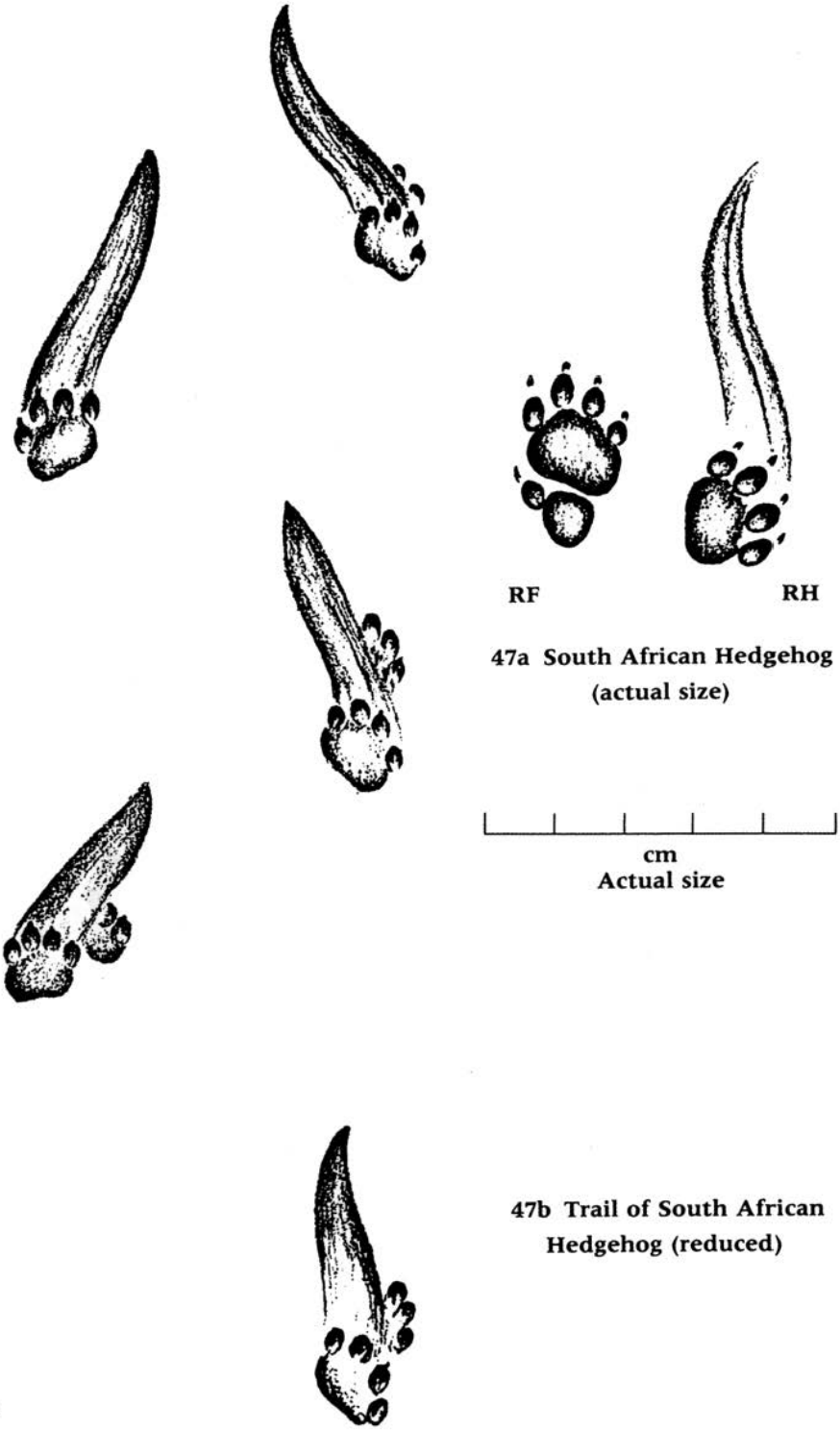


50.2 Giant Rat

51.3 Tree Squirrel

51.1 Ground Squirrel

51.7 Grey Squirrel



47a South African Hedgehog (actual size)

47b Trail of South African Hedgehog (reduced)

63 Striped Weasel

68.2 Slender Mongoose

68.5 Dwarf Mongoose

68.3 Small Grey Mongoose

cm
Actual size

68.11 Yellow Mongoose

68.12 Suricate

68.8 Meller's Mongoose

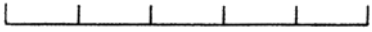
68.10 Selous' Mongoose

cm
Actual size

68.6 Banded Mongoose

64 Striped Polecat

68.7 White-tailed Mongoose



cm
Actual size

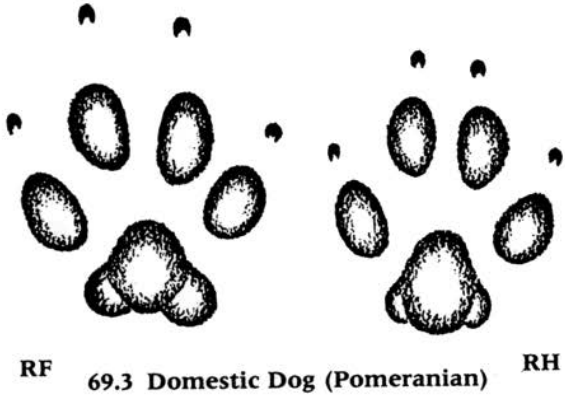
68.1 Large Grey Mongoose

68.4 Water Mongoose

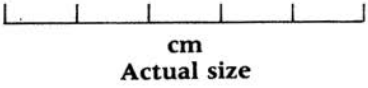
cm
Actual size

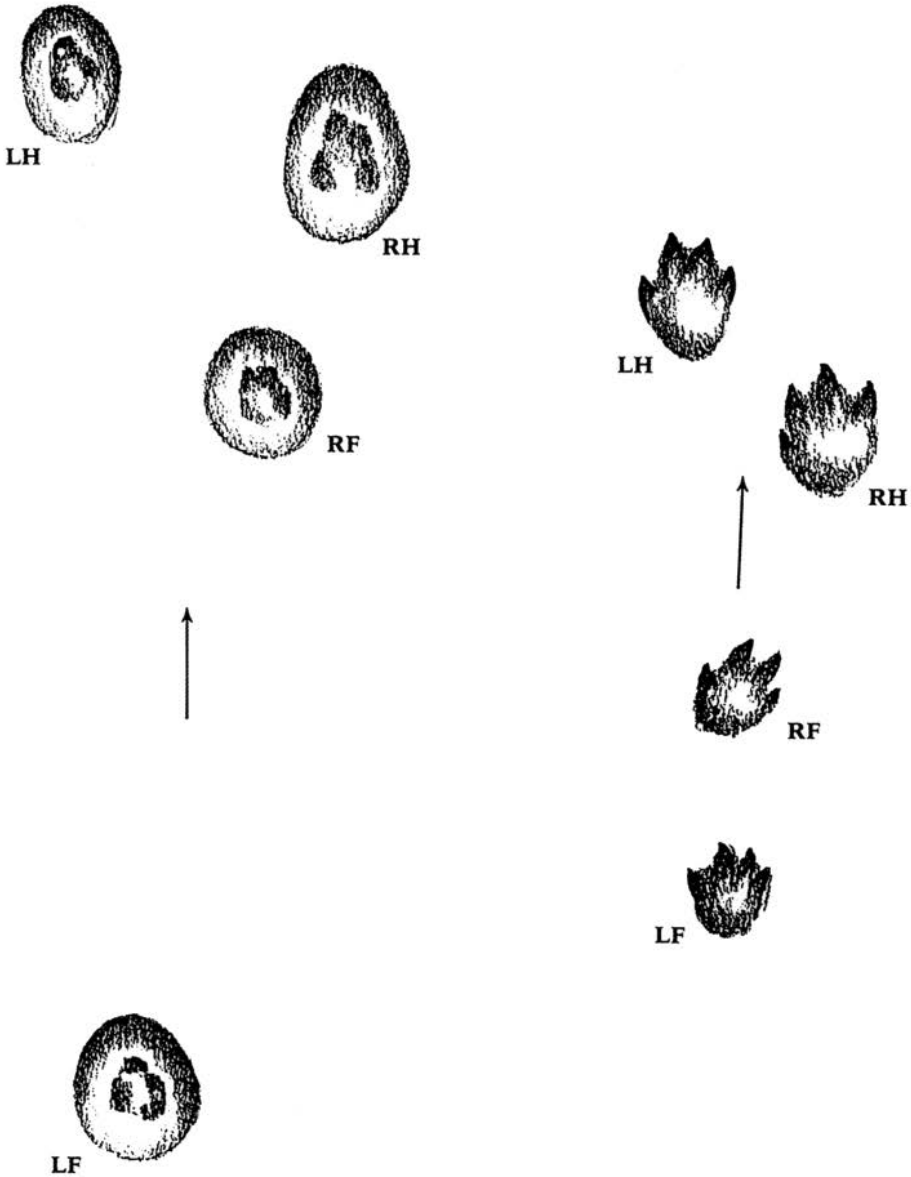
69.2 Cape Fox

69.1 Bat-eared Fox



69.3 Domestic Dog (Pomeranian)





56.1a Hare (bound)

56.1b Hare (jump)

cm
Reduced

74.1 Small Spotted Cat

74.2 African Wild Cat

67.1 Small-spotted Genet

67.2 Large-spotted Genet

74.3 Domestic Cat

66 Tree Civet

cm
Actual size

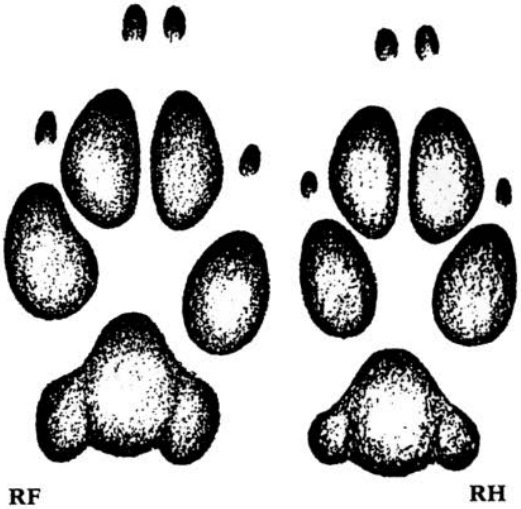
74.4 Serval

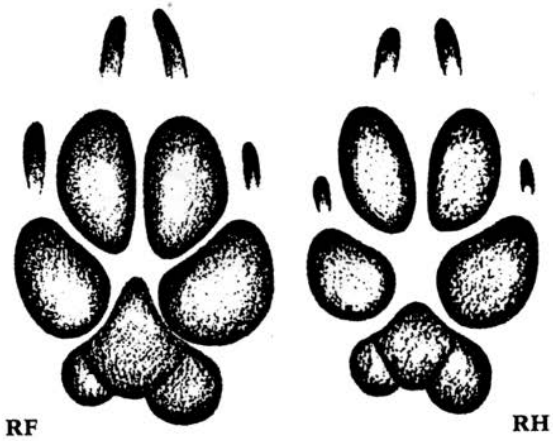
74.5 Caracal

cm
Actual size

70.2 Side-striped Jackal

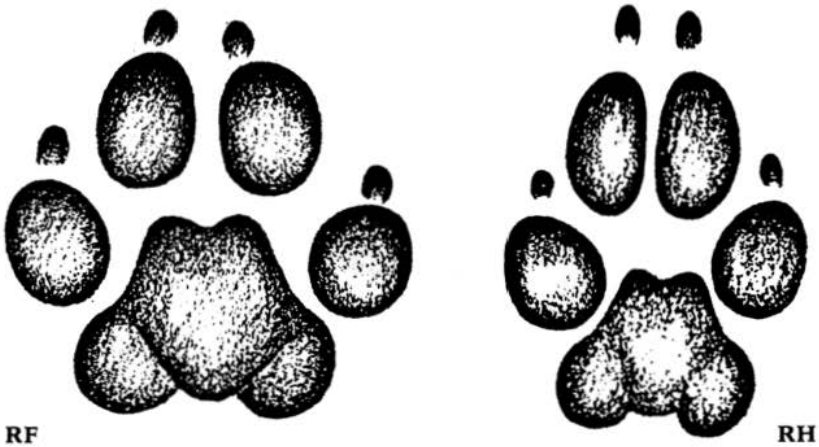
70.1 Black-backed Jackal



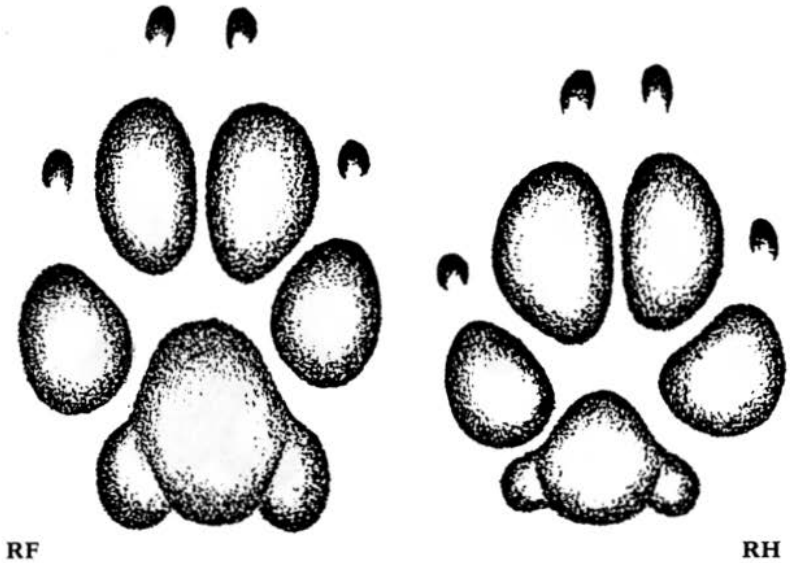


72 Aardwolf

Actual size cm



65 African Civet



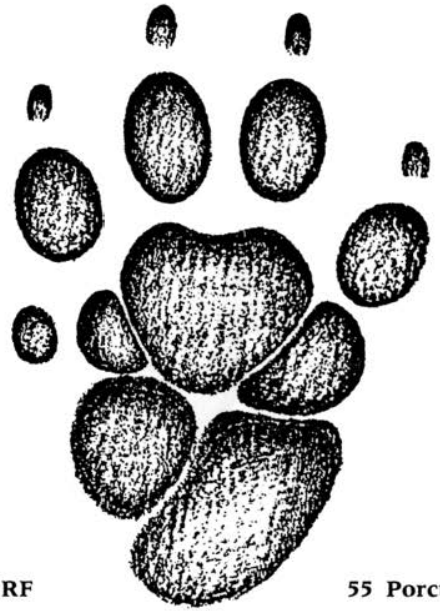
70.3 Domestic Dog (Kalahari tracker dog)

