

One of the last areas we worked was in the far north, close to Tumu, where Luivie and Lutie were from. Again, I redid this report for the department in 1997, so that report is included below. It was more tough country and we were there in the hot season. One day I finished my transect and so Kwame and I and a couple of the others drove up on a long hill with few trees, where we Ahmed would see us, after completing his rather longer transect from one side of the river valley to the other. I have always considered myself pretty tough and good at covering country but that day I was completely exhausted by the km covered in our transect and just the heat. Kwame and I were lying in the shade of land rover, sweating and waiting for the day to end. Then up out of the valley what do we hear? Ahmed coming up the hill and singing his heart out. I could have killed the sonofabitch that day... He was one of the toughest human being I have ever spent time with and despite the conditions, he never, ever lost his sense of humor. He was the best.

COVER LETTER

December, 2007.

Attached is a revision to a report written by the Faunal Survey Team in 1971. Original maps are included, and some photos from that era, that I recently had digitized, are included in this version of the report. Some additions to the original report are included. I hope this information will assist in the Department and others and will give some long term perspective on wildlife populations in the area.

Bob Jamieson

President
BioQuest International Consulting Ltd.
Box 73, Ta Ta Creek, B.C. VOB 2HO Canada
250-422-3322

Former Assistant Game Warden
Dep't of Game and Wildlife
Ghana.

**A FAUNAL SURVEY OF THE KAULPAWN RIVER AREA, TUMU DISTRICT,
GHANA.**



Kaulpawm River, near Wahabu, 1971.

**FAUNAL SURVEY TEAM
DEPARTMENT OF GAME AND WILDLIFE
GHANA
1972.**

ABSTRACT

An area near the Kaulpawm River in the Tumu District was surveyed in 1971 and 1972. It was found that heavy hunting had exterminated all elephants in the area. Leopard and lion are rare however there is small group of hippos that may remain. Some crocodiles are present. Numbers of all the important bush meat species are very serious reduced, especially the large ungulates. Soils are very poor. Some farming is carried out on the edges of the proposed reserve. All farms were located and mapped. Discussions were held with personnel from other government departments and with traditional leaders in the area. The area is not being considered for agricultural development in the near future. The forestry department has plans for the creation of a forest reserve on the west bank of the Kaulpawm which would dovetail nicely with department plans, at least initially. It is recommended that an area of 175 mi.² be demarcated as a game reserve. One small village will have to be relocated.

TABLE OF CONTENTS

INTRODUCTION

METHODS

STUDY AREA

RESULTS

CONCLUSIONS

RECOMMENDATIONS

LITERATURE CITED

LIST OF FIGURES

Figure 1. Transects and location of villages.

Figure 2. Vegetation Types.

Figure 3. Access in the Kaulpawm Area.

Figure 4. Farming areas in the Kaulpawm area.

Figure 5. Proposed Forest Reserve

Figure 6. Proposed Game Reserve.

LIST OF TABLES

Table 1. Species evidence found in the Kaulpawm Area.

Table 2. Wildlife species observed in the Kaulpawm area.

Table 3. Observations per mile of transect, November 1971 transects in the Tumu area and wet season transects in Mole National Park.

Table 4. Census strip widths in the Mole and Tumu areas.

Table 5. Wildlife Population densities (animal per square mile) in four areas of Ghana. (from Jamieson, 1972).

Table 6. Bushmeat observed in the Bugelebelle Market, Feb. 25, 1972.

Table 7. Cattle Numbers (Veterinary Services data, 1970)

LIST OF PHOTOS

Photo 1. Typical vegetation in higher areas in the Kaulpawm area.

Photo 2. Bushmeat for sale in a local market near Tumu, 1972.

