

A SURVEY OF EXISTING SOUND RECORDINGS
OF MAMMALS AND BIRDS OF SOUTHERN AFRICA
(DURING THE PERIOD DECEMBER 1971 —
FEBRUARY 1972)

by

G. DE GRAAFF* and ROWAN B. MARTIN**

Abstract – The present status of sound recording of mammals and birds in Southern Africa is assessed. It is clear that the most significant collections of recordings are the result of private initiative by a very small number of individuals. Only some 9% of mammals and 61% of birds have been recorded. Possible ways and means to overcome hazards for recording unrecorded species are indicated. The idea of a national wildlife sound collection is supported and recordists are encouraged to place their recordings (or copies) with the South African Broadcasting Corporation Sound Archives.

Introduction

On 1 December 1961, it was agreed at a meeting of persons involved in scientific research for the National Parks Board of Trustees, that a Bio-Acoustical Research Institute be founded, under the auspices of the National Parks Board. It was unanimously felt that there was a need for South Africa to contribute in this international field of zoological research.

Over the years, a number of people and in particular Mr. Clem Haagner has contributed valuable recordings to the National Parks Board in accordance with the above resolution, and the authors decided that it would be rewarding to survey the present status of sound recordings in southern Africa. From information thus gleaned, it is intended to begin a series of research projects (on post-graduate level), using recordings of animals available in South Africa, as well as abroad.

To launch the envisaged research projects, a survey of existing (and available) recordings of birds and mammals in South Africa is hereby undertaken. The objects of the survey are *inter alia*:

- (i) to obtain information of recordings which are sufficiently plentiful to provide a starting point for research projects;

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- (ii) to pinpoint the gaps in the recorded material for various species of birds and mammals; and
- (iii) to assist enthusiasts in this particular field.

It is felt that the results of this survey will avoid duplication of work by people in this field, and will bring focus to bear on species for which no or little data exist at present.

It is hoped that the gist of this article will be reprinted in other southern African magazines in the field of Natural History.

Material and Methods

This survey was undertaken during the period December 1971–February 1972. Data were gathered by means of a circular which eventually provided us with sufficient data for a bulk survey. It was requested that it be indicated whether or not private recordings would be made available for educational and research purposes. It was stressed that no commercial use would be made from the material submitted for inclusion in this survey.

The following information was requested:

- (a) In the column “Bird/Mammal” on the data sheet, fill in the bird or mammal name in English, Afrikaans or Latin. In the case of group recordings, the main species in the group was to be indicated e.g.
Lion kill – lions, hyaena, jackal.

Where more than one recording of any particular species existed, this was treated as a separate entry, e.g.

Purple crested loerie I
Purple crested loerie II
Purple crested loerie III

It was also stipulated that, for the purposes of this survey, it was necessary to know the quantity of recordings, especially, if on each occasion a different individual was involved, or different circumstances prevailed at the time of recording.

- (b) In the column “Roberts No.,” it was requested that the reference number from Roberts’ “Birds of South Africa” for each bird recording, be indicated.
- (c) In the column labelled “description of call”, the recorder had to fill in the call details in the following categories:
 - (1) Alarm
 - (2) Song
 - (3) Communication call
 - (4) Social sounds
 - (5) Duet or group song
 - (6) Other (specified where possible).
- (d) The column “Locality” is self-explanatory.
- (e) In the column labelled “Quality”, the recordings were to be labelled A, B or C, according to the individual judgement of the recorder and using the following criteria as a guide:

- (i) first class recording, free from 'hiss', 'rumble' and 'wind noise', suitable for sonographic analysis, with little background noise of other species (A).
- (ii) adequate recording, not meeting above requirements (B).
- (iii) poor recording, preserved for rarity value only (C).

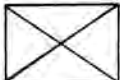
All the information contained in the returned data sheets, was broken down into a coding system. These codes in turn, were entered on to survey sheets for birds and mammals respectively.

The following codes were used:




Quality:  A  B  C

Code Letter for Recordist:  H = Haagner

Code Letters for Place Name:  KNP = Kruger National Park

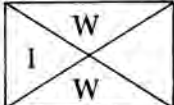
Code Number for Type of Call:  1 = Alarm Call

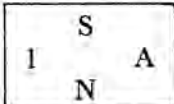
Code for Situation of Recording:

 (i)  (ii)  (iii)

- (i) ● – Commercially available
- (ii) A – Copy of the SABC Archives
- (iii) blank – Recording in owner's possession only.

Examples:

 'A' quality recording by A. Walker, made at Wankie of alarm call. Recording in owner's possession.

 'C' quality recording by J. Stannard, made at Ndumu of typical call. Copy in SABC Archives.

The taxonomic sequence followed McLachlan and Liversidge (1972) as far as the birds were concerned, while the interpretation of Meester, Davis and Coetzee (1964) was adhered to for the mammals.

