

**GOVERNMENT OF THE DEMOCRATIC REPUBLIC OF THE SUDAN  
MINISTRY OF FINANCE AND ECONOMIC PLANNING**

**Executive Organ of the National Council for Development of the  
Jonglei Canal Area**



**DEVELOPMENT STUDIES IN THE JONGLEI CANAL AREA**

**Technical Assistance Contract for Range Ecology Survey, Livestock  
Investigations and Water Supply**

**FINAL REPORT**  
**Volume 5**  
**WILDLIFE STUDIES**

**Mefit-Babtie Srl. Glasgow,  
Khartoum & Rome**

**April 1983**

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European Development Fund (Acc. No: 4105.035.48.18)

FINAL REPORT

Volume 5 - WILDLIFE STUDIES

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VOLUME 5 - WILDLIFE STUDIES

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## SUMMARY

The Jonglei area is richly endowed with wild animal resources and the wildlife studies, which are the subject of this volume, therefore had the following objectives:

- to understand the role of wild animals in the ecology of the Jonglei ecosystem;
- to investigate the role of wild animals as a source of protein to the local people;
- to gather the information with which to assess the role of wild herbivores as competitors for grazing resources with domestic animals;
- to investigate the role of wild animals in the harbouring and transmitting of disease;
- to investigate the distribution and abundance of major wild animal components of the ecosystem.

### Large Mammal Distribution and Numbers

Primarily with information from the three aerial surveys, seasonal distribution maps of all the major large herbivore species were compiled. The preferences of each species for different habitat types were also quantified. Estimates of the numbers of each were also made, as a result of the aerial census. The tiang was clearly demonstrated to be the most abundant species. Its numbers approach half a million in the dry season; extensive flying inside and outside the study area throughout most of one year showed that the tiang complete a round-trip annual migration of about 800 km, of which a crucial part is the dry season which is spent in the Jonglei floodplain. This conflicts with previous published accounts, which were based on inadequate evidence.

Other species, less numerous, also migrate. These include the reedbuck, Mongalla gazelle, zebra and elephants. More sedentary species, more typical of the Sudd, include the Nile lechwe and the sitatunga.

### Wildlife Diseases

Over 90 post mortem examinations were conducted, making it possible to compile a reasonable picture of the parasites of large herbivores. Through serological and other investigations, a picture was also assembled of the role of wild animals in certain diseases, which are discussed in detail in Volume 7. There were no signs in any of the animals examined of any significant pathology.

### Hunting

A formal study was conducted on the role of hunting in the local economy. Hunting is largely confined to the dry season, but is vigorously engaged in at that time. Optimal success occurs with four people and three

dogs. We were able to observe an average of three successful hunts per day. Among the Twic Dinka, hunting is clearly an extremely important part of the nutritional economy, producing, in Kongor District alone, a meat supply with a current notional market value of some £S 1.5 million per annum. The legality of different forms of hunting is discussed and a commentary follows on the various ways in which the wild animal protein of Jonglei might be harvested. It is concluded that a slightly modified and better documented form of the existing traditional hunting method would be hard to improve upon for efficiency and economy.

#### A List of Jonglei Mammals

An annotated list was compiled of all the mammals of Jonglei. The information was collected as and when the species were encountered, by all members of the team. Some 59 species were positively identified; systematic collection, particularly of bats and rodents, could almost certainly add a further 20 species to this list, probably more.

#### Birds

During the aerial surveys the larger birds were recorded. Maps of the distribution of 36 species are presented, while crude estimates are made of the population sizes of 42 species.

Team members recorded casual notes on birds throughout the study, as a result of which it was possible to compile a bird check-list, that numbered 269 species seen by us, out of a total of 475 species for which there is reasonable evidence of occurrence in the area.

The important role of birds in the Jonglei system is described, amongst other functions being as eaters of parasite-bearing snails. By the same token, the importance of the Jonglei wetlands to the birds is also described: the wetlands are the seasonal and in some cases year-round home to literally millions of ducks, geese, ibises, herons and storks. The Bahr el Jebel floodplain holds the bulk of the world population of the shoebill stork.