A FAUNAL SURVEY OF THE KAULPAWN RIVER AREA, TUMU DISTRICT, GHANA

INTRODUCTION

In the early 1950's this area was considered as a potential site for Ghana's first Game Reserve, however the Damongo area was thought to provide a better alternative and was subsequently developed at that time. At that time, this area supported very high numbers of animals including elephants. Since then intensive hunting has decimated the numbers of all species present and elephants have been exterminated. It was not until late 1971 that the department was again able to return to the area. Discussions earlier this year with the chief of the Tumu District (Tumu-Koro) lead to the suggestion that a survey be made in the area with a view to establish the Game Reserve in which wildlife could be protected. On this basis, the Faunal Survey Team was sent to the area in October 1971.

METHODS

A staff of one assistant game warden, one game ranger, one learner game ranger, one game scout and two labourers worked in the area from October 22 to November 21, 1971 and again from February 6 to February 29, 1972. The survey was carried out using transect as described in Jamison 1970 to provide data on the species present, their distribution and relative abundance. Figure 1 indicates the location of these transects.

To locate boundaries for a future reserve, all villages surrounding the area were visited. Farmers from each village were asked to lead members of the team to the farms furthest from the villages. Distances from the farms to the village were then paced and the direction recorded. These data were then plotted on 1:50,000 topographic sheets. Using this method it was possible to locate the farms with some precision. Unlike some other areas in Ghana, villages in the Tumu area and even the trails radiating from them are permanent. The maps used, based on 1961 to 1962 air photos, were very precise. Field checks as some of the trails indicated on the maps indicated that they were unchanged since 1961. The trails themselves show evidence of extended use. We were able to locate the farms with an accuracy of plus or minus 500 yards/500m.

The final phase of a survey consisted to discussing the area with officers from other government departments see what plans, if any, these departments had for the area.