Data was gathered from the following sources:

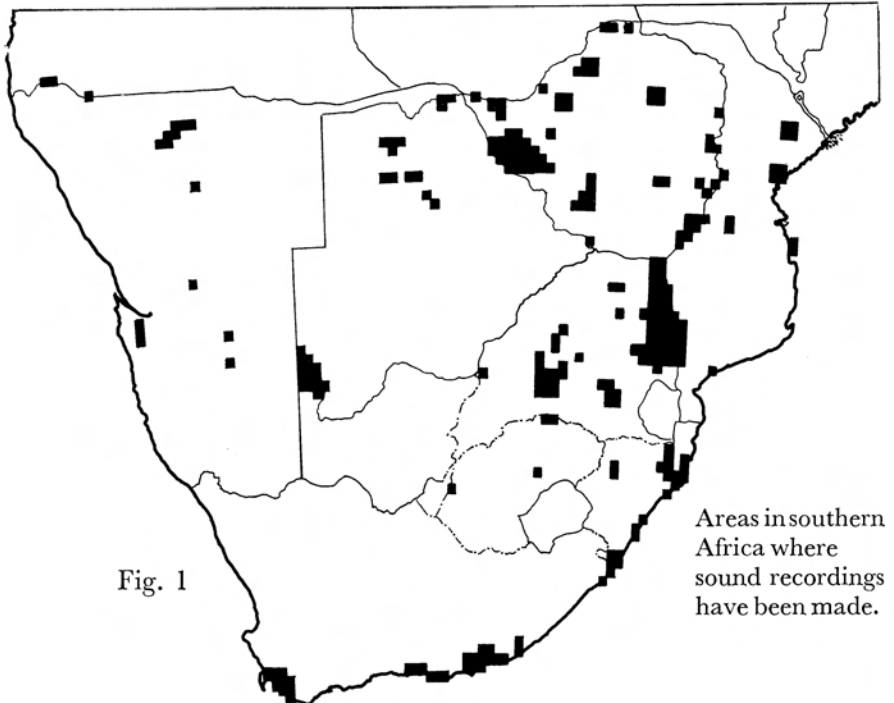
Organizations: the National Parks Board, Pretoria; the Percy Fitz-Patrick Institute of African Ornithology, Cape Town; the Transvaal Museum, Pretoria; the University of Pretoria; the Wildlife Sound Foundation, Johannesburg and the South African Broadcasting Corporation Sound Archives, Johannesburg.

Individuals: Circulars were sent to 44 individual private recordists, known to have carried out significant work in this field. Twenty-one replies have been forthcoming.

As here treated, southern Africa is the area south of the Cunene and Zambezi rivers, corresponding to Roberts' South Africa as described in his 'Mammals of South Africa' (1951).

Results

It must be clearly stated in advance, that no final and comprehensive lists of recordings can be expected based on this survey. The work in this field has been carried out almost entirely by private enthusiasts. To our knowledge, no professional bodies have financed any coverage of the area as a whole. Furthermore, the majority of individuals engaged in this field are not qualified zoologists and this must affect the identification of animals as well as the types of sounds recorded. This survey does, however, show that the most significant collection of sound recordings in southern Africa are the private works of a very small number of individuals. Although there are a large number of people involved in the field, the most comprehensive and significant work has been done by less than 10 persons.



Distribution and Bias of Recordings

It is inevitable that the majority of sound recording work has been carried out in a limited area of southern Africa. Usually, sound recording is only a subsidiary occupation on visits by individuals to chosen 'bush' or 'scenic' localities and thereby in large area of southern Africa no recording has been done (Fig. 1). This applies especially to the Karoo and North Western Cape Province, large tracts of land in South West Africa and Botswana and also Mocambique. Areas which seem to have had a fair coverage would be Rhodesia and in South Africa, the Provinces of Transvaal and Natal. This fact is partially explained by the presence of National Parks and other game sanctuaries which are accessible to the recording enthusiast, with relative ease.

Because of technical problems involved, the bias of recordings is towards the loudest sounds of wild animals (Fig. 2). This figure applies to birds, but the same statement also holds for mammals.

It is also to be expected that the commonest species will show the highest number of sound recordings. This is generally so, except in cases where the commonest species are not particularly 'vocal'.

Detailed Results of the Survey of Mammals

Of the *ca* 480 indigenous mammals (including subspecies) in southern Africa (Meester, Davis and Coetzee, 1964) some 9% have been recorded. This listing includes all the orders of both "smaller-" (rodent, bats, insectivores etc.) as well as the "larger-sized" mammals, including giant-sized species such as elephant and some cetaceans. If the "larger" mammals (including primates, carnivores, tubulidentates, hyracoids, proboscideans, perissodactyls and artiodactyls) are considered in isolation, this figure rises to approximately 20%. Existing sound recordings of mammals are shown in Fig. 3.

In general it would appear that the only hopes of obtaining sound recordings of the species unrecorded at present, would be to carry out the following steps:

- (i) Concentrate on a particular species.
- (ii) Discover its lair or regular pattern of movement within a given locality.
- (iii) Plant microphones at strategic points where the animal is likely to pass them.
- (iv) Mount hides at suitable places and maintain a constant watch with parabolic reflector equipment.
- (v) Where possible use baits to attract the animal (e.g. small carnivores).
- (vi) Carry out night work for nocturnal predators.
- (vii) Application of the newest techniques relating to biotelemetry and similar ways of marking.

Order Menotyphla

Elephant shrews.

Family Macroscelididae

This order consists of four genera, seven species and approximately 24 subspecies. Only one recording exists, that of the short-eared elephant shrew *Macroscelides proboscideus*.