cm
Actual size

62 Honey Badger

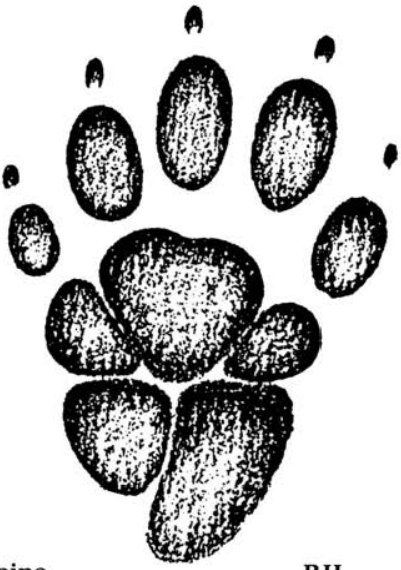
RF

RH



RF

55 Porcupine



RH

cm
Actual size

59.1 Lesser Bushbaby (bipedal hop)

60.1 Vervet Monkey

60.2 Samango Monkey

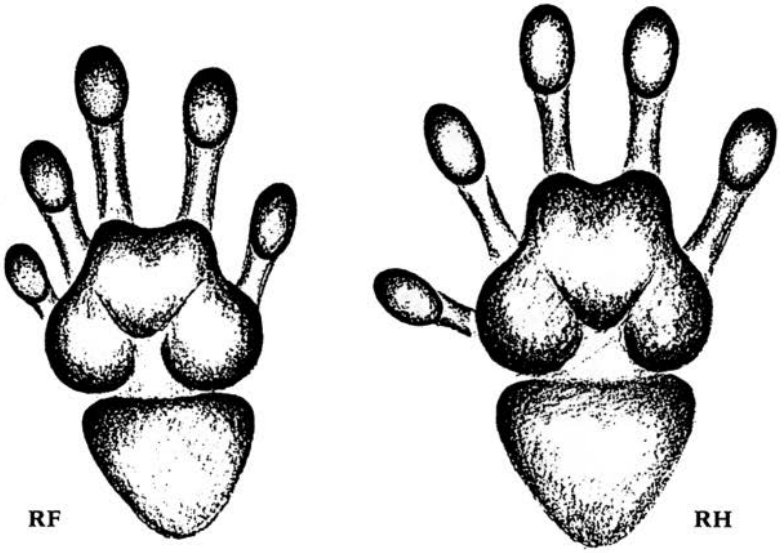
cm
Actual size

RF

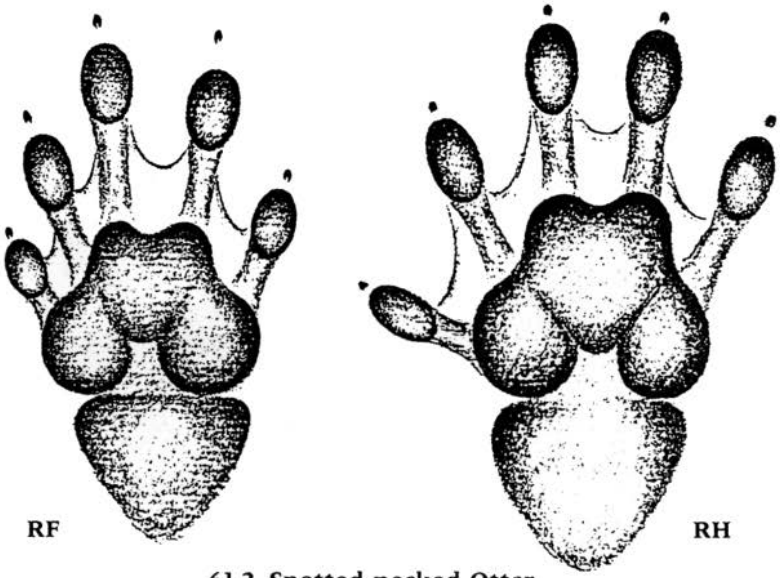
RH

60.3 Chacma Baboon

cm
Reduced



61.1 Clawless Otter



61.2 Spotted-necked Otter

cm
Reduced

RF

cm
Actual size

RH

76 Antbear

73.1a Brown Hyaena

73.1b Brown Hyaena

73.2 Spotted Hyaena

cm
Reduced

71.1 Wild Dog

75.1 Cheetah

71.2 Domestic Dog (Great Dane)

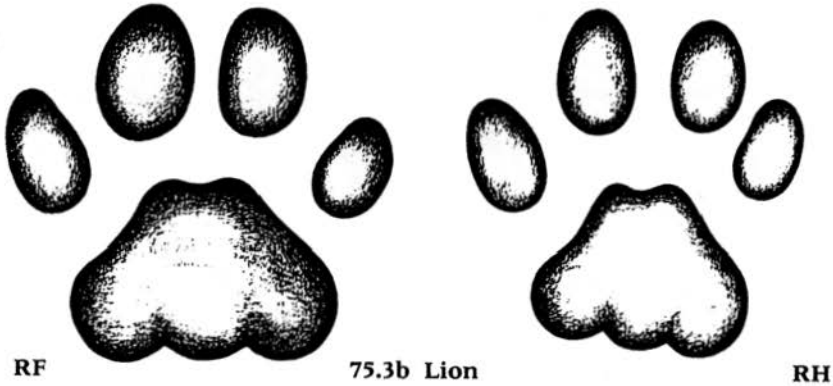
cm
Reduced

75.2a Leopard

75.2b Leopard

cm
Reduced

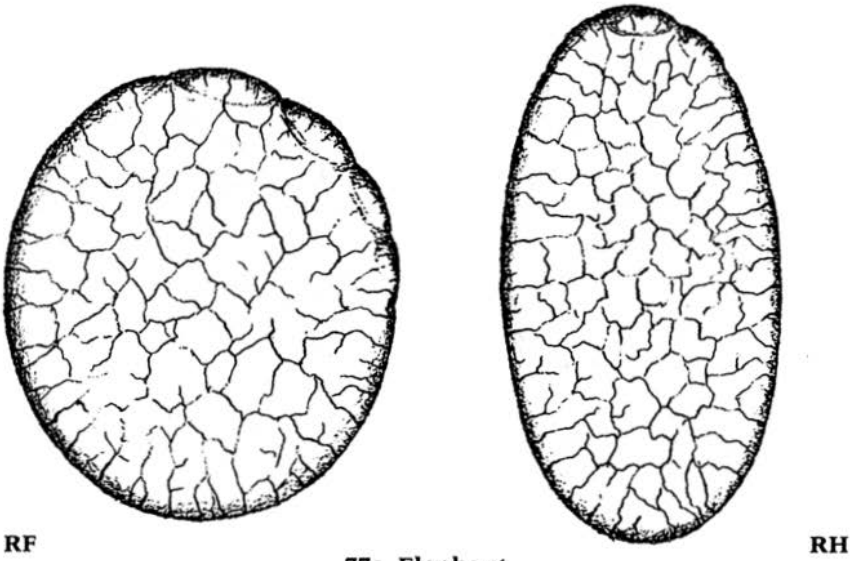
75.3a Lion



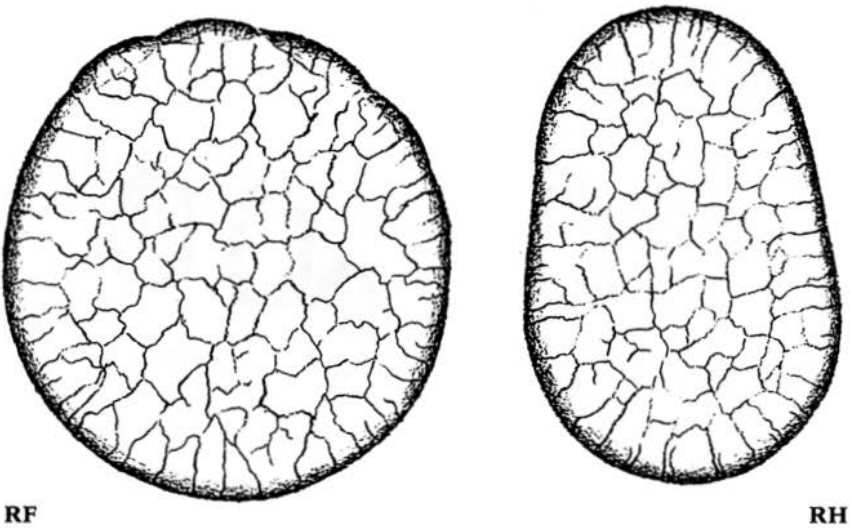
75.3b Lion

75.3c Lion

cm
Reduced

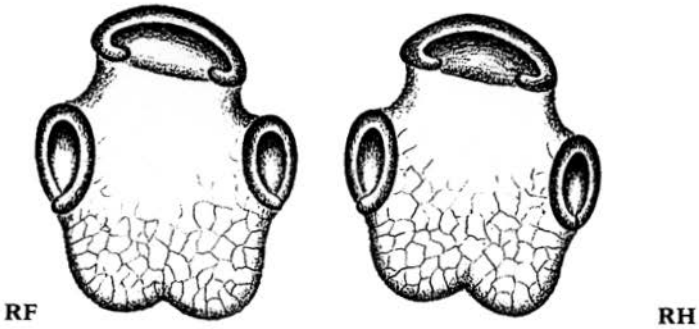


77a Elephant

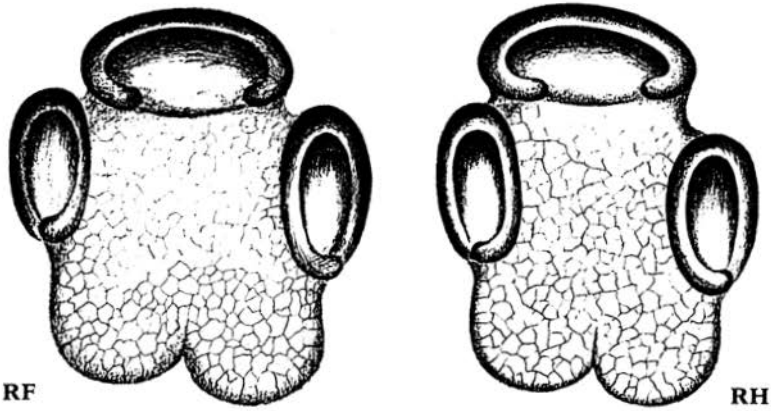


77b Elephant

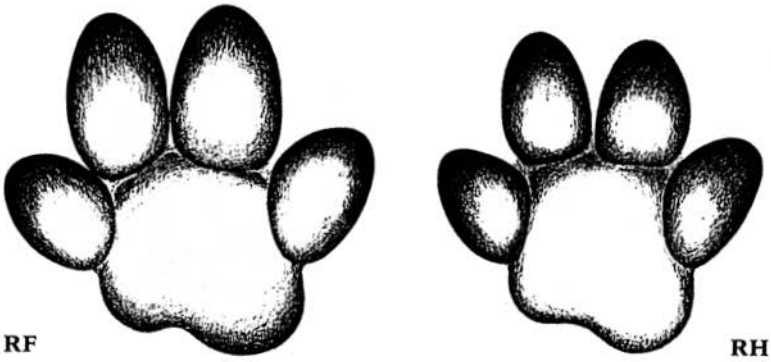
50 cm



79.2 Hook-lipped Rhinoceros

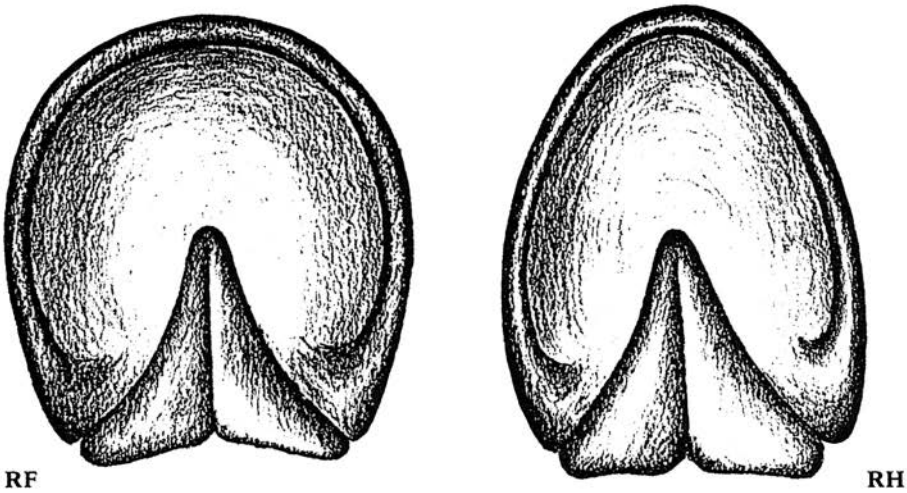


79.1 Square-lipped Rhinoceros

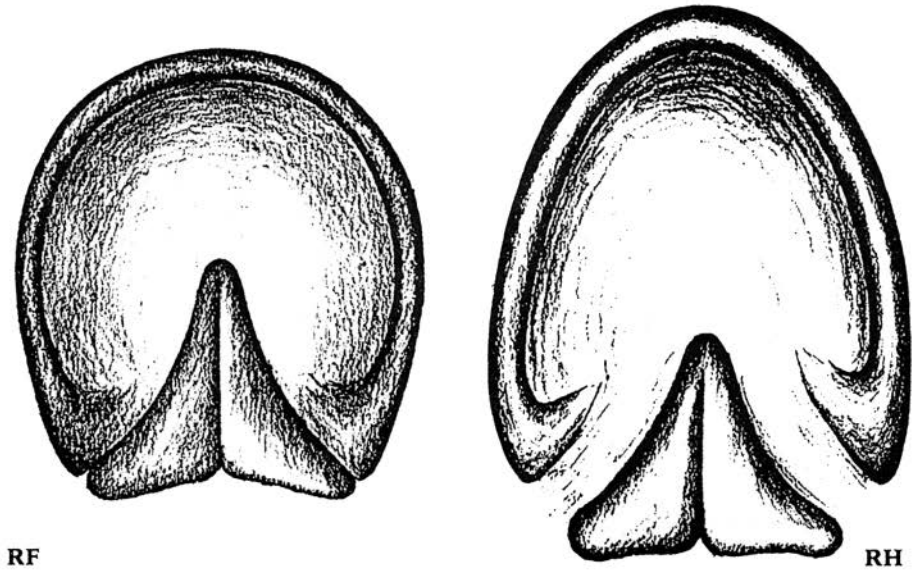


80 Hippopotamus

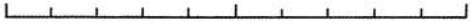
cm
Reduced



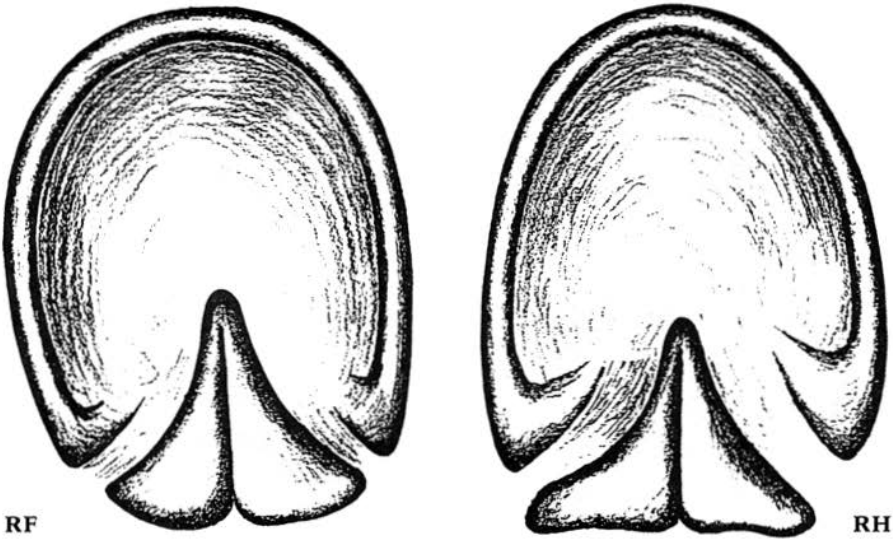
78.1a Burchell's Zebra



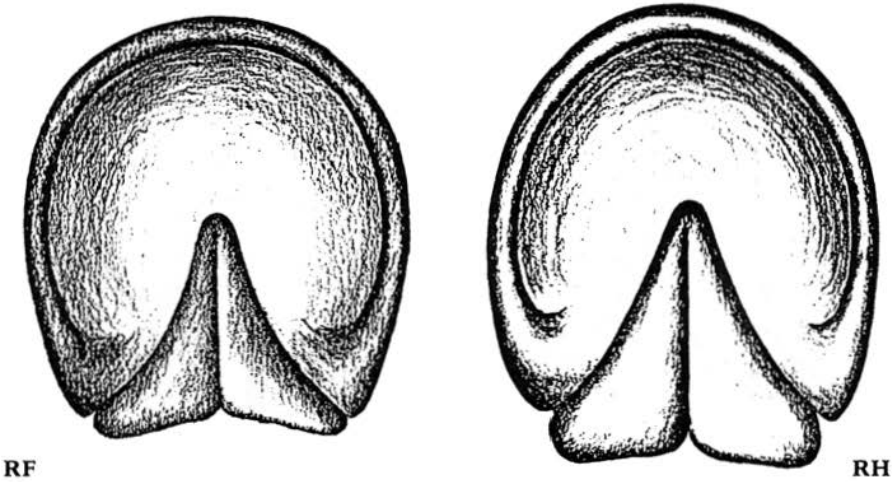
78.1b Burchell's Zebra



cm
Reduced

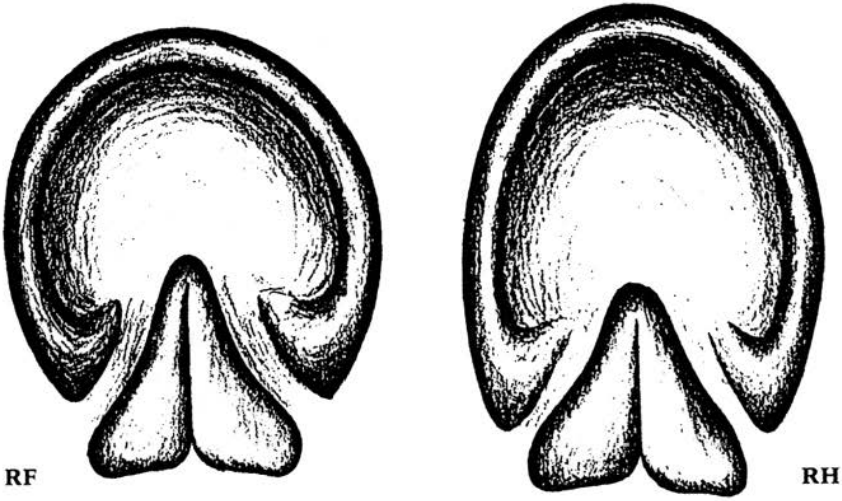


78.1c Burchell's Zebra



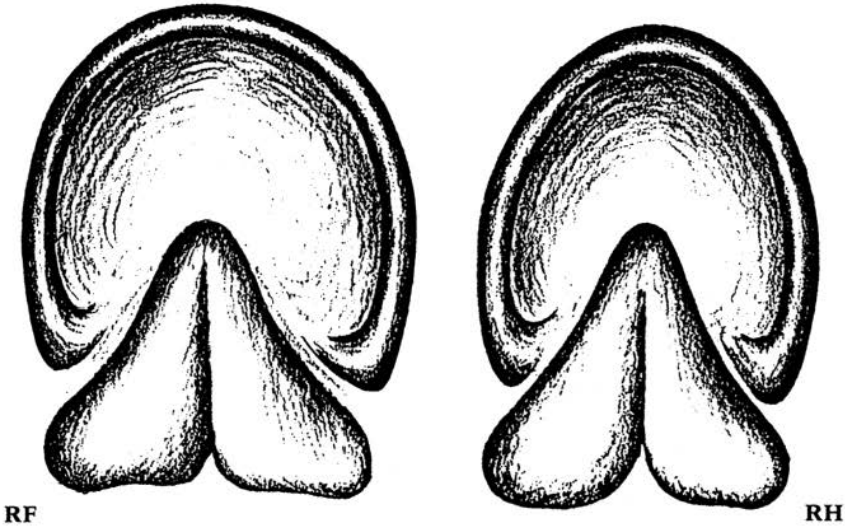
78.1d Burchell's Zebra

cm
Reduced

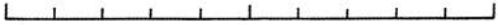


78.2 Cape Mountain Zebra

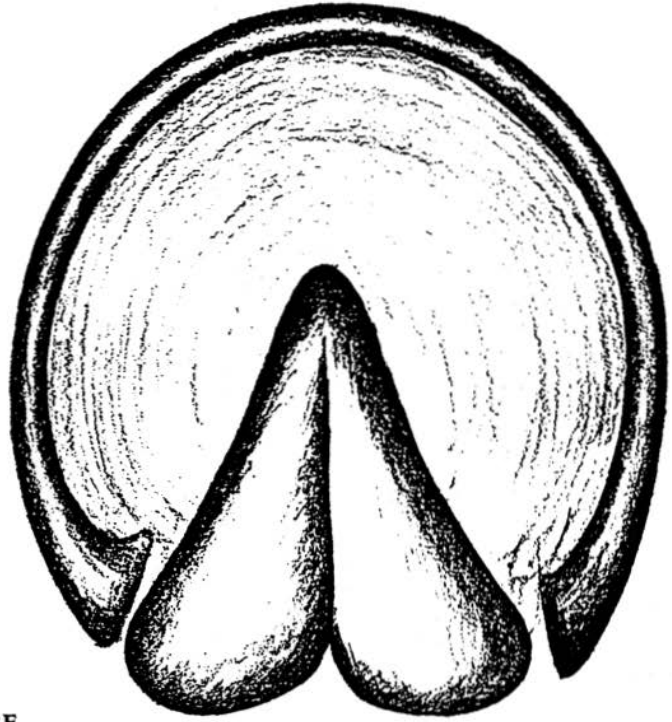
78.3 Hartmann's Mountain Zebra



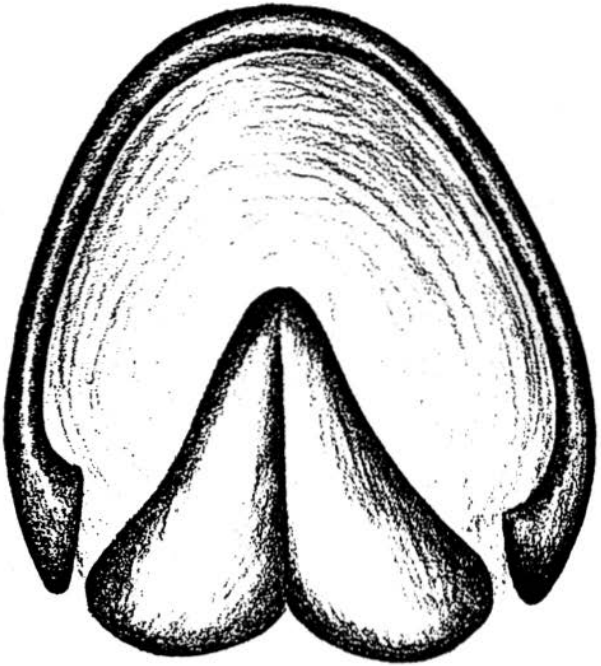
78.4 Domestic Donkey



cm
Reduced



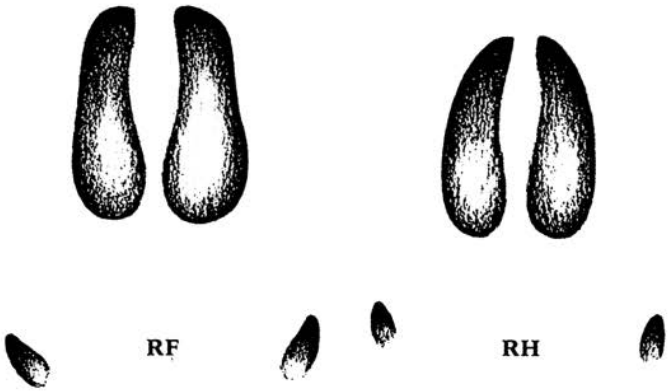
RF



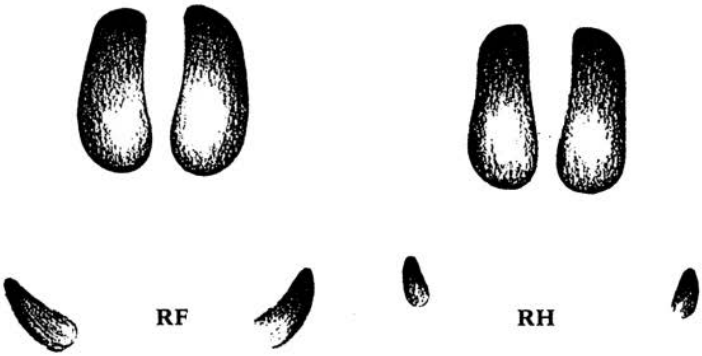
RH

78.5 Horse

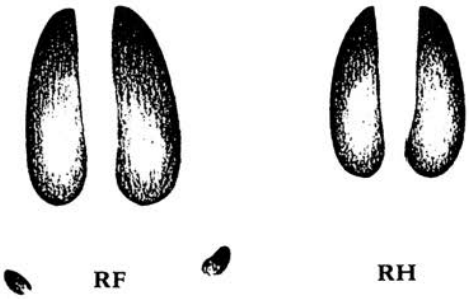
cm
Reduced



81.1a Warthog

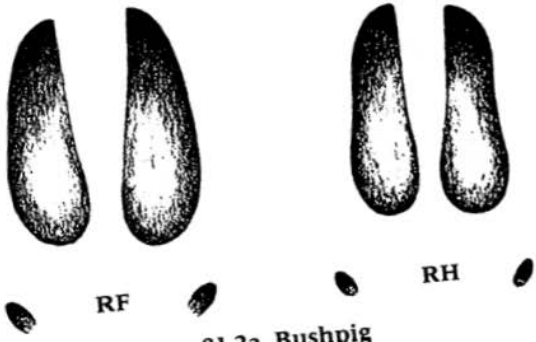


81.1b Warthog

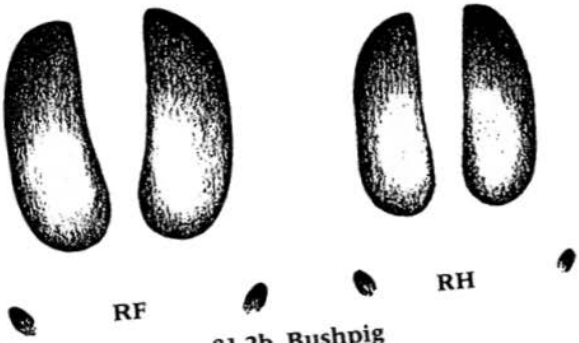


81.1c Warthog

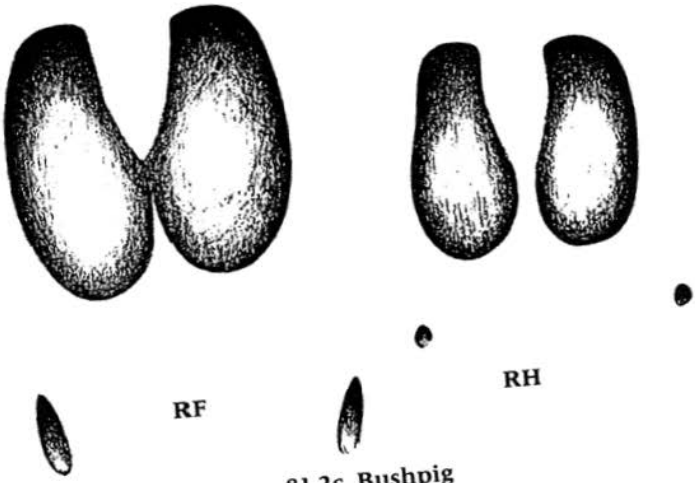
cm
Reduced



81.2a Bushpig



81.2b Bushpig

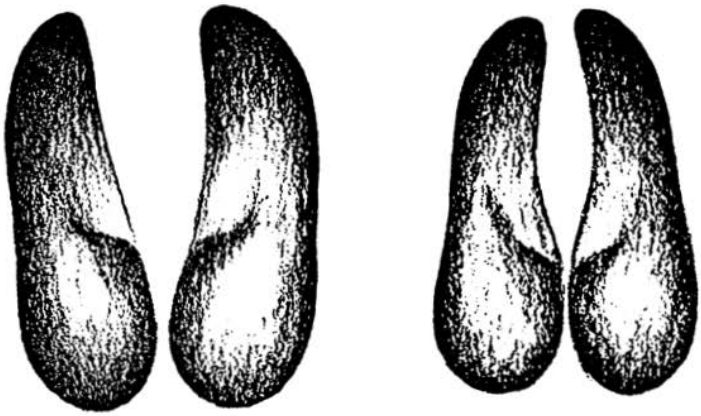


81.2c Bushpig

cm
Reduced

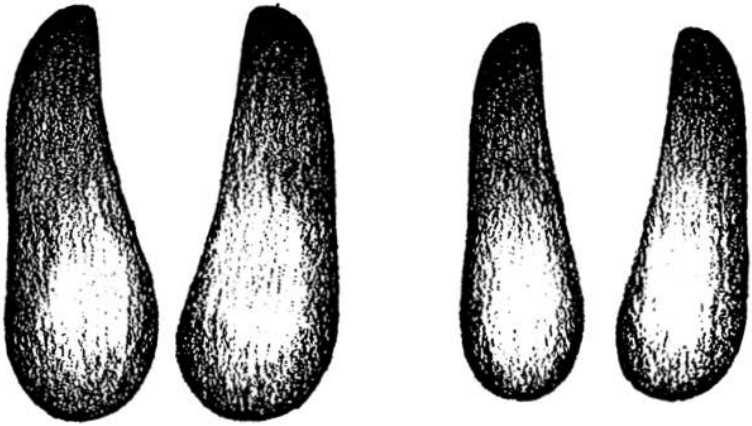
RF RH

81.4 Domestic Goat



RF RH

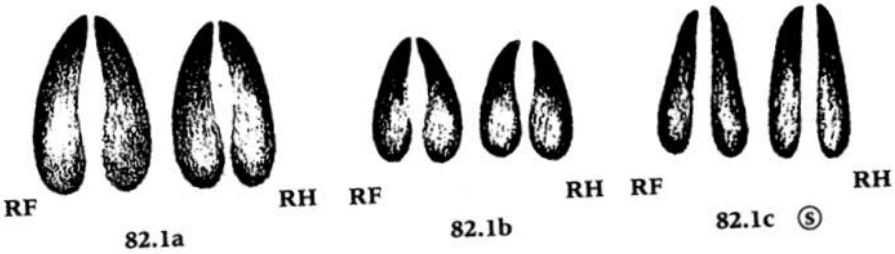
81.5 Domestic Sheep



RF RH

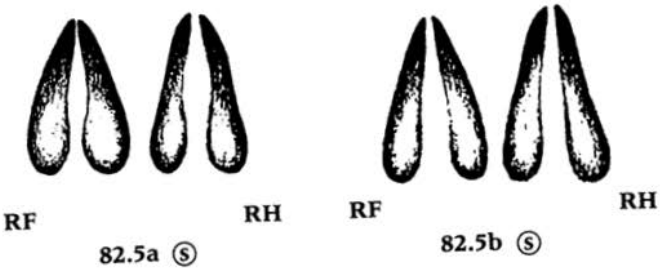
90 Himalayan Tahr

cm
Actual size

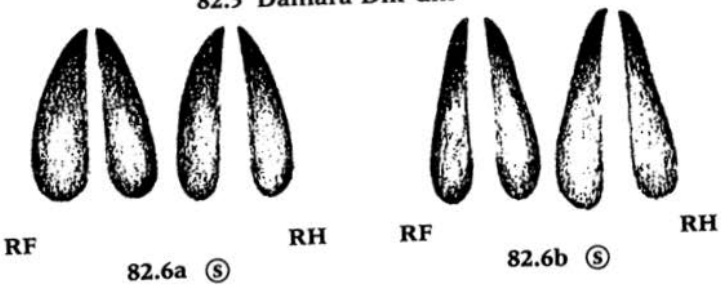


82.1 Blue Duiker

82.4 Suni

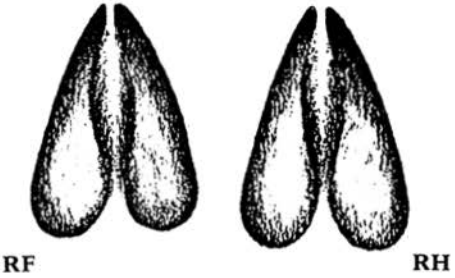


82.5 Damara Dik-dik



82.6 Sharpe's Grysbok

cm
Actual size

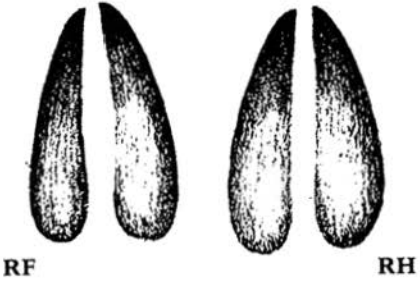


82.7a

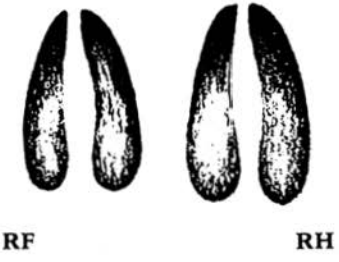
82.7b Ⓢ

82.7c Ⓢ

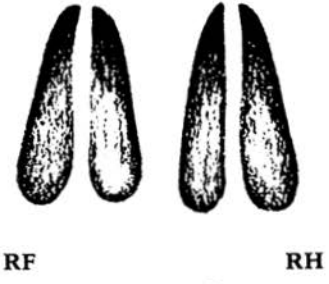
82.7 Grysbok



82.2a



82.2b Ⓢ

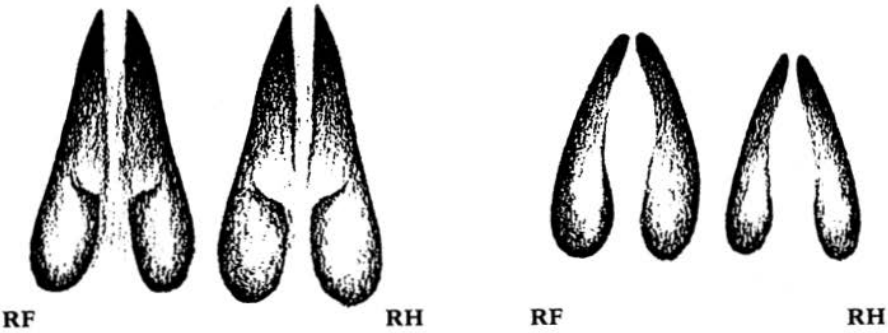


82.2c Ⓢ

82.2 Red Duiker

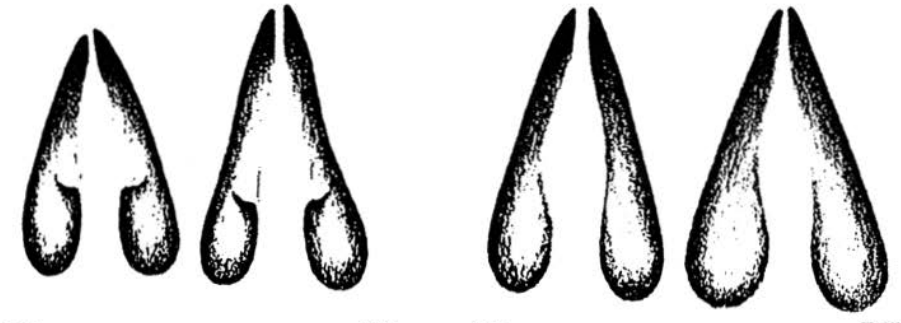
cm
Actual size

83 Klipspringer



82.8a 82.8b

82.8 Steenbok



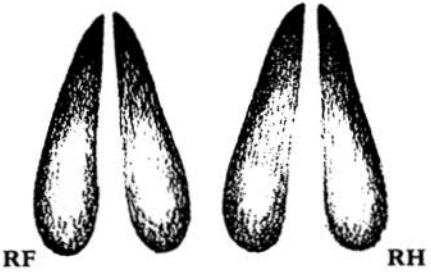
82.9a 82.9b

82.9 Oribi

cm
Actual size

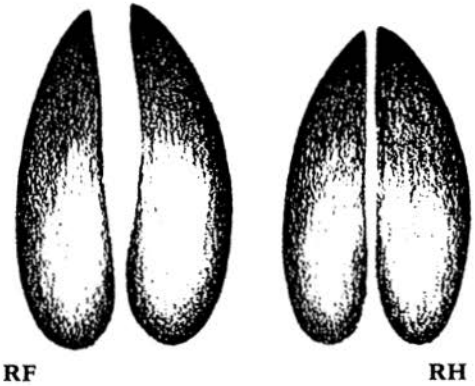
82.3a

82.3b Ⓢ

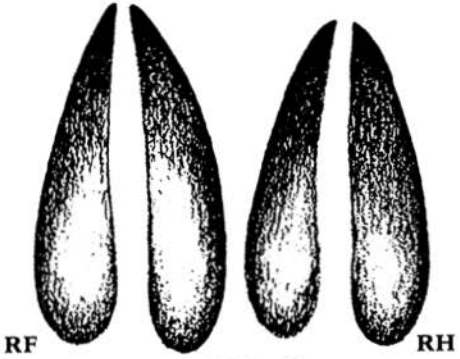


82.3c Ⓢ

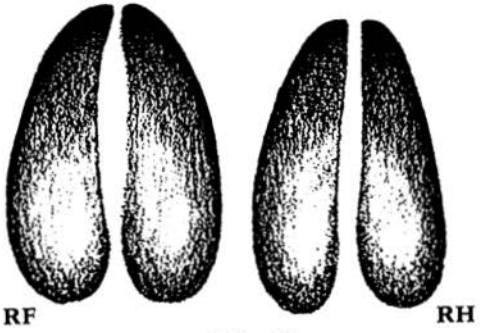
82.3 Common Duiker



87.1a



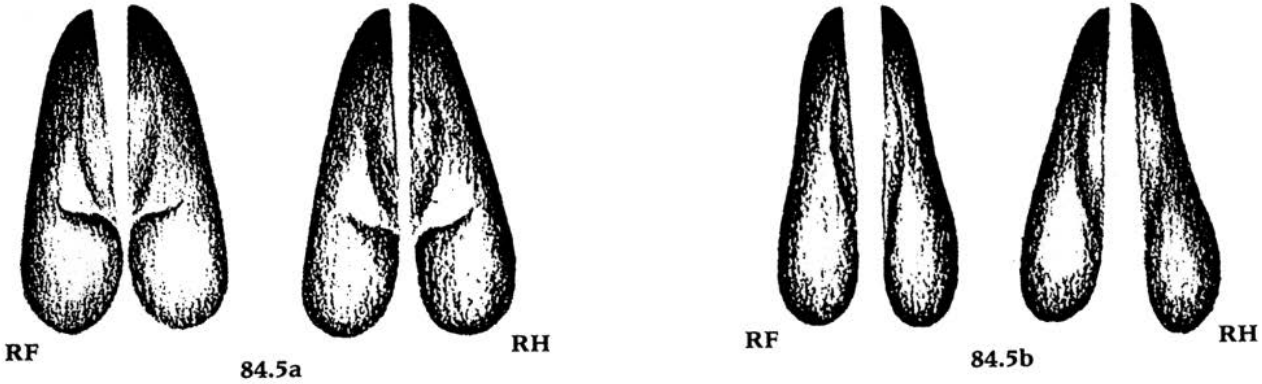
87.1b Ⓢ



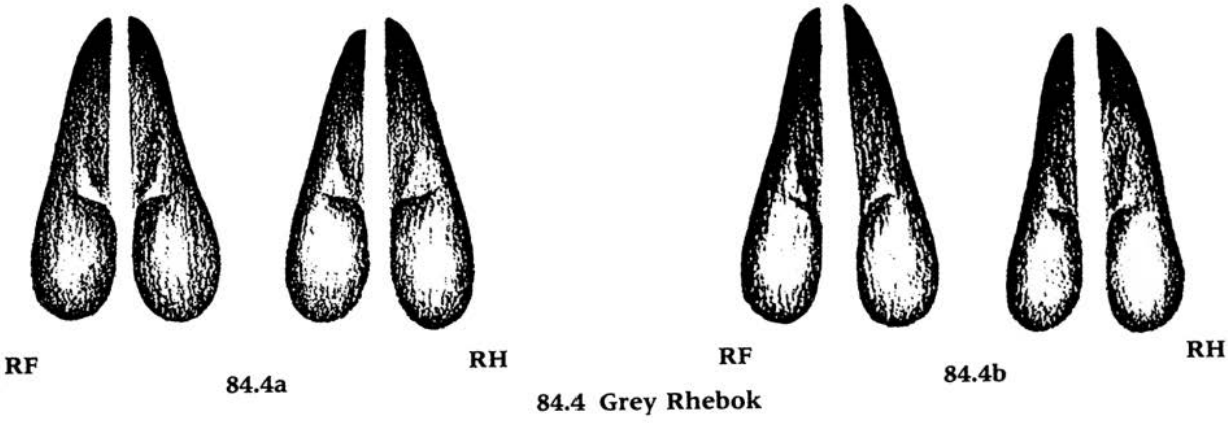
87.1c Ⓢ

87.1 Bushbuck

Actual size cm

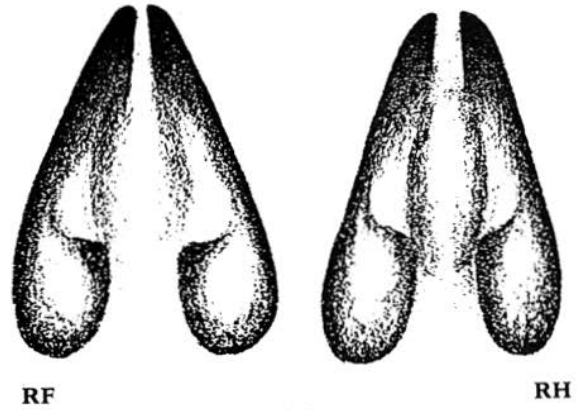


84.5 Mountain Reedbuck



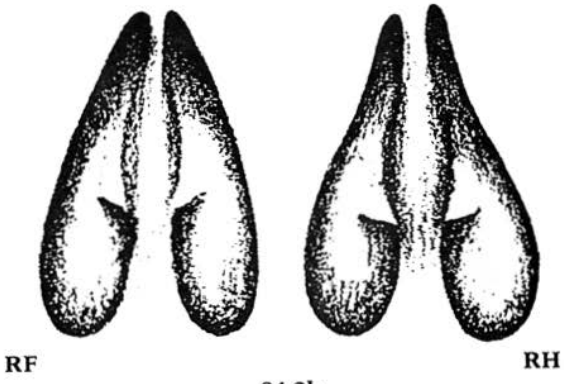
84.4 Grey Rhebok

Actual size cm

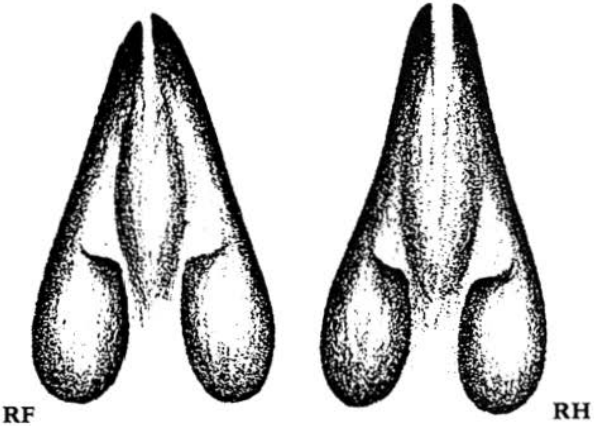


84.2a

84.2 Impala

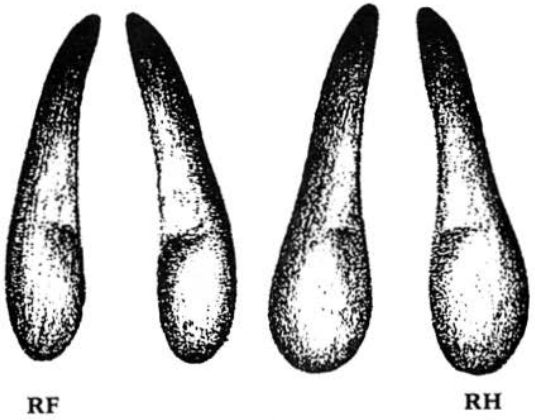


84.2b



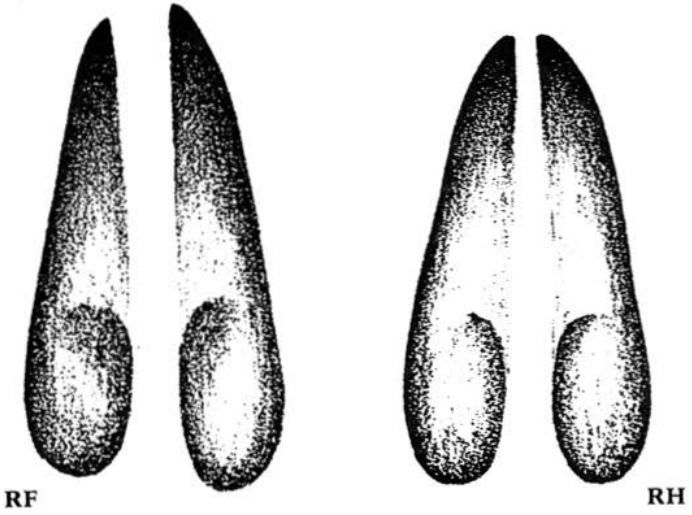
84.1a

84.1 Springbok

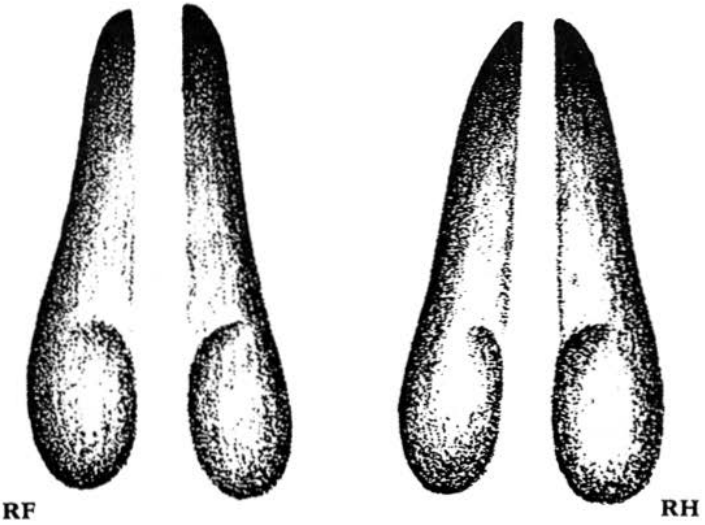


84.1b

Actual size cm



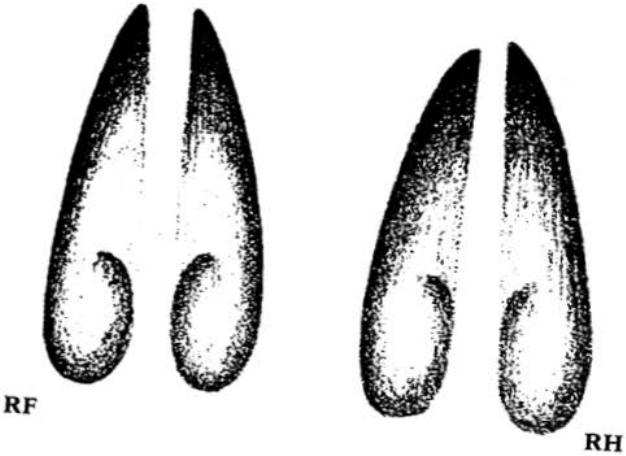
84.6a



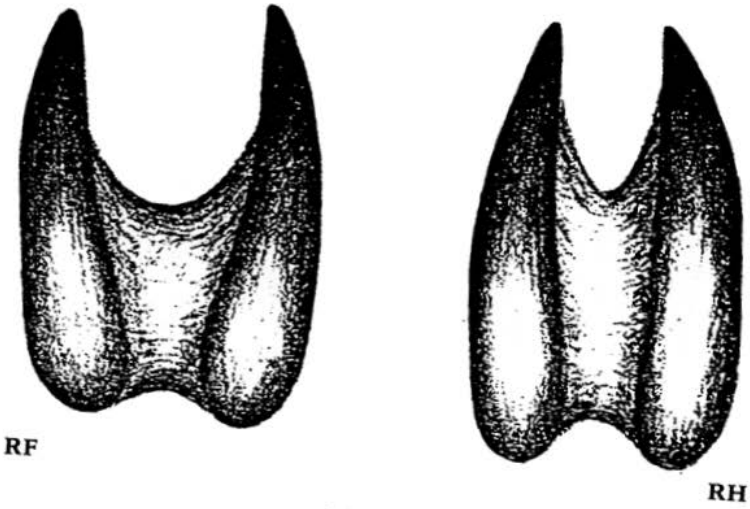
84.6b

84.6 Reedbuck

cm
Actual size



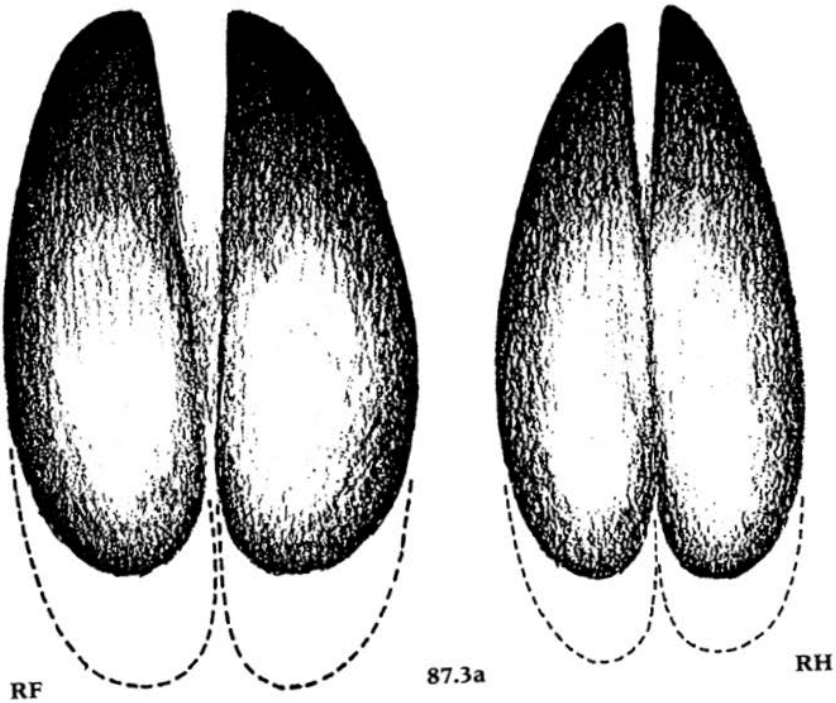
84.6c

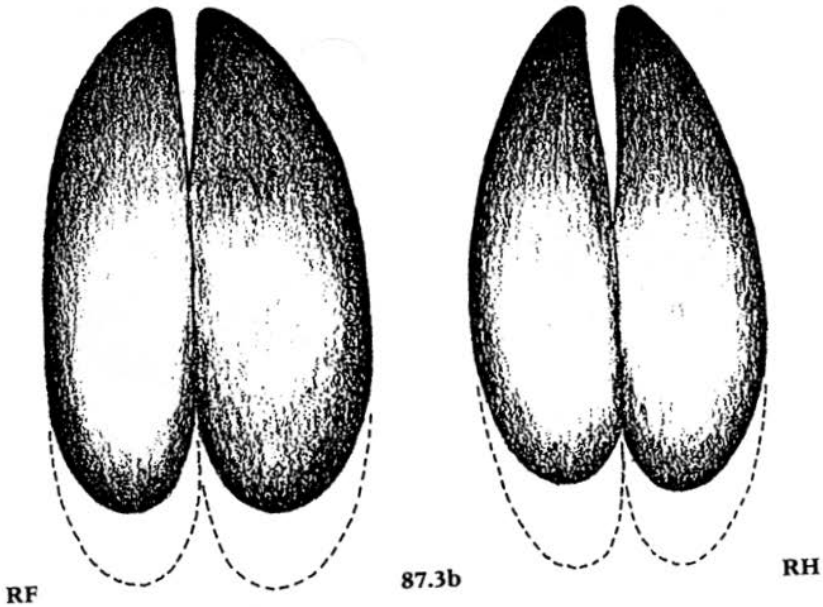


84.6d

84.6 Reedbuck

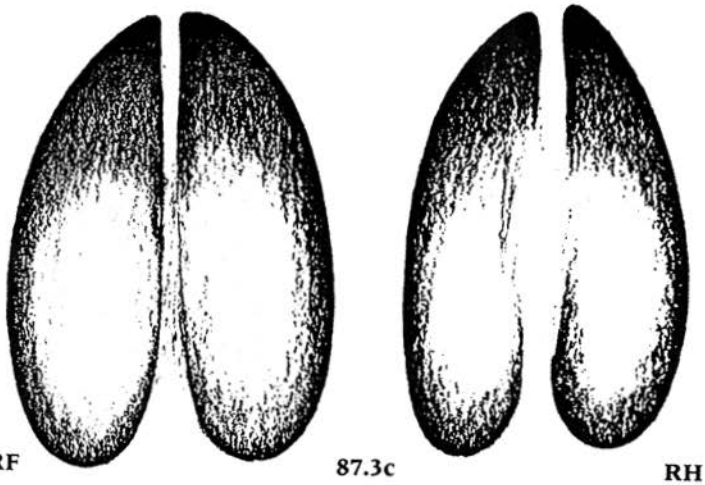
cm
Actual size

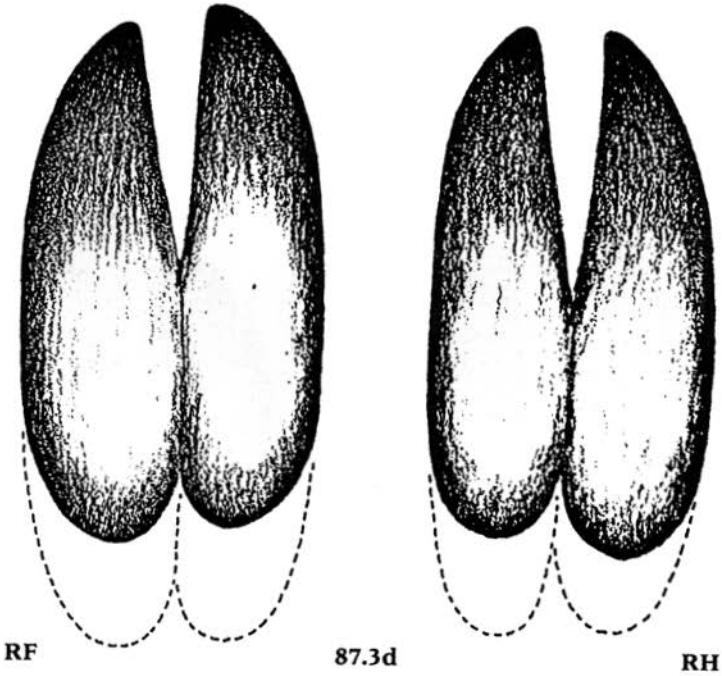




87.3 Kudu

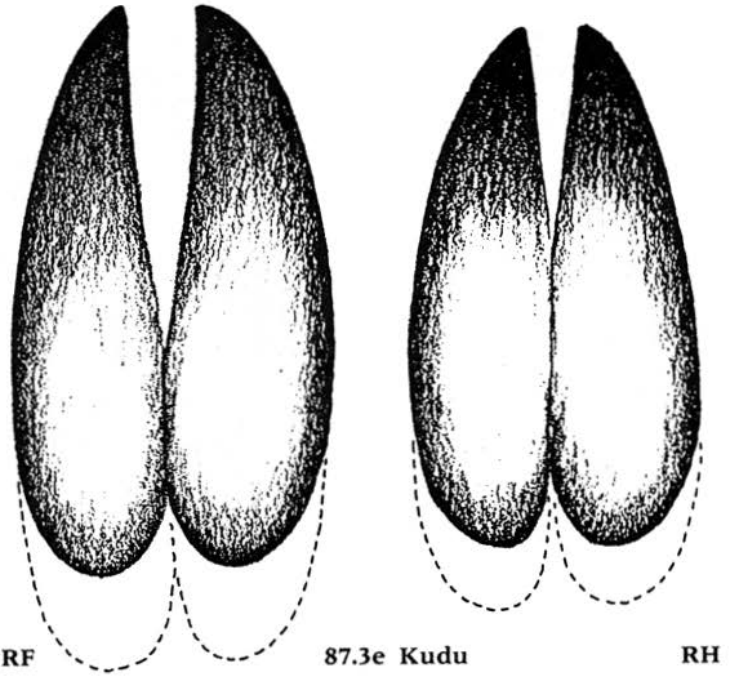
Actual size cm

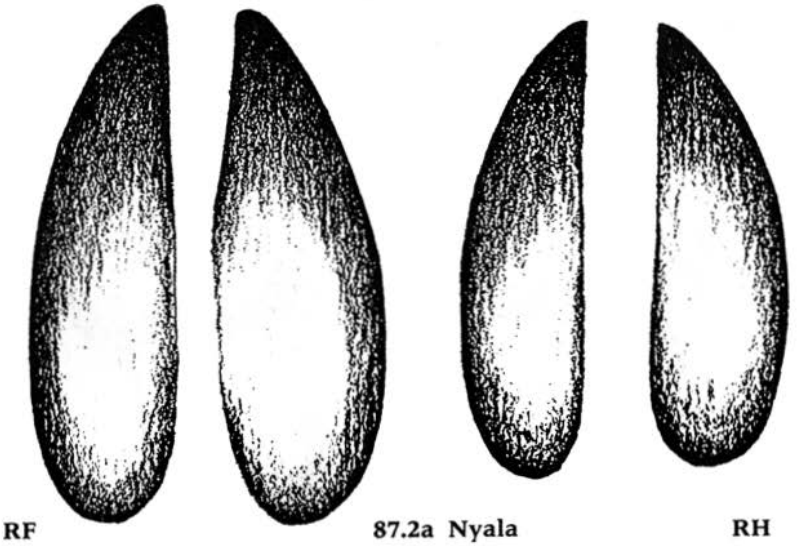




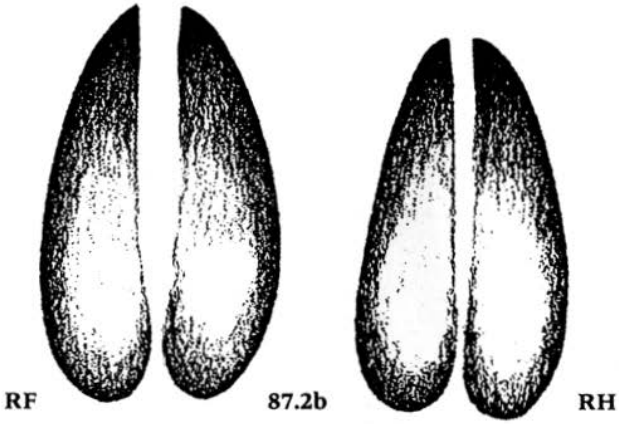
87.3 Kudu

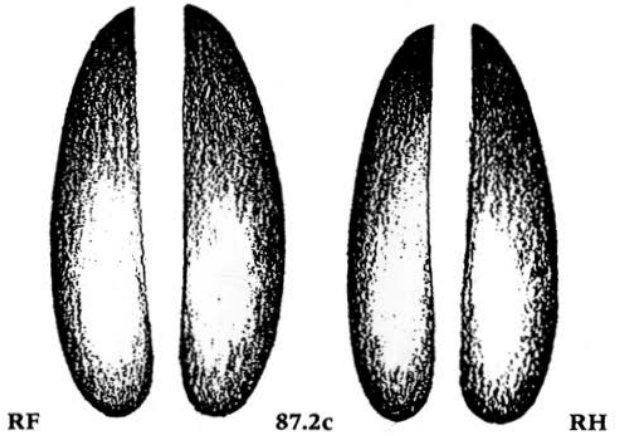
cm
Actual size

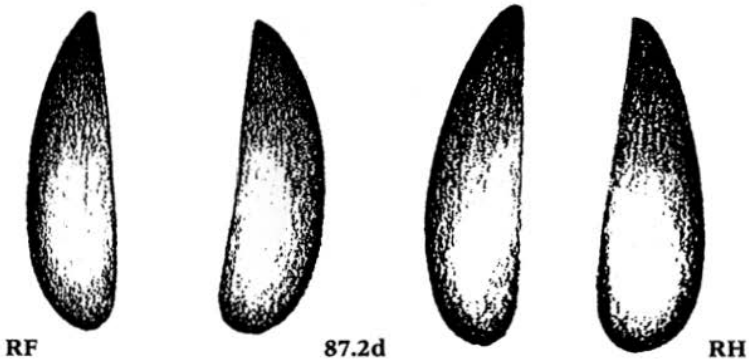




cm
Actual size

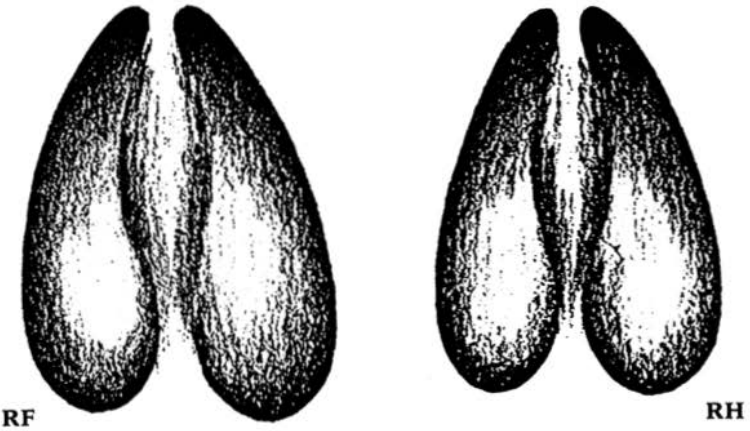




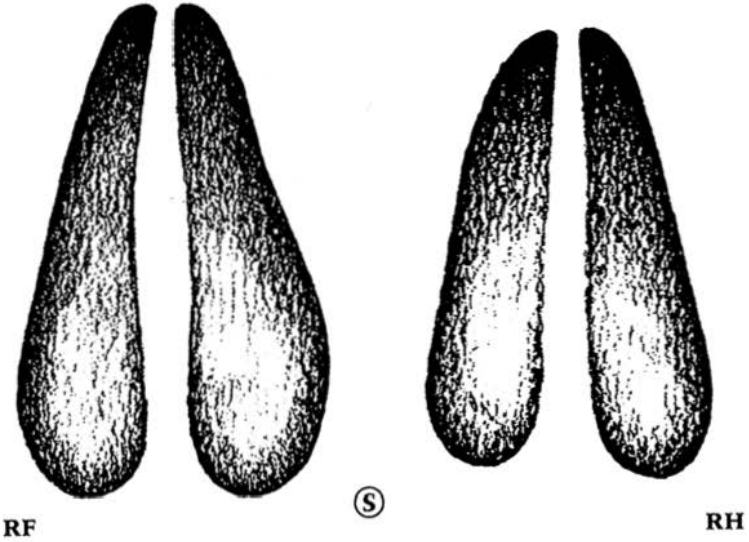


87.2 Nyala

cm
Actual size

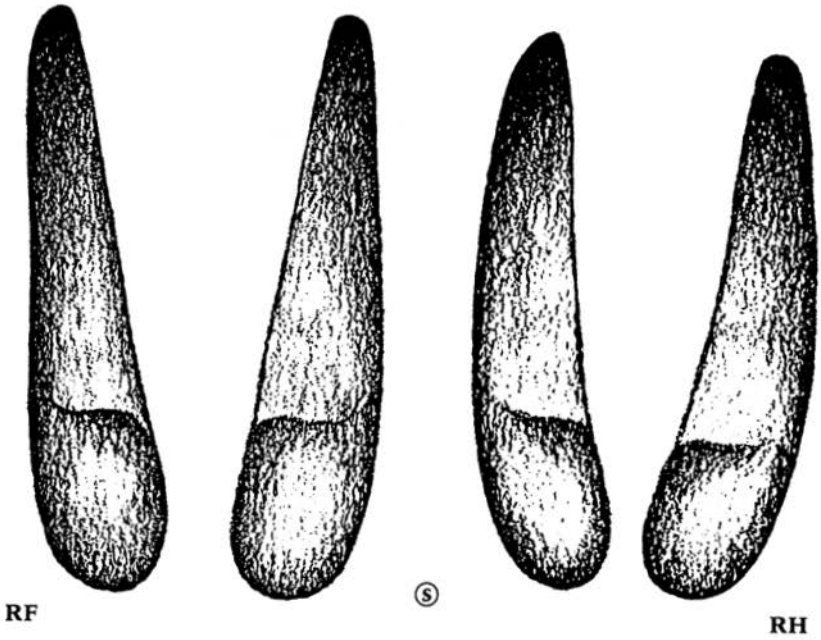


92 European Fallow Deer

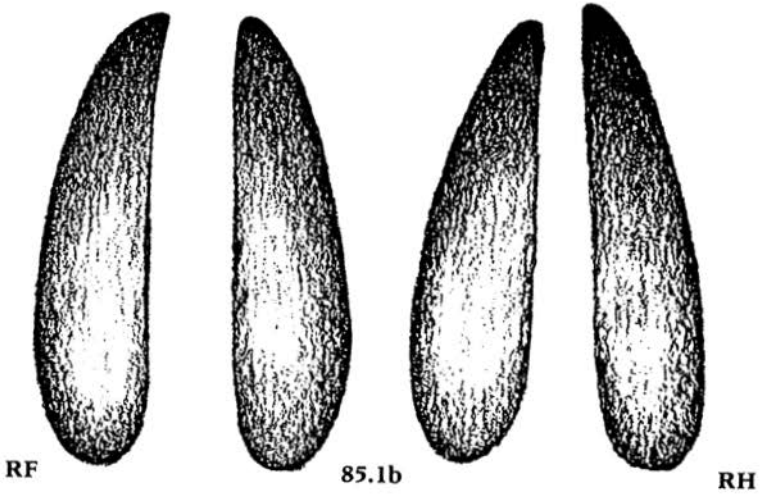


85.2 Puku

cm
Actual size



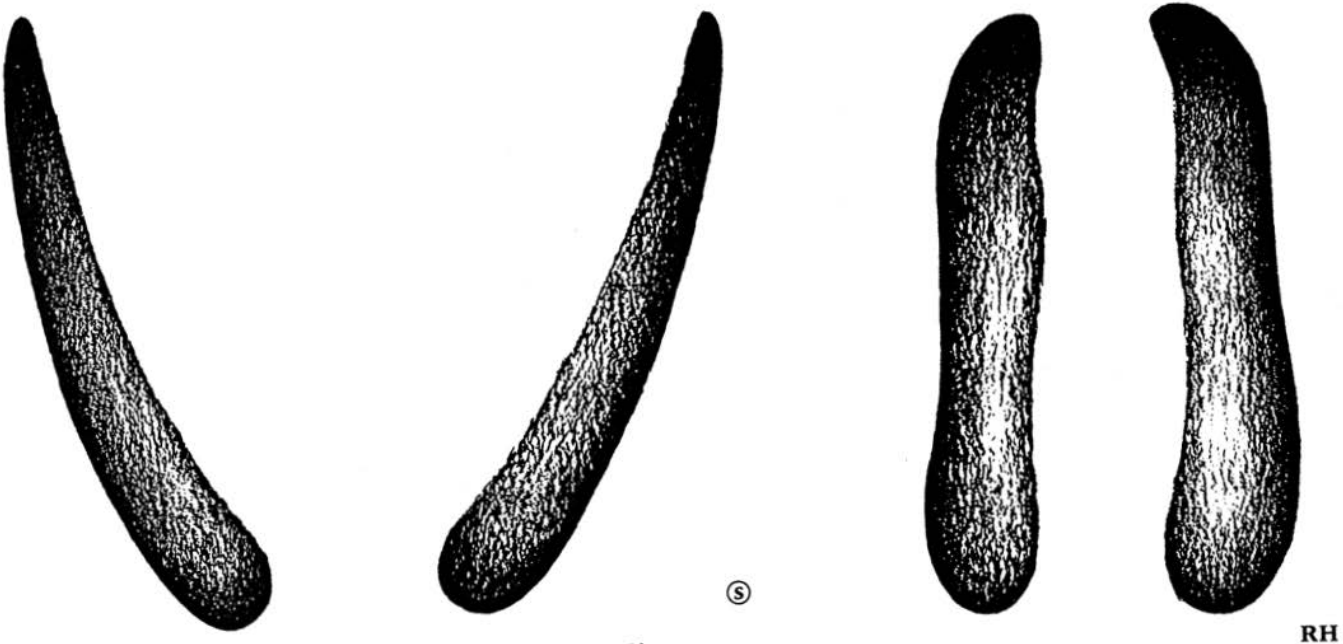
85.1a



85.1b

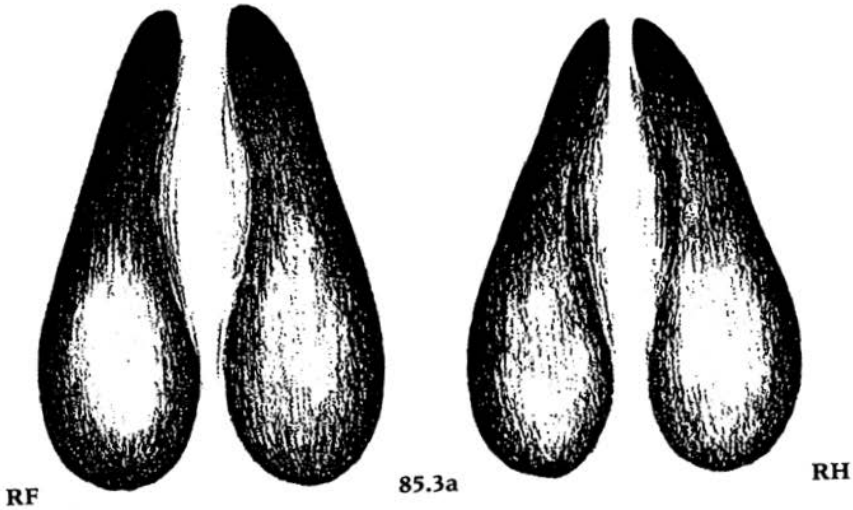
85.1 Red Lechwe

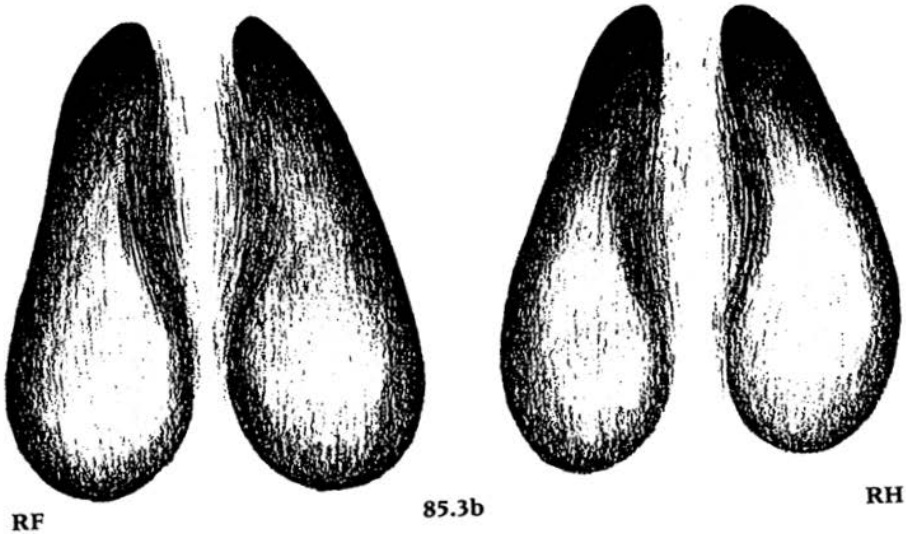
cm
Actual size



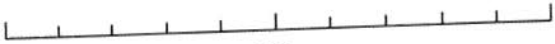
86 Sitatunga

cm
Actual size

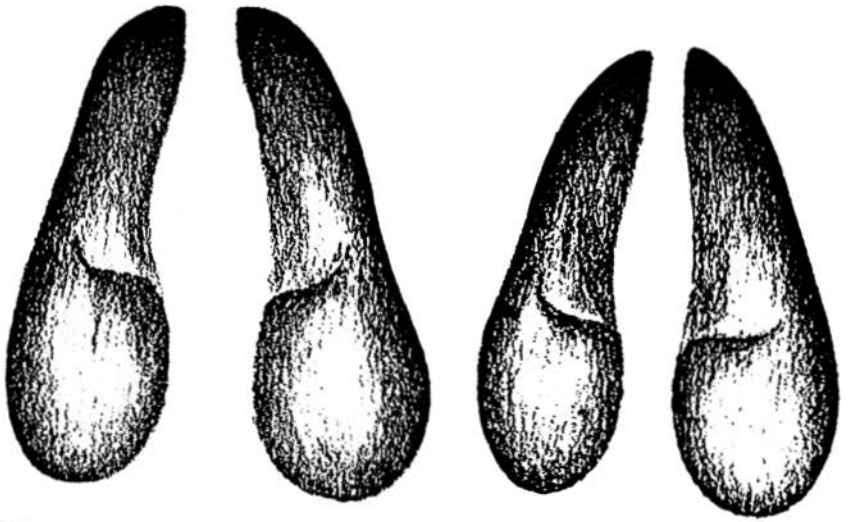




85.3 Waterbuck

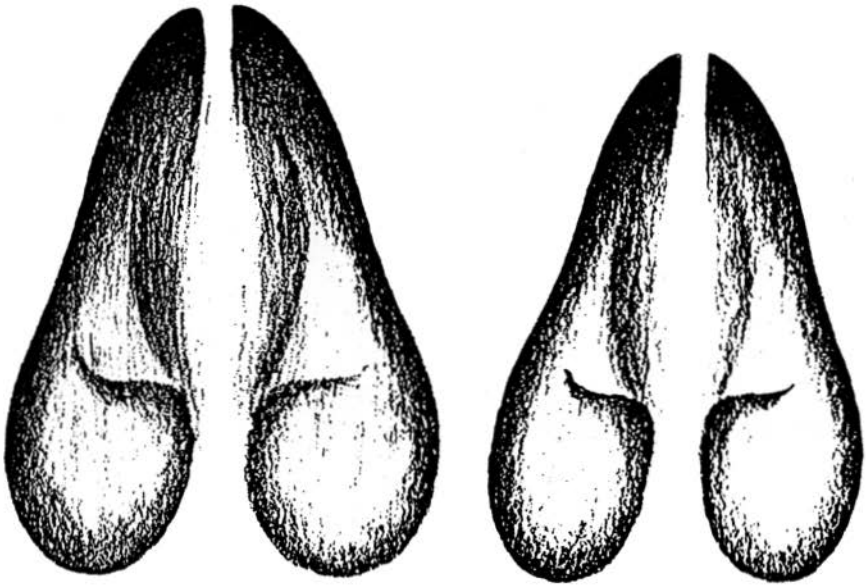


cm
Reduced



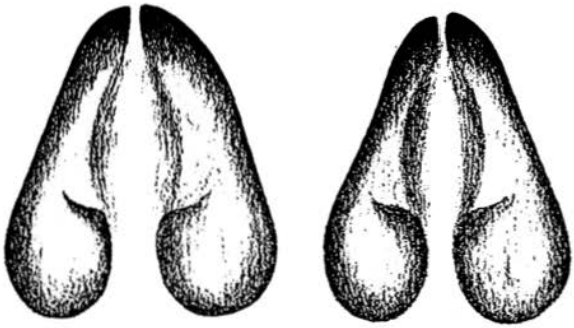
RF RH

89.5 Blesbok

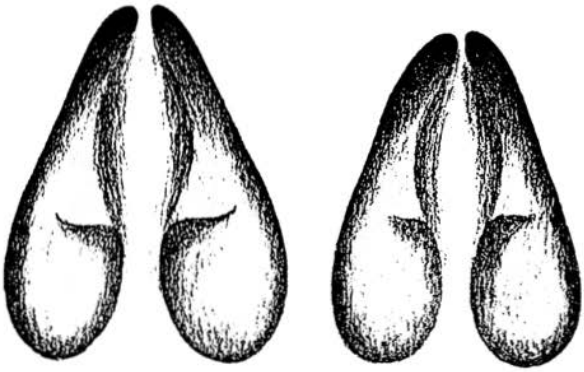


RF 89.4 Bontebok RH

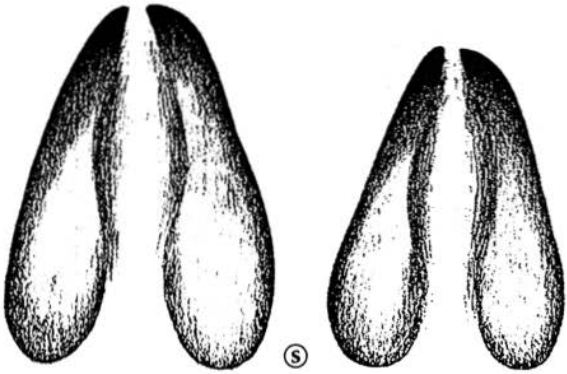
cm
Actual size



RF 89.6 Tsessebe RH

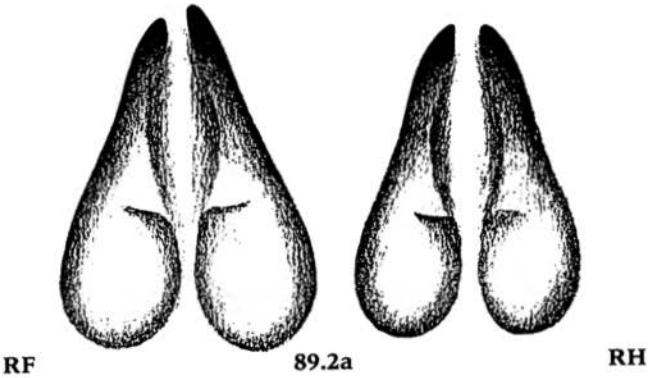


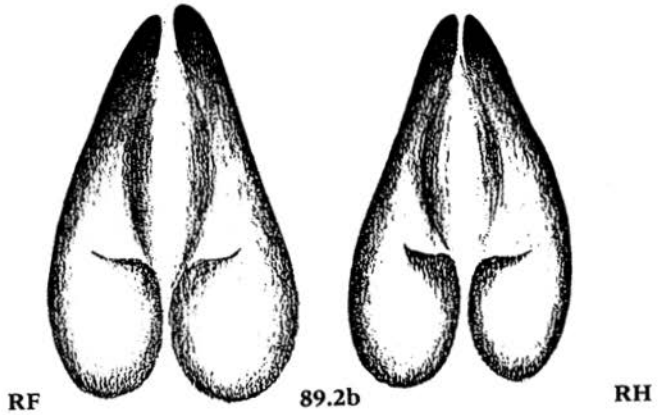
RF 89.7 Red Hartebeest RH

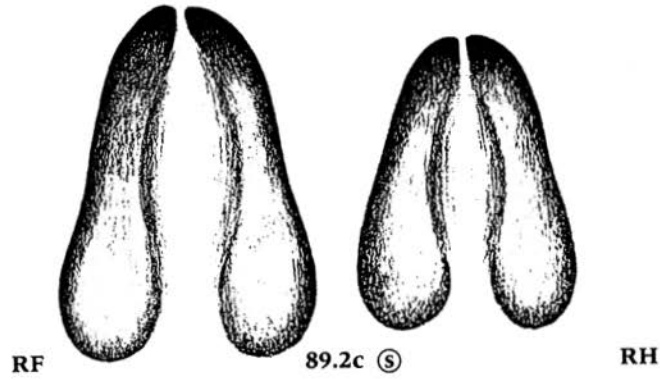


RF 89.8 Lichtenstein's Hartebeest RH

cm
Reduced

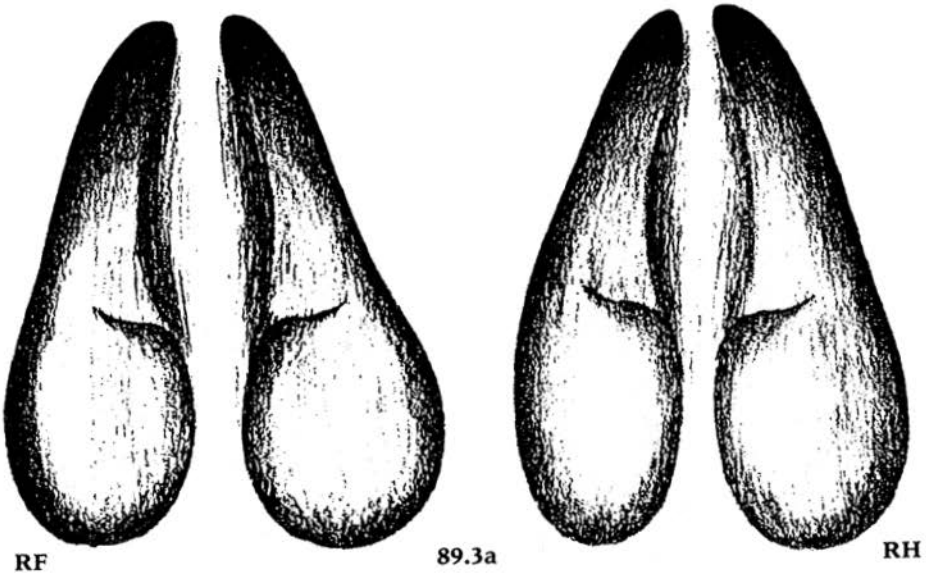


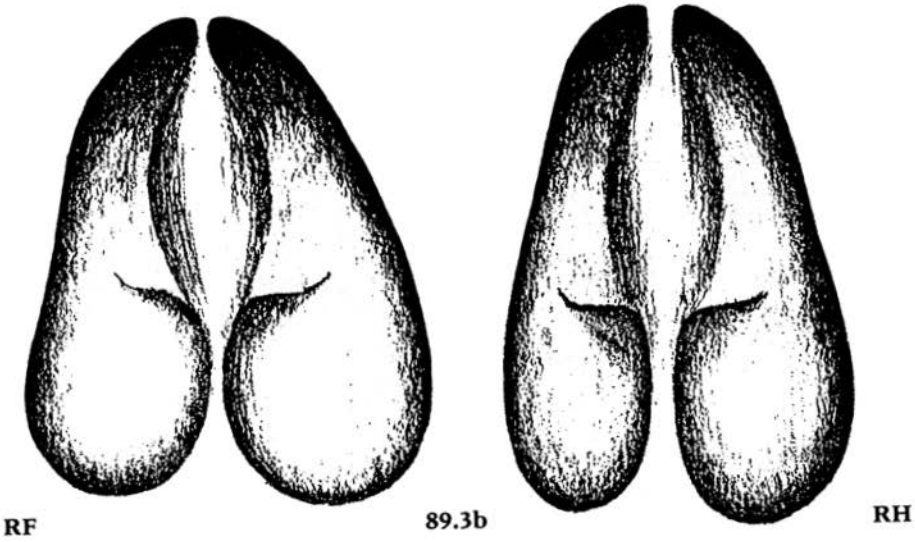




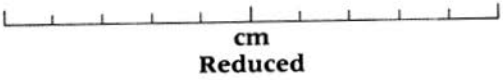
89.2 Sable

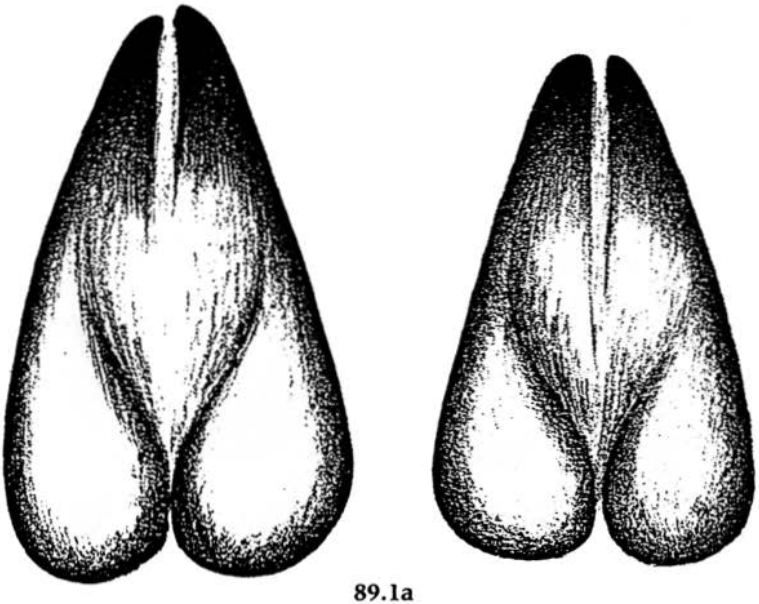
cm
Reduced



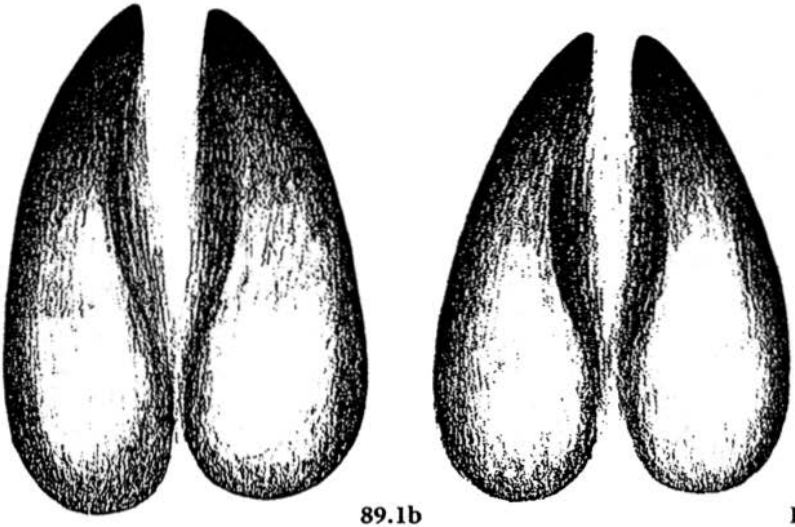


89.3 Roan



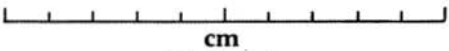


RF 89.1a RH

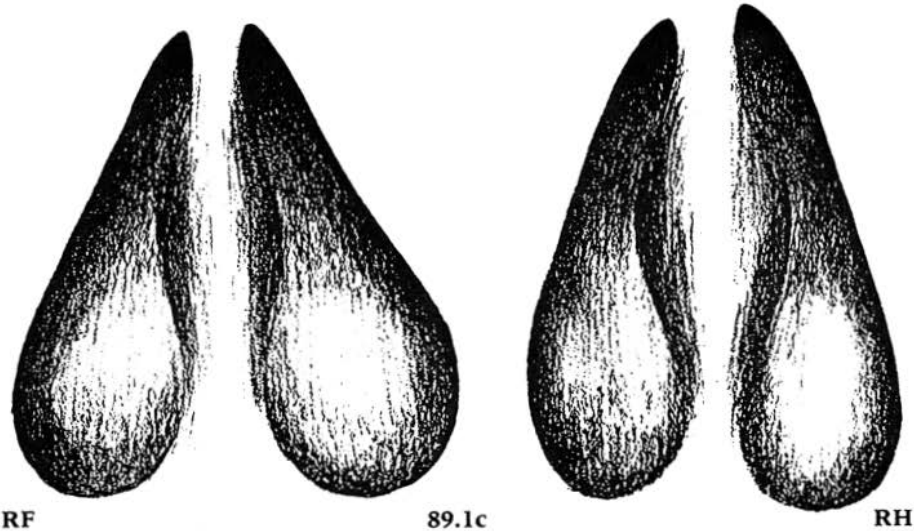


RF 89.1b RH

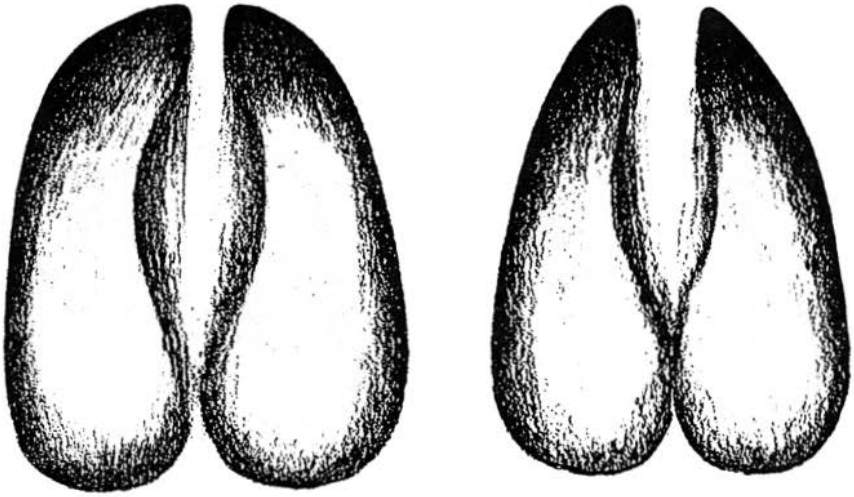
89.1 Gemsbok



cm
Reduced



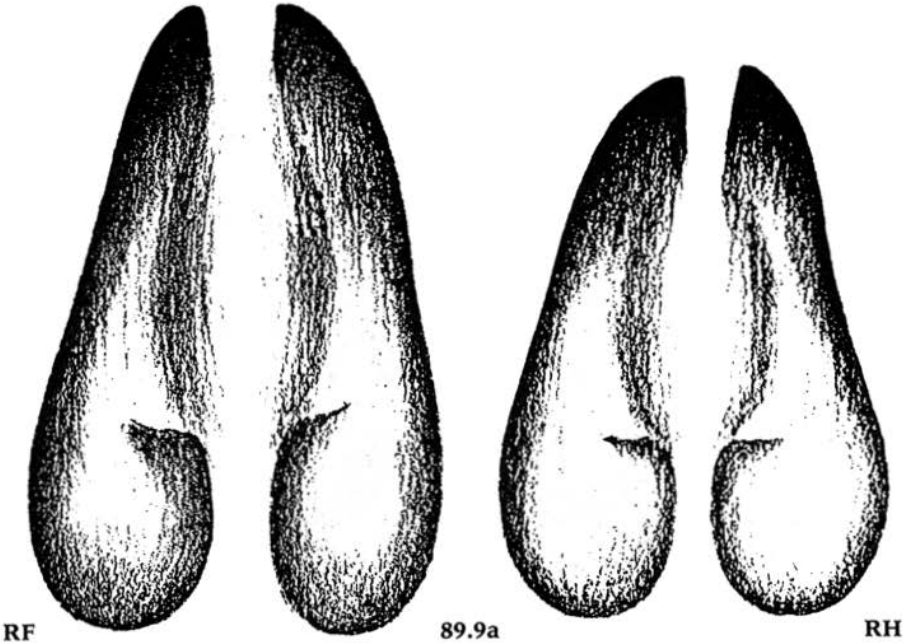
RF 89.1c RH

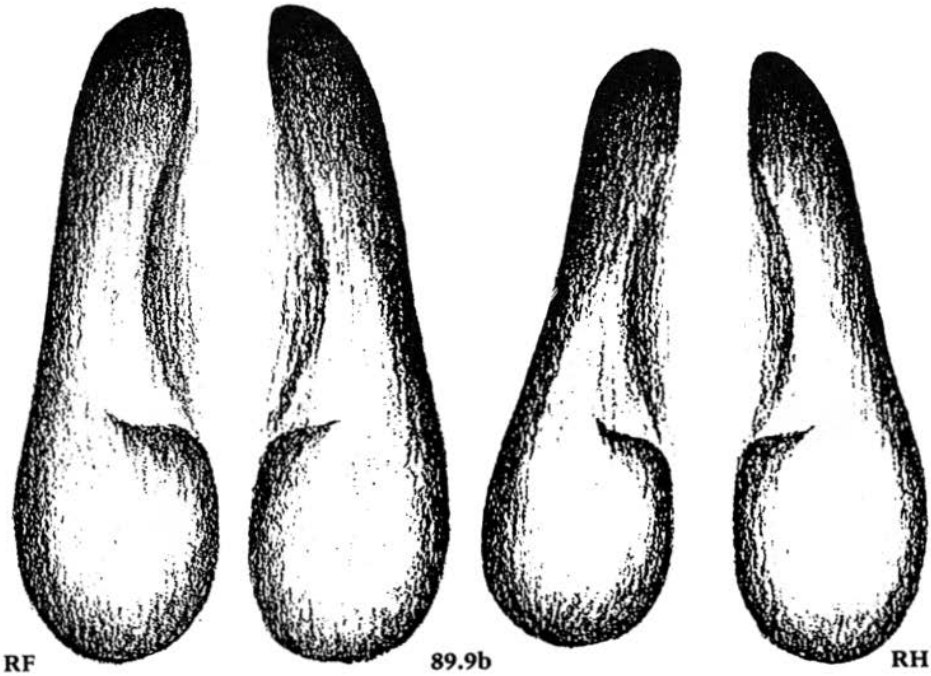


RF 89.1d Ⓢ RH

89.1 Gemsbok

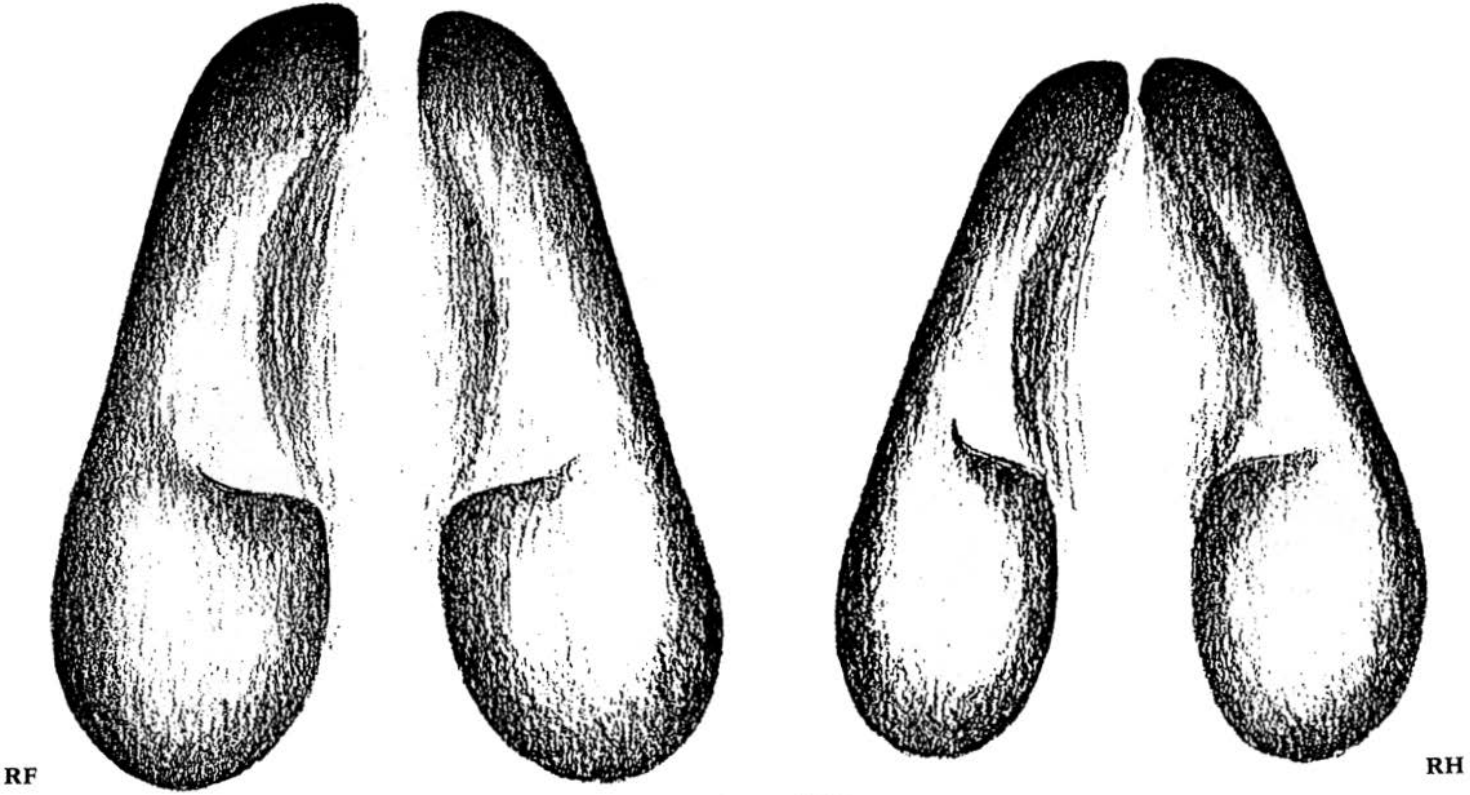
cm
Reduced





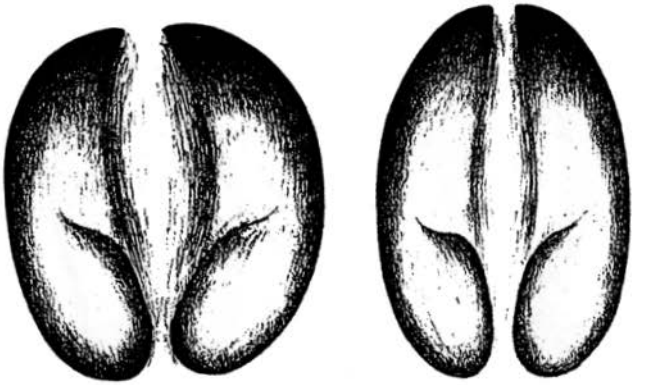
89.9 Black Wildebeest

Actual size cm



89.10 Blue Wildebeest

Actual size cm

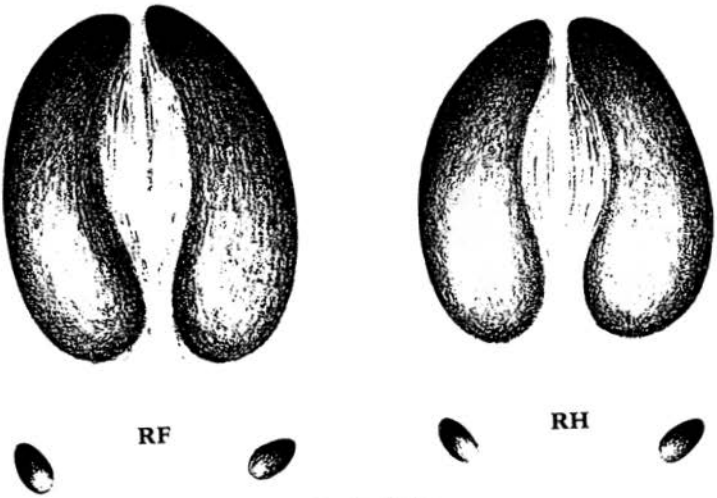


RF 88.1a Eland RH

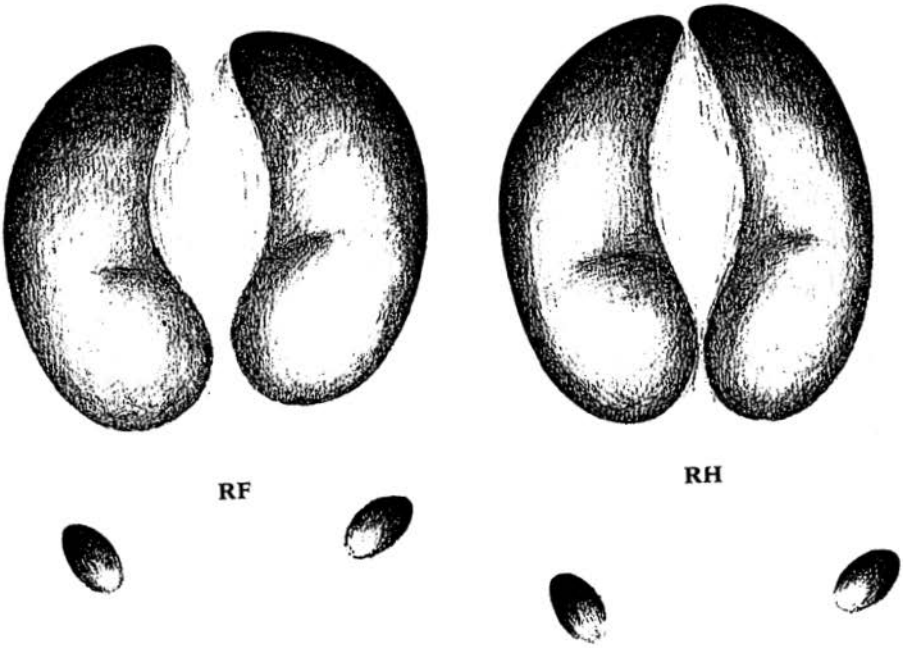
RF 88.1b Eland RH

RF 88.3 Domestic Cattle RH

cm
Reduced

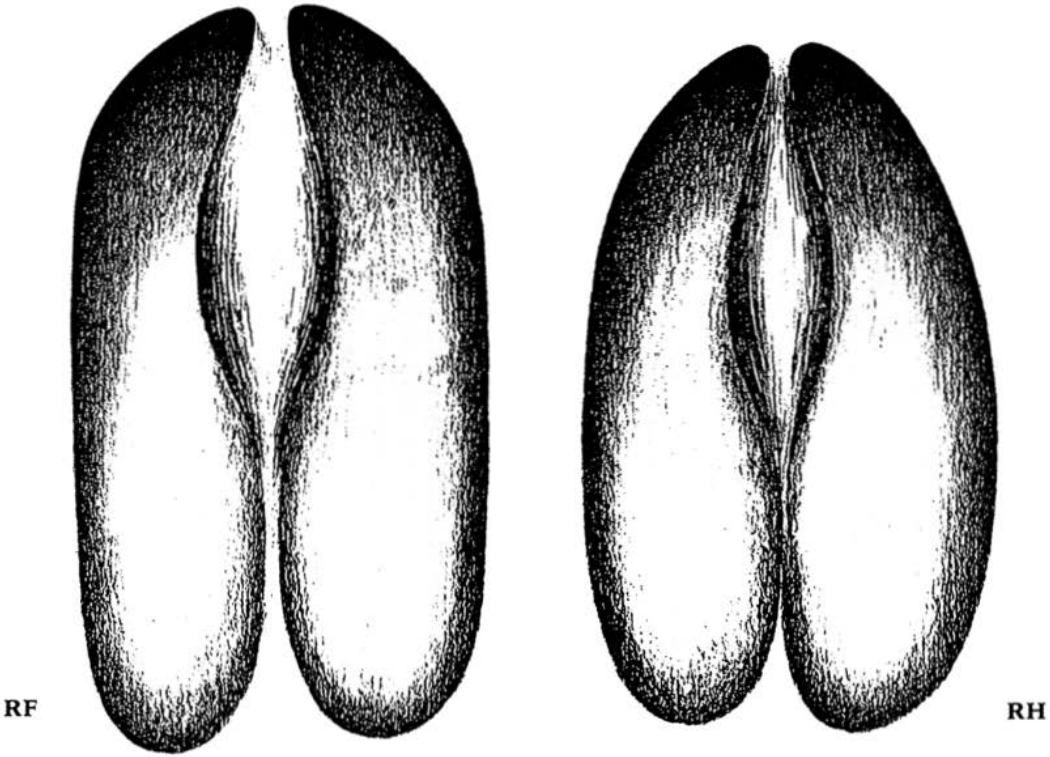


88.2a Buffalo



88.2b Buffalo

cm
Reduced



91 Giraffe

cm
Reduced

Spoor of mammals

Structure of feet

The original or primitive mammals had five clawed toes on each foot, and they were plantigrade, that is, they trod on the whole sole of the foot. This primitive type of foot is found in some of the insectivores and rodents. In animals with five well-developed toes, they are numbered from 1 to 5, beginning with the inner toe (which corresponds to the thumb of the human hand). The third toe is the longest, followed in order by the fourth, second, fifth and first.

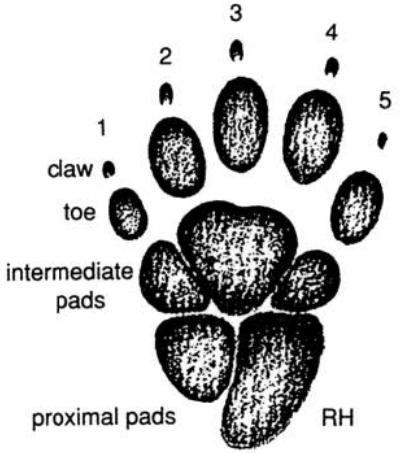
If all five toes show in the footprint, the inner toe is the shortest. In many cases the first toe makes only a weak impression, sometimes none at all, and the footprint will show four toes, with the outer toe the shortest. If all five toes are showing and the shortest toe is on the left side of the footprint, the track was made by the right foot. If only four toes are showing, then the shortest toe will be on the right side of the footprint made by the right foot. The spoor illustrations are those of the right fore- and right hind-feet.

The underside of the feet is protected by pads which are thick, elastic masses of connective tissue covered by a strong, flexible, horny layer. The pads themselves are naked but in most animals the skin between them is covered in hair. A secretion from sweat glands in the pads is transferred to the footprint, giving it a scent.

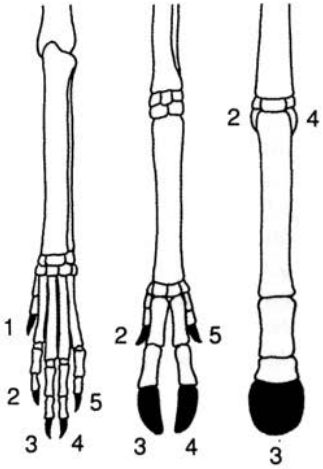
There is a toe pad beneath the tip of each toe, which is also known as a digital pad. Behind the toe pads there is a further row of pads, called the intermediate pads. The intermediate pads of the fore-foot are known as the palmar pads, while the intermediate pads of the hind-foot are known as the plantar pads. In many animals the intermediate pads are fused to form one large pad. In addition, some animals have one or two proximal pads, which lie further back on the foot. The proximal pads of the fore-foot are also known as the metacarpal pads, while the proximal pads of the hind-foot are also known as the metatarsal pads.