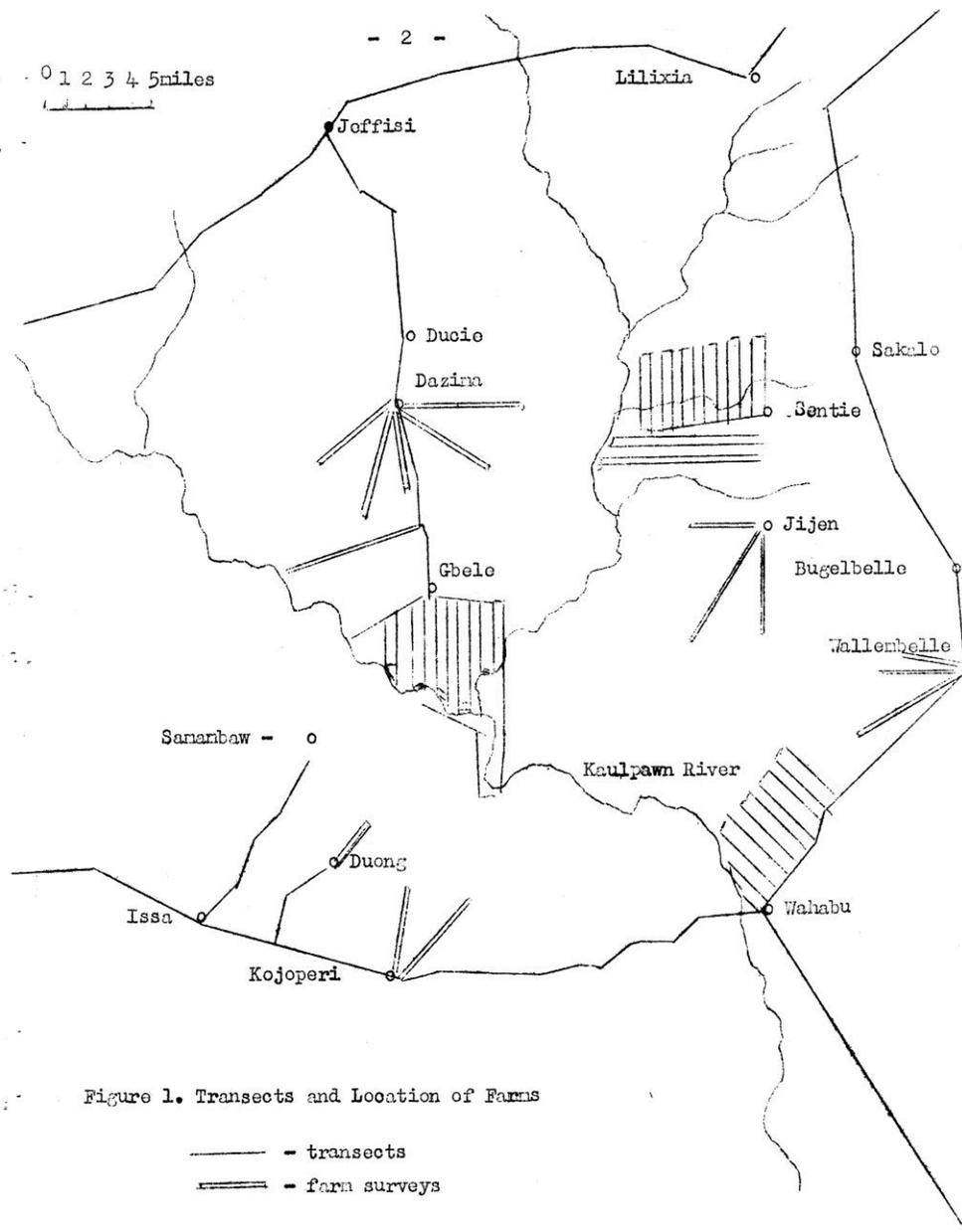


Figure 1. Transects and location of villages.

STUDY AREA

The basic rocks of the area are voltaian mudstones and shales. Granite intrudes in the higher areas. A detailed description of the geology area is provided in the FAO report on northern Ghana (Anon. 1968).

Topography: The area is flat and rolling, varying from 700 feet/240m altitude at Wahabu on the Kaulpaw River, to 1050 feet/300m on two minor hills in the Walembele and Kojoperi areas. An open hillside near the village of Duong gives a good view of the area; the two major water drainage systems, the Kaulpaw River and the Yelwia River can be seen.

Soils: Soils in the area are described as upland soils (Class 2 - VI -grey brown shallow) with less than 1 inch of soil, with patches of shallow soils and rock exposure; and alluvial soils (Class 4 - I -grey brown, 3 to 5 feet in depth. deep and imperfectly or poorly drained, with a light texture surface and medium texture self soils with iron concretions) (Anon, 1968).

The suitability of soils for cultivation was described as follows:

1. Dazima Area - Class IV - unsuitable for agriculture
2. Walembele-Bugebele Area – Class IV - suitable only for hand cultivation and dryland farming
3. Kaulpaw and Yelwia River Area – Class I - suitable for mechanized agriculture.

General conclusions which can be drawn from the soil and agriculture capability surveys carried out by the FAO are:

1. The upland soils in this area are the least suitable for cultivation found in northern Ghana.
2. The only valuable agricultural soils in the area are found in a narrow strip along the Kaulpaw in Yelwia Rivers.

Vegetation: Vegetation in general is very comparable to that of Mole National Park, though this area is generally more open. Tree-less areas occur around all the villages, presumably due to intensive farming, cattle husbandry and wood gathering. Open “shrub” bush from 9-15 ft/3-5 m tall occurs in all higher areas. The savannah woodland in lower areas is typical, but little riverine forest remains. Apparently most of the large trees along the Kaulpaw and Telwia Rivers were cut down the 1950’s by the Tsetse Control Department to destroy the habitat of tsetse fly. Several old village sites occurred in the area and support the plant communities indicative of such areas. Figure 2 indicates the distribution of vegetation types in the area. Photo one is indicative of conditions in the area.