Members of this family are insectivorous and mostly diurnal in habits and are distributed predominantly in savanna areas.

Order Lipotyphla

Family Erinaceidae

Hedgehogs,

Soricidae

Shrews,

Chrysochloridae

Golden moles.

These families are well represented in southern Africa, with a total of some 10 genera, 25 species and 34 subspecies. None of these animals have as yet been recorded. The cryptic nature and way of life of these insectivores may well explain this fact. Hedgehogs and shrews are normally nocturnal while golden moles are predominantly fossorial. In the normal course of events, it is therefore not to be expected that recordings will be obtained. These are most likely to be made in captivity (under laboratory conditions) by persons engaged in research on these families.

Hedgehogs tend to prefer grassveld districts, while the shrews are widely distributed in southern Africa and tend to occur in virtually all biotic zones. Golden moles are essentially non-forest animals and the majority of species occur in southern Africa where speciation has been most active (Bigalke, 1968).

Order Chiroptera

Family Pteropodidae

Fruit bats,

Emballonuridae

Insectivorous bats.

Nycteridae

Rhinolophidae

Molossidae

Vespertilionidae

In southern Africa, this order is represented by 20 genera, some 59 species and approximately 59 subspecies. Recordings exist of two species of fruit bats: The Wahlberg's epauletted fruitbat *Epomophorus wahlbergi* and Peters' epauletted fruit bat *E. crypturus*. Although it is assumed that the fruit bats are the most audible of the bats, it is surprising that no insect-eating bats (representing the remaining five families) appear to have been recorded. Certain other species are bound to have been recorded in caves, but this information has not come to light during this survey. Identification is difficult, but there is no reason why specimens should not be collected after recording, for correct taxonomic identification by experts. It is interesting to note that the bats are second only to rodents in the number of species which occur in Africa (Bigalke, 1968).

Order Primates

Family	Lorisidae	Bushbabies,
	Cercopithecidae	Monkeys, Baboons.

This order comprises three genera, six species and five to eight subspecies, depending on the classification followed.

It is surprising that details of only one recording of the larger grey bushbaby (*Galago crassicaudatus*) has been submitted. The bushbaby *G. senegalensis* appears to be unrecorded. Both species are nocturnal and tend to occur in the north-eastern tropics of southern Africa.

Likewise, the yellow baboon, *Papio cynocephalus* is not recorded, but as it occurs only in the north-eastern limits of our area, this is not surprising. The Chacma baboon, *P. ursinus*, being a vocal and widespread species, is well represented. Both the vervet monkey (*Cercopithecus aethiops*) and the Samango monkey (*C. mitis*) are recorded (as would be expected). In contrast to the bushbabies, they are predominantly diurnal. *C. mitis* overlaps *C. aethiops* zoogeographically, but the former is more strictly arboreal and generally confined to more moist, more densely wooded areas.

Order Pholidota

Pangolins.

Family	Manidae
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In southern Africa the single species *Manis temminckii* occurs and this timid animal emerges from its burrows only at night to feed. It occurs in open or savanna country, but not much south of the Orange River or Zululand (Roberts, 1951). Little is known about the habits of this species and it is doubtful if vocal at all.

Orders Carnivora and Pinnipedia

Family	Protelidae	Aardwolf, Hyaenas, Cats,
	Hyaenidae	Dogs and Jackals, Ratels,
	Felidae	Otters and Polecats,
	Canidae	Civets, Genets and Mongooses,
	Mustelidae	Sea Lions, Seals.
	Viverridae	
	Otariidae	
	Phocidae	

Like the rodents and ungulates, the carnivores are well represented in southern Africa, made up of some 28 genera, 36 species and a vast array (59) subspecies. The suborder Fissipedia comprises the greater part of the order, frequenting land and having well-developed legs and feet for cursorial progression. The order Pinnipedia (sea lions and seals) inhabit our oceans and are adapted to a purely aquatic mode of life. The limbs are short and flipper-like.

The Protelidae (aardwolf) are peculiar creatures with the appearance of a small hyaenid but with rudimentary cheek teeth only. It is mainly found in drier areas and not in forests, No recordings are available and these would only be possible at a known lair with planted microphones.

The hyaenas need no introduction. Both the brown (*Hyaena brunnea*) and the spotted (*Crocuta crocuta*) hyaenas have been recorded, the latter to a far greater extent than the more shy and timid former.

The Felidae (again needing no introduction as far as lions, leopards and cheetahs are concerned) are a well known group, but it is often forgotten that the Cape wild cat (*Felis silvestris*), the blackfooted cat (*F. nigripes*), the serval (*F. serval*) and the caracal lynx (*F. caracal*) are also felids in the true sense of the word. Of the seven species within the three genera (*Acinonyx* – cheetah, *Panthera* – lion and leopard and *Felis*), only the lion, leopard and cheetah have been recorded, and these profusely. It is understood that a considerable amount of luck would be needed to record the others in the field. As in the case with the insectivores, artificial and captive conditions under which these felids are kept, may be the only feasible method.

The Canidae are also a well known family and all the genera (*Otocyon*, *Vulpes*, *Canis* and *Lycan*) have been recorded, with the black-backed jackal (*C. mesomelas*) the most profusely.