The skeletal structure of the fore-foot consists of the carpal bones, metacarpal bones and phalanges, while that of the hind-foot consists of the tarsal bones, metatarsal bones and phalanges. While the first toe has two phalanges, the other toes each have three phalanges. Each toe of the fore-foot articulates with a metacarpal bone, which in turn articulates with a distal carpal bone. The toes of the hind-foot articulate with the metatarsal bones, which in turn articulate with the distal tarsal bones.

Primates, including humans, support their weight on the whole foot. Most mammals support their weight on the distal ends, or heads, of the metacarpal bones and the phalanges of the fore-feet and the distal ends of the metatarsals and phalanges of the hind-feet. Most ungulates, on the other hand, support their weight only on the tips of the distal phalanges of the third and fourth toes.



Porcupine



Plantigrade animals have relatively short limbs and they normally move at a steady pace, because the construction of their feet is not well adapted for jumping or for running any distance. An animal that runs fast and over long distances must have long limbs and the area of foot in contact with the ground must be as small as possible. In order to obtain a firm grip on the ground, the foot must exert the greatest possible pressure to dig into the ground. Since pressure is equal to force per area, for any given force – which depends on the mass of the animal and its acceleration – the contact area must be as small as possible to ensure the greatest possible pressure. Animals whose survival depends on their ability to run very fast, do so on their toes or on the tips of their toes. By the elongation of the limb bones they have evolved long slender legs, and at the same time there has been a reduction in the number of the toes. The toes on which they support their weight have also become very powerfully developed. The most common reduction involves the first toe, which may disappear completely so that the animal becomes four-toed. The second and fifth toes may be reduced, as in antelope, to form dew claws, and the weight is then supported on the third and fourth toes. In the equids the third toe is fully developed and ends in a hoof, and only the vestiges of the second and fourth, the splint bones, are present.

In most mammals the prints of the fore-feet are larger and broader than those of the hind-feet. The toes of the fore-feet are usually also more splayed than those of the hind-feet. This is because the fore-feet need to cover a larger area so as to support the head and fore-quarters of the body, which are usually heavier than the hind-quarters. Some mammals, such as rodents and otters, have larger hind-feet because the hind-quarters are more massive than the head and fore-quarters. The

fore-feet are rounder in shape than the narrower hind-feet, because the fore-legs are almost perpendicular to the ground and the hind-legs are at an angle to the ground. A cylinder that is perpendicular to a plane has a circular cross-section, while a cylinder that meets a plane at an angle has an elliptical cross-section.

Types of feet

Different species can be identified by characteristic variations. The most notable characteristics are usually determined by functional and environmental adaptations of the feet. Similar species may also be differentiated by subtle differences in the sizes and shapes of the feet. Understanding characteristic features of spoor enables a tracker to analyse fractional or partly obliterated spoor which may otherwise be difficult to identify and interpret.

Functional adaptation of feet may occur for the purpose of specific types of locomotion, for use as tools or weapons. Feet adapted for speed have only a small area in contact with the ground. The feet of predators have soft pads for stealth, some have sharp claws to hold down their prey, while others have short, blunt claws for traction. A number of animals have claws that are well developed for use as digging tools, or they are adapted for grooming.

Feet may have specific environmental adaptations for different types of terrestrial, aquatic or arboreal environments. Feet adapted to soft muddy ground have a large contact area for support. In soft, sandy terrain sharp pointed hoofs can dig into the sand to obtain a firm grip, while on firm ground hoofs need to be rounder. On hard, rocky surfaces small rounded hoofs can find footholds and indentations for swift, agile movement. Some animals, like otters, are adapted to semi-aquatic environments and are able to move on dry ground and swim well. Other animals, like seals, are mainly adapted to an aquatic environment. Animals adapted to swimming usually have webbed toes to increase the area of their feet and therefore the resistance, thus enabling them to pull themselves through the water. Animals adapted to arboreal environments often have sharp claws which dig into the bark of trees, such as squirrels, or they have opposable toes which can grasp branches, such as monkeys and birds. Some animals, such as cats, are not only terrestrial, but are also able to climb trees.

Apart from functional and environmental adaptations, feet may also have redundant features. The first toe of many species, for example, is reduced and has become redundant, but may still show in the spoor.

Heavier animals usually have larger feet to support their mass, but the shape of the feet is also determined by the animal's body structure. A strongly built animal usually has broader feet and rounder toes, while an animal with a slender body build has more narrow feet with slender toes. This can be seen when comparing the spoor of the Bat-eared Fox with that of the Cape Fox, or the spoor of the Caracal with that of the Serval. It can also be seen in variations in the shape of the hoofs of ungulates.

The feet of most insectivores and rodents are protected by small round pads while the thin, sharp claws are an adaptation for climbing. So, for example, squirrels are able to climb up a vertical tree trunk by digging their sharp claws into the bark of the tree. Hedgehogs and Porcupines have larger pads to support their more massive bodies. While the claws of the fore-feet of the Porcupine, canerats and Springhare are well adapted for digging, the broad pointed claws of the hind-feet of the Springhare are adapted for throwing the loosened soil clear of its excavation.

Predators all have well-developed pads which are adapted for stealth. Some also have well-developed proximal pads to give them support on soft muddy ground, like the Large Grey Mongoose and the Water Mongoose. The proximal pads and first toes of the White-tailed Mongoose have become redundant and do not show in the spoor, except for the first claw of the fore-foot that marks clearly. The relatively specialised mongooses only show four toes, with no proximal pad, in the spoor. While some, like the Yellow Mongoose, have five toes on the fore-foot and four on the hind, others, like the Suricate, have only four toes on the fore- and hind-feet. The area of the feet in contact with the ground becomes smaller as they are adapted to drier or more arid conditions.

Otters have not only well-developed proximal pads to give them support on soft muddy ground, but also have webs between the toes for swimming.

While some mongooses, like the Slender Mongoose, have thin sharp claws for climbing trees, many mongooses, as well as the Suricate, Striped Polecat, Honey Badger and Bat-eared Fox, have long, strong claws on the fore-feet adapted for digging.

Some predators, like Wild Dogs and Cheetahs, which hunt in open terrain and rely on their speed to capture their prey, have short, blunt claws which act like spikes to prevent slipping. The Cheetah and Caracal also have ridges under the intermediate pads to give them additional traction.

Most of the cats rely on stealth to stalk their prey in terrain that provides adequate cover. Even though the claws may be protracted to prevent slipping while charging, they cannot maintain high speeds, so they embrace their prey and hold it with their sharp claws, to stop it from getting away, until the killing bite can be delivered. When not in use, their claws are retracted into sheaths to protect them from being worn down. The claws are protractile rather than retractable since in their normal position, with the muscles at rest, they are retracted within the sheaths and are extended by the ligaments when required.