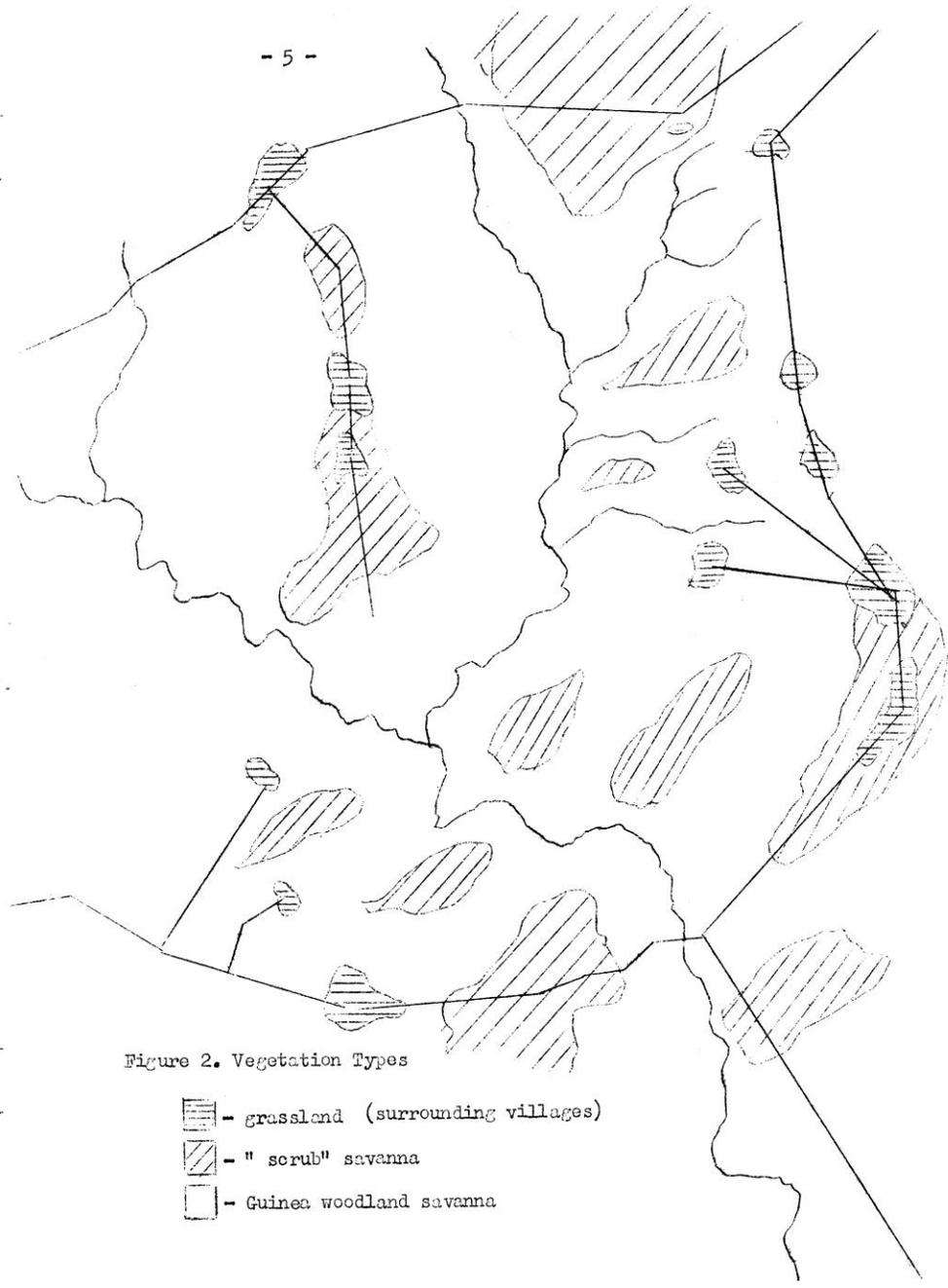


Figure 2. Vegetation Types

-  - grassland (surrounding villages)
-  - "scrub" savanna
-  - Guinea woodland savanna

Figure 2. Vegetation Types.