The Mustelidae are faunistically unimportant in Africa (Bigalke, 1968), but are none the less interesting animals. According to Roberts (1951), they are all thick-skinned and tough, which in association with a strong skull, appears to ensure survival against attacks from enemies. Only the honey badger (*Mellivora capensis*) has been recorded with certainty, while the Cape polecat (*Ictonyx striatus*), the white-naped weasel (*Poecilogale albinucha*), the spotted-necked otter (*Lutra maculicollis*) and the clawless otter (*Aonyx capensis*) are extremely difficult to record and will probably have to be recorded in captivity.

The Viverridae (civets, genets and mongooses) have speciated to a remarkable extent in Africa and southern Africa has also received its fair share of no less than 13 genera, 21 species and the possibility of 38 subspecies. In our area we encounter two subfamilies i.e. the Viverrinae (comprising the civet, the two-spotted palm civet and the genets) and the Herpestinae (mongooses) in the other. Recordings exist only of three species: the large-spotted genet (*Genetta tigrina*), the Cape grey mongoose (*Herpestes pulverulentus*) and the suricate (*Suricata suricata*). It is felt, that with concerted and concentrated effort, it would be possible to record many of the other species in the field.

The Pinnipedia (sea lions and seals) are also, as yet, unrecorded, according to the response of this survey.

Order Tubulidentata

Family Orycteropodidae

Aardvark.

The range of this animal (*Orycteropus afer*) is sporadic over the whole of

southern Africa (except possibly Mocambique and Rhodesia) whence it has not been recorded, and the Namib desert, *vide* Shortridge (1934) (Meester, Davis and Coetzee, 1964). No recordings exist, and it is not known whether this animal is vocal.

Order Proboscidea

African Elephant.

Family Elephantidae

The single genus and species (*Loxodonta africana*) has been extensively recorded, probably on account of the fact that this, the largest herbivore on the African continent, is widely distributed (especially in National Parks), ecologically tolerant and successful (Bigalke, 1968).

Order Hyracoidea

Dassies.

Family Procaviidae

These predominantly diurnal mammals occur especially in arid and savanna zones. The three genera are rather similar, while four species and at the most two subspecies are recognized. The Cape dassie (*Procavia capensis*) has been recorded but this does not apply to the yellow-spotted dassie (*Heterohyrax brucei*) and the tree dassie (*Heterohyrax arboreus*). The former two are rock dwellers and mainly diurnal, while the latter tends to frequent trees and is nocturnal. It is to be expected that the remainder of this family could be recorded in future, with relative ease.

Order Perissodactyla

Family Rhinocerotidae

Rhinoceroses,

Equidae

Zebras.

The white rhinoceros (*Ceratotherium simum*) is a grazer of open habitats, while the black rhinoceros (*Diceros bicornis*) essentially occupies more wooded country. Both species have been recorded.

The zebras have also undergone a great deal of diversification in southern Africa and the taxonomic interpretation is conflicting. For the purpose of this paper *Equus zebra* (Mountain zebra) and *E. burchelli* (Burchell's zebra) are accepted, in addition to the extinct *E. quagga*.

E. zebra has two subspecies (*E. z. zebra* - Cradock and Oudtshoorn districts and *E. z. hartmannae* - eastern boundary of the Namib desert) while *E. burchelli* consists of *E. b. burchelli* (extinct), *E. b. antiquorum* (Damaraland, Botswana, Transvaal and Zululand), and *E. b. selousi* (Mocambique and Rhodesia). It appears that all these forms are recorded, apart from *E. z. zebra* in the Mountain Zebra National Park near Cradock, and *E. b. selousi* in its range of distribution. It would be of interest to know whether this subspecies has a call similar to the nominate race: it certainly makes whinnying sounds and alarm snorts.

Order Artiodactyla

Family Hippopotamidae

Hippos, Warthogs

Suidae

and Bushpigs,

Giraffidae
Bovidae

Giraffes,
Antelopes and
Buffaloes.

As can be expected, the hippos are well recorded, but this can not be said for the indigenous suids. We have one doubtful recording of a bush pig (*Potamochoerus porcus*) and it seems that this nocturnal species is exceedingly difficult to record. More amazing, though, is the absence of recordings of sounds made by warthogs (*Phacochoerus aethiopicus*). Although the warthog is not particularly vocal, this survey has shown that its vocal repertoire is virtually unknown, and that it should not be impossible to obtain same in future. *Potamochoerus* is widespread in forest blocks.

The giraffes of southern Africa also need no introduction. No recordings are available and the controversy still exists whether these animals make any sounds.

The large and spectacular family Bovidae, is a dominant feature of the African fauna (Bigalke, 1968) and there is no general agreement about the classification of the 24 genera (including 38 species and some 65 subspecies) which occur in southern Africa. Wells (1957) has adduced evidence (based on palaeontological data) for the existence of two bovine strata, an older "African" (i.e. those forms which probably evolved in Africa: Cephalophini, Neotragini and Alcelaphini) and a younger "Afro-Eurasiatic" (Antilopini, Tragelaphini, Hippotragini and Reduncini). The peculiar isolated vaal rhebuck, *Pelea capreolus* (possibly a tribe on its own (Peleini)) should presumably be reckoned to the African stratum (Bigalke, 1968).