Particularly in the dry season, the floodplain swamp edge provides a vital food resource for populations of intra-African and Palaearctic migrant bird populations. It is the largest and possibly the most important wetland bird habitat on the African continent.

#### Reptiles and Amphibia

Records of 15 of the commonest species of snake are given, together with descriptions of their biology and notes on their bites and how to try to cope with them.

Information is also presented on terrapins, some amphibians and on crocodiles; there is a brief discussion of the surprisingly small size of the crocodile population and of the possible reasons for this.

### Termites

A special study was conducted on the biology of termites. Mound-building termites are, surprisingly, particularly common in the toic despite the seasonal flooding, against which they skilfully protect themselves. Twelve species of termites were recorded, most of which have fairly well-defined habitat and food preferences. Several are largely dependent on the present of other species, which build mounds which they then inhabit.

There are no practicable ways of combatting the perpetual nuisance in the area of termites consuming the thatch and wood of which luaks and tukuls are constructed. The evidence is that the grass-eating termite species do not eat an important fraction of the natural grass sward.

### 5.3 A LIST OF JONGLEI MAMMALS

The list that follows is a first step towards enumerating the mammals that occur in our study area. It is far from complete and by no means perfect. No formal attempt was made to collect mammals, nor to quantify information about any but the large herbivores. Thus, like the lists of birds and snakes that follow, this depends entirely on the casual field observations of team members. We do not attempt in this list to describe the ecology of any species; we simply annotate sight records. The large ungulates of the area are included, although some of them have been discussed already, in Section 5.2.

The list, whose sequence follows the conventional arrangement of mammalian orders, is arranged in six columns: the English name, the scientific name, the Dinka name, likely vegetation types in which it might be seen, whether it is usually seen by day or by night and finally, notes on field observations. Some species were seen so commonly that there is not space here to do justice to the observations.

The Dinka names were gathered in the following way. Several men from each of three of the Dinka tribes of Jonglei, namely Bor, Twic and Nyarreweng, went through the illustrations in *A Field Guide to the Larger Mammals of Africa* (Dorst and Dandelot, 1978) identifying each large mammal with which they might reasonably have been familiar.

The categories used in the habitat column are the same as those used to describe the distribution of birds, which are in turn the same as those used in the vegetation map (Volume 10, Map 3). They are as follows:

- A = Swamps
- B = River-flooded grasslands
- C = Rain-flooded grasslands
- D = Woodland
- X = densely populated areas



ENGLISH NAME	SCIENTIFIC NAME	DINKA NAME	HABITAT	TIME	COMMENTS
	INSECTIVORA				
Shrews	<u>Crocidura</u> spp	Twic Yen	C, X	day and night	Live specimens captured in August and November 1981. Many skulls removed from barn owl pellets, January to February 1982. Occasionally seen when barrels and other stationary objects moved.
Hedgehog	<u>Erinaceus albiventris</u>	Twic Cong	C, X	night	Seen throughout year. Attracted to insects at camp lights. Nests found in March and July 1981.
	CHIROPTERA				
Fruit bat	<u>Eidolon helvum</u>	Twic Anin	C, X	night	Well established colony in palms at Kongor.
Lesser epauletted fruit bat	<u>Epomophorus labiatus</u>				Seen in Bor.
Yellow winged bat	<u>Lavia frons</u>		C, D	night	Very widespread throughout.
	<u>Nycteris hispida</u>	Twic Aliik	C	night	Invaded buildings at Nyany in January and February of both 1981 and 1982. Seen throughout Jonglei.
	RODENTIA				
Striped ground squirrel	<u>Xerus erythropus</u>	Twic Marang	D	day	Seen throughout year, in woodland areas not in open grassland. Reported to damage groundnuts.