Photo 1. Typical vegetation in higher areas in the Kaulpaw area.

Access: Figure 3 indicates all major roads and tracks in the area. Dry season access is good and almost all areas are accessible with a four-wheel-drive vehicle in that season. Roads built by the Tsetse Control Department penetrate to the center of the area and could be made usable again with little effort. In the wet season the drift at Wahabu is not usable and the Jinjen, Sentie, Duong and Dazima roads are useable only part of the time.

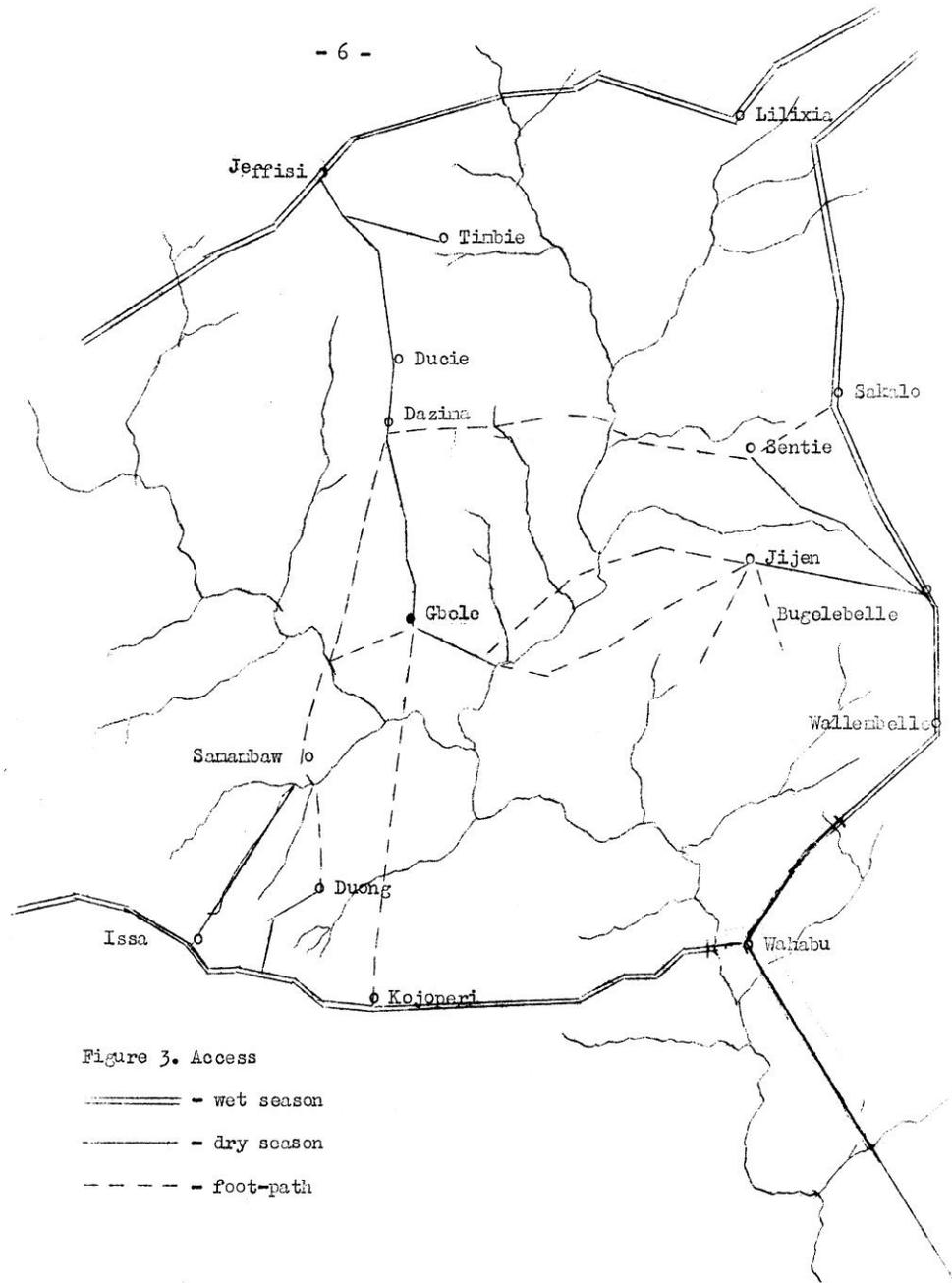


Figure 3. Access

- ==== - wet season
- - dry season
- - - - - foot-path

Figure 3. Access in the Kaulpawm Area.

RESULTS

Wildlife numbers: The animal community in this area is that typical of the Guinea woodland savanna and is comparable to that of Mole National Park. Table 1 lists the species presence present and the kinds of evidence found for each species.

Table 1. Species list key

1. Observed during study
2. Definitive evidence such as a skin or skull was seen.
3. Tracks or droppings were observed.
4. Observed recently by local hunters.
5. Possible (within the expected range of the species).

Table 1. Species found in the Kaulpaw Area.

SPECIES	1	2	3	4	5
Forest Elephant- <u>Loxodonta africana cyclotis</u>					x
Hippo- <u>Hippopotamus amphibius</u>				x	
Buffalo- <u>Syncerus caffer nanus</u>	x				
Western Hartebeest- <u>Alcelaphus buselaphus major</u>	x	x	x		
Roan Antelope- <u>Hippotragus equinus</u>		x	x		
Defassa Waterbuck- <u>Kobus ellipsiprymnus deffassa</u>		x	x		