The padded feet of the Rock Dassie allow it to negotiate steep and often smooth rocky surfaces. The soles of the feet are naked, the skin thick and padded with glandular tissue which keeps the surface permanently moist. The toes are short, ending in hoof-like nails. The inner toe of the hind-foot has a curved grooming claw.

Hares lack pads, which are replaced by a tight, springy layer of strong, stiff hairs. While the claws prevent slipping, the hairs muffle the sound of the feet as they run. The dense growth of hair in the sole of the foot tends to obliterate the characteristics of the footprint.

The hands and feet of primates are adapted to grasping branches and are ideally suited for an arboreal way of life. They also enable primates to hold their food while sitting in trees and have made the use of tools possible. Bushbabies have grooming claws on the second toes of their hind-feet.

Antbears and Pangolins have well-developed, strong claws for breaking open and digging into termite nests.

The feet of Elephants, rhinoceroses and Hippopotamuses are mainly adapted to support their massive bodies. Rhinoceroses and Hippopotamuses have large broad toes to increase the area of their feet in contact with the ground. Elephants have springy feet which consist of a mass of soft muscles and ligaments, enabling them to move very silently.

Equids have but one toe, the third, on each leg, and only tread on the outermost toe joint, which has a well-developed hoof. A hoof is a modified claw, and the wall of the hoof usually extends a short distance beyond the sole. In soft sand the toe pad, or 'frog', shows clearly in the spoor. In tracks on very hard substrates, only the edge of the hoof will appear in the footprint, as is also the case with animals with cloven hoofs. Hoofs are an adaptation for speed, which is essential for the survival of ungulates.

Ungulates with cloven hoofs have four toes, the first toe being absent, but they only tread on the tips of the third and fourth, which are well developed. The second and fifth toes, the dew claws, are much smaller and occur at the rear of the foot. They are usually positioned so high up on the leg that they do not touch the ground, except when the animal treads in soft mud.

The hoof consists of the wall which encloses the sole and the toe pad behind the sole. In very distinct tracks the toe pad may appear as a round depression. In some cases it extends to the tip of the hoof. The impressions of the two halves of the hoof are often almost mirror images of each other, but when they are not the same size the inner hoof is usually the shorter. The track made by the fore-foot is larger and more splayed than that of the hind-foot, and when moving fast the front hoofs splay even more.

Apart from random variations, the shape of hoofs are adapted to different conditions.

The more massive ungulates, such as Buffalo and Eland, have broad round hoofs, while the lighter antelopes have slender, narrow hoofs.

Very sharp, pointed hoofs are an adaptation for speed, especially on soft, sandy substrate, and act like spikes to prevent slipping. Steenbok, Oribi and Springbok, which prefer open terrain, have to rely on speed to escape being captured, and have sharp, pointed hoofs. Larger antelope, like Gemsbok, which prefer open country, have hoofs that are broad to support their massive bodies, and also pointed for speed, especially in soft sand.

At the other extreme, the Klipspringer has small rounded hoofs which are adapted for agility in rocky terrain. Its hoofs not only ensure a firm foothold on rocky surfaces, but also enable the Klipspringer to change direction abruptly as it leaps swiftly from rock to rock.

There are many varieties of hoof, from sharply pointed to rounded. While specialisation, such as adaptation for speed in open terrain or agility in rocky terrain, has advantages, it also has disadvantages, for as more efficient performance is gained for a given function, efficiency in the performance of alternative or complementary functions is lost. In contrast, a generalised form preserves a more or less versatile balance in performing various functions, although it does so less efficiently in each case than forms specialised for each alternative.

So, for example, the heart-shaped hoof, such as found in the duikers, Bushbuck and Kudu, is not very specialised, but is more versatile. These antelope rely more on cover to escape detection, and when detected rely on a combination of speed and agility to find their way amongst bushes and other obstacles. For the smaller duikers very sharply pointed hoofs may be a disadvantage as they tend to fork up leaves in their forest habitat. Moreover, hoofs that are too rounded may slip on the leaves.

Another specialised adaptation is the long, slender, widely splayed hoofs of the Sitatunga, which are adapted to soft muddy substrate. Owing to surface tension,

toes that are splayed out distribute the weight over a larger area. The toes of Reedbuck may be close together on firm substrate, but splay out in soft mud.

While species can be identified by characteristic features, there also exist individual variations within a species. These variations make it possible for an experienced tracker to determine the sex and provide an approximate estimation of the animal's age, size and mass. A tracker may also be able to identify a specific individual animal from its spoor.

The sexes can be distinguished by the fact that the males are usually larger than the females, or in the case of the Spotted Hyaena and some of the smaller antelopes the females are larger than the males. This is evident not only in the larger sizes of the spoor, but (on account of the more massive body structure) in the fact that the fore-feet are usually proportionally broader. While the spoor of adult males is usually larger than that of adult females, young males have the same size spoor as adult females, but the fore-feet may be broader because of their more massive body structure.

The sexes may also be distinguished by association. The spoor of an adult in close association with a young animal is probably that of a female with her young. Nursery herds may be identified by the presence of several young, or else the absence of young may indicate a bachelor herd. When a species is gregarious, a solitary individual would probably be an adult male.

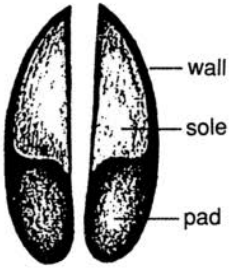
The sex of an animal may also be determined by the relative position of the urine to the back feet or faeces.

Furthermore, the size of the feet may indicate the age of an animal. The hoofs of young antelope will also have sharp edges, while old individuals may have blunted hoofs with chipped edges. With animals that have padded feet, younger individuals may have more rounded pads.

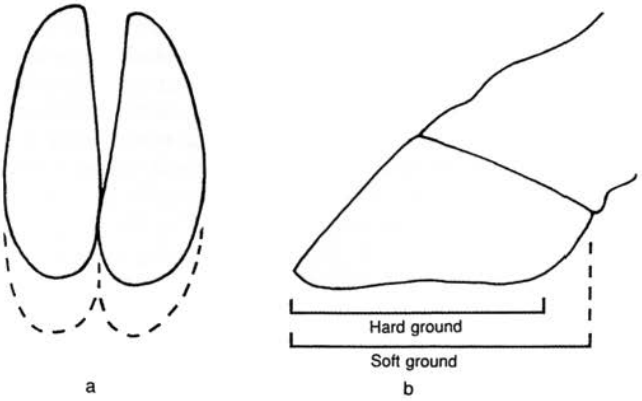
The size of an animal is proportionate to the size of the spoor, while its mass is indicated by the depth of the imprint. It should be noted that the depth of the imprint also depends on the firmness of the ground. Two animals may be the same size, in which case their spoor will be the same size, but the one may be more massive and therefore make deeper imprints. A small animal may have the same mass as a larger animal, but have smaller spoor, which will consequently leave deeper imprints. A larger animal must be proportionally more massive than a smaller animal if it is to leave the same depth of imprint. The depth of the imprint is determined by the pressure exerted. This pressure is equal to the weight of the animal divided by the area in contact with the ground at any one time. The weight, or gravitational force, is equal to the mass of the animal multiplied by the acceleration due to gravity at the earth's surface. An animal with a more massive body structure usually has broader footprints than a more slender animal. The size of an animal will be determined by its age and sex, as well as the normal variability in sizes in a population.

Apart from features characteristic of the species, there also exist random variations within the species which may differ from individual to individual. The exact shape of every individual is unique so that it is in principle possible to identify an individual animal. In practice this requires considerable experience, and is usually only possible with large animals. With smaller animals, like Steenbok or duikers, one can only identify individuals with abnormal features, such as elongated, skew or broken claws. With Elephant it is easy to identify an individual by the random pattern of cracks underneath the feet.

The shape of feet may also be altered by environmental factors. In hard terrain, hoofs of ungulates may be blunted by excessive wear, or in soft, sandy terrain they may grow elongated hoofs because of a lack of natural wear. Similarly, animals such as jackals may grow elongated claws in soft terrain, or their claws may be worn down in hard terrain. Accidental alteration may also occur. A claw may be broken or lost. Hoofs may be chipped or broken.



Cloven hoof



(a) The right fore footprint of a Kudu on hard ground (solid line) and soft ground (dashed line).

(b) Side view of a Kudu hoof, showing those parts of the hoof that make contact on hard ground and on soft ground.

Family SORICIDAE
Shrews
44

Shrews have long, narrow, pointed muzzles and very small eyes. Mainly solitary. Generally terrestrial, but most species can climb well. Active throughout the 24-hour period, in bursts, and require food and water on regular basis. Mainly insectivorous. Food includes locusts, grasshoppers, termites and beetles, but some also eat earthworms, rodent carcasses and seeds. **Spoor:** Shrews have five toes on the fore- and hind-feet, each with a small curved claw. They are capable of burrowing and excavating short escape tunnels from their nests.

Family MACROSCELIDIDAE
Elephant shrews
45

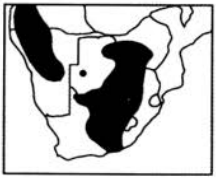
Elephant shews have a characteristic mobile, trunk-like, elongated snout, broad, upstanding, mobile ears, and relatively large eyes, with keen eye-sight. Predominantly diurnal. Occur mainly solitary or in pairs. Insectivorous for the most part. When suddenly alarmed, will jump straight up into the air before running for shelter. **Spoor:** Their hind-limbs are much longer than the fore-limbs, with long, slender hind-feet. In the genera *Elephantulus* and *Macroscelides* there are five digits on the hind-feet armed with claws, the first located well back of the other four. In *Petrodromus* there are only four toes on the fore- and hind-feet. In all the smaller species the normal method of locomotion is by running on all four feet, although they are capable of enormous leaps. The four-toed elephant shew, *Petrodromus tetradactylus*, proceeds in a series of jumps when moving quickly, as indicated by its spoor in its paths on the forest floor. When searching for food it walks around on all fours. Shrews are very fast movers, especially when out in the open, running from one bush to another. They shelter in holes in the ground, under rocks or roots of trees. Spoor not recorded.

Family CHRYSOCHLORIDAE
Golden moles
46

Golden moles have cylindrical bodies with no external tail. Head is pointed, with a horny pad enclosing the nostrils. The ears are simple small openings. All moles are blind. They are not all golden in colour; the Cape Golden Mole, *Chrysochloris asiatica*, and Arends' Golden Mole, *Chlorotalpa arendsi*, are dark brown. Insectivorous, but also eat earthworms. Extremely sensitive to surface disturbances, they will take insects and earthworms moving on the surface of the ground. Usually drag food underground where it is eaten. **Spoor:** Their fore-limbs are short and muscular, each having four toes. The claws on the third toes are well developed, those on the first and second toes being smaller, and the fourth toes in most species are reduced to stumps. The claws are sharply pointed and hollowed out underneath. The outside edges of the second and third claws are knife-like, adapted to cutting through the soil. The hind-limbs are less well developed than the fore-limbs and have five toes, joined by a membrane, each with a small claw. The membrane between the toes is used for pushing back the soil in burrowing. They usually burrow just beneath the surface of the soil, leaving a raised ridge marking their course, but also make tunnels deeper down, throwing up mounds of fresh earth at intervals. Compacted soil tends to crack as it is pushed up by their movement under it. Surface runs do not appear to be used as permanent paths of movement, and new ones are continually being made. They prefer to live in light soils or loose sand, as they are not capable of burrowing in the heavier clay soils or other types that are hard and compacted.

Family ERINACEIDAE Hedgehog
Subfamily ERINACEINAE
Genus *Erinaceus*

Erinaceus frontalis
South African Hedgehog
Suid-Afrikaanse Krimpvarkie
47



TL 20 cm. Mass 400 g. **Spoor:** Has five toes on the front feet, the first showing behind the intermediate pad and next to the proximal pad in the spoor. Has five toes on the hind-feet, but only four show in the spoor (Fig. 47a). Usually moves around slowly, the hind-feet leaving characteristic drag marks in the sand (Fig. 47b). Can move fast by rising high on its legs. Locates food by scratching and digging for it. **Habitat:** Wide variety of habitats, including scrub bush and grassland. Mean annual rainfail from 300 mm to 800 mm. Does not occur in desert. Absent from forest where rainfall is over 1 000 mm. Wet ground is avoided. Requires dry cover for resting and in which to have young. Must have abundant supply of insects and other food. **Habits:** Predominantly nocturnal. May be active by day after light showers to take advantage of emerging insects and surfacing earthworms. Rests by day curled up in debris in the shade of bushes, grass or holes. Except for semi-permanent sites of females with young, resting places are changed daily. Periods of hibernation may last up to six weeks at a time. Rarely seen during colder, drier months from May to July. When food is abundant, during warm wet summer months from about October to April, a thick layer of fat is formed under the skin. During the colder months it relies on its fat reserves for energy requirements. Will stay in its resting places while it remains cold, but will move around with the advent of a warm spell. Has an acute sense of smell, but sight is poor. Its alarm call is a high-pitched scream. Defends itself by rolling up into a ball, protecting the head, legs and soft under parts of the belly with the sharp, outstanding spines. **Food:** Beetles, termites, centipedes, millipedes, grasshoppers, moths, earthworms, small mice, lizards, frogs, slugs, eggs and chicks of terrestrial birds, and some vegetable matter. Food located mainly by scent. Although it will drink, it is not dependent on water.

Order RODENTIA Rodents

Family BATHYERGIDAE
Molerats
48

Molerats are adapted for a subterranean existence. They are vegetarians, burrowing tunnels under the surface of the soil to feed on roots, tubers and bulbs. They have cylindrical bodies, short legs and tails. They break up the soil with their large, ever-growing incisor teeth. Their eyes are small, and the ears open as holes in the surface of the skin. **Spoor:** They burrow underground, pushing up mounds at intervals. Fresh mounds can be recognised by the damp soil which retains the shape of the burrow, only breaking down into a loose pile as it dries. Spoor not recorded.

Family GLIRIDAE
Dormice
49

With their characteristic bushy tails, soft fur and large eyes, dormice look like miniature squirrels, but have a mouse-like anatomy. They are, however, much smaller than squirrels. The name dormouse is derived from the Latin *dormitorium*, a sleeping place, from their habit, in colder regions of the world, of hibernating. They are nocturnal, mainly terrestrial and to some extent arboreal, generally solitary. Their diet consists of insects, vegetable foods and seeds. **Spoor:** The fore-feet have four toes, lacking a thumb. The hind-feet have five toes, the first toe very

short and barely reaching the base of the second. The claws are curved and sharp and flattened from side to side. Spoor not recorded.

Families CRICETIDAE & MURIDAE
Rats & mice
50.1

Rats and mice vary considerably in habits and habitat. Mainly terrestrial, though some burrow. Some are arboreal, like the Tree Mouse (*Thallomys paedulcus*), and others are semi-aquatic like the Water Rat (*Dasymys incomtus*). Generally nocturnal, although some, like the Striped Mouse (*Rhabdomys pumilio*), are diurnal. Others are both nocturnal and diurnal. Both solitary and gregarious forms are known. Nests may be in underground burrows, piles of vegetation, rock crevices, or holes in tree-trunks. Some, like the House Mouse (*Mus musculus*) and the House Rat (*Rattus rattus*), occupy man-made shelters. Others, like the Multimammate Mouse (*Mastomys natalensis*), inhabit cultivated lands. Food consists of a diversity of plant material, invertebrates, small snakes and lizards, eggs and nestlings of birds. **Spoor:** An example of the jumping spoor of a murid is shown in Fig. 50.1. Four toes show in the fore footprints and five toes show in the hind footprints.

Cricetomys gambianus
Giant Rat
Reuserot
50.2

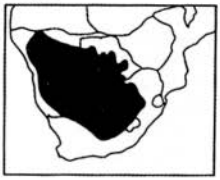
The largest murid species in Africa, with a head and body length of about 34 cm and tail about 42 cm. Towards the tip the tail is white for about 40 per cent of its length. The upper parts vary in colour from pale grey to buffy-grey and usually darker down the mid-back. The under parts are white or off-white. **Spoor:** On the fore-feet the first toe is rudimentary with a small nail, the remaining toes having short claws. Has five toes on the hind-feet, each with a claw. Spoor illustration, Fig. 50.2, based on specimen study and with reference to Smithers (pers. comm.). **Habitat:** Evergreen forest and woodland in higher rainfall areas with mean annual rainfall over 800 mm, where there is adequate undercover. Also urban and peri-urban areas of towns. **Habits:** Predominantly nocturnal, sometimes active in late afternoon or early morning. Terrestrial. Although atypical, it can climb trees. Can swim. Usually slow-moving and docile, but females with a litter can be aggressive and will bite fiercely. If provoked, will turn on an aggressor. **Food:** Omnivorous, mainly vegetable matter with smaller amount of insects, such as termites.

Family SCIURIDAE Squirrels

Being diurnal, squirrels are among the easier mammals to observe. They can be recognised by their long, bushy tails, although the smaller species can be confused with dormice. The smallest squirrel, the Striped Tree Squirrel (*Funisciurus congicus*), is about the same size as our largest dormouse, *Graphiurus ocularis*, but has longitudinal stripes on its flanks which distinguish it from the dormouse, and their distribution does not cover the same area.

Xerus inauris
Ground Squirrel
Waaierstert-grondeekhoring
(Grondeekhoring)

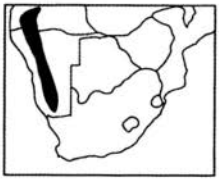
51.1



Upper parts cinnamon in colour, but individuals vary in shade. Belly usually tinged buffy. White lateral stripes on either side of body and white incisor teeth. HB 24 cm. T 21 cm. Mass 600 g. **Spoor:** Has four toes on the fore-feet, the first toe being rudimentary and without a claw, and five toes on the hind-feet (Fig. 51.1). The toes have long, sharp, slightly curved claws about 10 mm long. The claws are less curved than those of the arboreal squirrels and better adapted to digging. Walks over short distances and runs over longer distances. When alarmed it runs very fast to its own burrow, seldom using other burrows, even when these are in its flight path. Its warren system consists of a complicated system of burrows. Soil removed from funnels is piled up in front of the holes, forming characteristic crescent-shaped mounds. Eventually the warren system rises above the general ground level, forming a distinct mound. **Habitat:** Occurs throughout the more arid parts of the Subregion, with mean annual rainfall of 100–500 mm, up to 750 mm. Preference for open terrain with sparse bush cover. Utilises hard, consolidated substrate, avoiding loose sandy areas where burrow construction is difficult. Also occurs on fringes of dry watercourses, or floodplain, open grassland, overgrazed ground or karroid areas. **Habits:** Diurnal and terrestrial with no arboreal tendencies. Gregarious, colonies of up to about 30 living in warrens with many entrances. Emerges in the morning from burrow only when sun is well up and retires well before sunset. Less active in cold overcast weather and remains in burrow during rain. Will bask in sun, or lie in shade in very hot weather. Always acutely alert for danger from ground or air. To gain a wider view it will sit up on its haunches. Will react to the alarm call of certain birds. When alarmed may wave the tail up and down while giving a high-pitched whistling alarm call. Often shares the warren system with Suricates (*Suricata suricatta*) and Yellow Mongoose (*Cynictis penicillata*). **Food:** Mainly vegetarian, including leaves and stems of grasses, seeds, bulbs, roots and plant stems, as well as some insect food.

Xerus princeps
Mountain Ground Squirrel
Berg-waaierstert-grondeekhoring
(Bergeekhoring)

51.2



Very similar to Ground Squirrel, *X. inauris*, but slightly lighter in overall colour, and with yellowish incisor teeth. **Spoor:** See 51.1. **Habitat:** A rock-dwelling ground squirrel, with warrens frequently on rocky hillsides or among rocky outcrops. The Ground Squirrel, *X. inauris*, which prefers open flat country, normally avoids these rocky areas. **Habits:** Strictly diurnal and lives in warrens. Habits similar to those of the Ground Squirrel. **Food:** Probably same as Ground Squirrel.

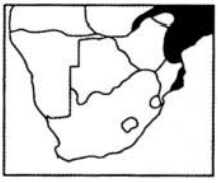
Paraxerus cepapi
Tree Squirrel (Bush Squirrel; Yellow-footed Squirrel)
Boomeekhoring

51.3

Great variety of colour and size. Has an overall pale grey colour in the western parts of their range, while in the eastern parts is darker, more buffy, sometimes rusty in colour. Under parts vary from white to yellowish or buffy. HB 18 cm. T 17 cm. Mass 200 g for males, females slightly lighter. **Spoor:** Has four toes on the fore-feet and five on the hind-feet, each with short, sharp, curved claws adapted to its arboreal life (Fig. 51.3). A characteristic feature of squirrel trails is that they nearly always start and end at a tree. Claw marks can also be seen in the bark of the tree. **Habitat:** Wide variety of types of savanna woodland. Avoids forest as well as arid and open grassland that do not provide tree and bush growth necessary for shelter and food. **Habits:** Generally solitary, but also occurs in pairs or female with two or three young. In the Transvaal, lives in groups consisting of one or two adults with subadults. Arboreal and terrestrial; much time is spent foraging on the ground. Diurnal, it is most active in the morning and late afternoon, less so during hottest hours. Active all day in cool weather, but not during rain. Will bask in the sun when emerging from the nest. Nests are natural holes in trees, or those made by barbets or woodpeckers, lined with leaves or grass. Has acute sense of hearing and good eyesight. Its alarm call is a high-pitched whistle. If disturbed it runs up the nearest tree and leaps from one tree to another until it reaches its hole or hides among foliage or lies spreadeagled and motionless along a branch. Habitually keeps the trunk or branch of the tree between itself and the intruder. The whole group may join in vocalising with loud clicking calls at predators from safe vantage points. **Food:** Predominantly vegetarian, including flowers, leaves, seeds, berries, fruits and bark; also insects, including termites, ants and aphids. Often sits and feeds on elevated sites to keep watch for danger. These sites are marked by accumulations of discarded inedible remains of food. Buries seeds and nuts in scattered burying sites, with no large accumulations.

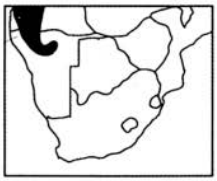
Heliosciurus mutabilis
Sun Squirrel
Soneekhoring

51.4



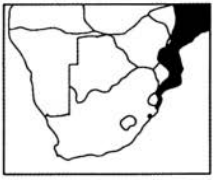
The largest of the arboreal squirrels found in the Subregion. HB 23 cm. T 27 cm. Mass 400 g. Upper parts are grizzled light brown in colour, but colour varies. The tail has narrow light and broad dark bands. **Spoor:** See 51.3. **Habitat:** Lowland or montane evergreen forest, but also riverine forest and thickets within woodland. Predominantly higher-rainfall areas with mean annual rainfall of 1 000 mm upwards, as well as riverine associations of about 600 mm. Occurs from sea level up to 3 000 m. **Habits:** Solitary or in pairs. Most active in late morning and afternoon up to about 17h00 during colder times of year, remaining active later during warmer weather. Rests in holes in trees or secluded, sheltered places such as dense clumps of creepers high in forest trees. Holes are lined with leaves. When disturbed it makes for highest parts of trees, hiding in foliage or lying flat on branches. If disturbed it clucks loudly while flicking its tail. **Food:** Mainly vegetarian, including flowers, leaves, buds, wild fruits, berries and nuts; also some insects, including grasshoppers and termites. Food eaten where found. No signs of hoarding.

Funisciurus congicus
Striped Tree Squirrel
Gestreepte Boomeekhoring
51.5



The smallest squirrel in the Subregion. HB 15 cm. T 17 cm. Mass 110 g. Has distinct lateral white stripes along the mid-body, with a dark band below these stripes. The upper parts above the white stripes are dark buffy-yellow, the under parts whitish. **Spoor:** See 51.3. **Habitat:** Like the Tree Squirrel (*P. cepapi*), it is associated with woodland, but more closely confined to the denser types, where there are larger trees with more luxuriant canopies, as along watercourses and rocky outcrops. Also in palm scrub, palm groves and forests, up to altitudes over 2 000 m. Does not occur in thinner woodland or more open areas in which the Tree Squirrel occurs. **Habits:** Arboreal, but spends almost as much time foraging on the ground. Lives in small family parties of up to 4. Diurnal, being most active in early morning, retiring well before sunset. Rests in holes in trees that are lined with leaves and grass or in dreys constructed of twigs, leaves and grass in the forks of branches. If one excludes the introduced Grey Squirrel (*Sciurus carolinensis*), the construction of dreys is a unique feature not found in any of the other indigenous squirrels. It flees to the nearest tree when disturbed where, sitting motionless, it blends into the background. The alarm call is a bird-like chirping, while flicking the tail, or a high-pitched whistle-like chattering, causing others to 'freeze' instantly. Will vocalise loudly at potential predators, like snakes, from safe vantage points. Can move around among the smallest twigs, and jumps considerable distances between branches, moving freely between trees. **Food:** Predominantly vegetarian, it also eats insects. Scatter-hoards hard food, burying it in suitable places.

Paraxerus palliatus
Red Squirrel
Rooi Eekhoring
51.6



Upper parts and tail are reddish or auburn, although colour varies. HB 20 cm. T 20 cm. Mass 300 g. **Spoor:** See 51.3. **Habitat:** Dry or moist evergreen forests, woodlands or riverine or other thickets, where these have a shady understorey of leafy vegetation. Its habitat contrasts with that of the Tree Squirrel (*Paraxerus cepapi*), which prefers more open savanna habitat. Where their distributional ranges overlap, the two are clearly separated by their habitat requirements. **Habits:** Predominantly arboreal, but forages on the forest floor. Diurnal. In summer, active from about 06h00 until late afternoon or early evening up to 18h00. In winter, active from about 08h00 to about 16h00. Generally solitary, or female with young, or male with female while she is in oestrus. If disturbed it makes for nearest thick cover or nest. **Food:** Mainly nuts, berries and wild fruits; also roots, leaves, flower buds, bark and lichens, as well as insects. Being a wasteful feeder, it often discards half-consumed food so that small accumulations of discarded debris mark feeding sites. Either feeds where food is found or carries food to vantage points on branches, a fallen log or a rock. Surplus food is scatter-hoarded in excavations at the base of a tree, under fallen logs, in holes in trees or wedged between branches. Drinks water when available, but may obtain moisture requirements from fruits.

Sciurus carolinensis
Grey Squirrel
Gryseekhoring
51.7

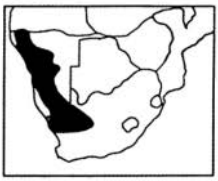
Introduced by Cecil John Rhodes in the last years of the nineteenth century and released on Groote Schuur Estate, Cape Town, from where they spread to other parts of the southwestern Cape. Also introduced to Swellendam and Ceres. Summer coat is smoother and yellowish-brown in colour, and tail hair sparser than in winter coat. Pelage of winter coat is dense and silvery-grey, tail dark grey with white fringe, and under parts

pure white. HB 28 cm. T 22 cm. Mass 580 g. **Spoor:** Fig. 51.7; see also 51.3. **Habitat:** Sufficient numbers of its staple food-tree, the oak, *Quercus robur*, and three species of pines, *Pinus pinea*, *P. pinaster* and *P. canariensis*, are essential. Requires adequate cover. Does not occur in evergreen indigenous forest or in open fynbos. **Habits:** Solitary or female with young. Arboreal. Diurnal, most active in early morning and late afternoon, less so during hotter hours. Active throughout day on cloudy days with light rain, except in heavy rains with cold wind. Constructs dreys of twigs, leaves and soft debris, lined with leaves or soft material, or rests up in holes in trees lined with leaves and soft debris. New dreys are constructed when old ones disintegrate. When alarmed, flattens itself along branches, remaining motionless, and keeps on far side of tree trunks out of sight of intruders. **Food:** Acorns, pine seeds, fruit, bark, leaves, grass, buds, twigs, stems, flowers, grass seeds, fungi, pollen, insects, birds' eggs and fledglings.

Family PETROMURIDAE

Petromus typicus
Dassie Rat
Dassierot

52



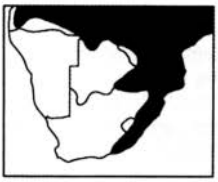
Squirrel-like in appearance, but tail is not bushy. Colour of upper parts from pale grizzled grey to dark chocolate. Under parts paler. HB 17 cm. T 14 cm. Mass 220 g. **Spoor:** Has four toes on the fore-feet, the first toe being rudimentary, and five toes on the hind-feet, each with short, curved claws. The under surface of its feet is naked and has well-developed pads, an adaptation to moving on a rocky substrate. Spoor not recorded, but probably similar to that of a squirrel. **Habitat:** Closely confined to rocky outcrops, rocky hills and koppies, living in crevices or amongst boulders. **Habits:** Crevices occupied by pairs or family parties. Diurnal, most active early morning or late afternoon. Suns itself when not foraging. Tends to urinate in latrines, staining rocks with yellowish urine. Nests lined with dry leaves and twigs. Will climb trees. **Food:** Vegetarian, including leaves, stems and flowering heads of grasses, and leaves and fruits of dicotyledonous plants.

Family THRYONOMYIDAE Canerats

In the Subregion the family is represented by 2 species. The Greater Canerat, *Thryonomys swinderianus*, is more closely associated with a damp habitat, while the Lesser Canerat, *Thryonomys gregorianus*, is capable of utilising a drier type of habitat.

Thryonomys swinderianus
Greater Canerat
Groot Rietrot

53.1

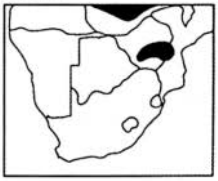


A short-bodied, bulky animal. HB 50 cm. T 20 cm. Mass ♂ 4,5 kg, ♀ 3,6 kg. Males over 7 kg have been recorded from the Subregion. Body colour speckled dark brown, under parts greyish-white or whitish. **Spoor:** The first toe of the fore-foot is reduced to a stump and the fifth toe is very small with a short claw. The other three toes of the fore-foot have very broad, slightly curved claws measuring up to 20 mm. The first toe of the hind-foot is absent and the fifth toe very small with a short claw. The other three toes on the hind-foot have very broad, slightly curved claws measuring up to 30 mm. The spoor illustration (Fig. 53.1) is based on a specimen study. The Greater Canerat forms distinct runs in reedbeds and grass. **Habitat:** Mainly reedbeds or areas of dense, tall grass with thick reed or cane-like stems. Vicinity of rivers, lakes and swamps, never far from water. Absent from desert and semi-arid areas. **Habits:** Generally solitary, but small groups of up to 10 live in restricted areas of reedbed. Predominantly nocturnal, with some crepuscular activity. Dis-

tinct runs formed in reedbeds and grass, marked by small piles of cut stems of grasses and reeds discarded in feeding, as well as small scattered piles of faeces. Resting places in densest part of reedbed. If disturbed, will run along runs for short distance and then stop, repeating if followed. Can run very fast and is an excellent swimmer. Eyesight poor, but hearing acute. Will thump ground with hind-feet and whistle loudly when suddenly disturbed. A group feeding grunts softly. **Food:** Vegetarian, living on roots, shoots and stems of grasses and reeds growing in damp habitat.

Thryonomys gregorianus
Lesser Canerat
Klein Rietrot

53.2



Externally very similar to the Greater Canerat, but smaller and lighter. HB 38 cm, T 14 cm. Mass 1,9 kg. **Spoor:** See 53.1. **Habitat:** Damp areas with reedbeds and semi-aquatic grasses. Also able to utilise dry terrain such as among koppies where there are stands of tall grasses. **Habits:** Predominantly nocturnal, with some diurnal activity. Mainly solitary. Shelters at base of clumps of grass, rock crevices, under rocks or in disused holes of Antbear or Springhare. Distinct runs are formed between resting places and feeding areas.

Family PEDETIDAE

Pedetes capensis
Springhare
Springhaas

54

With short front legs, long powerful hind-legs and long tail, it resembles a small kangaroo. The generally cinnamon-buff coloured coat varies in colour from one area to another. Tail has broad black tip, and under parts are whitish. The nostrils and ear holes can be closed to prevent sand and dust entering while burrowing. HB 39 cm. T 40 cm. Mass 3,1 kg. **Spoor:** Has five toes on the fore-feet, with narrow, sharp, curved claws 18–20 mm in length over the curve (Fig. 54a). The plantar pad and accessory pad are fringed with long hair. Has four toes on the hind-feet, the first being absent. The second, third and fourth are elongated, with the third being the longest (Fig. 54b). The fifth claw, which is the shortest, does not mark in the spoor, except when Springhare sits up, in which case the whole hind-foot back to the ankle may show in the spoor. The claws of the hind-feet are broad and triangular, with sharp edges, and taper to a sharp point. The front-feet with their curved claws are adapted to digging and the hind-feet with their broad claws to throwing the loosened soil clear of the excavations. A burrow that is in use will show the spoor of the hind-feet at the entrance. The marks of the front claws, used in excavation, show on the sides of the burrow, but seldom show in the spoor as it usually moves on the hind-feet. It hops on the back feet, holding the front legs close to the body. When chased, it can move very fast in long leaps of up to 2 m, using the tail to maintain balance. When it feeds the body is held low, the weight being taken on the front feet and the hind-feet move forward, in rabbit-like fashion. **Habitat:** Compacted light sandy soil in which to dig burrows is essential. Avoids hard ground or heavy clay soils, except where there are patches of sandy soil. Occurs on open sandy ground, sandy scrub, over-grazed grassland, fringes of vleis and dry riverbeds, floodplain grassland, cultivated areas of open scrub. Prefers short grass cover; absent from tall grass areas. **Habits:** Nocturnal. Congregates

in open groups when feeding. Often remains in its burrow during heavy rain or very cold nights. Usually feeds within 400 m of burrows. Shallow, crescent-shaped diggings and discarded stems and other parts of grasses indicate feeding sites. Simple burrows may be extended to include other side burrows and can have several entrances and escape holes. Entrance holes may be plugged with soil while animal rests inside. Deserted burrows often used by small species like Pangolin, Polecat, mongooses, mice and reptiles. **Food:** A grazer, living mainly on grass.

Family HYSTRICIDAE Porcupines

Hystrix africaeaustralis
Porcupine
Ystervark
55

The largest African rodent, characterised by the erectile spines and quills which serve as a means of self-defence. TL 84cm. Mass 18 kg. **Spoor:** Has five toes on the front feet, the first toe being reduced to a small stump without a claw. The other toes on the front feet have well-developed claws. Has five toes on the hind-feet, each with a claw. The fore-feet and hind-feet each show three intermediate pads and two proximal pads in the spoor. Has a ponderous gait, but can run very fast under stress. Has a habit of using tracks to travel along. The quills dragged on the ground can be seen in the spoor. **Habitat:** Occurs in most types of vegetation, from sea level to over 2 000 m. Generally absent from forest. Prefers broken country with rocky hills and outcrops. Availability of shelter in which to lie up is essential. Shelters often contain accumulations of bones which it gnaws, possibly to sharpen its incisor teeth and as a source of phosphates. **Habits:** Usually solitary, occasionally in pairs or female with young. The same shelter may be used by 3 or 4 adults, who scatter to forage. Almost exclusively nocturnal, but will sunbathe close to shelter. A good swimmer. It is a noisy animal, snuffling, grunting and rasping its quills and spines against obstacles. Can become aggressive if cornered, grunting, stamping its feet, erecting its quills and rattling the hollow quills on its tail. To defend itself, runs backwards or sideways so that its sharp quills penetrate the skin of its adversary, causing septic wounds which can prove fatal for predators. Facing into its hole it will erect its quills against the sides to form a protective hedge of sharp spikes which also act as a secure anchor. **Food:** Predominantly vegetarian, including bulbs, tubers, roots, fallen wild fruits. Also gnaws the bark of trees, and can be a problem in farming crops. Eats carrion too.

Order LAGOMORPHA Hares and rabbits
Family LEPORIDAE Hares, rock rabbits, rabbits
Genus *Lepus*

Lepus saxatilis
Scrub Hare
Kolhaas
56.1

Varies in size. In the southwestern Cape Province males have TL 60 cm and mass 3 kg, while in Zimbabwe they have TL 50 cm and mass 2 kg. Females are slightly larger and heavier. Upper parts are grizzled greyish or buffy. **Spoor:** Has a thick mass of hair underneath its feet, so footprints do not show well-defined pad imprints. Four claws may sometimes show in the spoor of the fore- and hind-feet. Its bounding trail is very characteristic of hares (Fig. 56.1a). Each bound may be about 0,6 to 1 m long. Although the spoor of all the hares and rabbits are similar, their different habitat preferences may help to distinguish the different species. When flushed it runs off in an irregular zigzag course, each jump being 2 to 4 m long (Fig. 56.1b). **Habitat:** Savanna

woodland and scrub with a grass cover, but absent from forest, desert and open grassland. Common in agriculturally developed areas. Where scrub or woodland association fringes grassland, it wanders out marginally to forage in the open. May be found in open grassland, but not far from its preferred habitat of scrub or woodland. The Cape Hare (*L. capensis*) is not found in woodland, and only in scrub where that is thinned out on the fringes of open areas such as pans. Apparently the Scrub Hare requires a more adequately vegetated habitat than the Cape Hare (*q.v.*). **Habits:** Nocturnal. More active on warm evenings than on cold, and not active during rain. Will feed during the morning in overcast weather. During the day it lies up in forms under bushes where there is some grass cover. As it crouches the grass is flattened by the broader fore- and hind-portions of its body, giving the forms a characteristic shape. Normally solitary, but female in oestrus may be accompanied by one or more males. **Food:** Leaves, stems and rhizomes of dry and green grass. Has a preference for green grass.

Lepus capensis
Cape Hare
Vlakhaas
56.2

There exists a wide variation in colour and size. In the Western Cape it measures about 60 cm with a mass of about 2 kg and in Botswana it measures about 48 cm with a mass of about 1,6 kg. In the southwestern Cape it is light buffy in colour, grizzled with black ticking, while in Botswana it is a much lighter whitish-grey with greyish ticking. **Spoor:** See 56.1. **Habitat:** Although their distributional ranges overlap, there are marked differences between the habitat requirements of the Cape Hare and the Scrub Hare (*L. saxatilis*). The Cape Hare has a preference for a dry, open habitat, such as open grassland plains, where the Scrub Hare does not occur. The Scrub Hare occurs in the fringing scrub and woodland surrounding grasslands. Where there is an open scattering of scrub bush not sufficient to permanently support the Scrub Hare or dense enough to exclude the Cape Hare, the two may occasionally occur together. As the Cape Hare is a grazer, palatable grasses are essential, as well as cover in the form of clumps of grass in which to lie up. Apparently independent of water, probably obtaining its moisture requirements from its food and dew. **Habits:** Predominantly nocturnal, but may forage during the day in overcast weather. Less active in cold weather and remains in cover during rain. Lies up during day in forms situated in grass clumps or under small bushes, always alert for danger. Becomes active just after sundown to feed and forage far into the night, resettling in cover before sunrise. Normally solitary, but female in oestrus may be accompanied by several males. Eyesight and hearing acute. **Food:** A grazer, with a preference for areas with short grass, green grass and fresh green shoots.

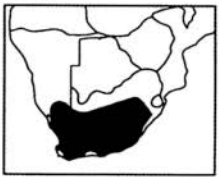
Genus *Pronolagus* Red rock rabbits

Apparently all three species of *Pronolagus* have similar habits and habitat requirements, but their distributional ranges overlap only marginally. They are closely confined to areas with substantial shelter in the form of rocks, occurring on krantzes, rocky hillsides, boulder-strewn koppies, in rocky ravines and on piles of rocks in dry river-beds. They lie up during the day in forms under rock ledges or boulders, where their coloration makes them difficult to see. They also shelter deep in crevices between boulders. Their specialised habitat requirements make their occurrence discontinuous in their distributional ranges. Their habitat must also provide some cover of bushes and palatable grasses. Although they will forage around the base of the koppies in which they live, they never move far from their rocky habitat. They are all predominantly nocturnal, occasional daylight activities being atypical. When disturbed they seek shelter in their rocky habitat, using the

cover of boulders to escape. They are very proficient in turning and doubling. They are gregarious, but forage solitarily, although numbers may congregate on preferred feeding grounds, and female in oestrus may be accompanied by more than one male. They are all grazers, partial to flushing green grass after a burn. **Spoor:** See 56.1.

Pronolagus rupestris
Smith's Red Rock Rabbit
Smith se Rooiklipkonyn

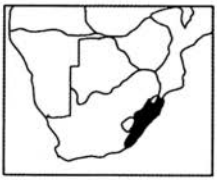
56.3



The smallest of the three species of *Pronolagus*, with HB 45 cm and mass 1,6 kg. Colour varies, with upper parts generally rufous-brown with distinct black grizzling. Rump and back of hind-legs are brighter rufous in colour. Tail is bushy with black tip.

Pronolagus crassicaudatus
Natal Red Rock Rabbit
Natalse Rooi Klipkonyn

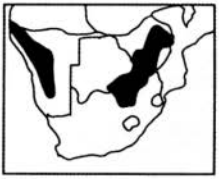
56.4



Upper parts grizzled rufous-brown with blackish wash. Rump and back of hind-legs are brighter rufous. Tail is short, not bushy, and uniformly ochraceous-brown. HB 50 cm. Mass 2,6 kg.

Pronolagus randensis
Jameson's Red Rock Rabbit
Jameson se Rooi Klipkonyn

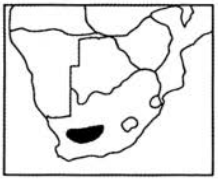
56.5



Upper parts grizzled rufous-brown. Rump and back of limbs lighter in colour. Tail large and bushy, and uniforn. ochraceous-brown with black tip. HB 46 cm. Mass 2,3 kg.

Genus *Bunolagus*

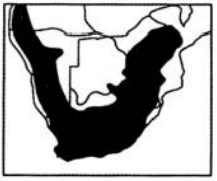
Bunolagus monticularis
Riverine Rabbit
Rivierkonyn
56.6



Ranks among the rarest of southern African mammals, and has only been observed a few times since its discovery in 1902. Has distinctive long ears, and characteristic dark brown band along the sides of the lower jaw. Upper parts grizzled drab-grey. Eyes encircled with distinct white rings. Round fluffy tail is pale greyish-brown. HB 43 cm. Mass 1,0–1,5 kg. **Habitat:** Dense riverine bush, as found on the Fish and Rhinoceros rivers in the Karoo. **Habits:** Little is known about their habits.