For the Bovidae, Simpson's (1945) arrangement into subfamilies and tribes, is here followed.

The Bovini (as represented by the buffalo *Syncerus caffer*) has not yet been recorded while this also applies to a large extent to the Tragelaphini. The latter includes the largest African antelope, the eland (*Taurotragus*), the kudu (*Tragelaphus strepsiceros*), the bushbuck (*T. scriptus*), the sitatunga (*T. spekei*) and the nyala (*T. angasi*). Of this group, only the kudu has been recorded. All the tragelaphids are medium-sized to large species which inhabit wooded savanna of various kinds.

The duikers, tribe Cephalophini, are medium to small-sized species and usually inhabit scrub and forest situations. In our area under discussion, the following are encountered: red duiker (*Cephalophus natalensis*), blue duiker (*C. monticola*), and the grey duiker (*Sylvicapra grimmia*). As is so often the case, these animals forage predominantly at night. Contrary to expectations, the very small blue duiker (*C. monticola*) has already been recorded, but that is the total tally as far as this survey is concerned.

The tribe Reduncini comprises the reedbucks, waterbucks and their allies. The typical genera and species encountered are: reedbuck (*Redunca arundinum*), mountain reedbuck (*R. fulvorufula*), waterbuck (*Kobus ellipsiprymnus*), puku (*K. vardonii*) and lechwe (*K. leche*). From these, only the reedbuck has been recorded.

The vaal rhebuck (*Pelea capreolus*), probably related to the former group, also offers a challenge to recorders. Hitherto, nothing is on record.

The beautiful antelope placed under the Hippotragini include the roan antelope (*Hippotragus equinus*), the sable antelope (*H. niger*) and the gemsbuck (*Oryx gazella*). As far as this tribe is concerned, only the gemsbuck has been recorded to any mentionable extent.

The Alcelaphini are basically grouped into three genera: *Damaliscus* includes the sassaby *D. lunatus* and the well-known blesbok (*D. dorcas phillipsi*) and bontebok (*D. d. dorcas*). The damaliscids are basically inhabitants of short grass plains. Apart from the sassaby, no recordings of any of the other species exist. *Alcelaphus* contains the red hartebeest (*A. buselaphus*) and Lichtenstein's hartebeest (*A. lichtensteini*), neither of which have been recorded, although fairly widely distributed in the northern areas of southern Africa. The third genus is *Connochaetes*: as species we have *C. gnou* (black wildebeest) and *C. taurinus* (blue wildebeest) and only the blue wildebeest has been recorded.

The Antilopini are small to medium-sized bovids, tending to inhabit savanna and dry plains. Both the impala (*Aepyceros melampus*) and the springbok (*Antidorcas marsupialis*) have been recorded.

The Neotragini are small bovids and form a heterogeneous array. The following are classified here: the klipspringer (*Oreotragus oreotragus*), the steenbok (*Raphicerus campestris*), the grysbok (also known as Sharpe's grysbok) (*R. melanotis*), and oribi (*Ourebia ourebi*), the suni (*Nesotragus moschatus*) and the Damara dikdik (*Madoqua kirki*). The latter two antelopes can be described as pigmy antelopes, usually occupying dense thickets. It is therefore surprising to note that the dikdik has already been recorded once.

From the information presented above, it is obvious that the bovids of southern Africa offer an exciting challenge to recordists. All these species certainly make sounds and with patience (and a fair amount of luck) could be recorded.

Order Lagomorpha

Hares.

Family Leporidae

This family is represented in southern Africa by two genera and five species. It includes the Cape hare *Lepus capensis*, the scrub hare *L. saxatilis*, the Bushman hare *L. monticularis* as well as the Natal red hare *Pronolagus crassicaudatus* and Smith's red hare *P. rupestris*. No recordings exist at all and reports have it that at certain times of the year these mammals make loud sounds. It is even possible that foot thumping could be recorded.

Order Rodentia

Family Hystricidae

Porcupines, Mole-rats,

Bathyergidae

Rock rats, Cane rats,

Petromyidae

Spring Hares, Squirrels,

Thryonomyidae

Dormice, Rats and Mice.

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Order Rodentia

Family Hystricidae
Bathyergidae
Petromyidae
Thryonomyidae

Porcupines, Mole-rats,
Rock rats, Cane rats,
Spring Hares, Squirrels,
Dormice, Rats and Mice.

Pedetidae
Sciuridae
Muscardinidae
Muridae

The rodents have a richer profusion of taxa than any other mammal order. In southern Africa, there are no less than 35 genera, comprising 64 species and a multitude (some authorities accept as many as 112) of subspecies. This richness and diversity is to a certain extent the result of the rapid and intensive evolution in Africa in a number of families.

The Bathyergidae (mole-rats), are interesting and fascinating fossorial rodents, with an element of isolation attached to them as far as taxonomic interpretation goes. At present they are accepted to show closer affinities to the porcupines, than any other group. The porcupines (Hystricidae) are the largest African rodents and need no further description. The rock rat (Petromyidae) is represented by one species only (*Petromus typicus*), which also shows hystricomorph affinities. Yet another hystricomorph-like rodent, the cane rat (*Thryonomys swinderianus* and *T. gregorianus* (Thryonomyidae)) occur in our area as defined, being widely distributed in savanna and extending into forest areas. None of these species have hitherto been recorded.