ENGLISH NAME	SCIENTIFIC NAME	DINKA NAME		HABITAT	TIME	COMMENTS
Mouse	<u>Mus minutoides</u>	Twic	Goout	C, D, X	night	Often seen in buildings, particularly where food is kept. One breeding record, October 1981.
Striped grass mouse	<u>Lemniacomys barberus</u>	Twic	Nyang dur	C, X	night	Widespread in grasslands.
Avicanthia rat	<u>Avicanthia niloticus</u>			C, X	day	Seen in grassland. Skulle found in barn owl pellets, January and February 1982.
Multimammate mouse	<u>Pracomys (Mastomys) natalensis</u>					The commonest rodent at Nyany. Main species found in owl pellets. Main species killed in stores.
Cerbils	<u>Tatera valida</u> (?) <u>Heterillus emini</u> (?)			C, X	night	Open grassland.
Shaggy swamp rat	<u>Deaymys incomptus</u>	Twic	Lok or Lho	C, X	night	Specimen collected in building, March 1981. Several in owl pellets.
Porcupine	<u>Hystrix cristata</u>	Bor Twic Nyarrevang	Ayok Ayok Ayok	C	day	Widespread. Skins and quills much in evidence in cattle camps, where the quills are used for many purposes.
	LAGOMORPHA					
Crawshay's hare	<u>Lepus crawshayi</u>	Twic	Nyankin biol	D	night	Commonly seen after dark along roads in Bor woodlands, but not seen on the roads in grassland around Nyany. One hit by car July 1981. Wt. 1.9 kg. February 1982, full grown hare taken from stomach of puff adder.

ENGLISH NAME	SCIENTIFIC NAME	DINKA NAME	HABITAT	TIME	COMMENTS
	PRIMATES				
Olive baboon	<u>Papio anubis</u>	Bor Agang Twic ngok Nyarreveng Agok	D	day	Often seen in groups of up to 30 to 40 individuals on or by the road in Bor woodlands.
Vervet monkey	<u>Cercopithecus aethiops</u>	Bor Agang Twic thelem Nyarreveng Agok Agok syen	D	day	Seen on Bor to Juba road just South of Bor
Patas monkey	<u>Erythrocebus patas</u>	Bor Agang Twic lusljok Nyarreveng Agok lusljok	D	day	Recorded near Bor and once North of Bor. Juvenile seen in February 1982.
	CARNIVORA				
Common jackal	<u>Canis aureus</u>	Bor Avan Twic Avan Nyarreveng Avan	C, X, D, B	night	Seen pouncing and catching a rodent in seasonally flooded grassland, June 1981. Around Nyany rest on wooded termite mounds or in long grass during the day.
Side striped jackal	<u>Canis adustus</u>	Bor Avan Twic Avan Nyarreveng Avan	C, X, D, B	night	Records from seasonally flooded grassland. Corpse examined on Bor woodlands road.
Bat eared fox	<u>Otocyon megalotis</u>	Bor Kak Twic Avan Nyarreveng Avan	B	night	Twice seen near dyke at Nyany (February and August 1981). Two possible records from air. If correct, these represent great extension of range.

ENGLISH NAME	SCIENTIFIC NAME	DINKA NAME	HABITAT	TIME	COMMENTS
Hunting dog	<u>Lycaon pictus</u>	Bor Jong Twic Jong nyapac or, magol Nyarreweng Jong nyapac			Probably occurs within the study area. Records from Fabor and Gemmeiza.
Zorilla	<u>Ictonyx striatus</u>	Twic Amagak	C	night	Two records at Nyany, February and November 1981. The latter was a female showing signs of being on heat.
Ratel, or honey badger	<u>Mellivora capensis</u>	Bor Cir Twic cicugiol Cir cibat or, Kir	C, D	day and night	Juvenile killed near Nyany January 1981. Male found dead on road in mixed woodland South of Sobat mouth; length 72 cm, weight 9.4 kg, remains of small bird in stomach.
Spot necked otter	<u>Lutra maculicollis</u>	Twic Lony avok	A		Reported by toich fisherman. One skin examined at Malakal booyard March 1982, had become tangled in a fishing net and drowned.
Cape clawless otter	<u>Aonyx capensis</u>		D		One possible sighting August 1981.
Civet	<u>Civettictis civetta</u>	Bor Looculo Twic Angol	D	night	Seen on road in Bor woodlands, and just south of Sobat mouth March 1982. Skin sometimes worn by dancers in Nyany area.
Large spotted genet	<u>Genetta tigrina</u>	Bor Angon Twic B'lang kwac Nyarreweng Angor	C, D, B	night	Frequently in Bor woodlands and at Nyany. Seen around wooded termite mounds. A female raised two young in thatch roof at Nyany March 1982. Other brooding evidence November, December and April.