Order HYRACOIDEA Dassies
Family PROCAVIIDAE
Genus *Procavia*

Procavia capensis
Rock Dassie
Klipdas
57.1



Male has a TL of 50 cm and mass 4,5 kg, females smaller and lighter. Upper parts vary in colour from yellowish-buff to reddish or greyish-brown, with grizzled appearance. **Spoor:** Has four toes on the front feet and three toes on the hind-feet. The toes all have nails, except the inner toe of the hind-foot, which has a curved grooming claw. The soles of the feet are naked, the skin thick and padded with glandular tissue which keeps the surface permanently moist to increase traction. This enables it to negotiate steep and smooth rock faces or to climb trees with agility. Urinates and defecates in latrines. **Habitat:** Occurs only in rocky outcrops such as krantzes, rocky koppies or hillsides, or piles of loose boulders with an association of bushes and trees that provide browse. Crannies and crevices in which to shelter are essential. Has a preference for granite formations with piles of huge boulders or sandstone krantzes with loose, rocky, overhanging slabs; also occurs in erosion gulleys. In many parts of its range it lives in close association with the Yellow-spotted Dassie (*Heterohyrax brucei*). Will use small piles of rocks which are not favoured by the Yellow-spotted Dassie. **Habits:** Predominantly diurnal. Only emerges after sun is well up in cool weather, retiring before sunset. Will feed before dawn or after sunset in warmer weather with half to full moon. Will feed any time of day, with peaks of activity in early morning and late afternoon. Will move up to 50 m or 100 m on flat ground to feed. Adept at tree-climbing. Gregarious, size of colonies may vary from a family party of 4 to 6 on an isolated pile of rocks to hundreds on extensive ranges of krantzes. When danger threatens one of the females will give the warning call, when all will dive for shelter. Has to rely on existing shelters as it cannot burrow. Can cover considerable distances between areas of suitable rocky habitat when under stress of overpopulation or food shortages, and may occupy isolated koppies up to 20 km from nearest krantzes. **Food:** Depending on the relative availability of food sources, it is a browser in some parts and predominantly a grazer in other parts. Will drink regularly when water is available, but is independent of water, obtaining moisture requirements from food.

Genus *Heterohyrax*

Heterohyrax brucei
Yellow-spotted Rock Dassie
Geelkoldas

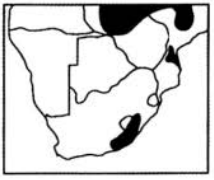
57.2

Can be distinguished from Rock Dassie by the distinct white or off-white patches above the eyes and the lighter colour of the sides of the face. Colour varies, from dark brown to a paler brown or grey, drab grey or light grey. The dorsal spot may be creamy-buff, reddish-ochre or yellowish. TL 50 cm. Mass 3 kg. **Spoor:** See 57.1. **Habitat:** Similar to that of Rock Dassie. The two species may live on the same rocks and be seen alongside each other basking in the sun. Less often occupies isolated koppies. **Habits:** Same as Rock Dassie. **Food:** Predominantly a browser, but also grazes, particularly during warm, wet summer months.

Genus *Dendrohyrax*

Dendrohyrax arboreus
Tree Dassie
Boomdas

57.3



Same size as Rock Dassie, but differs from other species in that its longer fur gives it a woolly appearance. Upper parts, which are grizzled greyish-white with a brown tinge, vary in colour. The Tree Dassie occurring in the higher rainfall areas is darker. **Spoor:** See 57.1. **Habitat:** Better-developed forests of Eastern Cape and Natal, lowland evergreen forests, and evergreen riverine forests. Does not utilise rocky areas in the Subregion. Habitat must not be too open, and must provide dense masses of creepers, thick foliage or holes in trees in which to rest. **Habits:** Predominantly solitary, arboreal and nocturnal. Difficult to observe, but very noisy. Agile in trees. During the day it lies up in hollow trees, among masses of creepers or thick foliage. **Food:** Has not been studied. Probably browse and perhaps graze.

Order PHOLIDOTA
Family MANIDAE
Genus *Manis*
Subgenus *Smutsia*

Manis temminckii
Pangolin
Ietermagog

58

Unmistakable, armoured with scales, reaches an overall length of over 1 metre and mass about 15 kg. **Spoor:** Has five toes on the fore-feet, the first with a small nail, the central three with long, strongly curved claws. The third, the longest, measures up to about 45 mm over the curve. Has five toes on the hind-feet, each with a short nail-like claw which marks in the spoor. The soles of the hind-feet are rounded in the front and taper off slightly behind. When walking the body is balanced on the hind-feet, the fore-feet and tail being held clear of the ground. May momentarily allow the tail to scrape the ground or take its weight on the front edge of either set of claws of the front-feet. The spoor shows the rounded pads of the hind-feet with usually four nails touching the ground, the occasional scrape of the tail and the mark of the front edges of the long, curved, front claws. Spoor illustration, Fig. 58, is based on a specimen study with reference to Smithers (pers. comm.). Normally a slow mover. Under stress it can move at a fast pace, raised high on its back legs. To locate danger it will pause and raise the body into the near vertical position on the back legs, balancing on the tail, to sniff the wind. **Habitat:** A savanna species, not occurring in forest or in desert. Occurs in scrub and various types of savanna woodland,

floodplain grassland, rocky hills and sandveld. Areas of rainfall from 250 mm per year up to 1 400 mm per year. Habitat must provide the species of ants and termites it lives on. Apparently not dependent on water. **Habits:** Solitary. Predominantly nocturnal with some diurnal activity. Can be noisy when moving in dry grass, but is shy and will 'freeze', standing motionless, when disturbed and can easily be overlooked. Under severe stress it will curl up into a tight ball, the tough scales protecting the head and soft under parts. By day it shelters in holes, such as disused Antbear or Springhare burrows, or hides in piles of debris in the shade. Does not excavate own hiding place. Terrestrial, it easily climbs over fallen logs and will climb over netting fences a metre high. Can force itself through very small holes. **Food:** Ants and termites, including larvae and pupal stages. Locates nests by scent and opens them up with the front claws. Inserts long, sticky tongue into internal tunnels, withdrawing it covered with ants, pupae and larvae. Considerable quantities of soil are ingested in the process of feeding.

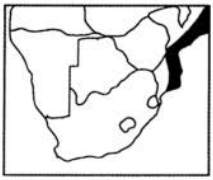
Order PRIMATES Bushbabies, baboons and monkeys
Suborder STREPSIRHINI
Family LORISIDAE Bushbabies
Subfamily GALAGINAE

Galago moholi
Lesser Bushbaby (Night Ape)
Nagapie
59.1

Has huge eyes and large ears. Upper parts are light grey or grey-brown, with under parts lighter. Males: HB 14 cm. T 23 cm. Mass 150 g. Females slightly smaller. **Spoor:** Has five digits on each of the feet, with soft, enlarged pads under the tips of each digit. The thumbs and big toes are opposable and are more heavily built than the other digits. Except for the second digit of the hind-foot, which has a curved grooming claw, each digit has a small nail with a convex edge. At the base of each long, slender digit there is a soft pad, and the whole palm of the fore-foot and sole of the hind-foot are similarly padded. Is known for its spectacular leaping abilities. Quadrupedal progression is used only at slow speed. On the ground it moves by hopping bipedally, the fore-limbs making no contact with the ground. **Habitat:** Savanna woodland. Occurs on forest fringes, but not within them. At altitudes of less than 200 m it is replaced in forest by the subspecies *Galagoides granti*. **Habits:** Nocturnal. Most active during first few hours after emerging, less active around midnight, and active again before sunrise. Remains in shelter on cold, wet, windy nights. Arboreal. Rests by day in family groups of 2 to 7, forages solitarily by night. May construct platform-like nest or use disused birds' nests, dense clumps of foliage or holes in trees. Has spectacular leaping abilities and can climb amongst the finer outermost twigs. **Food:** Lives on a diet of gum, augmented by insects. The gum oozes out of damaged bark of trees. In September–October, about 15 minutes per hour are spent foraging on the ground. After the onset of the rains it seldom forages on the ground. Apparently independent of drinking water, obtaining its moisture requirements from its food.

Galagoides granti
Grant's Lesser Bushbaby
Grant se Nagapie

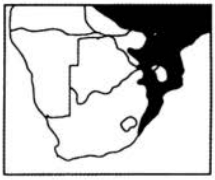
59.2



Grant's Lesser Bushbaby is browner on the upper parts of the body and more ochre-coloured on the under parts than the Lesser Bushbaby. It is also slightly larger and with a longer rostrum, more gregarious and more carnivorous. It occurs at low altitudes of less than 360 m above sea level, and replaces the Lesser Bushbaby in forests. **Spoor:** See 59.1.

Otolemur crassicaudatus
Thick-tailed Bushbaby
Bosnagaap

59.3



Has huge eyes and large ears. Pale grey in colour tinged with buffy brown, with the under parts lighter. Males: HB 32 cm. T 42 cm. Mass 1,25 kg. Females slightly smaller and lighter. **Spoor:** Has five digits on the hands and feet (see 59.1). On the hand the first digit is opposable. The second digit is widely separated from the first and the third digits. The remaining digits, three to five, are long and slender, the fourth being the longest. Has soft swollen pads at the tips and at the bases of these digits and on the palms of the hands. Each digit has a nail, the end of which is convex. The feet are similar to the hands except that they are larger and more robustly built, and the second digit has a grooming claw instead of a nail. On the ground it moves quadrupedally, galloping with both fore- and hind-quarters, or will hop bipedally. **Habitat:** Forests, thickets and well-developed woodland in the higher-rainfall parts. Penetrates dry terrain along avenues of riverine forest or woodland. Occurs from sea level to over 1 800 m. **Habits:** Nocturnal. Most active between sunset and midnight, least active around midnight. Rests during day in groups of 2 to 6, forages solitarily at night. Arboreal. Movements within home range follow established pathways, but will explore extensively to search for fruit-bearing trees. Walks or runs along branches, giving short jumps if necessary. On the ground it moves quadrupedally or hops bipedally. Normally silent, it can be very noisy. **Food:** Fruit and gum, as well as some insects, reptiles and birds.

Suborder ANTHROPOIDEA
Family CERCOPITHECIDAE Monkeys and baboons
Subfamily CERCOPITHECINAE
Genus *Cercopithecus*

Cercopithecus aethiops
Vervet Monkey
Blouaap

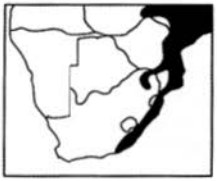
60.1

The upper parts are grizzled greyish and under parts whitish. Males: HB 50 cm. T 65 cm. Mass 5,5 kg. Females: HB 45 cm. T 60 cm. Mass 4 kg. **Spoor:** The thumb and big toe are fully opposable, and each finger and toe has a nail. The feet are larger than the hands. **Habitat:** Predominantly savanna woodland. Generally absent from open grassland or open scrub, except marginally. Will penetrate along rivers and streams into unsuitable terrain. **Habits:** Diurnal. Active from dawn till mid-morning when it rests in a sheltered area. May rest until early in the afternoon in hot weather, after which it continues foraging. Returns to sleeping-place well before sunset. Spends much time in trees searching for wild fruits, but also forages on the ground.

It is gregarious, occurring in troops up to 15 or 20. Aggregations up to about 100 may form at watering places or preferred feeding sites. Troops sleep in the higher branches of large trees or in rocky shelters. **Food:** Predominantly vegetarian, it lives on wild fruits, flowers, leaves, seeds and seed pods; also eats insects. Can become a problem animal, raiding beans, peas, vegetables, fruit and various grain crops.

Cercopithecus mitis
Samango Monkey
Samango-aap

60.2



Much darker in colour than Vervet monkey, and has a dark brown face. Males: HB 60 cm. T 80 cm. Mass 9,3 kg. Females: HB 50 cm. T 70 cm. Mass 4,9 kg. **Spoor:** Identical to 60.1. **Habitat:** Closely confined to forest habitat, it seldom strays from it except temporarily when foraging. **Habits:** Diurnal. Active from or just before sunrise. Rests during hottest time of day. At night it rests in trees, hiding among the foliage. Gregarious, living in troops from 4 to over 30. Vocal communication is important, as visual communication is difficult. **Food:** Mainly fruits, dry and green leaves, flowers, pods and shoots, as well as insects. Will raid orchard fruits such as guavas, mangoes and bananas.

Genus *Papio*

Papio ursinus
Chacma Baboon
Kaapse Bobbejaan

60.3

Colour varies with sex and age, as well as geographical areas. Colour may be a dark brown with yellow tinge, or grizzled yellowish-brown. Males: HB 70 cm. T 70 cm. Mass 32 kg. Females: HB 60 cm. T 60 cm. Mass 15,4 kg. **Spoor:** The thumb and big toe are fully opposable, and each finger and toe has a nail. The feet are twice as long as the hands. **Habitat:** A savanna and montane species, marginal on open grassland. Availability of water essential. **Habits:** Gregarious, troops may number up to about 100 individuals. Troops may have overlapping home ranges, but tend to avoid contact. While the troop feeds, males sitting on vantage points will act as sentinels. When troop is moving, adult males will move on flanks and travel ahead to act as sentinels, while the oldest males follow as a rear guard. At night they sleep on high krantzes or in trees with thick foliage. Sleeping sites are marked by accumulations of dung and urine stains, and have a distinct smell. If disturbed during the night adult males may bark, and the presence of Leopards or other large predators may cause persistent barking and squealing until the danger has passed. They are diurnal, and usually leave their sleeping sites at first light. They may move back to their resting sites quite early in the afternoon. Resting sites are approached with caution. On the approach of danger, large males will interpose themselves between the troop and the source of danger. **Food:** Omnivorous, including grasses, seeds, roots, bulbs, leaves, flowers, bark, gum oozing from trees, mushrooms, wild fruits, pods and shoots. Will pull up clumps of grass and shake off the soil before eating it. Usually turns over every stone in search of insects, spiders, scorpions, ants and slugs. May kill the young of the smaller antelope, such as Klipspringer and Steenbok, as well as hares. May take poultry and small domestic stock, but not carrion. Will also raid agricultural crops. Regular access to drinking water is essential.

Order CARNIVORA
Family MUSTELIDAE Otters, polecats, weasels, Honey Badger
Genus *Aonyx*

Aonyx capensis
Clawless Otter
Groototter

61.1

The colour of the upper parts varies from light to very dark brown, the under parts lighter in colour. The chest, throat and sides of the face are white. The thick pointed tail is flattened underneath, adapted for propulsion when swimming. HB 1 m. T 0,5 m. Ht 35 cm. Mass up to 18 kg. **Spoor:** Has five toes on the fore- and hind-feet. Those on the hind-feet are webbed for half their length, while webbing on the fore-feet is barely perceptible. The toes are adapted to feeling and grasping, and have no claws on the fore-feet and only rudimentary nails that just protrude from the skin on some of the toes on the hind-feet. The undersides of the toes are rough to assist in holding slippery objects. In soft mud the five toes, the intermediate pads and the proximal pads show clearly in the spoor. In firm mud only an indication of the proximal pads may show. The Clawless Otter may walk at a leisurely gait, but generally moves by bounding along, or will gallop with an undulating motion. Latrines are situated near the water and are characterised by the amount of crabshell remains and fish scales which they contain. These can be distinguished from the scats of Water Mongoose whose scats contain rodent fur and other items not normally eaten by otters, but where both are feeding extensively on crabs alone, identification is difficult. Otter latrines are usually near deep water, which facilitates escape if disturbed. With otters, the whole crab is eaten, only very few slivers of hard exoskeleton being discarded at the feeding site. The Water Mongoose invariably leaves the shell of the carapace. An empty carapace is a sign of the presence of Water Mongoose and not otter. **Habitat:** Predominantly aquatic, it occurs in rivers, lakes, swamps and dams. May occur in very small streams where it lives on crabs and frogs. Where it occurs in coastal waters, a supply of fresh water is essential. Providing there is sufficient cover in which to rest, its occurrence bears no relation to the surrounding terrain, providing the aquatic conditions are suitable. May occur along rivers that penetrate deep into extremely dry terrain. **Habits:** Predominantly aquatic, it spends much of its active time in water. Wanders widely in search of new feeding grounds, and is in this respect more terrestrial than the Spotted-necked Otter. Generally solitary, but also in pairs and family parties of two adults and up to three young. Predominantly crepuscular, it displays some nocturnal activity in its terrestrial environment, and may occasionally be seen foraging at midday. Main periods of activity are from sunrise until about 09h00, and from about 16h00 until sunset. During the heat of the day it rests in sheltered places. **Food:** Mainly crabs, frogs and fish, and to a lesser extent insects, birds, reptiles, mammals and molluscs. In a marine environment it also eats octopus. Feeds in the early morning and late evening, activity continuing throughout the night. Will also take water birds and wildfowl, and can become a problem raiding domestic ducks.

Genus *Lutra*

Lutra maculicollis
Spotted-necked Otter
Kleinotter

61.2

The Spotted-necked Otter is smaller and slimmer than the Clawless Otter. Colour varies from chocolate-brown to a deep, rich reddish brown. The throat and upper chest are mottled with white or creamy-white. Has a long tapering tail, which is flattened to assist in swimming. HB 60 cm. T 40 cm. Ht 30 cm. Mass up to 9 kg. **Spoor:** Has five toes on the fore- and hind-feet. Its feet are fully webbed, an adaptation to aquatic life. On land it has a clumsy shuffling gait and quickly becomes distressed, unlike the Clawless Otter which has more purposeful movements. In soft mud the five toes, the intermediate pads and the proximal pads show clearly in the spoor. Claws on the front feet, which are up to 1 cm over the curve, are lightly built and very sharp. Those on the back feet are slightly shorter. In soft mud the claw marks may be difficult to see and only slight indications of the webs may be detected on close inspection. Because the short claws are situated on top of the toes, they may not mark clearly on firm substrate, in which case claw marks may be hardly perceptible and the spoor may not be distinguished from that of a Clawless Otter. Defecates and urinates close to the water's edge, forming latrines in secluded spots where there is cover. **Habitat:** Aquatic, closely confined to large rivers, lakes and swamps which have extensive areas of open water. Does not wander far from this habitat, and its resting sites, breeding sites and latrines are all near the water's edge. Not known to enter estuarine or sea waters. **Habits:** Usually solitary or family parties of an adult and two young, but schools of up to five or six have been recorded. Apparently crepuscular, active in the early morning up to about 08h00 and in the evening after about 16h30, but has been seen to move around throughout the day. Activity rhythms can vary depending on the degree of disturbance. As it apparently catches fish by sight, light and therefore some diurnal activity seem necessary. Clear water would also be an advantage. While it normally creates very little disturbance when diving, it will dive with a resounding splash when alarmed. Lies up in holes in river banks, in rock crevices, or in dense reedbeds. **Food:** Mainly fish, but including crabs, fresh-water molluscs and frogs; also some birds and insects.

Genus *Mellivora*

Mellivora capensis
Honey Badger
Ratel

62

The stocky, short-legged Honey Badger has a broad, light-coloured saddle, which runs from above the eyes to the base of the tail, and contrasts with the black lower parts of the body. Appears to be slightly higher towards the rump. HB 75 cm. T 20 cm. Ht 25–28 cm. Mass 8–16 kg. **Spoor:** Has five toes on the fore- and hind-feet. The claws on the front feet are elongated and powerfully built, reaching a length of 35 mm. These on the back feet are much shorter, about 15 mm in length and more lightly built. The front claws are built like curved knives, broader on their top edges and sharp and knife-like below. These powerful claws enable the Honey Badger to dig, turn over stones, tear bark away from trees, and even tear its way through wire netting into poultry runs. The claws on the back feet lack the knife edge and are broad and hollowed out underneath. The intermediate pads are fused, and a proximal pad on each of the fore- and hind-feet is characteristic of its spoor. On very firm mud the proximal pads may not be very distinct. When hunting, it moves with a slow rolling gait, nose to the ground, sniffing here and there for prey.

Has a strong tendency to use tracks and roads along which it moves at a lumbering trot. **Habitat:** Has a wide habitat tolerance, occurring in rocky koppies, scrub sandveld, open grassland, open woodland, riverine woodland, floodplain grassland and at least on the fringes of montane forests. Not often found in forests and apparently does not occur in desert, although it may penetrate into it along drainage lines. Tolerates rainfall conditions from less than 100 mm annually to over 2 000 mm. Occurs from sea level to over 1 500 m. Will use crevices in rocky areas, adapt existing disused holes or dig its own in which to shelter. Apparently independent of water. **Habits:** Predominantly nocturnal, with some diurnal activity where undisturbed. Generally solitary, two or more may hunt together. While normally shy and retiring, it can, without provocation, become extremely aggressive and has a reputation for ferocity and fearlessness. When under stress it may secrete a strong smelling liquid from the anal glands to deter an enemy. Normally terrestrial, it can climb trees with stout branches to get at beehives. Its thick skin protects it when raiding beehives. **Food:** Omnivorous, including scorpions, spiders, mice, lizards, centipedes, grasshoppers, small birds, snakes, wild berries, fruit, bee larvae and honey. There is good evidence that it follows the Honey Guide (*Indicator indicator*) to a bee's nest.

Genus *Poecilogale*

Poecilogale albinucha
Striped Weasel
Slangmuishond

63

A slender and sinuous little animal with distinct white longitudinal stripes on the jet black fur of the dorsal surface, and a bushy white tail. Smaller than the Striped Polecat with shorter silky fur and much shorter legs. HB 30 cm. T 15 cm. Ht 5–6 cm. Mass ♂ 260 g, ♀ 170 g. **Spoor:** Has five toes on the fore- and hind-feet. The claws on the front feet are strongly curved and longer than those on the hind. All five toes and claws of the fore-feet show in the spoor, the first toe being very small. The proximal pad of the fore-feet may sometimes show in the spoor. The spoor of the hind-feet will show the outer four toes and claws, while the first toe or claw or both may sometimes show. Spoor illustration is based on specimen studies, with reference to Smithers (pers. comm.). The spoor is similar in shape and size to that of the Dwarf Mongoose, *H. parvula* (68.5). The differences in their habits as well as their distribution may help to distinguish the two species. **Habitat:** A savanna species particularly associated with grassland. Uncommon in most parts of its range. **Habits:** Mainly nocturnal, but may be active by day, especially in cool weather. Generally solitary, but also in pairs or family parties. Predominantly terrestrial, it climbs poorly. A good digger and excavates its own burrows. Relies on its warning coloration for protection, as well as the ejection of a foul-smelling fluid from the anal glands. **Food:** Carnivorous, including warm-blooded prey such as murids. Can probably crawl down the burrows of murids to catch them.

Genus *Ictonyx*

Ictonyx striatus
Striped Polecat
Stinkmuishond

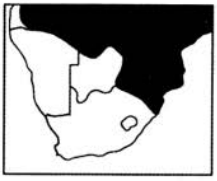
64

A black animal with distinctive longitudinal white stripes on the sides, and a mainly white tail. Larger than the Striped Weasel, lacking the latter's sinuous body shape and having much longer fur. Its conspicuous coloration serves as a warning of the nauseous ejection from its anal glands. HB 35 cm. T 26 cm. Ht 10–13 cm. Mass ♂ 970 g, ♀ 710 g. **Spoor:** Has five toes on the fore- and hind-feet. The claws on the fore-feet are long, strong and curved, up to 18 mm over the curve. Those of the hind-feet are much shorter, less curved and up to about 10 mm long over the curve. All five toes and claws of the fore- and hind-feet mark in the spoor, although the first toe of either foot may sometimes leave a weak impression. Compared to mongooses of similar size, the first toe of the fore- and hind-feet of the Striped Polecat is much larger, and no proximal pad shows in the spoor of the fore-feet. Movement is usually at a fast trot. When hunting, this trot may suddenly be arrested as the animal casts around with its nose close to the ground in search of prey. If suddenly disturbed, it breaks into a fast galloping run as it seeks the safety of a hole or other refuge. In soft sandy substrate it digs its own burrow, but more commonly uses the disused holes of other species or the shelter of piles of rocks, crevices in loose stone walls, under tree roots or fallen logs. **Habitat:** Has a wide habitat tolerance, occurring in open grassland, savanna woodland, thornbush, rocky areas, forest, exotic plantations and along drainage lines in desert. Occurs in areas with mean annual rainfall of less than 100 mm and up to 1 400 mm, and at altitudes from sea level to over 1 500 m. Nowhere common, and rare in some parts. **Habits:** Nocturnal, terrestrial and solitary. Will climb trees under stress. Occasionally pairs or female with young are seen. If cornered it is prone to take up aggressive attitudes. With the hair of the body and tail erected, it growls or will scream loudly and turn the hindquarters to the aggressor to eject the pungent excretion from the anal glands. In extreme cases it may sham death. During the day it lies up in holes, hollow trees, thick bush, in the shelter of piles of rocks, or in its own burrows which it digs in soft sandy substrate. **Food:** Mainly insects and mice, but will also take reptiles, birds, Amphibia, spiders, scorpions, millipedes and centipedes.

Family VIVERRIDAE Mongooses, civets, genets and Suricate
Genus *Civettictis*

Civettictis civetta
African Civet
Afrikaanse Siwet

65

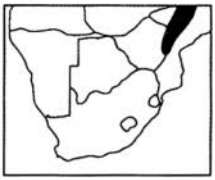


The Civet has a greyish or whitish shaggy coat with black spots on the body, and black stripes on the tail and neck region. The lower parts of the legs are black and the tail is bushy. HB 80 cm. T 46 cm. Ht 35 cm. Mass 12 kg. **Spoor:** Has five toes on the fore- and hind-feet, but only four toes show in the spoor of the fore- and hind-feet, as the first toes are set far back and do not touch the ground. The claws mark clearly in the spoor. Deposits its faeces in latrines or civetrines, normally located adjacent to paths and roads. The Civet makes extensive use of paths and roads, along which it moves slowly and purposefully. **Habitat:** Confined to well-watered savanna and forest, not occurring in the dry western and southern areas of the Subregion. Prefers good cover of high grasses, under bush, thickets or reedbeds. Occurs from sea level to altitudes of 5 000 m. Apparently not dependent on

surface water. **Habits:** Predominantly nocturnal. Most active from one or two hours after sunset, tailing off towards midnight, with some activity just before and after sunrise. Terrestrial, it is a poor climber. Generally solitary, but family parties of an adult and two young have been seen. When disturbed, will flatten and lie still or stand motionless, and then either remain lying or slink off. It moves and feeds silently, and moves off quietly when sensing danger. Its senses of smell and hearing are acute. **Food:** Omnivorous, including insects, wild fruit, murids, reptiles, birds, Amphibia, Myriapoda, Araneae and carrion.

Genus *Nandinia*

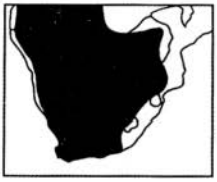
Nandinia binotata
Tree Civet
Boomsiwet
66



Very similar to a genet, but slightly larger and heavier. The brown woolly fur has faint dorsal spots, the thick tail is ringed, and there is a pair of light spots above the shoulder blades. HB 45 cm. T 45 cm. Ht 22 cm. Mass 2 kg. **Spoor:** Has five toes on the fore- and hind-feet, the first not marking in the spoor. Has sharp, curved, protractile claws about 6 mm long, which may or may not mark in the spoor. The spoor illustration is based on Smithers (pers. comm.) and Kenmuir and Williams (1975). Kenmuir and Williams indicate that the claws mark in the spoor, while Smithers (pers. comm.) does not. **Habitat:** Forest. **Habits:** Nocturnal, solitary and predominantly arboreal, but displays some terrestrial activity. By day sleeps in holes in trees or uses the cover of creepers. **Food:** Mainly vegetarian, but also takes carrion and may raid poultry.

Genus *Genetta*

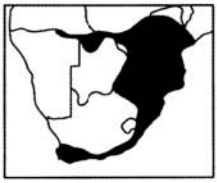
Genetta genetta
Small-spotted Genet
Kleinkolmuskejaatkat
67.1



Distinguished from the Large-spotted Genet by a crest of black hair along the back, a longer and coarser coat, more black on the hind-feet, darker body spots, and usually a white-tipped tail, as opposed to the black-tipped tail of the Large-spotted Genet. HB 50 cm. T 45 cm. Ht 15–20 cm. Mass 2 kg. **Spoor:** Has five toes on the fore- and hind-feet, but the first toe of the fore- and hind-feet is set back and does not touch the ground, so only four toes show in the footprints. Its sharp, curved, protractile claws do not show in the spoor. Footprints are indistinguishable from those of the Large-spotted Genet, but differences in their habitat preference may help to distinguish the species. Normal movement is at a fast trot. When stalking prey it moves very slowly before rushing to kill. **Habitat:** Utilises the more open areas of savanna woodland, dry grassland or dry vlei areas. Occurs more particularly in open, arid associations where the *G. tigrina* group of genets does not occur. Occurs in rainfall areas lower than 100 mm and up to about 800 mm, and where rainfall is less than 450 mm annually it occurs to the exclusion of the Large-spotted Genet. Cover, in the form of scrub or underbush, holes in the ground or in trees in which to shelter during day, is essential. Independent of water supply. **Habits:** Nocturnal. Mainly solitary, but also in pairs. Although mainly terrestrial, it is a good climber. By day it rests up in holes in the ground, hollow logs, holes in trees or the shelter of piles of boulders. **Food:** Small rodents, birds, reptiles, insects, spiders and scorpions.

Genetta tigrina
Large-spotted Genet
Rooikolmuskejaatkat

67.2

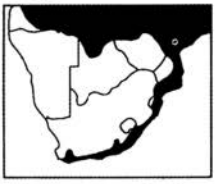


The Large-spotted Genet has a black-tipped tail, as opposed to the white-tipped tail of the Small-spotted Genet, and also lacks the spinal crest. The spots on the body, which are generally larger than in the Small-spotted Genet, vary from almost black, with a sprinkling of rusty-coloured hairs, to an overall rusty colour, and the fur is shorter. HB 50 cm. T 50 cm. Ht 18 cm. Mass 2 kg. **Spoor:** See 67.1. **Habitat:** Particularly associated with well-watered country, usually absent from arid areas and restricted to riverine associations in the drier parts of its distributional range. Occurs in areas with mean annual rainfall of over 450 mm. Cover is essential. **Habits:** Nocturnal. Mainly solitary, but also in pairs. Is a good climber and spends at least part of its active time in trees. By day it rests up in holes in trees, in hollow logs, under tree roots, in disused Antbear or Springhare holes, under piles of boulders or in any substantial shelter. **Food:** Rats, mice, insects, including locusts and beetles, ground birds, scorpions, spiders, reptiles and wild fruit.

Genus *Herpestes*

Herpestes ichneumon
Large Grey Mongoose
Groot Grysmuishond

68.1



A large grey mongoose with coarse fur, and a long tail which has a distinct black tip. The lower parts of the legs are black. The hair on the flanks and hind-quarters is long, hiding most of the hind-legs. HB 56 cm. T 52 cm. Ht 20 cm. Mass 3,4 kg. **Spoor:** Has five toes on the fore- and hind-feet. The first toe of the fore-foot is small and situated behind the intermediate pad. The other four toes of the fore-foot have long claws, up to 15 mm across the curve, that mark clearly in the spoor. The proximal pad of the fore-foot, which shows in the spoor when the animal is moving slowly, may not show when it is trotting or running fast. The first toe of the hind-foot does not usually show in the spoor, but the first claw may mark in the footprint. The other four toes have claws, which are shorter than those of the fore-foot, and mark clearly in the spoor. Will use paths and roads to move from one well-watered site to another. When pairs are moving together or young accompany their mother, one tends to follow closely the other. A powerful digger, it will excavate at the base of dead trees and in debris in search of beetles and other prey. **Habitat:** Closely associated with water, occurring in riverine forest and bush or any thick cover not far from water. It frequents reedbeds along rivers, the fringes of lakes, dams and swamps. Wanders widely in adjacent dry terrain. **Habits:** Mainly diurnal. Pairs and family parties up to 5 may be seen, as well as solitary individuals. Terrestrial, it swims well and will hunt in shallow water. If suddenly caught in the open, it will freeze, lying flat so that the long hair, pressed out from the sides, obscures the outline of its body. **Food:** Frogs, fish, crabs and murids as well as birds, reptiles and insects; also reputed to raid poultry.

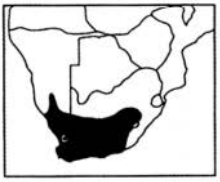
Galerella sanguinea
Slender Mongoose
Swartkwasmuishond

68.2

A small slender mongoose with a long tail which has a characteristic black tip. Colour varies, including reddish, yellowish, greyish or dark brown that looks black in the field. HB 30 cm. T 27 cm. Ht 10–12 cm. Mass ♂ 640 g, ♀ 460 g. **Spoor:** Has five toes on the fore-feet, the first being small and situated behind the intermediate pad. The first toe does not usually mark in the spoor, except in soft substrate. The proximal pad of the fore-foot, which may show when the animal is moving slowly or in soft substrate, does not show when it is trotting or running. The claws are sharp and curved, up to 7 mm across the curve. The hind-feet have five toes, but only the claw of the first toe may show. The other four toes each have a sharp, curved claw. There is a narrow web connecting the four outer toes of the fore- and hind-feet. Normally moves at a quick walk with a smooth action. Prone to use tracks and roads, moving in and out of the tall grass fringes to hunt. **Habitat:** Has a wide habitat tolerance, from arid to well-watered areas, from areas with mean annual rainfall of less than 200 mm to those with annual rainfall in excess of 1 400 mm. Does not occur in desert. Will inhabit open areas if there is cover, such as holes, fallen logs or shelter of rocks. Occurs in woodland and on fringes of montane or lowland forest, but not within forest itself. From sea level to over 1 500 m. Absence from karroid regions of Cape Province probably due to competition with the Small Grey Mongoose, *G. pulverulenta*. The two species overlap only to a limited extent at the perimeter of their respective ranges. **Habits:** Terrestrial and solitary. A good climber. Predominantly diurnal. Not active in cold, overcast weather. When disturbed, it will freeze, standing motionless to locate the source of disturbance. Will stand up on its back feet, balancing with the tail, to get a better view. It shelters in disused Antbear holes or holes in termitaria. **Food:** Mainly insects, including grasshoppers, termites, beetles and ants, as well as lizards, murids, birds, snakes, frogs, scorpions, centipedes and wild fruits.

Galerella pulverulenta
Small Grey Mongoose
Klein Grysmuishond

68.3



A small, slim mongoose, but heavier and more stoutly built than the Slender Mongoose. General colour is speckled grey. HB 35 cm. T 30 cm. Ht 10–12 cm. Mass ♂ 910 g, ♀ 680 g. **Spoor:** Has five toes on the fore-feet, the first being small and situated behind the intermediate pad. The first toe does not usually mark in the spoor, except in soft substrate. The proximal pad of the fore-foot, which may show when the animal is moving slowly or in soft substrate, does not show when it is trotting or running. The claws are sharp and curved. The hind-feet have five toes, but only the claw of the first toe may show. The other four toes each have a sharp, curved claw. Moves at a quick pace, pausing to sniff here and there or to scratch in debris in search of insects. Prone to move along existing tracks and paths. **Habitat:** Wide habitat tolerance. Found in open country as well as forest, and from sea level to 1 900 m. Occurs in areas with mean annual rainfall from less than 100 mm to over 1 000 mm. **Habits:** Diurnal, less active during the heat of the day. Normally solitary, occasionally in pairs. Will climb trees, but is predominantly terrestrial. Where vegetational cover is insufficient, it uses holes in the ground, the shelter of piles of rocks, holes in termitaria or holes and crannies in outcrops. Will live in close association with man, and

penetrates into peri-urban areas of cities. **Food:** Mainly insects, including grasshoppers and locusts, as well as rats and mice, reptiles and ground birds, their eggs and young; also fruit and carrion.

Genus *Atilax*

Atilax paludinosus
Water Mongoose
Kommetjiegatmuishond
(Watermuishond)

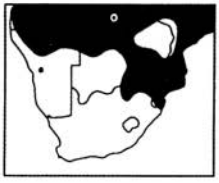
68.4

A robust mongoose with a coarse shaggy coat and a tapering tail. General colour varies, usually dark brown, sometimes almost black. HB 55 cm. T 35 cm. Ht 18–20 cm. Mass 3,4 kg. **Spoor:** Has five toes on the fore- and hind-feet, the first on both the fore and hind being small and showing in the spoor behind the intermediate pads. The other four toes are long and finger-like, and tend to splay, which facilitates walking on wet, muddy substrate. The claws on the front feet are stout and curved, the longest 11 mm. Those on the back are slightly longer and less curved. The proximal pad of the front foot, which may show in the spoor when the animal is moving slowly, may not show when it is moving fast. Tends to move along the muddy fringes of streams and dams or in shallow water where frogs and crabs are to be found. These are usually carried to the drier fringes to be eaten. Dry carapaces of crabs found on river banks are an indication of the presence of the Water Mongoose, since otters normally crunch up the carapace. Makes use of paths when moving from one area to another. An excellent swimmer, as may be indicated by its spoor entering the water at places where it is too deep to wade. **Habitat:** Associated with well-watered terrain, living in the vicinity of rivers, streams, marshes, swamps, wet vleis, dams and tidal estuaries, where there is cover of reedbeds, or dense stands of semi-aquatic grasses. May penetrate into dry country along rivers. Occurs from sea level to 1 800 m. Will wander some distance from this habitat in search of new feeding grounds or in foraging. When small tributary systems or rivers temporarily dry up, it does not vacate the area, but remains, turning to terrestrial food resources. **Habits:** In the northern parts of its range in the Subregion, it is crepuscular, active from first light to about 08h30 or, in overcast or cool weather, to about 09h00, and from about 17h00 or 17h30 until last light. Apparently also nocturnal. Normally solitary, adult females may be accompanied by juveniles. Terrestrial, but is an excellent swimmer. Lies up in dense cover. **Food:** Frogs, crabs, murids, fish, as well as insects, fresh water mussels and vegetable matter.

Genus *Helogale*

Helogale parvula
Dwarf Mongoose
Dwergmuishond

68.5



The smallest of the African mongooses. General colour is a uniform speckled brown or reddish, appearing at a distance very dark brown or almost black. HB 22 cm. T 17 cm. Ht 7–8 cm. Mass 270 g. **Spoor:** Has five toes on the fore-feet, the first being small and lying behind the intermediate pad. The first toe and the proximal pad of the front feet, which may show when the animal is moving slowly, may not show when it is trotting or running. Has five toes on the hind-feet, but only the claw of the first toe may show, well back of the other four toes. The claws of the front feet are long, curved and sharp, measuring up to 10 mm across the curve and are adapted to digging. Those on the hind-feet are shorter, up to about 8 mm. A troop lives in a permanent residence, usually in a termite mound, marked by loose accumulations of scats near the entrances. Has a preference for existing holes, but will excavate its own burrow, even in quite hard

ground. The entrances are often under fallen logs or piles of rocks. The burrows run deep underground. When a troop is far from its permanent refuge, it takes temporary refuge in hollow trees, under fallen trees or in hollow logs, in termitaria or shallow burrows. The permanent residences are marked by substantial accumulations of scats near entrances, the temporary refuges never showing these in any quantity. **Habitat:** A savanna species associated with dry open woodland and grassland. It tends to utilise areas of hard or stony ground, as opposed to sandy ground, where there are termite mounds and accumulations of debris. Uses holes in termitaria as shelter. Confined to altitudes below 1 100 m. Does not occur in semi-desert, desert or in forest. Not dependent on the availability of water. **Habits:** Diurnal, active only when sun is well up in the morning and retiring early, about 16h00. Not active in cold, rainy or overcast weather. Terrestrial and reluctant to climb. Gregarious, living in troops of 8–10, but troops of 20–30 are known. Has permanent residences, usually in termite mounds. When the troop moves out to forage, members scatter over a wide area, maintaining contact by vocalising. When one gives the alarm call, the rest will freeze, and after a time rise onto their back legs to locate the source of disturbance. When the one that gave the alarm call moves for cover, it is a sign for the whole troop to run for cover. **Food:** Mainly insectivorous, diet includes termites, locusts, snails, scorpions, centipedes, earthworms, reptiles and the eggs of ground birds and of snakes. Water is not essential, but will drink if it is available.

Genus *Mungos*

Mungos mungo
Banded Mongoose
Gebande Muishond
68.6

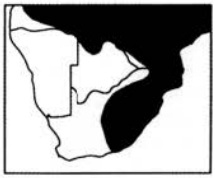
A small mongoose with a coarse and wiry coat, about a dozen black transverse bands on the back and a short tapering tail. Ground colour is brownish grey. HB 35 cm. T 24 cm. Ht 18–20 cm. Mass 1,4 kg. **Spoor:** Has five toes on the fore-feet, the first one being small and situated behind the intermediate pad. The first toe and the proximal pad of the fore-foot, which may show when the animal is moving slowly, may not show in the spoor when it is trotting or running. Has five toes on the hind-feet, but only the claw of the first toe shows in the spoor, well behind the other four toes. The claws of the front feet are long and sharply curved, up to 20 mm long. Those of the back feet are heavier, less curved and shorter. When foraging, individuals operate independently, scratching in fallen leaves and other debris, under stones, and in the bark of or under fallen logs. Will scratch around grass tufts and fork around in crevices. Never, however, digs very deeply. As it moves, the nose is held close to the ground and it pauses every few seconds to scratch or dig. Dens are in disused Antbear holes, erosion gullies or termite mounds. **Habitat:** Wide habitat tolerance, but generally absent from forest, desert or semi-desert areas. Woodland, underbush and fallen logs as well as the presence of termitaria are essential habitat requirements. Occurs in savanna, thickets, scrub thickets and in dry forest. **Habits:** Gregarious, living in troops which vary in size from a few to over 30. May scatter when foraging, maintaining contact by a continuous twittering. When the alarm call is given, it will freeze and rise on the back legs, balancing with the tail, to look around. The troop will then slip away with little noise, or disappear into the nearest thick cover or down holes. Diurnal, and nocturnal activity has not been recorded. Active from an hour after sunrise to sunset, resting during the hottest part of the

day. Dens are in disused Antbear holes, erosion gullies and termite mounds. Terrestrial, but will climb trees under stress. **Food:** Insects, grubs, myriapods, snails, small reptiles, the eggs and young of ground-nesting birds, wild fruits, as well as scorpions and spiders.

Genus *Ichneumia*

Ichneumia albicauda
White-tailed Mongoose
Witstertmuishond

68.7



A large, shaggy-coated mongoose, distinguished by longish legs and a tail that is white for about four-fifths of its length. The general colour is a grizzled darkish grey, with under parts of the limbs dark. Some exceptions occur that have dark grey tails, instead of white tails (Carpenter, pers. comm.). HB 68 cm. T 42 cm. Ht 22–25 cm. Mass 4,5 kg. **Spoor:** Has five toes on the fore- and hind-feet, but the first toes of both the fore and hind do not mark in the spoor. The first claw of the fore marks in the spoor well behind the other four toes, while the first claw of the hind barely touches the ground, leaving a mark well behind the other four toes that may not always be seen. The claws on the front feet are broad, strong and curved, and up to 13 mm long over the curve. Those on the back feet are straighter but also broad and about the same length. It walks with a fast restless gait and is capable of a good speed over short distances. Its strong front claws are ideally adapted to digging, although it does not appear to dig its own burrows, using disused Antbear or Springhare holes to rest in during the day. **Habitat:** Associated with savanna woodland in well-watered areas. Uses fringes of evergreen forest, but is not found within forest itself. Does not occur in desert or semi-desert. **Habits:** Nocturnal, active from about 20h30 to late into the night, activities tailing off by midnight. Terrestrial, it cannot climb trees, but can climb up the sides of wired enclosures. Under stress it takes to thick cover or holes. Normally solitary, also in pairs or family parties. By day it lies up in disused Antbear or Springhare holes. Will also use and adapt holes in rocky koppies. **Food:** Mainly insects, as well as frogs, murids, reptiles, millipedes, spiders, scorpions, and vegetable matter.