The Pedetidae (spring hares) (*Pedetes capensis*) is another nocturnal vegetarian which has eluded recording.

The squirrels (Sciuridae), with four genera, six species and a number of subspecies (possibly 18), occur frequently in forest areas. The bush squirrel, *Paraxerus cepapi*, as well as the South African red squirrel *P. palliatus* have been recorded, but nothing is known about the vocal capabilities of *Funisciurus*, *Heliosciurus* and *Xerus*.

The dormice (Muscardinidae) are represented in southern Africa by the genus *Graphiurus*. Three species occur, *murinus*, *platyops* and *ocularis*, none of which have been recorded.

The Muridae (rats and mice) are the dominant group of rodents in southern Africa. No fewer than 23 genera occur with 46 species and a maximum of 76 subspecies. No recordings of any of these genera have come to light during this survey.

It is felt, however, that it would be possible to record squirrels, the porcupine and the spring hare under natural conditions. It seems, however, that the remaining rodents are only likely to be recorded in captivity, or if cornered in and at their nests. *Thallomys paelculus* (the tree rat) has a variable repertoire, and can be recorded as was witnessed by one of us (G. de G.) in the Kalahari Gemsbok National Park.

Order Sirenia

Dugong.

Family Dugongidae

No recordings exist, and will probably only be obtained under captive conditions. These animals frequent coasts and river mouths as far south as Lourenco Marques.

Order Cetacea

Whales, Dolphins.

- Family Balaenidae
- Balaenopteridae
- Physeteridae
- Kogiidae
- Ziphiidae
- Delphinidae

This order contains the whales and dolphins frequenting our coasts and oceans. It contains some 20 genera and some 27 species. No recordings are known to exist at present, but it could be expected that sounds have been recorded by specialists in this field, working in oceanaria and associated research institutions.

Detailed results of the survey of birds

Of approximately 874 species listed in Roberts' "Birds of South Africa" (as revised by McLachlan and Liversidge, 1972), approximately 61 % have been recorded. See Fig. 4 for the percentage in each family.

As in the case of the mammals, it has not been possible to publish the original coded sheets, owing to extensive detail involved. A list of the Roberts' numbers indicating the state of recorded and unrecorded species, is given in Table 1.

It is evident that a wide range of techniques will be required to obtain recordings of the unrecorded *ca* 39% of our bird population. Those families for which few recordings exist are briefly discussed below:

- (i) Sea birds (albatrosses, petrels, terns etc.): The best possibility is specific expeditions to breeding grounds. Offshore recording is seldom feasible owing to prevailing winds.
- (ii) Birds of Prey: Owing to the generally silent nature of these species, and the difficulties of recording flight calls, the best hope of recordings is at nests, using planted microphones and hides.
- (iii) Water birds (rails, waders, ducks, etc.): Difficulties exist because of environment and shyness of these species. Blinds used on the edge of marshes, lakes etc., or floating blinds would seem to provide the only means of reaching these birds.
- (iv) Swifts and swallows: Recordings are unlikely to be good unless taken at the roosting places.
- (v) Larks, cisticolas and warblers: One reason for few recordings is the difficulty of identification. It is suggested that recordists carry out work in the company of an experienced ornithologist – especially during breeding activities.
- (vi) Small weavers etc.: As these species make extremely soft sounds, recordings will have to be made at close range with sensitive equipment.
- (vii) Rare species: It will be necessary to make expeditions to the known environments of certain rare birds, and spend the necessary time waiting for recordings.

Table 1
List of recorded and unrecorded species (Robert's numbers), classified in systematic order.

Order	Family	Number of Species in Order/Family	Recorded	Unrecorded (Robert's Number)
Struthioniformes	Sphenisciformes	1	All recorded	
		2		3,
		3	All recorded	7, 8, 9, 10, 11, 12, 12X, 13, 14, 15, 15X, 16, 17, 18, 19, 20, 21X, 22Y, 23, 24, 25, 26X, 27, 28, 29, 32, 33, 34, 35, 36, 37, 38, 39, 43, 46, 51, 53,
Podicipediformes	Procellariiformes	31		
Pelecaniformes	Ciconiiformes	16		62, 62X, 65, 66, 68, 70, 74, 75, 76, 77, 78, 83,
		35		87X, 91, 92, 93, 94, 96, 97X, 99, 99X, 101, 102, 103, 104,
		20		109, 110, 111, 112, 114, 116, 116X, 116Y, 118, 119, 121, 121X,
Anseriformes	Falconiformes	71		122, 124, 127,
				173, 176, 178, 180, 181, 184, 187, 191, 194, 195,
				197, 199, 200, 204, 206X, 207, 208X, 209, 211, 213, 215, 218,
Galliformes	Gruiformes	24		219, 221, 225, 226,
		34		229, 230, 234, 236, 237, 239, 240, 248, 249, 251X, 251Y, 252,
		88		268, 273, 276, 277, 278, 282, 282X, 283, 285, 287X, 288X,
Charadriiformes	Columbiformes			289X, 290X, 292, 293, 297, 301, 302, 304, 305, 305X, 306,
				309, 312, 324, 325,
				329, 332,
Psittaciformes	Cuculiformes	19		335, 338, 341, 342, 344X,
		7		
		27		
Strigiformes	Caprimulgiformes	12	All recorded	
		7	All recorded	
		13	All recorded	
Micropodiformes	Colliformes	3	All recorded	
		3		
		1		
Trogoniformes	Coraciiformes	37		381, 382, 383, 384, 385X, 387, 388, 389,
		27		
		442		396, 398, 400, 408, 417, 420, 429, 434, 438X, 442X, 444, 446X,
Piciformes	Passeriformes	27		434, 438X, 442X, 444, 446X,
		27		
		442		