ENGLISH NAME	SCIENTIFIC NAME	DINKA NAME	HABITAT	TIME	COMMENTS
White tailed mongoose	<u>Ichneumia albicauda</u>	Bor Agor Twic Lony Nyarreweng yar Lony yar	C, X, B, D	night	Frequently seen in car headlights in the grassland areas. Pair copulating by Meer dyke June 1981. Lactating female killed by large crowd with dogs August 1981. Wt. 2.58 kg. Length 1 m.
Marsh mongoose	<u>Atilax paludinosus</u>	Bor Agor Twic Lony Nyarreweng col Agor nyang	B, D	night	Seen frequently in both grassland, (especially around the Meer dyke and seasonally flooded areas) and also in Bor woodlands.
Egyptian mongoose	<u>Herpestes ichneumon</u>	Twic Lony yar	C	day and night	Seen during day July. Seen at night January to March.
Banded mongoose	<u>Mungoa mungo</u>				Seen in packs both in woodlands and more commonly in grasslands E. of Nyany.
Spotted hyaena	<u>Crocuta crocuta</u>	Bor Angui Twic Halang Nyarreweng angui Angui	C, X, D, B	night	Records throughout year at Nyany. Usually seen singly in grassland, sometimes heard calling, particularly in November. Cows twice brought in with udders ripped by hyaena. Near Nyany hyaena followed, maybe chased by male ostrich August 1981. Noted travelling on dyke road, avoiding entering water. Reported to break into lunks and raid them. Records from Woi and Ayod.
Wild cat	<u>Felis sylvestris lybica</u>	Bor Angau Twic Angau Nyarreweng Angau			Known to local Dinkas, not seen by team.

ENGLISH NAME	SCIENTIFIC NAME	DINKA NAME	HABITAT	TIME	COMMENTS
Serval	<u>Felis serval</u>	Bor Dho Twic Dho Nyarreveng Dho	B, C	night	A number of records. Seen hunting rodents in seasonally flooded grassland June 1981. Adult male killed by man and dog March 1982, Wt. 13.4 kg, shoulder ht. 54 cm, length 108 cm, rodent in stomach. Serval kitten about 15-20 cm long offered for sale in Maar September 1981. Dancers wear serval skins.
Lion	<u>Panthera leo</u>	Bor Koor Twic Koor Nyarreveng Koor or, cuor	C	day and night	Occur at low density. Seen from air on several occasions in <u>Hyparrhonia</u> grasslands. Records of lions speared at Jalla 1980, Bor 1981, Panyageor 1982, Maar 1982, all in dry season.
Leopard	<u>Panthera pardus</u>	Bor Kuac Twic Kuac Nyarreveng Kuac	B, C	night	Seen in Bor woodlands March 1981. Several records reported, and one leopard skull found close to Nyany. Probably still widespread.
	PROBOSCIDEA				
African elephant	<u>Loxodonta africana</u>	Bor Akon Twic Akon Nyarreveng Akon	A, B, D	day and night	Sparsely scattered throughout study area (Fig. 5.2.4). Largely confined to swamp in dry season, but more widespread in wet. Herds of up to 300 regularly seen from the air. One male killed near Nyany, April 1980. Man killed by elephant, Wanga, April 1981.