Reed buck - <u>Redunca redunca</u>		x	x		
Kob- <u>Kobus kob</u>		x	x		
Oribi - <u>Ourebia ourebi</u>	x	x	x		
West African Bushbuck- <u>Tragelaphus scriptus</u>	x		x		
Crowned Duiker - <u>Sylvicapra grinnia</u>		x	x		
Red-flanked Duiker- <u>Cephalophus rufilatus</u>	x	x	x		
Yellow-backed Duiker - <u>C.silvicultor</u>					?
Senegal Galago- <u>Galago senegalensis</u>					x
Red(Patas) Monkey- <u>Erythrocebus patas</u>	x				
Black and White Colobus- <u>Colobus polykomos</u>					?
Green Monkey- <u>Cercopithecus aethiops</u>	x				
Dog-faced Baboon- <u>Papio anubis</u>	x				
Warthog- <u>Phacocheerus aethiopicus</u>	x				
Red River Hog- <u>Potamochoerus porcus</u>					?
Lion- <u>Panthera leo</u>				x	
Leopard- <u>Panthera pardus</u>				x	
Serval- <u>Felis serval</u>					x
Caracal- <u>Felis Caracal</u>					x
Civet Cat- <u>Viverra civetta</u>		x			
Genet- <u>Genetta thierryi</u>		x			
Gambian Mongoose- <u>Mungos gambianus</u>					x
White-tailed Mongoose- <u>Ichneumia albicauda</u>					x
Cusimanse Mongoose- <u>Mungos obsurus</u>					x

Pygmy Mongoose	- <u>Herpestes sanguineus</u>			X
Egyptian Mongoose	- <u>Herpestes ichneumon</u>			X
Marsh Mongoose	- <u>Atilax paludinosus</u>			X
A ardvark	- <u>Orycteropus afer</u>			X
Honey Badger	- <u>Mellivora capensis</u>		X	
Togo Hare	- <u>Lepus capensis</u>	X		
Crested Porcupine	- <u>Hystrix cristata</u>		X	
Grasscutter	- <u>Thryonomys swinderianus</u>	X		
Giant Pangolin	- <u>Manis gigantea</u>			X
Spotted Hyena	- <u>Crocuta crocuta</u>		X	
Wild Dog	- <u>Lycan pictus</u>			?
Side-striped Jackal	- <u>Canis adustus</u>			?