Genus *Rhynchogale*

Rhynchogale melleri
Meller's Mongoose
Meller se Muishond

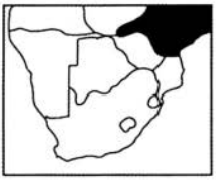
68.8

A medium-sized mongoose with long coarse fur. General colour a grizzled light brown. The tail may be black, brown or white. HB 47 cm. T 36 cm. Ht 15–18 cm. Mass 3 kg. **Spoor:** Has five toes on the fore- and hind-feet, but the first toes of both the fore and hind do not show in the spoor. The first claw of the fore may sometimes barely touch the ground, while the first claw of the hind does not. The claws on the other toes of the fore are short, curved and sharp, about 8 mm across the curve. Those on the hind are slightly heavier, less curved and about the same length. The toes on the hind-feet are generally longer and larger than those on the fore-feet. The larger size of the hind-feet shows in the spoor. Spoor illustration based on specimen studies with reference to Smithers (pers. comm.). A scratcher rather than a digger, the short claws of the front feet being ill-adapted for digging. **Habitat:** A savanna species particularly associated with open woodland or grassland with termitaria. **Habits:** Nocturnal. Solitary, or female with young. Terrestrial. **Food:** Termites, beetles, grasshoppers, small rodents, lizards and wild fruits.

Genus *Bdeogale*

Bdeogale crassicauda
Bushy-tailed Mongoose
Borselstertmuishond

68.9



Similar in size to Meller's Mongoose, but is darker, having a dark greyish-brown overall colour and a long coarse coat. The tail is very bushy. HB 45 cm. T 25 cm. Ht 15 cm. Mass 1,9 kg. **Spoor:** Has four toes on the fore- and hind-feet. The front have stout, curved claws, which usually show considerable wear, and are up to 9 mm long over the curve. Those on the hind are up to 11 mm over the curve. The fore-foot has a proximal pad immediately behind the intermediate pads, but it is not known whether it shows in the spoor. Spoor not recorded; similar to 68.8. **Habitat:** Woodland, floodplain, rocky koppies. **Habits:** Little is known about its habits. Nocturnal and solitary. **Food:** Insects, rodents, reptiles, as well as frogs, millipedes, spiders and scorpions.

Genus *Paracynictis*

Paracynictis selousi
Selous' Mongoose
Kleinwitstertmuishond

68.10

A small but long and slender mongoose with long soft fur. Tail is long and bushy with a white tip. Colour is an overall white-grey; legs dark. It is smaller than the White-tailed Mongoose, and the tail is white only for a short section towards the tip. HB 40 cm. T 38 cm. Ht 15–18 cm. Mass 1,7 kg. **Spoor:** Has four toes on the fore- and hind-feet. The claws on the fore are slightly curved and about 8–10 mm long, but usually show considerable wear. Those on the hind are straight and the same length. Normal movement is a quick walk, the animal pausing frequently to investigate possible food sources. An avid digger and scratcher, and will dig among litter or at the bases of tufts of grass for subterranean beetle larvae. Excavates its own burrow in sandy substrate, or will use holes made by other animals in harder substrate. Spoor illustration based on specimen studies with reference to Smithers (pers. comm.). **Habitat:** A savanna species associated with more open areas of scrub, woodland, floodplain or grassland. Does not occur in desert, semi-desert or forest. Has a preference for sandy substrate where it can excavate its own burrows, but also uses holes excavated by other animals in harder ground. Areas with mean annual rainfall from about 400 mm to 1 000 mm. Not dependent on the availability of water. **Habits:** Nocturnal. Terrestrial, with no arboreal tendencies. Normally solitary, also in pairs. Lies up in burrows during the day. Locates food by smell. **Food:** Mainly insects, but also spiders, scorpions, centipedes, rats, mice, small birds, eggs of birds and reptiles, lizards and snakes.

Genus *Cynictis*

Cynictis penicillata
Yellow Mongoose
Witkwasmuishond

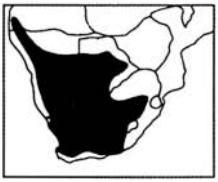
68.11

A small mongoose with a short pointed muzzle. The colour varies from a richly coloured tawny-yellowish in the southern parts of the range to a grizzled, greyish in the northern parts. The former have long white-tipped tails and long-haired coats, the latter have shorter tails with no white tip and the body is covered with short hair. Botswana: HB 30 cm. T 21 cm. Mass 590 g. Orange Free State: HB 34 cm. T 24 cm. Mass 830 g. Ht 15–18 cm. **Spoor:** Has five toes on the fore-feet and four on the hind-feet. The first toe of the front foot is set far back of the other four and does not mark in the spoor. The claw of the first toe does not usually mark in the spoor, but may sometimes touch the ground. The other four toes of the fore-foot have long claws measuring up to 10 mm over the curve. Those on the hind-feet are shorter, at about 7 mm. The proximal pads of the fore-feet are set high up and do

not mark in the spoor. A good digger, it commonly scratches in piles of debris and in dung in search of termites and other insects. Because of the soil which is thrown up in excavation, extensive warrens are sometimes situated eventually on a low mound. **Habitat:** Associated with open country, generally of the South West Arid Zone, but also extending into savanna. Does not occur in desert, forest or areas of thick bush. Areas of mean annual rainfall of about 100 mm to 800 mm. Independent of water supply. **Habits:** Predominantly diurnal, with some nocturnal activity. In the vicinity of humans it may become nocturnal. Gregarious, living in colonies of up to 20 or more, in warrens. Often shares warrens with Ground Squirrel (*Xerus inauris*) and Suricate (*Suricata suricatta*). Yellow Mongoose wanders more widely from the warrens than the other two species. It is terrestrial, with no arboreal tendencies. **Food:** Predominantly insectivorous, but also takes mice, small birds, reptiles, scorpions, centipedes, spiders and frogs. May raid hens' eggs and chickens, but is deterred by wire netting.

Genus *Suricata*

Suricata suricatta
Suricate
Stokstertmeerkat
68.12



Small and stockily built. Conspicuous black rings around the eyes. General colour is light grizzled fawn with dark brown transverse bands on the back, and a slender tapering tail with a black tip. HB 28 cm. T 22 cm. Ht 15 cm. Mass 730 g. **Spoor:** Has four toes on the fore- and hind-feet. The claws on the front feet are strong, curved and about 15 mm long over the curve, ideally adapted to digging. Those on the back feet are much shorter, about 8 mm across the curve. As it moves it is continually pausing to dig with the long front claws, turning over stones or scratching in debris for insects. Adept at digging, and excavates its own burrows. Colonies of up to 30 may live in warrens with many entrances. Warren sites may eventually become raised above the level of the surrounding ground. **Habitat:** Occurs throughout the South West Arid Zone, also in the fynbos of the southern Cape Province and the southern savannas. Areas of mean annual rainfall from about 100 mm to 600 mm. Absent from desert and forest, and avoids mountainous terrain. Associated with hard, often stony or calcareous substrate. Has a preference for open, arid country. **Habits:** Diurnal, not active before sun strikes burrows. Gregarious, living in colonies of up to 30 in warrens. Will take over the warrens excavated by Ground Squirrel (*Xerus inauris*) or Yellow Mongoose (*Cynictis penicillata*), which it will drive out. Will sun itself, sitting on its haunches. Always alert for predators from the air and ground, and when the alarm call is given the whole colony will dive for their burrows. **Food:** Mainly insects, as well as scorpions, spiders, small reptiles and myriapods.

Family CANIDAE Foxes, jackals and Wild Dog
Genus *Otocyon*

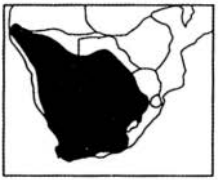
Otocyon megalotis
Bat-eared Fox
Bakoorvos
69.1

Looks like a small jackal. Has large black-edged ears, blackish legs and a bushy, black-tipped tail. The overall colour is silvery buffy-grey. HB 54 cm. T 30 cm. Ht 30 cm. Mass 4 kg. **Spoor:** Has five toes on the fore-feet, but the first toe is situated far back and does not mark in the spoor. The claws on the fore-feet are long and slightly curved, up to about 20 mm across the curve, and are ideally adapted to digging. Has four toes on the hind-feet, with short claws, about 7 to 10 mm long. When foraging it meanders

apparently aimlessly, alert to the faintest sound or movement in the surrounding grass. The holes which it digs when feeding are characteristically narrow and deep, as the two sets of front claws dig in exactly the same hole, an action that is quick and effective. Will defecate at the base of a bush and return to the same spot. Avoidance actions include turning suddenly, even when running at high speed, doubling back, twisting, jumping and dodging. **Habitat:** Particularly associated with open country within the South West Arid and southern savanna zones, which have a mean annual rainfall of about 100–600 mm. Occurs on open grassland, with a preference for areas of short grass, in open woodland and karoo scrub. Does not occur in Namib Desert or in montane or evergreen forest. Habitat requirements may also be determined by the occurrence of the Harvester Termite, *Hodotermes mossambicus*, which is an important food item. **Habits:** Both diurnal and nocturnal. During the hotter times of the day, from about 11h00 to 16h00, it lies up in the cover of dense bush, tall grass or holes in the ground. Will adjust Antbear or Springhare holes or excavate its own. When foraging it moves around apparently aimlessly, alert to the faintest sound or movement in the grass. If it detects a sound it will locate the exact position of subterranean noise among grass roots with its ears close to the ground. The two sets of front claws dig in exactly the same hole in a quick and effective action, making a narrow and deep hole. Scent is well developed, sight apparently less so. The pair bond is very strong and it may mate for life. Pairs or family parties, consisting of two adults and up to four young, are often seen. **Food:** Mainly insects, in particular the Harvester Termite, *Hodotermes mossambicus*; also scorpions, murids, reptiles, spiders, millipedes, centipedes and wild fruit.

Genus *Vulpes*

Vulpes chama
Cape Fox
Silwervos
69.2



A small fox, with large pointed ears and a short, pointed muzzle. The upper parts of the body look silvery grey, the under parts pale buffy. The bushy tail is pale fawn with a black tip. HB 55 cm. T 36 cm. Ht 35 cm. Mass 3 kg. **Spoor:** Has five toes on the fore-feet, but the first toe and claw do not mark in the spoor. Has four toes on the hind-feet. The claws on the front feet are thin, sharp and curved, about 15 mm in length across the curve. Those on the hind-feet are the same shape and about the same length. **Habitat:** Associated with open country, open grassland, grassland with scattered thickets, or semi-desert scrub, penetrating marginally into open dry woodland and into the fynbos of the southwestern Cape Province. **Habits:** Predominantly nocturnal, with peaks of activity just after sundown and before first light. By day it lies up in holes or in the cover of stands of tall grass. Is a good digger, and will dig its own shelters or adapt those of other animals. Vocalisation is a high-pitched howl and a bark. Generally solitary, it is asocial compared with other canids. The foxes only have contact with each other at the time of mating, and females maintain contact with young until they are ready to disperse. **Food:** Mainly mice and insects; also small mammals, scorpions, spiders, centipedes, birds and eggs, reptiles, carrion, wild fruit and green grass. Where found to eat domestic stock, it has been impossible to determine whether these had been killed by foxes or taken as carrion. The Cape Fox is not a harmful predator and control measures are not economically justifiable or ecologically desirable.

Canis mesomelas
Black-backed Jackal
Rooijakkals

70.1

Characterised by reddish body colour, black saddle on the back, and bushy, black-tipped tail. HB 72 cm. T 33 cm. Ht 38 cm. Mass ♂ 8 kg, ♀ 7 kg. **Spoor:** Has five toes on the front feet, but the first toe, which carries the dew claw, is set well back and does not mark in the spoor. The hind-feet have four toes. The claws are broad at the base and relatively short, measuring about 15 mm over the curve. Normally moves at a trot, leaving a trail in which both fore-foot tracks lie on one side and both hind-foot tracks on the other side. When hunting it walks around slowly, searching for prey. **Habitat:** Wide habitat tolerance, occurring in the South West Arid and southern savanna zones, in areas with mean annual rainfall of about 100–1 000 mm. Associated with open terrain. The only species of jackal that occurs in arid areas, but in parts occurs alongside the Side-striped Jackal in better-watered areas. Absent from forest. Where it occurs in the same areas as the Side-striped Jackal, it occupies the more open conditions while the Side-striped Jackal occupies the river valleys. Independent of water. **Habits:** Both diurnal and nocturnal. In developed areas it is mainly nocturnal. Normally occurs in pairs or solitary, as well as family parties consisting of parents with 3 to 4 young. Aggregations up to 10 may be found at carcasses. Terrestrial. Senses are acute, particularly sense of smell. Will follow up the downwind scent of a dead animal from a distance of well over a kilometre. Rests in holes, in rock crevices or piles of boulders. Wary of humans, but will at night move in the close vicinity of human dwellings and urban areas. Vocalises with a long-drawn-out howl followed by a stacatto yapping. Mated pairs are territorial and will mark and defend their territories. **Food:** Mainly carrion, but also small mammals, such as rats and mice, insects, vegetable matter, birds, reptiles, sun spiders, scorpions, centipedes and green grass. Independent of water, but will drink when available.

Canis adustus
Side-striped Jackal
Witkwasjakkals

70.2

A large jackal with an overall grey or greyish-buff colour. Has a faint black-and-white stripe along the side and a white-tipped tail. HB 72 cm. T 36 cm. Ht 38 cm. Mass 9 kg. **Spoor:** Has five toes on the front feet, but the first toe, which carries the dew claw, is situated far back and does not show in the spoor. Has four toes on the hind-feet. The claws on the front feet are up to about 20 mm over the curve, those on the hind are shorter at about 15 mm. Moves at a walk or more typically at a slow trot, giving the appearance of being more sluggish in its actions than the Black-backed Jackal. Spoor illustration based on photographs and sketches provided by Smithers (pers. comm.). **Habitat:** Avoids open savanna grassland, where it is replaced by the Black-backed Jackal, favouring more thickly wooded country, but does not occur in forest. Associated with well-watered habitat, not found in drier terrain utilised by the Black-backed Jackal. Occurs at sea level up to altitudes of 2 700 m. **Habits:** Nocturnal, with peaks of activity early in the night and just before sunrise. Occasionally active just before sunset or after sunrise until about 08h00. By day it lies up in holes in the ground or in piles of boulders. Normally solitary, pairs or family parties consisting of a female with young. May be active in close proximity of human dwellings and urban areas. Vocalises with a series of melancholy yaps, lacking the long-drawn-out howl characteristic of the Black-

backed Jackal. Terrestrial. **Food:** Mainly vegetable matter, including wild fruits and agricultural crops; also small mammals, predominantly rats and mice, insects, carrion, birds and reptiles.

Genus *Lycaon*

Lycaon pictus
Wild Dog
Wildehond

71

Dog-like in appearance, its body is blotched with black, yellow and white. It has large rounded ears and white-tipped bushy tail. HB 80–108 cm. T 30–40 cm. Ht 70–75 cm. Mass 18–28 kg. **Spoor:** Has four toes on the fore- and hind-feet, each with short, powerful claws. **Habitat:** Associated with open plains and open savanna woodland. Utilises open country because it relies on sight for hunting. Avoids forest or woodland with thick underbush or tall grass cover. Independent of water, but will drink when available. **Habits:** Adapted to living in packs of about 10–15 individuals, up to 50. Pack-hunting increases the probability of success and is more efficient. Hunts by sight, normally in the early morning and late evening. They are coursers, the pack moving on a broad front up to the prey in open country, breaking into a run when the prey runs off. The prey is singled out by the pack leader and relentlessly pursued, sometimes for several kilometres at sustained speeds of up to 48 km/hour. Tolerant of vultures and jackals, but Spotted Hyaena is actively resisted. Hyaenas do not have the mobbing instinct and are no match for a pack of Wild Dogs. Generally active only during daylight hours, most active around sunrise and the late afternoon. Known to hunt on moonlight nights. Lies up during the heat of the day. **Food:** Mainly smaller to medium-sized antelope; also hares and the young of the larger bovids.

Family HYAENIDAE Aardwolf and Hyaenas
Subfamily PROTELINAE
Genus *Proteles*

Proteles cristatus
Aardwolf
Aardwolf

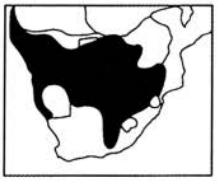
72

About the size of a jackal, but has the shape of a hyaena, with shoulders sloping down to the back legs. Has a thick-haired mane on the back and a bushy black-tipped tail. General colour is yellowish brown or buff, with vertical stripes on the body. HB 68 cm. T 25 cm. Ht 50 cm. Mass 9 kg. **Spoor:** Has five toes on the fore-feet, but the first toe is situated high up and does not mark in the spoor. Has four toes on the hind-feet. The claws are narrow when viewed from above, but in side view broad at the base and strongly built, and about 20 mm long over the curve. Defecates in oval-shaped middens which tend to be grouped within the foraging area. A narrow trench is excavated with the fore-feet, into which it defecates, after which the faeces are covered up by scraping with the front feet. Tends to urinate at the middens, again covering up with soil. When foraging it moves slowly, hearing and scent guiding it to where termites are active. It laps these up with its broad tongue. May scratch with the front claws or use its lower incisor teeth to excavate. **Habitat:** Wide habitat tolerance. Occurs in South West Arid and Southern Savanna zones, in open karroid associations, grassland and scrub, and open savanna woodlands. Does not occur in desert or forest. Generally associated with more open areas. Is independent of water. Dependent on the availability of various species of termites. Occurs in areas where mean annual rainfall ranges from 100 mm to 800 mm. **Habits:** Predominantly nocturnal. By day it

lies up in burrows, which may be disused Antbear holes or those of other animals adapted. Is an avid digger and may excavate its own burrows. Normally solitary, but sometimes in pairs or family parties. It is terrestrial. Its senses, particularly of hearing and sight, are well developed. **Food:** Mainly termites, as well as other insects, spiders, and millipedes.

Subfamily HYAENINAE
Genus *Hyaena*

Hyaena brunnea
Brown Hyaena
Strandjut
73.1



In profile higher at the shoulders than at the rump, it has a long, shaggy brown coat, a lighter-coloured mantle and a long bushy tail. The Brown Hyaena is smaller than the Spotted Hyaena. HB 120 cm. T 20 cm. Ht 80 cm. Mass ♂ 47 kg, ♀ 42 kg. **Spoor:** Has four toes on the fore- and hind-feet, each with a short, heavy claw. The head, neck and shoulders are massive, the extra mass carried by the fore-legs being shown in the size of the fore-feet which are much larger than the hind. !Xõ trackers identified Fig. 73.1a as that of a female and 73.1b as that of a male, the fore-feet of the male being relatively broader than that of the female. The difference in the shape of the toes is due to age. The more rounded toes of 73.1a are those of a young animal, while the more angular shape of the toes of 73.1b is due to age. The difference between the spoor of the Brown and Spotted Hyaenas can be seen in the relative difference in size between the front and back feet. In the Brown Hyaena the back feet are much smaller than the front feet, while in the Spotted Hyaena the difference is not nearly so marked (Mills, pers. comm.). The adult Brown Hyaena is also smaller than the adult Spotted Hyaena. The Brown Hyaena defecates in latrines which are scattered throughout its territory but tend to be concentrated around the territorial boundary. It scent-marks on grass stems, bushes or rocks. Although it will freely use paths and roads when foraging, its movements are more inclined to be erratic. **Habitat:** Occurs in desert, with mean annual rainfall of less than 100 mm, in semi-desert, open scrub and open woodland savanna with a maximum annual rainfall of up to 650 mm. In the Namib Desert it scavenges along the open beaches. Cover in which to lie up by day is essential. Independent of water, but will drink when available. It makes use of tsamma melons (*Citrellus lanatus*) and gemsbok cucumbers (*Acanthosicyos naudianus*) for water requirements. **Habits:** Predominantly nocturnal, active from about 18h00 to 08h30 in the summer and from about 16h30 to 06h00 in the winter. Diurnal activity is atypical. By day it lies up in holes in the ground or in the shelter of bushes or clumps of tall grass. Lives in groups that occupy fixed territories and will scavenge communally, but forage solitary. Group sizes vary from about 4 to 6 in January rising to about 14 in July, depending on the birth of cubs and subadults leaving the group. Senses are well developed, especially that of scent, since it can detect carcasses over considerable distances. Night sight is also well developed. **Food:** Predominantly a scavenger, but also hunts small mammals, birds, reptiles, and eats fruit and insects. Keeps clear of Lions, but will easily take possession of the kills of Cheetah, and has been known to steal from Leopards. Wild Dogs will drive it off carcasses; they are wary of Spotted Hyaenas. Black-backed Jackals are known to trail it when foraging and are their greatest competitors for food.

Crocuta crocuta
Spotted Hyaena
Gevlekte Hiëna
73.2

Characteristically the shoulders are heavier and stand much higher than the hind-quarters. The dull yellowish coat is marked by irregular dark spots. HB 136 cm. T 26 cm. Ht 80 cm. Mass ♂ 60 kg, ♀ 70 kg. **Spoor:** Has four toes on the fore- and hind-feet, each with a short, heavy claw. The heavy build of the fore-quarters is reflected in the size of the front feet, which are larger than the hind. In the Brown Hyaena the back feet are much smaller than the front feet, while in the Spotted Hyaena the difference is not nearly so marked (Mills, pers. comm.). The adult Spotted Hyaena is also larger than the adult Brown Hyaena. Territory boundaries are assiduously scent-marked with a creamy exudation from the anal glands, by 'pawing', which applies scent from the interdigital glands, or by defecating at latrines. Latrines are often situated on or near boundaries of territories. At a kill of a large prey, an individual would urinate and thereafter scrape the soil; others smelling it would follow suit, later defecating and eventually creating a temporary latrine one or two metres in diameter. Moves widely, up to 80 km. Movement is usually at a walk; at its fastest, a bouncing gallop. When walking it can cover very long distances. In chasing prey it can hold a fast gallop, at speeds of 40 to 50 km/hour, for distances of up to about 4 to 5 km. There is a significant difference in size of individual stools between those of the Spotted Hyaena and the Brown Hyaena. The former have an average mass of 160,92 g as against those of the Brown Hyaena at 45,78 g. Part of the reason is that those of the Brown Hyaena contain a large percentage of hair. Spotted Hyaenas characteristically regurgitate oral casts and so get rid of this undigestible part of the food, whereas in the Brown Hyaena, casts are rarely found. Assemblages of bones are characteristic of hyaena breeding dens, but these are never so extensive in the case of the Spotted Hyaena as in the Brown Hyaena. **Habitat:** A savanna species associated with open plains, open woodland and semi-desert scrub. Absent from forest, except marginally. Dependent on the availability of water and will travel long distances to obtain it, but can go without water for periods of up to a week. An essential requirement is a plentiful food supply. **Habits:** Social organisation is based on a matriarchal system of clans. These number up to 80 in East Africa, but only about 8 to 12 in the southern parts of its distributional range. Territories are defended from members of other clans. Senses of sight, smell and hearing are acute, and it has very good night vision. Predominantly nocturnal, but also active by day. During the hotter parts of the day it rests in the shade of bushes, trees or among piles of boulders, or it will use holes in the ground. Its call is a characteristic series of long-drawn-out *whoops*, each beginning low and rising high. Also grunts, groans, giggles, yells. The characteristic giggling can be heard when a number congregate at a carcass. **Food:** Predominantly large- or medium-sized ungulates, but will hunt or scavenge a wide range of other prey, including Springhare, birds, fish, reptiles, crabs, snails and termites as well as fruit. An active predator in its own right. Also scavenges and will try to steal food from other predators. Locates a carcass by observing vultures circling and descending on it. Dependent on water, but can go without water for up to a week. Where game species have been exterminated and cattle introduced, it is considered a problem animal.

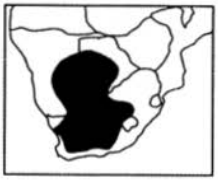
Family FELIDAE Cats

Spoor: All members have five toes on the fore-feet and four toes on the hind-feet. The first toes on the fore-feet, with the 'dew claws', are situated far back and do not mark in the spoor. In most species the sharp, curved claws of the other toes are retracted into sheaths when not in use, and do not mark in the spoor. The claws are protractile rather than retractable, for in their normal position, with muscles at rest, they are retracted within the sheaths, the action of the ligaments being to extend them when they are required. The Cheetah is the exception for, although the claws can be extended, they do not retract into sheaths and remain exposed.

Genus *Felis*

Felis nigripes
Small Spotted Cat
Klein Gekolde Kat

74.1



The smallest cat occurring in the Subregion. The general colour is tawny, marked with large black spots and transverse stripes on the shoulder. It has three black bands around the legs, and a bushy tail with a black tip. HB 40 cm. T 18 cm. Mass ♂ 1,6 kg, ♀ 1,1 kg. **Spoor:** Footprints are much smaller than any of the other cats, although the spoor of young African Wild Cats or Domestic Cats would be very similar. While spoor are about the same size as those of genets, the shapes of the toes and intermediate pads are different. **Habitat:** Particularly associated with open habitat with some cover, such as stands of tall grass or scrub bush. Associated with arid country with mean annual rainfall between 100 and 500 mm. Independent of water, but will drink if available. **Habits:** Exclusively nocturnal, not active until two or three hours after sunset. During the day it lies up in disused Springhare or Antbear holes or holes in termite mounds. Solitary, but probably two or more males will temporarily accompany a female in oestrus. Capable of climbing trees, but is almost exclusively a terrestrial feeder. If disturbed it quickly takes cover. **Food:** Mainly murids, as well as spiders, insects, reptiles and birds. Unlikely that it kills lambs and questionable whether it is even capable of dealing with a fully grown chicken.

Felis lybica
African Wild Cat
Vaalboskat

74.2

Looks very much like the Domestic Cat, but slightly larger. General colour from greyish to buffish or ochraceous, with dark spots and stripes. Males: HB 60 cm. T 30 cm. Mass 5 kg. Females: HB 52 cm. T 30 cm. Mass 4 kg. **Spoor:** The footprints of the African Wild Cat are similar in shape and size to those of the Domestic Cat. Like the Domestic Cat, it also excavates a depression and carefully covers the scats by scraping with the front feet. **Habitat:** Wide habitat tolerance. From sea level up to about 3 000 m. Does not occur in areas where mean annual rainfall is less than 100 mm, but penetrates drier terrain along rivers. Usually absent from montane and tropical forest. **Habits:** Nocturnal, usually moving late after sundown. By day it lies up in the cover of underbush, reedbeds, stands of tall grass or rocky hillsides. Where adequate cover is not available, it lies up in holes excavated by other animals. Solitary, except when several males accompany female in oestrus. Terrestrial, but is adept at climbing trees under stress or when hunting. Highly territorial. **Food:** Mainly rats and mice, as well as birds, reptiles, insects, spiders and small mammals such as hares, Springhare and the young of small antelope.

Felis catus
Domestic Cat
Huiskat
74.3

Spoor: See also 74.2. The Domestic Cat is an introduced species which has become feral in many parts of the Subregion. Its ancestors were African Wild Cats, *Felis lybica*, domesticated by the Egyptians from about 3 000 B.C. A process of selection by humans, continued over the centuries, led to the great variety of Domestic Cats existing today. Has a very wide habitat tolerance and has established itself in parts of the Kalahari as well as in the sub-Antarctic conditions of Marion Island. Has interbred with the indigenous African Wild Cat, *Felis lybica*, in the vicinity of settlements, and the danger exists that, in time, pure-bred *F. lybica* will no longer be found in the Subregion.

Felis serval
Serval
Tierboskat
74.4

A slender cat with long legs, small head, large ears and spotted and barred coat. The general colour is yellow with black spots. HB 80 cm. T 30 cm. Ht 55–60 cm. Mass ♂ 11,1 kg, ♀ 9,7 kg. **Spoor:** Compared to that of the Caracal, the Serval has narrower footprints, and the indentation at the front of the intermediate pads is not as prominent. Like other small carnivores, it tends to use established paths or roads to reach hunting areas, even if they entail a longer journey, rather than use a more direct route through rough country. Wanders widely at night, covering at least 3–4 km. The Serval drops scats randomly along roads or paths, usually choosing a patch of short grass or a depression. Takes little or no trouble to cover the scats, making no more than a few quick scratches with the hind-feet. **Habitat:** Confined to areas where there is permanent water, in the higher rainfall areas. Does not occur in desert or semi-desert, but can penetrate arid country along intrusions of better-watered terrain. Occurs in parts of the forests of West Africa. Requires adequate cover such as stands of tall grass, underbush or reedbeds in which to lie up by day. **Habits:** Predominantly nocturnal, but may sometimes be seen in the early morning or late afternoon. Normally solitary, also in pairs or females with young. Will hunt in swampy areas in search of vleirats (*Otomys* spp). When disturbed it takes cover in the nearest stand of tall grass or reedbeds or takes to hillsides where there is good cover of underbush. Will climb trees under stress. **Food:** Mainly rats and mice, as well as other small mammals, birds, reptiles, insects and sun spiders. Its flexible and narrow paws are used to hook mice and other prey out of their holes. Given the opportunity it will take poultry not penned at night, but is deterred by wire-netting.

Felis caracal
Caracal
Rooikat
74.5

The Caracal is stockier than the Serval, with shorter limbs, a short bushy tail and characteristic tufts on the ears. Overall colour is a reddish tan. HB 80 cm. T 30 cm. Ht 40–45 cm. Mass ♂ 14 kg, ♀ 11 kg. **Spoor:** Compared to those of the Serval, the footprints of the Caracal are broader and the indentation at the front of the intermediate pads is more prominent. **Habitat:** Associated with open savanna woodland, open grassland and open vleis, where cover is available. Can tolerate more arid conditions than the Serval, occurring in semi-desert, karroid and savanna areas. Absent from true desert and forest. **Habits:** Predominantly nocturnal, but apparently hunts by day in cool or cloudy weather. By day it is able to conceal itself in the most meagre cover. Solitary, only associating for mating and that for short periods. Normally terrestrial, it is adept at climbing trees. Its speed surpasses that of

most cats and it has extraordinary powers of leaping. Is generally silent. **Food:** Predominantly small- and medium-sized prey, including small mammals, the young of larger antelopes, birds and reptiles. Does not normally take carrion. Is known to kill small domestic animals such as sheep and goats.

Genus *Acinonyx*

Acinonyx jubatus
Cheetah
Jagluiperd
75.1

The Cheetah is a much longer, more slender animal than the Leopard, with longer legs, a much smaller head, and characteristic black 'tear marks' from the eyes to the mouth. The spots are much smaller and more rounded than the rosettes of the Leopard. HB 130 cm. T 70 cm. Ht 85 cm. Mass ♂ 54 kg, ♀ 43 kg. **Spoor:** Unlike those of other cats, the Cheetah's claws do not retract into sheaths but remain exposed. Although not touching the ground when immobile, their claws protract with every step taken, thus gripping the ground. Longitudinal ridges beneath the intermediate pads act like tyre-treads to prevent skidding. Normal method of locomotion is a slow, stately walk from which, if disturbed, it may break into a fast gallop. Unlike other cats that hunt by stalking, stealth and pouncing, the Cheetah hunts by setting up its prey, pursuing it at great speed, up to 110 km/hour, knocking it down and then seizing it by the throat to strangle it. **Habitat:** Open plains and the more open areas within savanna woodland, as well as the fringes of desert. Does not occur in forest or woodland with thick underbush or tall grass cover, although will use this for shelter. Not dependent on water, but will drink if available. **Habits:** Predominantly diurnal, most active around sunrise and sunset. During the hottest hours it lies up in the shade. Occurs in pairs or family parties of 3 or 4, and to a lesser extent solitary. Family parties consist of females with young, while males form bachelor groups. Males only join females when the latter are in oestrus. Terrestrial, the Cheetah is ill-adapted to climbing, and averse to swimming. **Food:** Mainly medium-sized or small bovids or the young of larger bovids, as well as terrestrial birds and small mammals such as hares and Porcupines. When two or more hunt together they may kill larger ungulates. In open country it simply walks up to the prey, pausing motionless when the prey shows anxiety. In woodland or scrub country it will use cover in stalking. Gives chase when the prey takes fright and runs off, maintaining maximum speed for about 300–400 m. Feeds rapidly, probably because other predators often drive it off its kills. Will also scavenge.

Genus *Panthera*

Panthera pardus
Leopard
Luiperd
75.2

The Leopard is more solid-bodied, with shorter, stockier legs, and a larger head than the Cheetah. Golden yellow in colour, with distinct black, light-centred rosettes. Males: HB 130 cm. T 80 cm. Ht 50–70 cm. Mass 50–60 kg. Females: HB 110 cm. T 75 cm. Ht 45–60 cm. Mass 30–40 kg. The Cape Mountain Leopard is usually smaller than that of the bushveld, with mass of 30–40 kg for males and 20–25 kg for females (Norton, 1984). **Spoor:** Two groups of !Xõ trackers independently identified Fig. 75.2a as the spoor of a female Leopard and Fig. 75.2b as that of a male Leopard. The footprints of males are not only larger than those of females, but also relatively broader. The toes of the female are also more slender than those of the male. A young male whose

footprints are the same size as those of a female can be distinguished by the shape of his footprints. The Leopard moves at a slow, casual walk. If disturbed, it bounds away in a bouncing gallop, which soon gives way to a fast trot, carrying it quickly out of sight as it makes for the nearest cover. It is a stalker and pouncer and does not maintain fast movement except over short distances. Only extends its claws when alarmed or when charging. Both males and females scent-mark by spraying urine. **Habitat:** Wide habitat tolerance. Occurs in areas of rocky koppies, rocky hills, mountain ranges, bushveld savanna and forest, as well as semi-desert. Will penetrate desert along avenues of watercourses. Cover to lie up in by day and to hunt from is essential. Not so well-adapted to open savanna environment, where it requires the cover of bush, tall grass or rocky terrain. Independent of water, but will drink when available. **Habits:** Solitary, except during mating season or when female is accompanied by young. Mainly nocturnal, it has some diurnal activity in undisturbed areas. During the hotter hours of the day it lies up in dense cover, the shade of rocks or caves. Where shade is not available it will use holes in the ground. Predominantly terrestrial, it is a good tree-climber and negotiates steep rocky areas. Has considerable powers of leaping. Is a good swimmer. The Leopard is a secretive and silent animal. Its senses are well developed, particularly sight and hearing. **Food:** Dassies, rats and mice, hares, small to medium-sized ungulates, sometimes larger mammals such as Kudu and hartebeest, birds, baboons, snakes, lizards, insects, scorpions and some of the smaller carnivores, such as jackals and Domestic Dogs. Will also scavenge. When natural prey is scarce it kills domestic stock. There are many records of healthy Leopards turning into man-eaters, but such behaviour is atypical of the Leopard in the Subregion. Protects its kill actively and aggressively against other predators and vultures.

Panthera leo
Lion
Leeu
75.3

The largest of the African carnivores, the colour of the body is sandy or tawny, the males carrying a mane of thick hair around the neck. HB 145–200 cm. T 67–102 cm. Ht 75–125 cm. Mass 120–200 kg. Males larger and heavier than females. **Spoor:** Two groups of !Xõ trackers independently identified Fig. 75.3a as the spoor of a female Lion, Fig. 75.3b as that of a young male Lion and Fig. 75.3c as that of a mature male Lion. The footprints of males are not only larger than those of females, but relatively broader. The toes of the female are also more slender than those of the male. A young male whose footprints are the same size of those of a female can be distinguished by the shape of his footprints. The Lion walks at about 3–5 km an hour. The claws are extended when charging, showing in the spoor. It scent-marks by spraying urine against shrubs, accompanied by scrape marks on the ground. Claw marks on the bark of trees indicate where it has sharpened its claws. **Habitat:** Wide habitat tolerance, but does not occur in forest. Will penetrate desert along avenues of watercourses, and is common in semi-desert areas. Independent of water, but will drink regularly if available. Requires ample food resources in the form of medium- and large-sized game animals, shade in which to lie up during the heat of the day and some cover to facilitate stalking of prey. **Habits:** Predominantly nocturnal and active around sunrise and towards sunset, but often also active

during daylight hours. During the heat of the day it lies up in the shade. Terrestrial, but is a good climber. Its life consists of short periods of intense activity, when hunting or exhibiting aggression, and longer periods of slow movement or relaxation. If suddenly disturbed during resting periods it can quickly become aggressive. The Lion lives and hunts in prides which may number from a few individuals to 30 or more. Hunts in areas where prey is concentrated and the cover is relatively poor; and it is therefore to its advantage to cooperate in hunting. Occupies home ranges that vary in size. Solitary males ousted from prides, and solitary subadult males and females may also occur and tend to be nomadic, not occupying established territories. **Food:** Mainly medium-sized to large ungulates, but will kill a wide range of mammals, from mice to Buffalo. Also birds, reptiles and even insects. Has been recorded to kill and eat Spotted Hyaenas, Leopards, Cheetahs, jackals, civets, Honey Badgers, Caracal and even Crocodiles. Is known to appropriate the kills of other carnivores such as hyaenas and Leopards, and will take carrion. Is an expert stalker and will make use of the barest cover to get close to its prey. If the prey shows signs of anxiety it will freeze motionless until the former relaxes and continues feeding before moving forward again. A careful stalk is followed by a quick rush to seize the animal. In the final short sprint a Lion may cover 100 m in 6 seconds. Remains silent while hunting. Prey is killed by strangulation. Where normal prey is absent, will take cattle and small stock. Can also become a man-eater.

Order TUBULIDENTATA
Family ORYCTEROPODIDAE
Genus *Orycteropus*

Orycteropus afer
Antbear (Aardvark)
Erdvark

76

The Antbear has a humped back, long pig-like snout, long donkey-like ears and a thick tapering tail. Its body is pale yellowish-grey and sparsely covered with hairs. HB 105 cm. T 55 cm. Ht 60–65 cm. Mass 53 kg. **Spoor:** Has four toes on the fore-feet and five on the hind-feet. The toes are armed with stout, broad claws, ideally adapted to digging in the hardest substrate. Has webs between the second and third, and third and fourth toes, on the fore- and hind-feet. There are no plantar pads on the front feet. Walks on its toes with the tail held clear of the ground. The fore footprint shows three toes and their claws, with only the tip of the fifth claw marking in the spoor (the first being absent). The hind footprint shows the three middle toes and claws, with only the tips of the first and fifth claws marking in the spoor. The hind footprints usually lie close behind or slightly overlying the fore. When pausing it sinks onto its haunches and the whole of the hind-feet marks, with the impression of the tail between them. Normally travels 400–9 600 m in an hour. Uses dirt roads and paths to move to feeding grounds and is capable of moving up to 30 km in a night. When foraging it moves slowly with its nose to the ground, moving around irregularly searching for prey. Eyesight is apparently not very good, for as it runs off when disturbed, it often collides with tree trunks or crashes its way through bushes, as if unable to perceive the easier routes open to it. Apart from small exploratory scratchings, it makes three types of excavations. The first consists of shallow diggings to gain access to food. The soil is excavated with the claws of the front feet, pushed back under the body, and thrown clear with the

hind-feet. The second type of excavation consists of temporary refuges and may penetrate several metres shallowly underground. These are dug overnight and may be re-used sporadically. The third type of excavation is the most permanent and is used as a shelter in which the young are born. These shelters may extend deep into the ground, and have an extensive burrow system with numerous chambers and several entrances. Occupied burrows are often characterised by swarms of small flies which congregate in the shade inside the entrance. After entering the burrow for the daytime rest, the Antbear closes the burrow immediately behind it with soil. An Antbear can burrow at a prodigious rate and can rarely be dug out, as it digs much faster than its pursuers can. Unoccupied burrows provide shelter and safe refuge for a wide range of mammals, birds, reptiles and insects. It buries its faeces and does not use latrines. The droppings are ovoid and consist mainly of sand and other indigestible matter. **Habitat:** Wide habitat tolerance, including open woodland, scrub and grassland, especially where these are associated with sandy ground. Is capable, however, of utilising heavy soils. Particularly associated with heavily utilised grassland where there are termite populations. Independent of water. **Habits:** Almost exclusively nocturnal, only seen during daylight hours under exceptional circumstances. Is a late mover, seldom seen before 21h00. By day it hides in burrows which it excavates. Solitary, except female with young or pairs at time of mating. Senses of smell and hearing well developed, but sight poor. If suddenly disturbed, it may freeze momentarily and then run off. **Food:** Mainly termites and ants, including the eggs and larvae. Termites are taken chiefly during the wet season and ants during the dry. Antbears are often more numerous where game animals or stock are plentiful as the trampled grass and dung create favourable conditions for termites and ants. Also eats beetle larvae, locusts and wild cucumber seeds. Food is located by smell. When a nest is located, it digs until the nose and mouth can be inserted. Inserts its long, slimy tongue into the tunnels, withdrawing it into the mouth covered with ants.