ENGLISH NAME	SCIENTIFIC NAME	DINKA NAME		HABITAT	TIME	COMMENTS
	TUBULIDENTATA					
Aardvark	<u>Drycteropus afer</u>	Bor Twic	Akuom Akuom		night	Holes and diggings seen near Malek, and in plains from the air.
	PERISSODACTYLA					
Common zebra	<u>Equus quagga</u> <u>boehmii</u>	Bor Twic Nyarroveng	Maguar Maguar Maguar	C	day	Widely distributed in small numbers over the Southern part of the study area. Prefer woodland areas. Some migrate to toich in dry season, from unknown wet season range to the South (Fig. 5.2.17).
Black rhinoceros	<u>Diceros bicornis</u>	Bor Twic Nyarroveng	Marial Kil Kil			A very few individuals in woodlands South of Malek. Two fighting sticks made of rhino horn were offered for sale at Nyany by an ivory trader, March 1981.
White rhinoceros	<u>Ceratotherium</u> <u>simum cottoni</u>	Bor Twic Nyarroveng	Marial Kil Marier			Confined in study area to small part of West bank near Shambe. None seen by team. Current numbers unknown.

ENGLISH NAME	SCIENTIFIC NAME	DINKA NAME		HABITAT	TIME	COMMENTS
	ARTIODACTYLA					
Hippopotamus	<u>Hippopotamus</u> <u>amphibius</u>	Bor Twic Nyarreweng	Rau Rau Rau	A	night and day	Extremely common throughout the swamp and swamp margins (Fig. 5.2.8). Numbers apparently much reduced over the last 30 years. Regularly hunted by Dinka, Nuer and Shilluk fishermen using canoes and harpoons, for meat (immediate consumption) and hides (export). Bones used as weights for fishing nets.
Warthog	<u>Phacocoerus</u> <u>aethiopicus</u>	Bor Twic Nyarreweng	Kul Kul Kul	D, C	day	Uncommon in Nysny area, though the remains of two corpses found and the animal is well known to local Dinka. Numbers increase in woodlands from Bor Southwards.
Giraffe	<u>Giraffa</u> <u>camelopardalis</u>	Bor Twic Nyarreweng	Mirr Mirr Mirr	D, C	day and night	Wide ranging in both woodland and treeless grassland areas (Fig. 5.2.6). Occasionally in groups up to 100. Surprisingly, frequently seen in water over 50 cm deep. Many corpses (drought?) in Eastern plains March 1980.
Blond	<u>Taurotragus</u> <u>oryx</u>	Bor Twic	Amer nyang Amer nyang			Very scarce visitor. Skull collected near Fengko.
Sitatunga	<u>Troglodytes</u> <u>spokoi</u>	Bor Twic Nyarreweng	Tail Daol Per	A	day	Widely seen from the air along swamp-toic margin (Fig. 5.2.13). Preferred habitat identical to that of shoebill stork.



ENGLISH NAME	SCIENTIFIC NAME	DINKA NAME	HABITAT	TIME	COMMENTS
Bushbuck	<u>Tragelaphus</u> <u>scriptus</u>	Bor Twic Kabuk Kabuk	D	day and night	Confined at apparently low density to dense woodland areas, mostly in the South of study area, on both banks of the Nile. Frequently seen Bor woodlands.
Roan antelope	<u>Hippotragus</u> <u>equinus</u>	Bor Twic Nyarreweng Amon Amon	C	day and night	Seen, usually in groups of 10-30 animals, widely throughout study area. Common in open grassland. Never far from water in dry season (Fig. 5.2.12).
Waterbuck	<u>Kobus</u> <u>defassa</u>	Bor Twic Nyarreweng Pior Pior Pior	A, B, D	day and night	Scattered in wooded areas throughout the study area, particularly those dominated by <u>Acacia seyal</u> . Close to water's edge in South, but apparently not so in North (Fig. 5.2.15). Regularly seen in toic near Nyeny.
White eared kob	<u>Kobus kob</u> <u>leucotis</u>	Bor Twic Nyarreweng Guil Guil Guil	C, D, B	day and night	Apparently resident close to river on West bank of B. el Jebel; East bank population apparently migratory, though seen in toic throughout year (Fig. 5.2.16). Probably not connected with huge populations that spend dry season near Fabor, to East of study area. Frequently seen hunted near Nyeny.