We found:

1. Elephants are no longer present in the Kaulpaw area. Though relatively common up until 1960, they have since been exterminated, apparently due almost entirely to the efforts of a single ivory hunter. The nearest known elephant populations are 40 miles to the southwest along the Black Volta (a small group only), and the elephants in the north portion of Mole National Park some 50 miles to the southwest. A small population also occurred north of Tumu in Burkina Faso in the Nazinga/Po area, but we were not aware of this population at the time.

2. Hippos were thought to occur in the Kaulpaw River; within the last year hunters had observed tracks of five animals (three adults and two young). In February this area was studied, but no evidence of hippo was found. It is possible that the animals observed had moved upstream from the known population on the Kaulpaw River at the north end of Mole National Park. Further work will be necessary to find out if there is, in fact, a resident population still existing in this area.

3. Lion, leopard and spotted hyena were still present in the area and had been observed recently by local hunters.

4. Dorcas gazelle. We found no evidence of this sahelian species in this area. In our work in the Gambaga Scarp area one horn sheath was found that appeared to be from a Dorcas gazelle.

5. Large mammals. Discussions with people in the area indicate that originally the area supported high numbers of ungulates, apparently much higher numbers than the Damongo area did. At that time there were very high numbers of Roan Antelope, suggesting that this area was better habitat for this species than the Damongo area. This is supported by evidence from the Nazinga area in Burkina Faso where comparatively high numbers of Roan Antelope occur.

For only those species with a special ability to survive under heavy and heavy-hunting are presently found in the area (Table 2). Buffalo are present since they are difficult to kill with the weapons available to local hunters. Bushbuck, Oribi and Warthog appear to

the only ungulates that are present in any numbers in the area. Studies in other heavily hunted areas also found that these species seem to be able to survive better than other species (Table 5). Most other ungulates are present but were very rarely observed. The only the animals observed in any numbers were the primates. These animals are adept at avoiding hunters and their meat is considered to be of less value than that of ungulates, therefore their numbers have not been so seriously reduced.

Table 2. Wildlife species evidence found in the Kaulpaw area.

SPECIES	November Survey *		February Study **	
	No. Obs.	Frequency	No. Obs.	Frequency
Buffalo	5	6.8%	-	-
Hartebeest	-	-	3	3.9%
Bushbuck	5	6.8	2	2.6
Oribi	-	-	7	9.2
Crowned Duiker	-	-	2	2.6
Red-Flanked Duiker	-	-	2	2.6
Warthog	1	1.3%	-	-
Sub-Total - Ungulates	11	14.9%	16	20.9%
Baboon	19	26.0	35	46.0
Patas Monkey	10	13.6	7	9.2
Green Monkey	30	41.0	18	23.7
Sub-Total - Primates	59	80.6%	60	78.9%
Other - Grasscutter	4	5.4	-	-
TOTAL	73	100.0%	76	99.8%

* - 17 transects totalling 134 miles.

** - 8 transects totalling 67 miles.

Table 3, based on observations collected at the end of the wet season when visibility was still restricted by high grass, indicated that the number of animal groups observed is only slightly lower in this area, despite heavy hunting, than it is in Mole National Park. Ungulates were reduced by almost half and primates were lower by only 20%. However, more precise data collected in February provided a different picture.

Table 3. Observations per mile of transect, November 1971 transects in the Tumu area and wet season transects in Mole National Park.

Species Group	Mole National Park-savannah	Mole National Park-Riverain areas	Tumu Area
Primates	.020	.100	.680
Ungulates	.114	.060	.034
Totals	.134	.160	.114

Wildlife Density Estimates, dry season data.