Order PROBOSCIDEA
Family ELEPHANTIDAE

Loxodonta africana
Elephant
Olifant

77

The Elephant is the largest living land mammal. The trunk is used for gathering food, sucking up water, chastening youngsters, smelling, trumpeting, breathing, and as a weapon. Apart from being organs of hearing, the ears have many blood vessels which facilitate heat loss when the Elephant flaps its ears to cool off. The tusks are used as weapons, as well as for digging and prising bark off trees. Females can be distinguished from males by the much more pronounced forehead. Males: Ht 3–3,5 m, up to 4 m. Mass 4 500–5 000 kg, up to 6 000 kg. Females: Ht 2,4–2,8 m, up to 3 m. Mass 2 200–2 500 kg, up to 3 000 kg. **Spoor:** The Elephant has five hoofed toes on the front feet and four on the hind. Sometimes the outer hoofs on the front feet and the outer and inner on the hind are missing, having been torn out or worn away. The feet have a thick layer of cartilage which acts as a shock-absorber. When placed on the ground in walking, the soles splay out, and when the foot is raised, they shrink. This layer allows the Elephant to move without making a sound. The soles

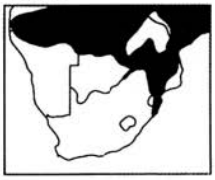
of the feet are horny and superficially cracked, the mosaic of cracks marking in the spoor. The random pattern of these cracks makes it possible to identify individual Elephants by their spoor. The front feet are round and larger than the hind, which are oval. The hind-feet of the female are more slender, as in Fig. 77a, than those of the male, as in Fig. 77b. (This has been confirmed independently by Oelofse, pers. comm.) It is also believed that an indication of the animal's shoulder height can be obtained by multiplying the circumference of the fore footprint by 2,5, but this needs to be confirmed by a systematic study. Elephants move at a steady walk of about 6 km/hour and tend to string out into single file, thereby creating well-worn paths which are regularly used over many years. Tends to move in relation to its preferred feeding areas and water supplies and can cover very long distances. Can be very destructive in its feeding habits, pushing over trees, pulling them up by the roots, or breaking off branches to get at the young fresh foliage. Will dig holes in sand close to the water's edge in river banks, to drink the clean, filtered water seeping through the sand. In drought years it will dig for water, using the tusks and the trunk. Is partial to wallowing in mud or dusting itself to protect the skin from the hot sun or to rid itself of parasites. Wet mud on leaves and branches along its trail may indicate that it has recently been at a waterhole or river. Rubbing of trees and stone is indicated by branches and stones with polished surfaces, especially near waterholes. **Habitat:** Wide habitat tolerance. Occurs in woodland, savanna, plains, semi-desert and on the fringes of the coastal Namib Desert or the Sudan savannas bordering the Sahara. Will wander down river courses in the Namib. Essential habitat requirements include clean, sweet water, a plentiful supply of food in the form of palatable grasses and browse plants, and some shade in which to shelter during the hottest hours of the day. **Habits:** Gregarious. Family groups consist of an adult female with her offspring or a number of closely related females with their offspring. Family groups may combine to form herds. Bulls join family herds only when a female is in oestrus. Bulls may join male herds or remain on their own. Very old bulls often live solitary lives. Large associations numbering hundreds of individuals of all age classes and sexes may be found. Elephant society is matriarchal. Young males leave family groups when they reach puberty. Home ranges vary in size, and the animal shows no territorial behaviour. Fights between bulls can develop over females in oestrus. Both diurnal and nocturnal. During the hottest hours of the day the Elephant stands under shady trees. Whenever it seeks water, it will bathe, and is partial to wallowing in mud or dusting itself to protect its skin from the hot sun. Can swim, or will walk on the bottom with the tip of the trunk above the water. Sense of smell very keen, but eyesight and hearing are not very good. Vocalisation consists of trumpeting and screaming when upset, and Elephants maintain contact with a deep rumbling. A feeding herd can be very noisy as they break branches down. When disturbed, the Elephant remains dead quiet and will move off without a sound. **Food:** Browse and graze, utilising a wide range of species; also eats the bark of certain trees. Partial to sweet, clean water.

Order PERISSODACTYLA
Family EQUIDAE Zebra
Genus *Equus*

In the equids the middle toe is fully developed and ends in a hoof. Only the vestiges of the second and fourth toes (the splint bones) are present, the first and fifth toes being absent.

Equus burchelli
Burchell's Zebra
Bontsebra (Bontkwagga)

78.1

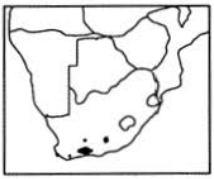


Burchell's Zebra may be distinguished from the two mountain zebras (*E. zebra*) by the yellowish or greyish shadow stripes between the black on the hind-quarters and the lack of the 'gridiron' pattern on top of the hind-quarters. Shadow stripes vary from distinct to missing altogether. The black stripes of individuals are never exactly alike. HB 230 cm. T 45 cm. Ht 136 cm. Mass 320 kg. **Spoor:** Two Shangaan trackers independently identified Fig. 78.1a and Fig. 78.1b as the spoor of female Zebras and Fig. 78.1c and Fig. 78.1d as those of male Zebras. This distinction was first pointed out to me by a Hei//um tracker employed at the Etosha Nature Reserve. The difference between the sexes is that the hind-hoofs of the female are more slender and more pointed than those of the male. This can be seen quite clearly when comparing Fig. 78.1a with Fig. 78.1d, but the difference between Fig. 78.1b and Fig. 78.1c is more subtle. Some individuals have hind-hoofs that are intermediate in shape, and it is therefore not possible to determine their sex by their footprints alone. The spoor of adult Burchell's Zebra are larger than those of domestic donkeys, but much smaller than those of adult horses. **Habitat:** A savanna species, partial to open areas of woodland, open scrub and grassland. Dependent on water, and seldom found more than 10–12 km from it. Does not occur in forest or desert and avoids areas of dense woodland except in transit. **Habits:** Generally active throughout the day. At night it rests for periods with short grazing spells in between. Gregarious, living in small family groups consisting of a stallion and one or more mares and their foals. Surplus stallions form bachelor groups or remain solitary. In Zebra herds consisting of many family groups, the stallion groups tend to take up position at the rear or on the flanks of the herd. Individual stallions will be attacked by stallions of family group and by adult mares to stop them from integrating with the family groups. When a family group is attacked by predators, the family group stallion will take up the rear position and defend his group by kicking or biting. Mares will defend their foals. Timid and shy, and approaches water with great caution. Senses of sight, smell and hearing are acute, and for this reason other species, such as wildebeest, are frequently associated with them, since the Zebra will alert them to signs of danger. **Food:** Predominantly a grazer, but will occasionally browse and feed on herbs. Partial to feeding in areas of short grasses.

Equus zebra zebra
Cape Mountain Zebra
Kaapse Bergsebra (Kaapse Bergkwagga)

78.2

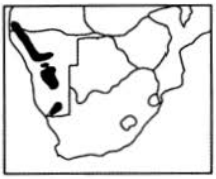
The Mountain Zebra differs from Burchell's Zebra in that the black body stripes do not continue onto the white under parts, and have no shadow stripes between them; moreover, on the rump the black markings form a 'gridiron' pattern which is a characteristic feature. The Mountain Zebra is smaller in body size than Burchell's Zebra, and the Cape Mountain Zebra is in turn smaller than Hartmann's Mountain Zebra. HB 225 cm. T 42 cm. Ht 125 cm. Mass 250 kg. **Spoor:** Although the hoofprints of the



Cape Mountain Zebra are identical to those of Hartmann's Mountain Zebra, they cannot be confused as their distribution does not overlap. Its spoor also cannot be distinguished from that of domestic donkeys, although the context within which it is found would probably tell which is which. The spoor of adult mountain zebra are smaller than those of adult Burchell's Zebra, though the distribution of the Cape Mountain Zebra does not overlap with that of Burchell's Zebra. **Habitat:** Occurred historically throughout the mountainous areas of the Cape Province, but today is confined to the Mountain Zebra National Park, Cradock, with small isolated populations in the Gamka, Kammanassie, Kouga and Baviaanskloof mountains, and introduced to De Hoop Nature Reserve. Closely confined to mountainous areas that offer the required types of grazing and supply of water, as well as shelter in the form of kloofs and ridges. **Habits:** Predominantly diurnal, most active for an hour or two after dawn and in the late morning and late afternoon. Activity continues until sunset in the summer and after dark in the winter. Rests between periods of activity. Drinks water daily, during the late morning and in the afternoon. Has a preference for clean water, avoiding muddy water. Dusting is regularly practised by rolling in the sand. Gregarious, breeding herds consist of a stallion and his mares with their foals, ranging in numbers from 2 to 13. When danger threatens, the stallion maintains a defensive position at the rear. At water the stallion leads to check for possible danger. The herd stallion may utter an alarm snort or a high-pitched alarm call. Will react to the flight or alarm signals of Black Wildebeest (*Connochaetes gnou*). Sensitive to adverse weather conditions, and during heavy rainstorms it ceases to feed and stands with its back to the rain. On cold mornings it tends to use east-facing slopes and stands with its body at right-angle to the sun's rays. Uses kloofs and caves for shelter. **Food:** Predominantly a grazer, but will also browse. Has three main grazing periods by day: from dawn to about 08h30 in winter, later in summer; from 10h00 to 12h30 in winter, irregular in summer; and from 14h00 to dusk in winter, 16h00 to dusk in summer.

Equus zebra hartmannae
Hartmann's Mountain Zebra
Hartmann se Bergsebra
(Bergkwagga)

78.3



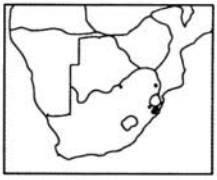
Hartmann's Mountain Zebra is slightly larger than the Cape Mountain Zebra. Ht 150 cm. Mass ♂ 300 kg, ♀ 276 kg. **Spoor:** Although the hoofprints of Hartmann's Mountain Zebra are identical to those of the Cape Mountain Zebra, their distribution does not overlap. Their spoor also cannot be distinguished from that of domestic donkeys, although the context within which it is found would probably tell which is which. In very hard, rocky terrain, such as in the Kaokoveld, the 'frog' of the Mountain Zebra is usually worn away, while that of the donkey is usually not. Where their distribution overlaps with that of Burchell's Zebra, they can be distinguished by the fact that the spoor of adult mountain zebra are smaller than those of adult Burchell's Zebra. The hoofs of Hartmann's Mountain Zebra grow very fast to compensate for the heavy wear which they encounter on the rocky substrate on which it lives. In grazing it moves slowly in a zig-zag pattern, with the group members narrowly scattered. **Habitat:** Prefers the ecotone of mountainous areas and flats. As the food supply on the mountains reaches low levels at the end of the dry season, about September, it moves to the flats, later returning to the mountains as the food supply there improves. Uses kloofs and krantzes as shelters from cold winds. Dependent on water.

Habits: Diurnal, most active shortly after first light in the morning and in the afternoon from 15h00 until sunset, but may be active for short periods in between. Where undisturbed, it may drink at any time of the day, but where disturbed it drinks at night. Gregarious. Family groups consist of a stallion with his mares and their foals. Stallion groups may temporarily attach themselves to family groups. Solitary stallions are occasionally found. When alarmed, a sudden, short, explosive snort will alert the group. During the hotter hours of summer days it rests in the shade of trees. Dust bathes regularly throughout the day. **Food:** Mainly a grazer. It is not known if it browses as well. Dependent on water, and where surface water is not available it will dig for it.

Family RHINOCEROTIDAE
Genus *Ceratotherium*

Ceratotherium simum
Square-lipped Rhinoceros (White Rhinoceros)
Witrenoster

79.1



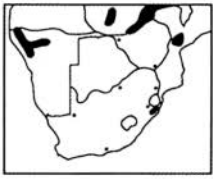
Characteristic features include the square upper lip and prominent hump above the shoulders. It is larger in size and has a longer head than the Hook-lipped Rhinoceros. HB 380 cm. T 100 cm. Ht 180 cm. Mass ♂ 2 000–2 300 kg, ♀ 1 400–1 600 kg. **Spoor:** Has three toes, each with a broad, stout nail, on the fore- and hind-feet. Compared with those of the Hook-lipped Rhinoceros, the nails of the Square-lipped Rhinoceros are relatively bigger and the gaps between them smaller. The spoor of an adult Square-lipped Rhinoceros is also bigger than that of an adult Hook-lipped Rhinoceros. The cushioned pads on the soles of the feet have a hard surface with a mosaic of irregular cracks. The random pattern of these cracks makes it possible to identify individual rhinos by their spoor. Walks slowly, one foot at a time, placing the hind-feet behind the fore-feet. When in a hurry it moves at a trot of up to 28 km/hour, and under stress canters and gallops at up to 40 km/hour. Tends to use established routes to water or preferred grazing areas. Regulates its body temperature by wallowing in mud or lying in muddy pools. Afterwards it will rub itself on tree trunks or boulders, which may become polished through continued use. Has a preference for short grass, which it crops to within a centimetre of the ground. The bite width of an adult is about 20 cm. Stands in one place, moving the head in an arc, then takes a step forward to repeat the process. Dominant bulls demarcate their territories by latrines and by spray-urinating along the boundaries. Outside his own territory he will urinate without spraying, in the same way that subordinate bulls urinate. Before and after defecating, scratching movements are made with the hind-feet. The type of vegetation consumed is evident from the droppings, according to which the latrines of Square-lipped Rhinos can be distinguished from those of Hook-lipped Rhinos. **Habitat:** Areas of short grass, adequate thick bush cover and relatively flat terrain. Wooded grasslands. Dependent on water. **Habits:** Grazing and resting at intervals of a few hours, at night, morning, late afternoon and evening. During the heat of the day it rests in the shade of trees. Occurs in small groups consisting of a dominant bull, subordinate bulls, cows and their offspring. Territorial bulls occupy clearly defined territories, which are defended against bulls from neighbouring territories. Cows have home ranges that may overlap with those of other cows or several territorial bulls. Has poor sight but acute senses of smell and hearing. Responds better to moving objects than those at rest. When downwind, will respond to human scent at about 800 m. Puffs when suddenly alarmed. **Food:** A grazer, with a

preference for short grass. Dependent on water; drinks regularly. Drinks mostly between 17h00 and 21h00, continuing after sundown, drinking less during the day. During the dry season it will drink at intervals of one to four days.

Genus *Diceros*

Diceros bicornis
Hooked-lipped Rhinoceros (Black Rhinoceros)
Swartrenoster

79.2



It is distinguished from the Square-lipped Rhinoceros by its smaller size, its pointed upper lip and its smaller head. HB 360 cm. T 70 cm. Ht 160 cm. Mass up to 1 000 kg. **Spoor:** Has three toes, each with a broad, stout nail, on the fore- and hind-feet. Compared with those of the Square-lipped Rhinoceros, the nails of the Hook-lipped Rhinoceros are relatively smaller and the gaps between them are bigger. The spoor of an adult Hook-lipped Rhinoceros is also smaller than that of an adult Square-lipped Rhinoceros. The cushioned pads on the soles of the feet have a hard surface with a mosaic of irregular cracks. The random pattern of these cracks makes it possible to identify individual rhinos by their spoor. Deposits its dung in latrines, but will also defecate randomly anywhere in its home range. After deposition the dung is vigorously scraped by the bulls with alternate kicks of the hind-feet, leaving scrape marks on the ground. The latrines may be used by a number of individuals, and in northern Natal many latrines are used by both species of rhinoceros. The type of vegetation consumed is evident from the droppings, according to which the latrines of the two species of rhinoceros can be distinguished. Spraying of urine and its habit of kicking its dung about and spreading it around with its horns may help to make its presence known in an area. **Habitat:** An adequate supply of scrubs and young trees up to about 4 m high from which to browse, is required. Will push over higher trees to obtain edible parts that are out of reach. Also requires well-developed woodland or thickets in which to shelter during the heat of the day. Occurs in wide range of habitats from forest to savanna woodland and scrub, but not in open plains. Dependent on water, seldom found more than 10–15 km from it. If not available it will dig for it in the sand in riverbeds. **Habits:** Solitary, or female with calf. Associations of an adult male with female or a number of individuals of all ages, are transitory. Rhinos are not territorial, and tend to avoid each other. Bulls may fight over a female. Where feeding areas are far from water, it is nomadic and will share tracks, feeding and resting sites, and water supplies with others. Active during the early morning or late afternoon. During the heat of the day it rests in the shade. Where undisturbed it usually drinks in the evening, but where disturbed it does so after dark. In dry country, where feeding grounds are far from water, it drinks every second or third evening. Sight is poor, but senses of hearing and smell are acute. When alarmed it gives a loud snort. **Food:** Mainly browse, but small quantities of grass are taken during the wet season. Bushes show little sign of breaking or tearing, characteristic of Elephant feeding. Will drink daily if water is available, or every second or third day if it is far from its feeding grounds.

Order ARTIODACTYLA Even-toed ungulates
Family HIPPOPOTAMIDAE
Genus *Hippopotamus*

Hippopotamus amphibius
Hippopotamus
Seekoei

80

A special adaptation for its aquatic life is the positioning of the eyes, nose and ears, which all protrude from the water when the rest of the animal is submerged. HB 370 cm. Ht 150 cm. Mass 2 000 kg. **Spoor:** Has four toes, each with heavy broad nails, on the fore- and hind-feet. The four toes are webbed to aid in swimming. On dry land it tends to use established routes, the ground eventually being worn deeply into narrow paths. These are grooved on either side by the feet, leaving a narrow raised central ridge of loose soil. It can run very fast on dry land. In extensive areas of swamp, the Hippo creates deep, clear channels through the reedbeds and permits freer movement of the water. Hippo will walk on the bottom in deep water, and even under these conditions it tends to use the same paths which become clearly marked on a sandy bottom. Territories are marked by piles of faeces, which it scatters over a bush or stone by flicking its tail from side to side. **Habitat:** Open water in which it can totally submerge is essential. Prefers permanent water with submerged sandbanks or gently sloping sandy banks where it can rest by day partially submerged. Also requires food supplies within its range of normal movement. **Habits:** A nocturnal feeder, it rests by day partially submerged in water. Gregarious, it occurs in schools of about 10 or 15, but may congregate in far larger numbers. Territorial, and males defend their territories against intruders. When it moves to its feeding ground at sunset the adult male leads the group, followed by the females and young. Where food is plentiful it remains in the vicinity of the resting pool, but moves up to 10 km or much further when food is scarce locally. Overnight movements to feeding grounds of up to 30 km have been recorded. Individuals may wander far from water. Can remain under water for five to six minutes, emptying its lungs with a loud blast as it surfaces. May venture into the sea. **Food:** A grazer, it prefers to feed on open areas of short green grass. An adult may eat about 130 kg of green grass in one night. A very close cropper, giving a lawn-like appearance with the horny edges of its lips. A proportion of the food is usually lost as it drops from the mouth in the process of plucking and mastication.

Family SUIDAE Pigs

Pigs have four digits on the fore- and hind-feet. The central pair of digits, which bear the weight of the animal, are armed with well-developed hoofs. The lateral digits, which may not always mark in the spoor, are armed with claw-like hoofs, or dew claws.

Genus *Phacochoerus*

Phacochoerus aethiopicus
Warthog
Vlakvark

81.1

The skin colour, often determined by the colour of the mud in which it wallows, is generally grey. Has characteristic tusks and wart-like protuberances on the face. HB 150 cm. T 40 cm. Ht ♂ 70 cm, ♀ 60 cm. Mass ♂ 80 kg, ♀ 56 kg. **Spoor:** Hoofs are narrower than those of Bushpigs, and the dew claws usually mark clearly in the spoor. Its movements are generally leisurely, but under stress will trot off at a fair speed. Defecates randomly and is prone to rubbing itself against any convenient object. **Habitat:** Open ground, grassland, floodplain, vleis and other open areas around waterholes and pans, as well as open woodland and

open scrub. Water not essential. Avoids thick bush, riverine and montane forest, forest and desert. **Habits:** Diurnal, it lies up in holes during the night. Usually adjusts disused Antbear holes to its own requirements. Remains in its hole during cold or stormy weather. During the hottest time of the day it rests in the shade. Wallows in mud, which serves as a means of temperature regulation and protection against biting flies. Sounders consist of an adult male, adult female and her offspring, and usually number 5 or less, but sometimes up to 10. Maternity groups, bachelor groups and solitary individuals are also found. Responds to the warning calls of other animals or birds, in particular to the oxpeckers (*Buphagus* spp), which climb over them in search of ticks. It grunts to maintain group contact, and snarls and snorts with aggressive display. **Food:** Generally a vegetarian, food includes grasses, especially freshly sprouting grasses, the underground rhizomes of grasses, sedges, herbs, shrubs and wild fruits. Prefers to graze on short grass and grasses growing in damp areas. When feeding it walks with its nose close to the ground, smelling out underground sources of food. In rooting it kneels on the front legs, using the upper edge of the hard snout as an efficient digging tool.

Genus *Potamochoerus*

Potamochoerus porcus
Bushpig
Bosvark

81.2

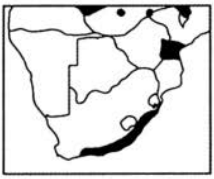
Overall colour varies, but is commonly reddish brown with a dorsal crest of long white hair. Males are slightly larger than females. HB 115 cm. T 40 cm. Ht 55–80 cm. Mass 62 kg. **Spoor:** Hoofs are broader than those of Warthogs, and the dew claws usually mark clearly in the spoor. Tends to feed in damper places or in litter, generally making less use of hard ground than Warthogs. Its broader hoofs are therefore better adapted to the type of terrain where it usually feeds. Makes continued use of the same routes to feeding areas, thereby forming narrow, clearly marked paths. Practises tree-marking by tusking, and defecates in latrines. **Habitat:** Forests, thickets, riparian undercover, reedbeds or heavy cover of tall grass. Essential requirements are dense cover and water. **Habits:** Predominantly nocturnal with some diurnal activity. Where subject to control it is strictly nocturnal. Gregarious, moving in groups of 6 to 8, sometimes up to 12, and occasionally in larger aggregations of up to 30 or 40. Sounders consist of a dominant boar and sow, other sows and juveniles. Wallows in mud, probably as a means of temperature regulation and protection against biting insects. Swims well, and will freely cross rivers. When foraging it grunts softly to maintain contact. The alarm call is a long-drawn resonant grunt. Lies up in dense cover when sleeping or resting, and remains alert. **Food:** Omnivorous, it will root with the hard upper edge of the snout in damp places and browse. Food includes underground rhizomes of grasses, bulbs, tubers, rhizomes of ferns, corms of nutgrass, wild and cultivated fruits, flowers of lilies, earthworms and the pupae of insects, as well as carrion. Has an association with Vervet Monkeys and baboons who dislodge fruit from trees.

Sus scrofa
Feral Pig
Wilde Huisvark
81.3

A domestic strain of pig that has taken to the wild and bred successfully. The Forestry Department released domestic pigs into its plantations in the southwestern parts of the Cape Province (Kluitjieskraal) and in the George area to control the pine-tree emperor moth (*Nudaurelia cytherea*), whose caterpillars defoliate pine trees. Herds of feral domestic pigs have also been reported in the Piketberg district of the Cape Province, in the mountains near Broekhuizen's Poort west of Grahamstown, as well as some farms in the Transvaal. Crosses between Bushpig (*P. porcus*) and feral domestic pigs are known.

Family BOVIDAE
Subfamily CEPHALOPHINAE
Genus *Philantomba*

Philantomba monticola
Blue Duiker
Blouduiker
82.1

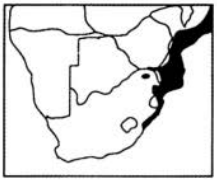


The smallest antelope found in the Subregion. The colour of the upper parts varies considerably, including a dark smokey-brown with a dark bluish sheen, rusty-brown, or dark brown. Has large eyes and slim legs, and both sexes carry tiny horns. HB 58 cm. T 8 cm. Ht 30 cm. Mass ♂ 4 kg, ♀ 4,5 kg. **Spoor:** Fig. 82.1a represents a typical Blue Duiker spoor, while Fig. 82.1b gives an indication of how small its footprints can be. Fig. 82.1c shows a more pointed variation. Within its dense habitat it creates well-marked paths between areas where it lies up and its feeding grounds or drinking places. **Habitat:** Confined to forests, thickets or dense coastal bush. Frequents forest glades and slightly more open parts of the underbush cover, but requires dense underbush to lie up in or in which to take cover when disturbed. At night it may feed on the forest fringes. **Habits:** Usually solitary, but pairs may associate temporarily or female with single young. Active in the early morning, when it may emerge from the dense undergrowth to browse on the underbush and forbs on the forest floor. Active after dark at least up to about 22h00, when it may move out to the more open areas on the fringes of the forest. Approaches open areas with great caution. Shy and timid, and at the least sign of danger runs for the cover of thick underbush. Normally silent. **Food:** A browser, it lives on the fine shoots and leaves of low-growing underbush and forbs and fruits fallen from trees. Will also graze on fresh green grass. The wasteful feeding habits of Samango Monkeys and baboons also supply it with fruit knocked off trees. Dependent on water, and drinks regularly.

Genus *Cephalophus*

Cephalophus natalensis
Red Duiker
Rooiduiker

82.2

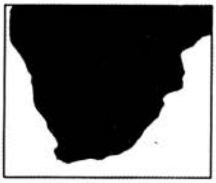


The colour of the upper parts is a deep chestnut-red or an orange-red colour. Both sexes carry short, straight horns. HB 100 cm. T 14 cm. Ht 35–45 cm. Mass 14 kg. **Spoor:** Fig. 82.2a represents a typical Red Duiker spoor, Fig. 82.2b a more rounded variation and Fig. 82.2c a more pointed variation. Red Duikers use communal dung heaps. **Habitat:** Associated with forests and dense thickets where water is available. Occurs in riverine forest, on forest-clad mountain slopes, in thickly wooded ravines and in dense coastal bush. **Habits:** Solitary or female with her offspring, or pairs in a loose association. Shy and secretive, it runs for the cover of the thickest bush when disturbed. Mainly nocturnal. **Food:** A browser, it lives on fallen wild fruits, the leaves and fine stems of low-growing shrubs, and dry fallen leaves.

Genus *Sylvicapra*

Sylvicapra grimmia
Common Duiker
Gewone Duiker

82.3

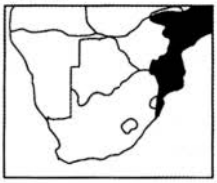


The colour varies from a grizzled grey to a yellowish-fawn. Only males carry short straight horns, although occasional horned females are known. Has a characteristic black band on the face from the nose to the forehead. HB 100 cm. T 15 cm. Ht 50 cm. Mass 20 kg. Females larger and heavier than males. **Spoor:** Fig. 82.3a represents a typical Common Duiker spoor, while Fig. 82.3b represents a more pointed variation. Fig. 82.3c is a very unusual pointed variation, based on one specimen only. Secretions from the facial glands are used to mark the animal's territory. **Habitat:** Presence of bush is essential for shelter, shade and food requirements. Will use woodland with ample underbush, but avoids parts that are too open. Does not occur in open grassland where grass is short, but may be seen on grassland where grass is of medium length with patches of tall grass. Occurs on the fringes of forests, but avoids the forests themselves, where it is replaced by the Blue Duiker (*Cephalophus monticola*), the two being mutually exclusive. Found in a wide variety of vegetational associations that provide the required shelter and food. Occurs from sea level to over 1 800 m. **Habits:** Solitary, or pairs when females are in oestrus, or female with single young. Mainly active in late afternoon extending well into the night, and in the early morning. Active throughout the day on cool or overcast days. Where disturbed it becomes nocturnal. Lies up in the shelter of bushes or stands of tall grass at night from about 01h00 to 04h00, and during the hotter hours of the day. When approached it will lie tightly, springing up at one's feet to bound off in a zig-zag course to the nearest cover. Does not normally run far before halting to look back at the source of disturbance. Its alarm call is a nasal snort. Eyesight and senses of hearing and smell are acute. **Food:** Almost exclusively a browser, only rarely eating grass. Food includes leaves, twigs, flowers, fruits and seeds. Will also dig for tubers and roots and nibble at the bark of trees. May also do minimal damage to crops. Independent of water, and rarely drinks even if available.

Subfamily ANTILOPINAE
Tribe NEOTRAGINI
Genus *Neotragus*

Neotragus moschatus
Suni
Soenie

82.4

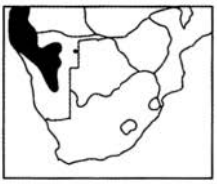


The upper parts are rufous-brown with a slightly speckled appearance; and under parts white. Only males carry horns. HB 60 cm. T 10 cm. Ht 35 cm. Mass ♂ 5 kg, ♀ 5,4 kg. **Spoor:** Fig. 82.4a, Fig. 82.4b and Fig. 82.4c show three variations based on specimen studies. Uses communal latrines. Tends to rest in the same places and uses pathways through dense underbush. Demarcates its territory with secretions from facial glands. **Habitat:** Dry woodland, with thickets and underbush, riparian scrub or dry scrub along drainage lines. **Habits:** Solitary, pairs or family groups consisting of a male and female with their offspring. Shy and wary, and if suddenly disturbed it will freeze, standing motionless for a while before running for cover. Mainly active in the early morning and late afternoon. During cool weather it is active from earlier in the afternoon. During the hottest hours it lies up in dense thickets. **Food:** A browser, food includes the terminal leaves of scrubs and fallen and growing fruits. Independent of drinking water.

Genus *Madoqua*

Madoqua kirkii
Damara Dik-dik
Damara Dik-dik

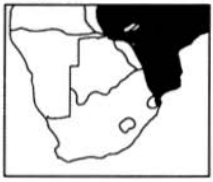
82.5



The upper parts of the body are yellowish-grey. Only the males carry small, straight horns. The hairs on the forehead form a distinct crest when erected, and there are white rings around the eyes. Has an elongated proboscis-like, mobile nose. HB 60 cm. T 5 cm. Ht 40 cm. Mass 5 kg. **Spoor:** Fig. 82.5a and Fig. 82.5b show two variations based on specimen studies. Uses communal dung heaps. A male will paw the dung into a heap with the fore-feet, urinate on it and may dig again before defecating. The digging applies scent to the feet which scent-mark the trail. Females do not dig in the dung. Afterwards it wipes its preorbital glands on the nearest grass stems or scrubs. Repeated marking of a black tarry secretion may build up into blobs. **Habitat:** Dense woodland and thicket on stony or hard clay ground with well-developed scrub understory, but with little or no grass. Avoids rocky outcrops, but occurs around their fringes. Found on hillsides and may penetrate desert or semi-desert along riverine thickets. Confined to areas with mean annual rainfall of between 75 and 500 mm. **Habits:** Occurs singly, in pairs or in family groups of 3. During the dry season from April to August small groups of up to 6 may be seen together. Is shy and, when suddenly disturbed, gives an explosive whistle as it runs for cover. May also bound away stiff-legged, stotting, with its legs tucked up under its body and giving a short explosive whistle each time it makes contact with the ground. Active at sunrise, in the late afternoon and at dusk, with some activity after dark. During the heat of the day it rests in the shade. **Food:** Predominantly a browser, but will graze on the leaf tips of grasses during the hot, wet months from December to April. Browse includes stems, twigs, shoots, leaves, flowers and fruits. Will stand on its hind-legs to reach browse, and food is also made available by Elephant, rhinoceros, Kudu and Giraffe breaking down browse plants. Independent of drinking water, but will drink when available.

Raphicerus sharpei
Sharpe's Grysbok
Sharpe se Grysbok

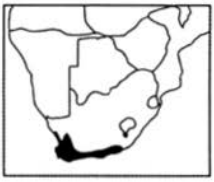
82.6



The colour of the body is a rich reddish-brown, sprinkled with white hairs. Only the males carry short horns. HB 70 cm. T 6 cm. Ht 45–50 cm. Mass 7,5 kg. **Spoor:** Fig. 82.6a and Fig. 82.6b show two variations based on specimen studies. Often returns to the same place to deposit its droppings, forming heaps. The droppings are exceptionally small in size. **Habitat:** Areas of low-growing scrub and grass of medium height, up to about 40–50 cm, avoiding areas of solid stands of high grass. Common in riverine vegetation and also in broken country. **Habits:** Usually occurs singly, in pairs or female with single offspring. Predominantly nocturnal but also active in the early morning or late afternoon. Lies up in dense cover in the heat of the day. Shy and secretive and can be overlooked in areas where it is common. Is inclined to lie up very tightly, and unless disturbed by close approach remains hidden. When it does run off it crouches low to the ground as it runs through the thick underbush, making it difficult to see. **Food:** Predominantly a browser but food includes a fair amount of grass.

Raphicerus melanotis
Grysbok
Grysbok

82.7



The colour of the upper parts is rufous-brown, sprinkled with white hairs, giving it a grizzled appearance. Only the males have horns. HB 74 cm. T 6 cm. Ht 54 cm. Mass 10 kg. **Spoor:** Fig. 82.7a represents a typical Grysbok spoor. Fig 82. 7b and Fig. 82.7c show two slightly more pointed variations based on specimen studies. Deposits its dropping in dung heaps. **Habitat:** Thick scrub bush, particularly along lower levels of hills, as well as in broken country or in kloofs, coastal forest or dry succulent veld where there is cover of scrub bush. **Habits:** Mainly solitary, female with young or pairs during the mating period. Nocturnal, it lies up in thick cover during the day. Moves slowly, carrying the head low. In the event of danger, it prefers to lie flat, concealed in the grass. **Food:** Predominantly a grazer, but will also feed on leaves and wild fruits. Can do without drinking for long periods.

Raphicerus campestris
Steenbok
Steenbok

82.8

The colour of the upper parts is reddish-brown and the under parts white. Only the males carry horns, although females with horns are occasionally found. The ears are very large. HB 90 cm. T 10 cm. Ht 52 cm. Mass 11 kg. **Spoor:** Fig. 82.8a represents a typical Steenbok spoor. Fig. 82.8b, which is the spoor of an old female, shows the sharp points have been blunted through age. Its latrines tend to be situated near the perimeter of its territories. When defecating or urinating a Steenbok will clear a spot with the front hoofs, defecate or urinate, and then cover it up by scraping soil over it with its front feet. **Habitat:** Associated with open grassland with some cover in the form of stands of tall grass, scattered bushes or scrub. Avoids wide open, short-grassed plains which do not provide cover, although will utilise these marginally. Also found in open woodland and on clearings in woodland. Partial to areas where there is fresh sprouting vegetation. Does not occur in forest or thick woodland, or on rocky hills or mountains. Absent from desert, but may penetrate it along dry watercourses. **Habits:** Solitary, except male attending female in oestrus, or female with young. Mainly diurnal, active in the early morning and late evening, but active throughout the day on cool,

overcast days. Some nocturnal activity, especially where disturbed. During the hottest time of the day it lies up in cover. Will lie tightly, only flushing when closely approached. When it runs off it will pause momentarily to glance back at the disturbance. Territorial, with established resting places, latrines and preferred feeding places. Occurs on the fringes of developing towns and intensively farmed areas. **Food:** Both browse and graze, varying from area to area. Independent of drinking water, but will drink if water is available. Will dig for succulent bulbs, roots and rhizomes as food and to provide for its moisture requirements.

Genus *Ourebia*

Ourebia ourebi
Oribi
Oorbietjie
82.9

The colour of the upper parts is yellowish-rufous, and the under parts white. The summer coat is shorter and smoother than the winter coat, which is thicker and more shaggy. The tail is black and bushy on the upper surface, and the neck longer and thinner than for Steenbok. Only the males have horns. HB 100 cm. T 10 cm. Ht 60 cm. Mass 14 kg. **Spoor:** Fig. 82.9a and Fig. 82.9b represent two typical variations of Oribi spoor. Uses communal dung heaps in open areas such as on pathways. These have no territorial function. Marks grass stems with its preorbital glands, leaving a small amount of black secretion. **Habitat:** Prefers an open habitat, such as open grassland or floodplain, and extensive grassed vleis. Prefers areas where the grass is short, but with some cover in the form of isolated stands of grass, and does not occur where there is a dense cover of tall grass. In parts of its range it is associated with stony ground. When resting it tends to choose slightly raised ground. Avoids woodland, except marginally, and does not occur in forest or arid waterless areas. Water is an essential requirement. **Habits:** Solitary, pairs, or male and one or two females with their offspring. Parties may join up temporarily to form small groups of up to a dozen. Adult males are territorial. If suddenly disturbed it will give a snorting whistle alarm call as it bounds off stotting with a rocking-horse motion. Often, after running for a few hundred metres, it stops and gazes back at the disturbance. **Food:** Predominantly a grazer, it will also browse. Has a preference for sprouting grass in burnt areas.

Genus *Oreotragus*

Oreotragus oreotragus
Klipspringer
Klipspringer
83

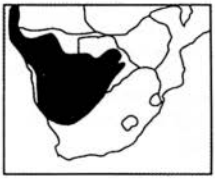
Colour varies from speckled yellowish-brown to greyish-brown and the coat has a coarse texture that blends with the rocks among which it lives. Only the males carry horns. HB 82 cm. T 8 cm. Ht 60 cm. Mass ♂ 10 kg, ♀ 13 kg. **Spoor:** Walks on the tips of its hoofs, which have long, narrow soles and blunt rounded tips. The rounded hoofs are an adaptation to the rocky terrain it inhabits. It scent-marks by smearing a black, tarry secretion from its preorbital glands onto twigs. Its dung heaps are scattered throughout its territory, but there is a tendency to establish them on the territorial border. These are usually situated on flat ground within the territory. The presence of hairs on rocks may also indicate that it uses a particular koppie. **Habitat:** Closely confined to a rocky habitat, its occurrence is patchy and discontinuous within its distributional range. Mountainous areas with krantzes, rocky hills or outcrops, rocky koppies and gorges with rocky sides. Also along boulder-strewn riverbeds in flat plains. Will cross long distances of up to 10 km of flat ground between rocky

areas, and is often found on isolated koppies in flat country. **Habits:** Generally found in pairs, singly, or in small family groups of a male, female and young. Up to 6 may congregate at preferred feeding sites. Well adapted to moving around in its rocky habitat, bouncing up steep rock faces or leaping from rock to rock with agility. Often seen standing motionless on a rock pinnacle scanning the surroundings. Will browse or graze on the flatter ground surrounding its rocky habitat, but if disturbed it runs for rocky shelter. When predators are spotted in the distance, it will freeze and watch. If the predator closes in, it will give a loud, high-pitched alarm call, which has the function of communicating its alertness to the predator. This acts as a pursuit deterrent, since the Klipspringer can outrun and outmanoeuvre predators in its rocky habitat, and predators have been observed to turn away once the alarm call is given. The male and female may duet, the female calling immediately after the male. Active in the early morning and late afternoon from about 16h00 until dusk, resting up in the shade during the hotter hours of the day. In cool weather it is active throughout the day. Occasionally forages at night on the flat ground surrounding its rocky habitat. Territorial. **Food:** Predominantly a browser, diet consisting of leaves, berries, fruit, seed pods, and flowers. Grass may form a small portion of its diet. Independent of water, but will drink when it is available.

Tribe ANTILOPINI
Genus *Antidorcas*

Antidorcas marsupialis
Springbok
Springbok

84.1



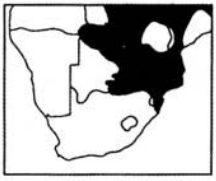
The colour of the back is a bright cinnamon-brown with a distinct broad, dark reddish-brown horizontal band separating the upper parts from the white under parts. Both sexes carry horns. HB 125 cm. T 25 cm. Ht 75 cm. Mass ♂ 41 kg, ♀ 37 kg. **Spoor:** Fig. 84.1a represents a typical Springbok spoor, while Fig. 84.1b has blunted points, probably due to age. Normally it moves slowly, but can quickly break into a fast trot. Can gallop at speeds of up to 88 km/hour. When suddenly alarmed it performs gigantic leaps. When stotting the back is arched, the legs held stiffly downwards, and the dorsal fan of white hair is fully erected as it leaps into the air. It lands with all four legs touching the ground simultaneously, and then shoots up into the air again, repeating this several times. Its territory is marked by conspicuous latrines. Solitary males will spread their legs far back and widely spaced to urinate and then defecate on the same spot; this may be preceded by pawing of the ground. **Habitat:** Associated with arid regions and open grassland. Partial to short grass fringes of pans, or the pans themselves where they have a short grass or karroid bush cover. Avoids mountainous areas, rocky hills, thick woodland and areas of tall grass. Independent of drinking water. **Habits:** Gregarious, it moves in small herds during the dry months. In arid regions herds move to areas where sporadic and localised rain has fallen to feed on fresh, green vegetation, forming aggregations that may number up to thousands. The smaller winter herds consist of mixed herds of adults and juveniles of both sexes, bachelor herds and solitary males. Mixed herds consist of up to 100 individuals, and bachelor groups number between 2 and 50, up to 300 being on record. Males are territorial. Active in the early morning and late afternoon, with some activity after dark. Solitary males will rest in the open, while herds often seek the shade of low bushes, but do not require shade to the same extent as other species.

Normally silent, when suddenly alarmed it may omit a high-pitched whistling snort. **Food:** Both browses and grazes. Leaves, shoots and fruits of most shrubs and trees are rich in protein and phosphate, and are important foods during the drier months of the year, when grasses are of little importance as they are low in protein and energy value. During the summer months, fresh green grasses and herbs are predominantly utilised. Independent of water, obtaining its moisture requirements from succulent vegetation, but will drink when water is available.

Subfamily AEPYCEROTINAE
Genus *Aepyceros*

Aepyceros melampus melampus
Impala
Rooibok

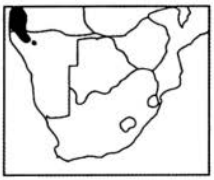
84.2



The upper parts are a rich reddish-brown, the flanks are a reddish pale fawn, and the under parts white. On its rump there are distinct vertical black bands. Only the males carry horns. HB 130 cm. T 30 cm. Ht 90 cm. Mass ♂ 55 kg, ♀ 40 kg. **Spoor:** Fig. 84.2a represents a typical Impala spoor, while Fig. 84.2b shows a variation. When active it keeps moving slowly, with foot stamping caused by the irritation of biting flies. When alerted beyond the distance at which it will flee from intruders, the Impala will merely watch carefully. This may be indicated in the spoor by the fore-feet being turned towards the direction in which it was looking. A nearer approach may cause it to move off slowly, but if suddenly alerted within flight distance, it may break wildly in all directions, leaping over bushes or into the air. Will run with a bounding motion, crossing tracks in graceful leaps across distances of up to 12 m. During the rut the territorial males create dung heaps which are scattered randomly within their territories. At other times both sexes urinate and defecate wherever they happen to be. **Habitat:** Associated with woodland, preferring light open associations. Avoids open grassland and floodplain, but may occur on the ecotone of this and woodland, and will graze on open grassland with fresh, green grass. Absent from montane areas. Cover and availability of surface water are essential. **Habits:** Gregarious, occurring in small herds from half a dozen to 20 and in larger congregations of 50 to 100 during the cold dry months of the year. Social organisation consists of males, which are territorial only during the rut, and bachelor and breeding herds. Territorial males defend their territories against intruders. Predominantly diurnal with some nocturnal activity. During the hotter hours of the day it rests in the shade. **Food:** Browses and grazes, depending on the locality and season. In most areas it is predominantly a browser. During the rainy season it is partial to feeding on fresh, sprouting grass. Dependent on the availability of drinking water, and will drink daily. Under certain circumstances it can obtain its moisture requirements from dew and from its food.

Aepyceros melampus petersi
Black-faced Impala
Swartneusrooibok

84.3

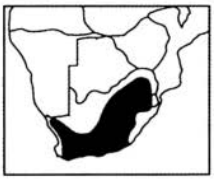


Darker in colour than the Impala. Has a distinct purplish-black band from the nostrils to just in front of the eyes which continues on top of the head as a thinner band. Mass ♂ 63 kg, ♀ 50 kg. **Spoor:** See 84.2. **Habitat:** Dense riverine vegetation bordering on vegetation zones of moderate density. Availability of water essential. **Habits:** Gregarious, occurring in small herds from 3 to 15 individuals, occasionally up to 20. Aggregations of larger herds are formed during or after the lambing season. Solitary males are also found. At night herds lie up on open terrain, as many as 150 combining together. During the heat of the day small herds lie up in thickets. **Food:** During the rainy season it both browses and grazes, and during the dry season it mainly browses.