<i>Order</i>	<i>Family</i>	<i>Number of Species In Order/Family</i>	<i>Recorded</i>	<i>Unrecorded (Robert's' Number)</i>
	Euryleninidae	1	All recorded	455.
	Pittidae	1		462, 463, 464, 465, 467, 469, 471, 473, 475, 476, 477, 478, 479,
	Alaudidae	37		480, 481, 482, 484, 485, 487, 489, 491, 492, 494, 497, 498, 499, 504X, 507, 510, 511, 512, 514, 515.
	Hirundinidae	21		521X.
	Campophagidae	4	All recorded	
	Dicruridae	2	All recorded	
	Oriolidae	4	All recorded	
	Corvidae	3	All recorded	
	Paridae	5	All recorded	
	Remizidae	2		531.
	Certhiidae	1		532.
	Timaliidae	8		534, 537, 540, 541.
	Pyconotidae	9		542.
	Turdidae	44		555, 560, 561, 565, 566, 567, 569, 571, 573, 583, 587, 593X, 597, 600, 604X, 604Y, 605, 615, 616, 617, 619, 621X, 621Y, 623, 623X, 626, 632, 633, 636, 637, 641, 642, 645.
	Sylviidae	61		655, 659, 667, 668, 669, 670, 671, 676, 678, 679, 687, 689, 690, 691, 693, 695, 697, 700, 701, 708X, 716, 718, 729, 732, 739, 740.
	Prinidae	6	All recorded	
	Muscicapidae	31		754, 757, 761, 767, 768, 773, 776, 778.
	Motacillidae	22		781, 782, 794, 795, 796, 798, 800, 802, 806, 807, 809, 811, 812, 814, 815, 816, 817, 819, 821, 822, 824, 826, 827, 828, 829, 832, 834, 838, 840, 842X, 844, 845, 848, 850, 852, 854, 855, 856, 860X, 862, 863, 864, 865, 868, 869, 870, 875.
	Laniidae	27		
	Sturnidae	14		
	Buphagidae	2	All recorded	
	Promeropidae	2	All recorded	
	Nectarinidae	24		
	Zosteropidae	4		
	Ploceidae	85		
	Fringillidae	19		

NOTE: Doubtful Roberts' Numbers are included in this survey.

Discussion

To a large extent the existing recordings have come as a result of general recording carried out 'in the right place at the right time'. To increase the present number of recorded species, particularly the mammals, it would appear that each animal would need to become the object of a particular quest for a recording. For example, if recordings of a black-footed cat (*Felis nigripes*) were wanted, it would be necessary to find a family of specimens, set up suitable recording devices and remain in their area for as long as necessary, before a recording could be obtained.

Certain mammals are unlikely ever to be recorded in the field, particularly the smaller rodents, and the insectivores. It would appear that these would only be recorded in captivity as part of a specific study on any particular species.

Recording equipment

Tape recorders: Tests in sound studies have shown that there are very few portable tape-recorders on the market capable of meeting the required standards for high quality recordings. The majority of good recordings constituting the bulk of this survey were made on 'VAGRA' or 'UHER' tape-recorders. Also to be recommended is the 'STELLAVOX' recorder.

Microphones: Best results are obtained with high quality microphones such as BEYER, CRAMPAN, NEUMANN and others.

Parabolic reflectors: This apparatus is essential for all but the loudest sounds. Audio wave-length considerations indicate that high fidelity requirements are satisfied only with large diameter reflectors (70 cm plus). However, problems of portability, focusing, and support affect the larger parabolic reflectors as the diameter increases.

Future Research Projects

The purpose of this survey was to examine existing available sound recordings and to put forward specific research projects which are feasible and which appear necessary. Admittedly, the list is far from complete and other possibilities will no doubt spring to mind with different people.

- (a) Studies would include projects on particular species, elucidating ethological aspects, in both birds and mammals. A significant amount of recording data for this survey has been supplied by individuals engaged in particular animal studies at institutions in South Africa and the Bio-Acoustic Institute feels that one of its primary objects should be to give assistance required by these researchers in the field of sound analysis.
- (b) As there are only a very small number of mammal species on record, it is suggested that a sonogram is made of a typical recording of each mammal hitherto recorded. The basic parameters defining the call in each case should be defined and published.
- (c) Projects should be initiated to clear up confusion on certain issues, e.g. it is possible to differentiate aurally and sonographically between

the roar of a lion and a lioness? Apart from trumpeting and bellowing sounds, is the so-called 'belly-rumble' of an elephant an involuntary sound, or a deliberate process?