ENGLISH NAME	SCIENTIFIC NAME	DINKA NAME	HABITAT	TIME	COMMENTS
Mile lochwoc	<u>Kobus megaceros</u>	Bor Ror, or Abiok Twic Abiok Nyarreweng Abiok	A, B	day	Confined to wet floodplain. Often in groups of over 500, both sexes and all ages. These split into breeding and bachelor herds in late wet/early dry season (Fig. 5.2.9). One group of over 500 spent wet season in toic 8 km West of Nyany; by end of dry season had moved 40 km North West (regular serial observations).
Reedbuck	<u>Redunca redunca</u>	Twic Keu Nyarreweng Keu	C, X, D	day and night	Migratory, spending dry season scattered through toic and wet season in <u>Hyparrhenia</u> grassland (Fig. 5.2.11). Extent of migration not yet known. Some evidently independent of water in dry season. Very vulnerable to hunting, easily outrun by dogs.
Lelwel hartebeest	<u>Alcelaphus buselaphus lelwel</u>	Bor Alualweng Twic Alualweng	D	day	Confined to woodland in extreme South of study area (Fig. 5.2.7).
Tiang	<u>Damalisca lunatus tiang</u>	Bor Tiang Twic Tiang Nyarreweng Tiang	C, X, B	day and night	The most numerous large herbivore in the study area, in the dry season. Migrates far to South East in wet. (Discussed in greater detail in Sections 5.2.2 and 5.2.3. See also Figs. 5.2.14 and 5.2.21). One of four biggest populations of large wild terrestrial mammals in world. Important dry season food for people.

ENGLISH NAME	SCIENTIFIC NAME	DINKA NAME	HABITAT	TIME	COMMENTS
Mongalla gazelle	<u>Cazella thomsoni</u> <u>albnotata</u>	Bor        Nger Twic        Nger Nyarreweng Nger	C, B	day and night	Occur in large numbers throughout Hyparrhenia grassland in dry season. Favour short regrowth after burning. Some reach floodplain, but mostly independent of water. Most migrate out of study area in wet season, not known where (Fig. 5.2.5).
Grey (or Grimm's) duiker	<u>Sylvicapra grimmia</u>	Twic        Amuk	D	day	Quite common in dense woodland areas where usually seen as single animals. Difficult to see from the air (Fig. 5.2.3).
Oribi	<u>Ourebia ourabi</u>	Bor        Loic Twic        Loic or, Adiel Nyarreweng Adiel	C, D, B	day	Widespread throughout woodlands and dry grasslands of study area, particularly in the North. Rarely enters floodplain. Normally seen in pairs or singly (Fig. 5.2.10).
Buffalo	<u>Syncerus caffer</u>	Bor        Anyer Twic        Anyer Nyarreweng Anyer	D, C	day	Scattered distribution throughout the area, always within reach of rivers and swamps. Usually in herds, though these rarely exceed 75 animals. Largest groups seen on Zeraf Island. No evidence of seasonal movement (Fig. 5.2.1)

In addition to the mammals in the list above, a number of others almost certainly occur in the area. Evidence for this comes either from unconfirmed field records or, in the case of bats, from published records from nearby areas (Kock, 1969). These species include:

INSECTIVORA

Crocidura flavegens and possibly as many as four other species present in owl pellets. Awaiting identification.

CHIROPTERA

Coleura afra  
Taphozous perforatus  
Nycteria thebaica  
Hipposideros ruber  
Tadarida condylura  
Tadarida pumila  
Eptesicus randalli  
Pipistrellus rueppelli  
Scotophilus nigrita

RODENTIA

Lemniscomys striatus  
Thryonomys swinderianus

Systematic collection would no doubt reveal more species in these and other mammalian orders.



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**Development Studies in the Jonglei Canal Area. Technical Assistance Contract for Range Ecology Survey, Livestock Investigations and Water Supply. Final Report. Volume 5. Wildlife Studies.**

Government of The Democratic Republic of the Sudan Ministry of Finance and Economic Planning; ( Executive Organ of the National Council for Development of the Jonglei Canal Area)

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