Subfamily PELEINAE
Genus *Pelea*

Pelea capreolus
Grey Rhebok
Vaalribbok

84.4

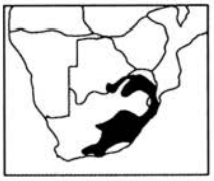


The Grey Rhebok has a long, slender neck and long, narrow pointed ears. The upper parts of the body and flanks are greyish-brown, the under parts are white. The hair is short, thick and woolly. Only the males carry horns. HB 120 cm. T 15 cm. Ht 75 cm. Mass 20 kg. **Spoor:** Fig. 84.4a and Fig. 84.4b represent two typical variations of Grey Rhebok spoor. An accomplished leaper, it jumps over barriers with apparent ease. When alarmed it moves off with a characteristic 'rocking-horse' movement, and tends to flee towards higher ground and mountain summits where it is impossible to reach. **Habitat:** Associated with rocky hills, rocky mountain slopes and mountain plateaux with good grass cover. Able to utilise more exposed habitat than that preferred by the Mountain Reedbuck (*R. fulvorufula*). Independent of water supply. **Habits:** Solitary males or family parties numbering up to 12, consisting of an adult male and several females with young. Family parties may temporarily join up to form groups numbering as many as 30. Males are territorial, and family parties remain within home range throughout the year. Active throughout the day with short periods of resting. Rests during the hotter hours of the day. **Food:** Grazes.

Subfamily REDUNCINAE
Genus *Redunca*

Redunca fulvorufula
Mountain Reedbuck
Rooiribbok

84.5



The overall colour is greyish on the upper parts, the under parts white. The coat is soft and woolly with a bushy tail. Only the males carry the short, heavily ridged horns. HB 125 cm. T 25 cm. Ht 75 cm. Mass 30 kg. **Spoor:** Fig. 84.5a represents a typical Mountain Reedbuck spoor, while Fig. 84.5b represents a more pointed variation. If disturbed, it bounds away with a characteristic 'rocking-horse' motion, and invariably runs either round or obliquely down a hill, seldom running towards the summit as the Grey Rhebok does. **Habitat:** Dry, grass-covered, stony slopes of hills and mountains where there is cover in the form of bushes or scattered trees. Infrequently found on more open mountain grassland. Avoids bleak open conditions associated with the summits of mountainous areas. More generally found on the lower slopes. Avoids sheer rock faces and cliffs. Will move onto flats adjacent to its stony habitat to feed and drink. Availability of water is essential. **Habits:** Usually occurs in small groups of 3 to 6, but also in herds of up to 30. Social organisation consists of

solitary territorial males, solitary non-territorial males or small bachelor groups, and herds of females with young. Most active in the early mornings, late afternoons and at night, resting during the late mornings and early afternoons in the cover of bushes. They lie up tightly together when resting. The alarm call is a shrill whistle, and after running a few hundred metres it pauses to look around at the source of disturbance. Can sometimes be halted in flight if one whistles sharply. At night it moves from the hillsides to feed on adjacent flat ground. Has a tendency to live on the warmer, drier, northern or western slopes of its hilly habitat. **Food:** Almost exclusively a grazer. Almost always feeds on the greenest, softest leaves of grasses and, as long as these are available, avoids eating the stems. During the dry season more has to be eaten to compensate for the low food value of the grasses during that period.

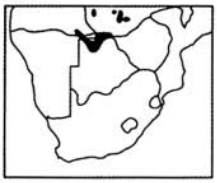
Redunca arundinum
Reedbuck
Rietbok

84.6

The overall colour of the body varies from brown, tending to grey or buffy-grey, to yellow or buffy-yellow or greyish-brown. The back is usually slightly darker and the under parts are white. Only the males carry horns. HB ♂ 160 cm, ♀ 140 cm. T 25 cm. Ht ♂ 90 cm, ♀ 80 cm. Mass ♂ 80 kg, ♀ 70 kg. **Spoor:** Fig. 84.6a represents a typical Reedbuck spoor. Fig. 84.6b and Fig. 84.6c show two variations. Fig. 84.6d shows how the hoofs splay in soft mud. Tends to use fixed trails leading to water. Normally rests in the cover of tall grass or reedbeds. Before lying down, it will trample around, breaking down the grass to form a bed. When at rest together they lie several metres apart, never close together, facing in different directions. **Habitat:** Two essential habitat requirements are cover in the form of tall grass or reedbeds and a water supply: usually vleis with a wet drainage area or grassland adjacent to streams, rivers or other areas of permanent water. Avoids woodland or scrub, although it will tolerate scattered trees and bush within its grassland habitat. **Habits:** Lives in pairs or family parties. Temporary associations of 15 to 20 may be seen together during the cold, dry months of the year. A pair occupy a territory but move about independently, maintaining contact through olfactory and visual signals. Daily activity varies according to the season, weather and disturbance. When food supplies and water are plentiful it tends to become nocturnal. During the dry season, activity during the day is extended as the time spent in grazing increases because large quantities of food are required to compensate for its decreased nutritive value. During the dry season it also visits water supplies more frequently, while during the wet season a large proportion of its moisture requirements are obtained from dew and the more succulent nature of the food. Tends to use fixed trails leading to water. Averse to entering water, choosing drinking places where it can stand with its feet relatively dry. Visits to drinking places are more frequent on hot days. Normally rests in the cover of tall grass or reedbeds, but will lie out in the full sun. High wind may prolong its resting periods. Whistles when disturbed, the frequency depending on the degree of alarm. Territorial males also whistle to advertise their presence or to establish contact with others. **Food:** Almost exclusively a grazer. During the dry months it prefers to graze near water, and may also eat small quantities of herbs and browse when the nutritional value of grasses is low. Water is essential, and the animal cannot survive long without it.

Kobus Leche
Red Lechwe
Rooi-lechwe

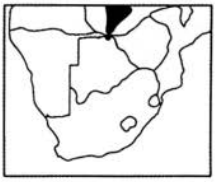
85.1



The upper parts of the body and flanks are reddish-yellow and the under parts white. Only the males carry horns. HB 160 cm. T 35 cm. Ht 100 cm. Mass ♂ 103 kg, ♀ 80 kg. **Spoor:** The hoofs of the Lechwe are distinctly elongated, as shown in Fig. 85.1a, although not to the extent seen in the Sitatunga. Fig. 85.1a is based on specimen studies, with reference to Smithers (pers. comm.). It spreads sideways on soft ground, which is advantageous in moving on a soft muddy substrate. Fig. 85.1b shows a variation recorded on firm ground, which is less splayed. **Habitat:** Occurs on shallowly inundated floodplain fringing swamps and rivers on the ecotone of high-standing beds of papyrus, reeds and high-standing semi-aquatic grasses, and the fringes of dry land. This ecotone has ox-bows and lagoons with permanent water and a lush cover of palatable grasses in water up to about 0,5 m deep. Rarely found more than two or three kilometres from permanent water. **Habits:** Gregarious, occurring in small herds of 15 to 20, and huge aggregations numbering thousands. Herds are loose associations constantly breaking up and reforming. Solitary adult males also occur. Active before sunrise and in the early morning, and again in the late afternoon and for a time after sunset, but some may be active throughout the day. During the hotter hours of the day it normally lies up in the drier parts of its habitat, often on islands in the swamp. At night it lies up near the water's edge, avoiding the swamp islands where it is subject to predation. When disturbed it scatters in small groups, making for the shelter of its watery habitat. Relatively slow on dry land, but once in the water it moves with a plunging gait at a considerable speed. Takes freely to deep water and swims strongly. **Food:** Almost exclusively a grazer, feeding on semi-aquatic grass and on grasses surrounding its swampy habitat. During the cool, dry season it rarely drinks, but during the hot, dry season it drinks on average three times a day.

Kobus vardonii
Puku
Poekoe

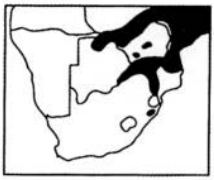
85.2



The upper parts of the body are a golden-yellow, the under parts lighter. Only the males carry horns. HB 140 cm. T 30 cm. Ht 80 cm. Mass ♂ 74 kg, ♀ 61 kg. **Spoor:** Fig. 85.2 is based on a specimen study, with reference to Smithers (pers. comm.). **Habitat:** Associated with grassy areas in the immediate vicinity of water. Will utilise narrow stretches of grassland which lie between rivers or swamps and woodland on adjacent higher ground. Occupies a niche intermediate between the wetter area of the floodplain with its reedbeds and open water frequented by Lechwe, and the drier inland woodland occupied by the Waterbuck. **Habits:** Gregarious, it occurs in small herds from 1 to 28, usually 5 or 6. Adult males are territorial. Crepuscular, with some activity for about an hour after sunset. Produces an alarm whistle up to about five times in succession. When suddenly disturbed it may hop a few paces with stiff legs in a stotting motion. **Food:** Predominantly graze.

Kobus ellipsiprymnus
Waterbuck
Waterbok

85.3

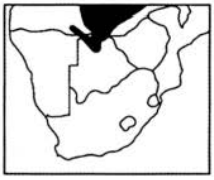


The colour of the upper parts is variable and may be a dark brownish-grey or greyish-brown, grizzled with white and grey hairs. Has a characteristic white ring encircling the rump. Only the males carry horns. HB 210 cm. T 35 cm. Ht 170 cm. Mass 250 kg. **Spoor:** Fig. 85.3a represents a typical Waterbuck spoor, while Fig. 85.3b shows a broader, blunted variation. **Habitat:** Associated with water, and remains within about 1 800 m of open water. Open areas within reedbeds as in the case of floodplain or with woodland cover. **Habits:** Gregarious, it occurs in small herds of about 6 to 12, occasionally up to 30. Social organisation consists of territorial males, nursery herds and bachelor herds. Group size increases during the summer months. Fragmentation of herds during winter months may be due to the fact that acceptable food is low in density and scattered in distribution. Most active in the morning and afternoon to evening, otherwise resting. **Food:** Predominantly a grazer, but also browses.

Subfamily BOVINAE
Tribe TRAGELAPHINI
Genus *Tragelaphus*

Tragelaphus spekei
Sitatunga
Waterkoedoe

86



The adult male is a dark drab brown. Its hair is long, coarse and shaggy. The female may be the same colour or redder. Only the male has horns. HB 150 cm. T 30 cm. Ht 90 cm. Mass 115 kg. The females are smaller than the males. **Spoor:** Its elongated, widely splayed hoofs may in adult males reach a length of 18 cm on the fore-feet and 16 cm on the hind. Between the hoofs and the greatly enlarged false hoofs the feet are covered with a swollen leathery pad. The spoor illustration is based on specimen studies and photographs provided by Smithers (pers. comm.). Sitatunga use established paths when moving from a swamp to woodland. These are narrow, not more than about 50 cm wide, not well defined and not very deep. These paths may also be used by Lechwe. It does not use Hippo paths, tending to leap across them. This may be because Hippo paths are regularly used by Crocodiles or the water is too deep for ease of movement. Hippo paths in swamps are up to 1,5 m wide and the path in the mud at the bottm is characteristically marked by a central raised ridge. **Habitat:** Semi-aquatic, it spends the greater part of its life in dense papyrus and reedbeds in swamp areas in water up to about a metre deep. These swamp areas are fringed with savanna woodland and floodplain grassland. At night it moves out into the woodland, but avoids the open floodplain except in the immediate vicinity of reedbeds. **Habits:** Active most times of the day, except during the hottest hours when it lies up resting. Also active at night when it moves to the dry fringing woodland. Occurs in small herds of up to about 6, consisting of an adult male with several females and juveniles. Solitary males or females also occur. An excellent swimmer, and if disturbed readily takes to deep, open water and swims to safety. Under stress or when wounded it will totally submerge among the reeds, with only its nostrils above the surface. Its resting sites are on platforms of broken-down reedstems. **Food:** Aquatic grasses, plants growing in the shallower water, and freshly sprouting tips of reeds. Will feed in deep water with its body submerged and only the head and top of the back visible.

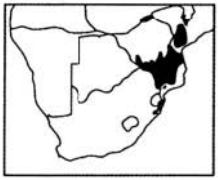
Tragelaphus scriptus
Bushbuck
Bosbok

87.1

Individuals vary widely in size over their range. The general colour varies from chestnut to dark brown. Has a conspicuous white collar. White spots are found on the cheeks and flanks, and sometimes stripes on the flanks and hind-quarters. Only males carry horns. HB 125 cm. T 20 cm. Ht ♂ 80 cm, ♀ 70 cm. Mass ♂ 40 kg, ♀ 30 kg. **Spoor:** Fig. 87.1a represents a typical Bushbuck spoor. Fig. 87.1b shows a more pointed variation and Fig. 87.1c a blunted variation. Fig. 87.1b and Fig. 87.1c are based on specimen studies. **Habitat:** Closely associated with riverine or other types of underbush adjacent to permanent water supplies. In the warm, wet summer months from about September to March it disperses from the riverine underbush to thickets in the hinterland where water is temporarily available. As the country dries up, it returns to the riverine underbush. Cover and the availability of water are essential. **Habits:** Generally solitary. Also occurs in small groups of 2 or 3 and sometimes in large aggregations. Active at night or in early morning or late evening. During the day it lies up in dense bush. In overcast, cool weather it may also be active during the day. Has acute senses of hearing, sight and smell. Shy and retiring, and may live in close association with human development. When cornered or wounded, the males can be dangerous and under these circumstances have a reputation for aggressiveness. When alarmed it utters a loud, hoarse bark. Grunts to maintain contact in dense bush. A fast, manoeuvrable swimmer and can swim up to 3 km. Under stress it will hide in shallows. **Food:** Predominantly a browser, but also grazes. Food consists mainly of leaves, but also fine twigs with buds, flowers and fruits. Eats fresh grass when available.

Tragelaphus angasii
Nyala
Njala

87.2



The male is characterised by a greyish shaggy coat with a white crest on the back and long hair on the neck, belly and rump. The sides of the body have 9–14 vertical white stripes, and there are a number of white dots on the body, and a white chevron between the eyes. Only the males carry horns. The females are much smaller, not as hairy, and have a redder coat and more distinct stripes on the sides. Males: HB 165 cm. T 43 cm. Ht 112 cm. Mass 108 kg. Females: HB 140 cm. T 36 cm. Ht 97 cm. Mass 62 kg. **Spoor:** Fig. 87.2a is that of an adult male, Fig. 87.2b that of a young male and Fig. 87.2c that of a female. The fore-feet of the males are relatively broader than those of females. Adult males are also much larger than females. Fig. 87.2d shows the spoor of a young female splayed out in soft mud. **Habitat:** Associated with thickets in dry savanna woodland; closed woodland or more open associations such as found on flood-plains; riverine woodland with thickets; and dry forest. Tends to use open grassland at night, but is never more than a few hundred metres from thicket. **Habits:** Gregarious, it occurs in herds of usually 2 or 3, but numbering up to 30. Solitary males are also common. The larger aggregations are found in open habitat. Usually silent, its alarm call is a deep bark. It reacts to the alarm calls of Impala, baboons and Kudu. Both diurnal and nocturnal, but mainly nocturnal where disturbed. **Food:** Predominantly a browser, living on leaves, twigs, flowers and fruits; as well as grass, especially when fresh and spouting after rain. Also eats bark. Where water is available it drinks daily, but is not dependent on it.

Tragelaphus strepsiceros
Kudu
Koedoe

87.3

The body colour is fawn-grey. Has 6 to 10 vertical white stripes on the sides. Usually only the males carry horns, but rarely females as well. Males: HB 240 cm. T 43 cm. Ht 140 cm. Mass 230 kg. Females: HB 200 cm. T 42 cm. Ht 125 cm. Mass 160 kg. **Spoor:** Fig. 87: 3a is that of an adult male and Fig. 87.3b that of an adult female. Fig. 87.3c shows a young male. Fig. 87.3d shows a slightly blunted female spoor and Fig. 87.3e a more pointed female variation. The dashed line shows the shape of the spoor when the hoofs sink into soft ground. !Xõ trackers correctly identified the male and female spoor, pointing out that the fore-feet of the males are relatively broader than those of the females. **Habitat:** Savanna woodland. Partial to areas of broken, rocky terrain, where it has a cover of woodland and a nearby water supply, which is essential. In arid country, confined to woodland along water courses. Occurs in clearings in woodland close to cover. Does not occur in desert, forest or in open grassland areas. **Habits:** Gregarious, it occurs in small herds usually up to about 4, rarely more than a dozen. Adult males may be solitary. Most active in the early morning and late afternoon. During the heat of the day it lies up in woodland or thickets. When disturbed it runs for the nearest cover. When alarmed it utters a loud harsh bark. An accomplished jumper and can surmount a two-metre-high fence. **Food:** Predominantly a browser, but may eat fresh grass. Will also raid grain crops and vegetable farms.

Genus *Taurotragus*

Taurotragus oryx
Eland
Eland

88.1

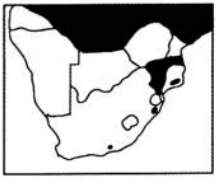
The largest African antelope. The overall colour is a light rufous-fawn, with narrow white stripes down its flanks. Both sexes carry horns, those of the males being much heavier than those of the females. Males: HB 340 cm. T 90 cm. Ht 170 cm. Mass 700 kg. Females: HB 270 cm. T 80 cm. Ht 150 cm. Mass 460 kg. **Spoor:** Fig. 88:1a and Fig. 88.1b show two variations of Eland spoor. Compared to the spoor of Buffalo and domestic cattle, the hind-feet of the Eland have a more elongated shape. When adult Eland walk they produce a characteristic clicking noise which can be heard from quite far. A timid animal, quick to gallop off if disturbed. This gallop soon develops into a fast trot. Difficult to follow for, even at a walk, it moves faster than the good walking-pace of a man. A prodigious jumper and can clear 2 m with apparent ease. When jumping fences it will walk slowly up to them, pause, settle back slightly on its hind-quarters, then jump. **Habitat:** Wide habitat tolerance, which included in the past the South West Arid Zone, the Southern Savannas as well as the Cape Macchia. Occurs in various types of woodland, but avoids more extensive open, short-grass plains except in transit. Does not occur in desert where mean annual rainfall is less than about 300 mm. Occurs on the fringes of forests, but does not penetrate into them. As it is predominantly a browser it requires trees and bushes. Where water is available, drinks regularly, but this is not an essential requirement. **Habits:** Gregarious, it occurs in small herds, but at times in huge aggregations of over 1 000. Active in mornings and afternoons, resting in the shade at noon. Will continue to feed after sunset, particularly during the summer months. Movements of large aggregations are apparently related to the availability of food, as controlled by seasonal rains. Will move on to burnt areas in search of fresh, sprouting grass or to areas where shrubs or trees offer palatable seed pods. Not

territorial, and hierarchy is based on age and size. **Food:** Predominantly a browser, but it is partial to fresh, sprouting grass after fire. When feeding, it has a tendency to settle in an area, then walk a considerable distance before settling again. Uses its horns to break down the higher branches of shrubs and trees, by inserting the horns on either side of a branch and twisting it. Will drink when water is available, but is not dependent on it and can obtain its moisture requirements from food.

Tribe BOVINI
Genus *Syncerus*

Syncerus caffer
Buffalo
Buffel

88.2

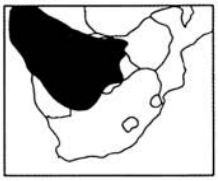


The Buffalo is a very large, heavily built animal, ox-like in general appearance. Old males are black, and females show a tinge of reddish-brown. In old adult males the horns are massive; those of females are always lighter in build. HB 250 cm. T 80 cm. Ht 140 cm. Mass ♂ 800 kg, ♀ 750 kg. **Spoor:** Fig. 88: 2a is the spoor of a female and Fig. 88.2b that of a male. The dew claws, which usually show in soft mud, may not always show on hard ground. The hind-feet of the Buffalo are not as elongated in shape as those of Eland. When walking it moves one leg at a time, with three feet always on the ground. The hind-foot is therefore placed behind the fore, so that the spoor are not superimposed when it walks. **Habitat:** Requirements include a plentiful supply of grass, shade and water. These are found in various types of woodland and open vleis. Does not occur in wide open areas of grassland or floodplain far from the shade of trees, except in transit. **Habits:** Gregarious, it occurs in herds of up to several thousand. Smaller herds may split off temporarily. Small bachelor groups may live independently, and solitary old bulls also occur. The larger herds are subject to seasonal movements. Moves to permanently watered areas as the country dries up, moving out with the onset of the rains and then tending to fragment into smaller herds. When resting, the larger herds break up into groups, rejoining at the end of the rest period. Herds have clearly defined home ranges. Most active in evening, night and morning. During the heat of midday it rests in the shade of trees, bushes or reeds. **Food:** Predominantly a grazer, but also browses. Avoids areas where the grass has been trampled or overgrazed. Most of its feeding takes place at night. Herds move to water in the early morning and again in the early evening, and bulls indulge in mud-wallowing, especially during the hottest hours of the day.

Subfamily HIPPOTRAGINAE
Genus *Oryx*

Oryx gazella
Gemsbok
Gemsbok

89.1

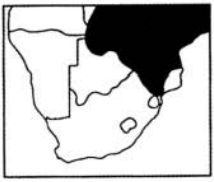


The Gemsbok has very distinct and conspicuous black markings on the body and face. The upper parts and flanks are a pale fawn-grey, the under parts white, with a broad dark-brown band in between. The straight horns are lighter in build in the females than in the males. HB 230 cm. T 90 cm. Ht 120 cm. Mass ♂ 240 kg, ♀ 210 kg. **Spoor:** Fig. 89.1a, Fig. 89.1b and Fig. 89.1c show three variations of Gemsbok spoor. Gemsbok will dig in sand with its front hoofs for water, and will also dig for succulent roots, rhizomes and bulbs. Fig. 89.1d shows an example where the fore-foot hoof has been blunted by digging. Territorial male Gemsbok exhibit a characteristic defecation posture in the form of a low crouch. This ensures that the fecal pellets lie in a small

pile and thus retain their odour longer than if they were scattered. These dung sites may be located along boundaries or randomly throughout the territory. Before defecating, territorial males paw the ground to transfer secretions from the pedal glands to the ground. Territorial males shrub-horn more frequently than females or bachelor males. **Habitat:** Open, arid country. Occurs in open grassland, open bush savanna and in light open woodland. May penetrate into savanna woodland in the more open areas within them. **Habits:** Gregarious, it occurs in herds of up to 12, smaller herds of 2 or 3, and solitary males. During the wet season the animal occurs in large herds which break up into smaller herds during the dry season because of the dispersed food supply. Active during the early mornings and late afternoons, lying up during the day. Also active in moonlight. **Food:** Mainly grazing. Will dig for succulent subterranean roots, rhizomes and bulbs. Drinking water is not essential, but it will dig in sand for water and eat tsamma melons (*Citrellus lanatus*).

Genus *Hippotragus*

Hippotragus niger
Sable
Swartwitpens
89.2



Old adult males are black, females very dark brown, with white under parts. Both sexes carry horns, which are more slender in females. HB 250 cm. T 70 cm. Ht 135 cm. Mass 230 kg. **Spoor:** Fig. 89.2a and Fig. 89.2b represent two typical variations of Sable spoor. Fig. 89.2c, which is based on one specimen, shows an unusually blunted variation. Territorial males engage in breaking branches and stripping bark with the horns, which may be a way of marking their territories. **Habitat:** Savanna woodland. Dependent on cover and the availability of water. Prefers woodland with adjacent vleis or grassland with medium to high stands of grass. Avoids dense woodland or areas where grass is short. **Habits:** Gregarious, it occurs in herds of 20 to 30, as well as larger temporary aggregations of up to 200. Social organisation consists of territorial bulls, nursery herds and bachelor groups. Bulls are often solitary. Most active in the early mornings and late afternoon. Rests in the shade during the middle of the day. Dominant females are the leaders of the herd, and determine its movements, taking the lead to feeding grounds and water, keeping watch for danger and directing flight from it, but are always subservient to the territorial male. **Food:** Predominantly a grazer, but in some areas will browse, especially towards the end of the dry season when the nutritional value of grasses is low. Has a preference for fresh growth of grasses of medium height. Dependent on drinking water and seldom found more than 3 km from it. Drinks at least once a day, between 10h00 and 16h00.

Hippotragus equinus
Roan
Bastergemsbok
89.3

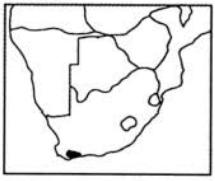
The body colour is greyish-brown. The face is black with contrasting white patch around the nose and mouth, and a white patch on either side of the face. HB 260 cm. T 70 cm. Ht 140 cm. Mass 270 kg. **Spoor:** Fig. 89: 3a and Fig. 89.3b show two variations of Roan spoor. All members will horn bushes and even grass, and will also horn the ground. These activities serve as visual and scent markers of their territories. Apart from defecating and urination, they also scent-mark the area with their pedal glands. **Habitat:** Confined to lightly wooded savanna with extensive open areas of medium to tall grasses, where water is available. Avoids woodland where trees form a closed canopy or where bush forms thick, closed stands. Avoids areas of short grass. **Habits:** Gregari-

ous, occurring in small herds of about 5 to 12, sometimes up to 25, with temporary aggregations of up to 80. Social organisation consists of nursery herds, bachelor groups and solitary bulls. The dominant bull defends his females and an area of 300–500 m around them from the attention of other males. Active from sunrise until about mid-morning and late afternoon. During the day it rests up in the shade. **Food:** Predominantly a grazer, but also browses. Feeds on medium to long grass, avoids areas of short grass.

Subfamily ALCELAPHINAE
Tribe ALCELAPHINI
Genus *Damaliscus*

Damaliscus dorcas dorcas
Bontebok
Bontebok

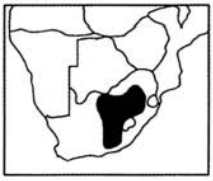
89.4



The general body colour is a rich dark brown, the under parts and the rump patches are white. The white face blaze is not divided by a transverse brown band, but is constricted between the eyes. The horns of the female are more slender than those of the male. Apart from the fact that they do not occur in the same distributional range, the pure white patch on the rump of the Bontebok probably distinguishes it best from Blesbok. Ht 90 cm. Mass 61 kg. **Spoor:** Fig. 89.4 represents a typical Bontebok spoor. The latrines of territorial males are scattered about the territory and are generally disregarded by other males. A central latrine in the territory is often used to lie on during the day. The bachelor males, females and juveniles defecate randomly. Has a habit of facing the sun, which would give an indication of what time of the day it had been standing there. **Habitat:** Confined in its distribution to a restricted area in the southwestern Cape Province. Lives in a narrow sector of coastal plains at an altitude of 60–200 m above sea level within the Cape fynbos zone – a sandy, alluvial plain with stony ridges and gravel terraces. Areas of short grass, cover and drinking water are essential. **Habits:** Gregarious, its social organisation consists of territorial males, female herds and bachelor groups. Diurnal, it is mainly active in the early morning and later afternoon. During the hotter hours of the day it rests in thickets where it clusters together. Like the Blesbok, it has a characteristic habit, on hot days, of standing in orientated groups facing the sun with its head held low. Remains alert during this time, occasionally shaking its head and snorting or stamping its feet, then running in a circle to resume its place in the group. **Food:** Almost exclusively a grazer, with a preference for feeding on short grass.

Damaliscus dorcas phillipsi
Blesbok
Blesbok

89.5

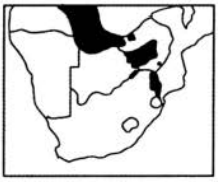


The colour of the body is brown, the under parts are white. The white face blaze is divided just below the eyes by a narrow brown band. Both sexes carry horns. Does not have a white patch on the rump, which distinguishes it from the Bontebok. Ht 95 cm. Mass: ♂ 70 kg, ♀ 61 kg. **Spoor:** Fig. 89.5 represents a typical Blesbok spoor. When moving to their feeding or drinking places, or back to their night resting sites, they string out in long single files. This activity creates distinct paths. It marks its territories by inserting grass stems in its preorbital glands to smear them with its secretion or by wiping the glands across vegetation. The territorial males create dung patches in their territories and tend to lie on them during resting periods. These dung patches are a focal point during the rut, as indicated by the intensity of

movement and grazing in their vicinity. Blesbok has interdigital glands, and pawing, especially of the dung heaps, by territorial males may be an additional factor in marking. It also occurs in conjunction with face-wiping, horning and defecating. **Habitat:** In the past it was restricted to grassland where water was available. Wide introduction to other areas shows that it is versatile in its requirements, but sweet grasses and water are essential. **Habits:** Gregarious, its social organisation consists of territorial males, female herds and bachelor groups. Diurnal, it is active in the early morning and late evening, and lies up in the shade during the hotter hours of the day. Tends to rest together in small groups. Much more active during cool, overcast weather, but during heavy rainstorms takes shelter or stands with its back to the direction of the rain. Like the Bontebok, it has the characteristic habit of standing in orientated groups with its head towards the sun and its face close to the ground. **Food:** Predominantly a grazer, but will occasionally browse. Partial to sprouting grasses.

Damaliscus lunatus
Tsessebe
Tsessebe

89.6

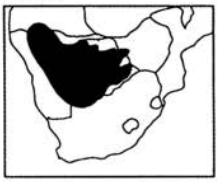


The general colour of the body is dark reddish-brown with a distinct purplish sheen. Both sexes carry horns. HB 170 cm. T 45 cm. Ht 125 cm. Mass ♂ 140 kg, ♀ 126 kg. **Spoor:** Fig. 89.6 represents a typical Tsessebe spoor. In patrolling their territories, territorial males maintain a steady gait and defecate at regular intervals. Both sexes mark with the preorbital glands, but the territorial males are more active in doing so. They also rub the sides of their faces on the ground, usually on a termite mound or on a sandy patch, dropping to their knees to do so. Both sexes horn the ground, especially after rain. The animal has well-developed interdigital glands on the front feet, and territorial males paw and scrape the ground as a means of territorial marking. **Habitat:** Requirements include the availability of palatable grasses, water and shade. Favours the fringes of grassland, at the boundary of woodland. While it needs the shade of woodland, it will take to the open when disturbed, preferring to keep potential danger in sight. **Habits:** Gregarious, it occurs in small herds, up to about 30 in number. Larger aggregations occur on preferred feeding grounds. The social organisation consists of territorial males, breeding herds and bachelor groups. Territorial males establish territories which they patrol regularly. Active mainly morning and evening, resting in the shade at midday. The Tsessebe is reputed to be the fastest of any of the antelope occurring in the Subregion and it can sustain a gallop for great distances. **Food:** Almost exclusively a grazer, with a preference for grass up to 60 cm tall. Dependent on water.

Genus *Alcelaphus*

Alcelaphus buselaphus
Red Hartebeest
Rooihartbees

89.7



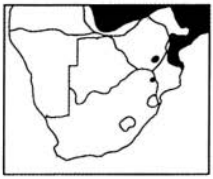
The general colour of the body is reddish brown, but varies and may be yellow-fawn or tawny. Both sexes carry horns, those of the males heavier in build than those of the females. HB 165 cm. T 47 cm. Ht 125 cm. Mass ♂ 150 kg, ♀ 120 kg. **Spoor:** Fig. 89.7 represents a typical Red Hartebeest spoor. When disturbed it will pause in flight, milling around. When the animal runs away in a bounding gallop it tends to take a swerving course, a few metres to the left, then a few to the right. **Habitat:** Associated with open country, occurring in grassland, areas of vleis, and semi-desert bush savanna and open woodland. Avoids closed woodland. Independent of surface water, but will drink when available. **Habits:** Gregarious, it occurs in small herds of up to 20, as well as

in larger herds of up to 300. Large aggregations of over 10 000 are found between about August to May in Botswana; this may be due to movement to preferred feeding grounds following rain. Moves to areas where rain has fallen. Social organisation consists of breeding herds, bachelor herds and solitary males. Territorial males herd females and defend territories against other males. Most active in the early morning and late afternoon, but during cool weather may be active throughout the day. At midday it may seek shade in hot weather, but in the winter it lies out in the full sun. Tends to lie individually and scattered, and not in a compact group. Senses of smell and hearing are acute, but sight is poor. **Food:** Predominantly a grazer.

Genus *Sigmocerus*

Sigmocerus lichtensteinii
Lichtenstein's Hartebeest
Lichtenstein se Hartbees

89.8

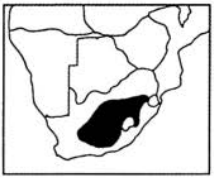


The colour of the body is yellowish-tawny with an indistinct saddle of a more rufous colour. Both sexes carry horns. HB 190 cm. T 48 cm. Ht 125 cm. Mass ♂ 177 kg, ♀ 166 kg. **Spoor:** Fig. 89.8 has been based on a specimen study. When alarmed, the alarm 'sneeze-snort' may be accompanied by stamping the ground with a fore-leg before trotting off. The males mark their territories by horning the ground, dropping onto their knees to dig up the soil with their horns and rubbing their preorbital glands on it. **Habitat:** A savanna species associated with the ecotone of open woodland and vleis or floodplain grassland. A supply of perennial grasses and surface water is essential. **Habits:** Gregarious, it occurs in small herds of up to about 10, with seasonal aggregations of much larger numbers. It is territorial, and a territorial bull will be accompanied by 8 or 9 females and their offspring. He maintains a position some distance from his females, usually downwind of them, and is always on the alert for danger. When the herd takes flight he brings up the rear, while an adult female takes the lead. When alarmed the animal vocalises with a 'sneeze-snort' through the nostrils. Has good eyesight, but sense of smell is not so well developed. Most active in the morning and afternoon, resting up in the shade during the heat of midday. May graze at night. **Food:** Almost exclusively a grazer, with a small percentage of browse. Has a preference for burnt areas.

Tribe CONNOCHAETINI
Genus *Connochaetes*

Connochaetes gnou
Black Wildebeest
(White-tailed Gnu)
Swartwildebees

89.9

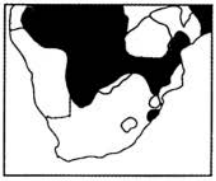


The general colour is buffy-brown. It has a characteristic tail with long, off-white hair reaching to the ground. Both sexes carry horns. HB 220 cm. T 95 cm. Ht 120 cm. Mass ♂ 180 kg, ♀ 160 kg. **Spoor:** Fig. 89.9a and Fig. 89.9b represent two variations of Black Wildebeest spoor. It scent-marks its territories with faeces and urine as well as with its preorbital and interdigital glands. Territorial males paw vigorously before defecating. Kneeling and horning of the ground as well as rolling coupled with pawing have been interpreted as a threat gesture. **Habitat:** Open plains, grasslands and the Karoo country. **Habits:** Gregarious, its social organisation consists of territorial males, female herds and bachelor groups. During summer the female herds and bachelor groups are active in the early morning and late afternoon and lie up during the heat of the day. They are also active before dawn and after sunset. During the colder winter

months, the midday resting period is reduced, and they may be active throughout most of the day. The territorial males do not keep to this pattern as they may have to defend their territories at any time. The animal does not always rest in the shade, but when lying in the sun it tends to orientate itself with the head or hind-quarters towards it. Young calves lie close to their mothers. On the approach of danger the animal will snort and stamp the ground. If suddenly disturbed it will buck and throw its back legs high in the air, before galloping off. **Food:** Predominantly a grazer, but will browse on karroid bushes during the cold winter months. Has a preference for short grass. Dependent on water and drinks regularly, usually in the late afternoon.

Connochaetes taurinus
Blue Wildebeest
Blouwildebees

89.10



The adult is dark grey in colour. Has a mane of long black hair, with long black hair on the end of its tail. Both sexes carry horns; the horns of the females are lighter in build than those of the males. HB 240 cm. T 100 cm. Ht ♂ 150 cm, ♀ 135 cm. Mass: ♂ 250 kg, ♀ 180 kg. **Spoor:** Fig. 89.10 represents a typical Blue Wildebeest spoor. Territorial males mark their territories by dropping onto their knees and rubbing their preorbital glands on the ground or on bushes or tree trunks. During the rut, pawing of the ground and rubbing the preorbital glands on the ground may represent a threat gesture. The pedal glands scent-mark the ground as the animal moves, so that other wildebeest can follow. **Habitat:** Associated with savanna woodland, open grassland, floodplain grassland, open bush savanna and light open woodland. Availability of drinking water is essential. **Habits:** Gregarious, it occurs in herds of up to 20 or 30 or in much larger aggregations numbering thousands. Social organisation consists of territorial males, female herds and bachelor groups. While in some parts it is relatively sedentary, in others it is subject to wide movements. In Botswana aggregations of over 100 000 may move to and from the Makgadikgadi Pan on a seasonal basis. Sensitive to localised rainstorms and will move in their direction in search of fresh grazing. When alarmed, adult males will snort. Active in morning and afternoon, it rests in the shade during the hotter hours of the day. In cool, overcast weather it may be active throughout the day. May be active on moonlight nights, but is less active when dark. Will drink at any time of the day except during the last hour before sunset, with a preference for five to seven hours after sunrise. **Food:** A grazer, it has a preference for feeding on areas of short, green, lawn-like grassland. Rarely eats grass that is more than 10 or 15 cm high. Partial to fresh sprouting grass on burnt areas, and will move in search of fresh green grass sprouting after rain.

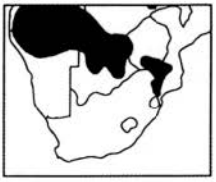
Subfamily CAPRINAE
Genus *Hemitragus*

Hemitragus jemlahicus
Himalayan Tahr
Himalaja Tahr
90

The male has a heavy mane of long hair on its neck, shoulders and chest. Reddish-brown to dark brown in colour. Both sexes carry goat-like horns. HB 175 cm. T 20 cm. Ht 100 cm. Mass ♂ 90 kg, ♀ 70 kg. **Spoor:** Fig. 90 shows an example of a Himalayan Tahr spoor. **Habitat:** In the early 1930s a pair of Himalayan Tahr escaped from Groote Schuur Zoological Gardens and established themselves on Devil's Peak and on Table Mountain. The distribution of their offspring has since extended over the north–northwest and south–southeast faces of both Devil's Peak and Table Mountain. They occur in fairly large groups, which tend to remain in restricted areas and have the ability to eat any sort of plant material. As over-utilisation of the habitat led to the destruction of vegetation and soil erosion problems, the population had to be drastically reduced. During the first four months of the year the males are found either in bachelor herds or alone. With the onset of the wet in May the males join the females, then accompanied by immatures and juveniles. While the males are separated from the females they tend to occupy open slopes of the mountain which have dense, tall fynbos association and are not precipitous. The female herds occur in precipitous areas, such as narrow ledges or terraces or close to cliffs which provide this type of habitat. They have a remarkable climbing ability on the roughest rocks. Active in morning and afternoon, resting at midday. Has a preference for recently burnt areas.

Family GIRAFFIDAE
Genus *Giraffa*

Giraffa camelopardalis
Giraffe
Kameelperd
91

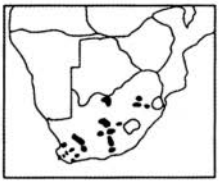


The tallest animal in the world; males are about 5 m high and females about 4,5 m high. Mass: ♂ 1 200 kg, ♀ 830 kg. **Spoor:** Its footprints are much larger and longer than those of any of the other cloven-hoofed animals. When it walks the two legs on one side swing more nearly in unison than in other species. The maximum speed attained at the gallop is 56 km/hour. Can also jump fences up to about 1,5 m high. Often rubs against trees and other objects. **Habitat:** A wide variety of dry savanna associations ranging from scrub to woodland. Does not occur in desert or forest and normally not on open plains. Will drink if water is available, but is not dependent on it. **Habits:** Predominantly diurnal, but will also feed and move at night. Rests during the hottest time of the day, standing or lying down in the open or in shade. When lying down the fore-legs are folded underneath the body and then the hind-legs are bent. When alarmed it grunts or snorts. Senses of hearing and sight are good. Generally docile, but especially females with young will put up a fierce defence against Lions. In defence will chop-kick with the front feet or kick with the hind-feet. Males will engage in sparring by swinging their heads at each other, hitting out with their horns. The animal has a loose herd structure consisting mainly of females and young, bachelor herds or mixed herds. Bulls are mainly solitary. **Food:** Predominantly a browser, but will graze on fresh sprouting grasses.

Family CERVIDAE Deer
Genus *Cervus*

Cervus dama
European Fallow Deer
Europese Takbok

92



The European Fallow Deer, which occurs from Turkey westwards through Europe, was introduced to southern Africa from England. In 1897 a number were released on the Groote Schuur estate in the Cape Peninsula. They were later introduced to other districts of the Cape Province, as well as farms in the Orange Free State and Transvaal. The summer pelage is deep fawn with white spots on the flanks, the winter pelage greyish-fawn and is rough and thick. Many colour varieties are known, including black bodies and others with white bodies. HB 150 cm. T 20 cm. Ht 80–100 cm. Mass up to 110 kg. Females smaller than males. **Spoor:** Fig. 92 shows an example of a European Fallow Deer spoor. **Habitat:** Catholic in habitat requirements, they have been introduced to a wide variety of vegetational areas. On the slopes of Table Mountain they live in oak and pine woodland with areas of open grassland. Elsewhere they live in areas of scrub on brackish soils, vleis and low-lying ground inundated during the wet season, dense riverine bush as well as Highveld grassland. **Habits:** In Europe they are predominantly nocturnal. Their alarm call is a loud bark, which makes them seek safety in cover. Gregarious, in small to large herds. **Food:** Predominantly browsers, including leaves, herbs, nuts and berries and the bark of trees. They will also graze to a lesser extent. They are not dependent on water, but will drink when available.

Further Reading

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For a more advanced study of tracking, the reader is referred to the author's book *The Art of Tracking: The Origin of Science*, 1990, Cape Town: David Philip.

An interesting section on nature observation can be found in Tom Brown's *Field Guide to Nature Observation and Tracking*, 1983, New York: Berkley Books.

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This is the most comprehensive field guide to the animal tracks of southern Africa. It is arranged for ease of reference and is intended both for practical use in the field and scientific use.

In the introductory section, author Louis Liebenberg explains how to identify and interpret spoor, and how to master the basics of tracking. The second, and far larger, section contains the field guide proper, divided into sub-sections on invertebrates, amphibians, reptiles, birds and mammals of the sub-continent.

In addition to almost a hundred pages of highly accurate illustrations of spoor, drawn from the field, the guide contains detailed entries describing prominent features of the spoor, along with general information on the size, identification, habits, distribution and habitat of the relevant animal.

Distribution maps are included.

Louis Liebenberg is also the author of *The Art of Tracking: The Origin of Science* (published by David Philip), which deals with the theory of tracking.

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