Furthermore, recordings can, in all probability be an additional tool to be applied to the infinite array of taxonomic problems that one is confronted with. Sonographic work could be carried out on controversial species (especially in the case of birds) to confirm (or otherwise) present classifications. This would also lead to studies on geographical variations (vocally) and in turn stimulate genetic studies. Studies on mimicry would also be possible, as well as the discovery of new species, based on the identification and analysis of sound recordings.

Conclusion

On a quantitative basis, we would estimate that the facts presented in this article are based on over two-thirds of the total number of existing sound recordings in southern Africa.

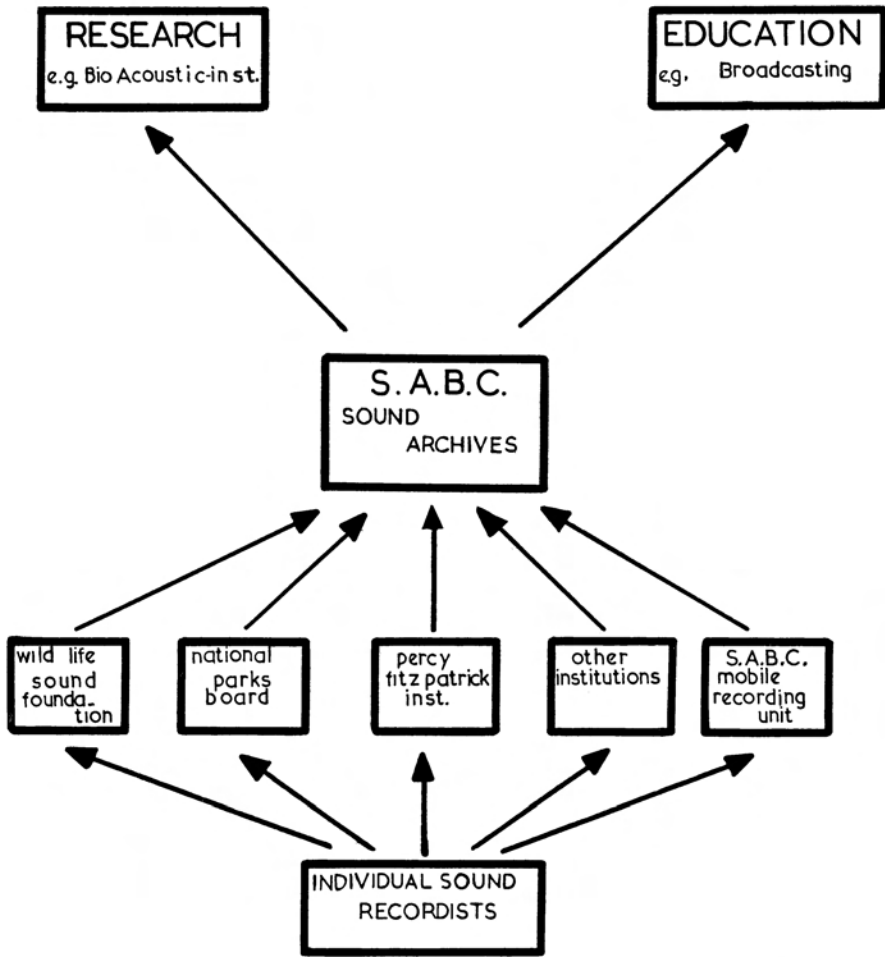
Assuming that a complete collection of the wildlife sound recordings of southern Africa is a desirable object there is a need for an official programme to collect the missing recordings and co-ordinate the existing recordings. With present individual efforts most of the common animal species have been recorded, and the rarer and more difficult species will remain unrecorded unless a particular effort is made to rectify this state of affairs.

The National Parks Board is supporting the policy that S.A.B.C. Sound Archives should be the library for a national wildlife sound collection, and individual recordists are encouraged to place their recordings or copies with the S.A.B.C. through the Wildlife Sound Foundation. A flow sheet indicating how this could be done is given in Fig. 5.

The Bio-Acoustic Institute, as a result of this survey, will endeavour to take steps to fill the gaps for recordings of animals which exist within the National Parks in South Africa. However, as the map in Fig. 1 shows, considerable sound recording work needs to be carried out in other areas of southern Africa. If this is to be executed systematically, it should be done on a professional basis with financial support from institutions within the country.

Summary

An attempt is made to assess the present status of wildlife recordings in southern Africa. Material for this survey was obtained by means of a circular sent to organizations and private individuals. This information was coded and entered on survey sheets for birds and mammals respectively. The mammals and birds are discussed at some length and problems associated with possible sound recordings are stipulated. Only *ca* 9% of the mammals and 61% of the birds in this area have been recorded. A few thoughts are offered on possible future research projects and the



FUTURE SYSTEM FOR CHANNELING WILD-LIFE SOUND RECORDINGS

Fig. 5

necessity of sonographic analysis and its application to different problems is accentuated. The idea of a national wild life sound collection is supported and recordists are encouraged to place their recordings (or copies) with the Sound Archives of the South African Broadcasting Corporation.

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reason that without their willingness and enthusiasm, this bulk survey would not have been possible.

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