An analysis of sighting distances for this area indicates that visibility in this area is a factor of 2.5 times as great as in Mole National Park for larger species and 1.2 times as high for the small ungulates. The strip widths used are indicated below (Table 4).

Table 4. Census strip widths in the Mole and Tumu areas.

Study Area	Large Ungulates	Medium Ungulates	Small Ungulates*	Primates
Mole N.P.	60-87 m	44-60m	40-49m	60m
Tumu study	200m	150m	50m	150m

Based on this dry season data, population density estimates were calculated as indicated in Table 5. These data suggest the populations in the Kalpaw area are very much reduced. Primates numbers are 30% of the Mole Park populations, small ungulates were 26% and larger ungulates are only 1% of the Mole National Park populations. Although these estimates are based on a small sample, it is obvious that over-hunting is having a serious effect on the wildlife populations in this area, especially the large ungulates.

Table 5. Wildlife Population densities (animal per square mile) in four areas of Ghana. (from Jamieson, 1972).

Species Group	Mole National Park	Dwija Arm, Digya N. Park	Gbele Game Res.	Gambaga Scarp/Red Volta area
Large Ungulates	31.7	4.7	.4	.5
Small Ungulates	15.0	4.0	4.0	1.3
Primates	24.9	8.0	9.6	11.0
TOTAL	71.6	16.8	14.0	12.8

Almost all animals were observed close to the Telwia and Kaulpawm Rivers. Figure 6 indicates the areas in which wildlife concentration should be expected to occur in the future, with protection. Nile monitor lizards were very common along the Telwia River in the wet season. Droppings of crocodile were found along the Kaulpawm River. According to fishermen, a few large crocodiles still occur in both the Kaulpawm and Telwia rivers.

Bush meat Survey

During the wet season portion of the study only a few animals carcasses were observed in the markets. More meat was observed in the February surveys at Bugelebelle market, the only important bush meat market in the area. Some bushmeat also moves through the Kojoperi market. Complete data was collected on only one date as indicated in Table 6. These data reflects the condition of the wildlife resource in the area.

Table 6. Bushmeat observed in the Bugelebelle Market, Feb. 25, 1972.

Species	No. of Animals	Price (cedis)	Total Value
Baboon	9	51.00	45.00
Bushbuck	6	51.00	30.00
Hartebeest	1	30.00	30.00
Porcupine	2	31.00	62.00
Warthog	7	10.00	70.00
Dompo (Akan)	1	3.0	3.00
TOTAL	26		240.00



Photo 2. Bushmeat for sale in a local market near Tumu, 1972.

Farming Areas

Villages in the area are surrounded by areas of $\frac{1}{4}$ to $\frac{1}{2}$ a mile in diameter that are almost treeless. These areas are occupied by the village cattle, sheep and goats. Little agriculture other than rice cultivation occurs. Rarely are farms found less than a mile from a village, the maximum distance found was 6 miles. In most cases the farms were concentrated in one or two areas, usually along established roads or trails.

Figure 4 indicates the location of farms around all the villages studied. These farms were plotted on 1:50,000 sheets of the area. Major crops are those typical of the Upper Region, being guinea corn, millet corn and yams. Rice is cultivated in a few areas as is cotton.

The system of land ownership is a complex problem in this area. There is some contention between chiefs and some individuals. In the village of Wallembele, there is no appointed chief and land ownership is invested in the elders of the village. In other villages it is invested in the chieftaincy. Generally the chiefs of Gbele and Dazim claim ownership of the area between the Telwia and Kaulpawm rivers.

The chiefs of Jijen and Sentie, under the Sakai chief, claim ownership of the east bank of the Telwia River. The Wallembele elders claim ownership of the area along the Kaulpawm River downstream from the confluence of the Kaulpawm and Telwia rivers.

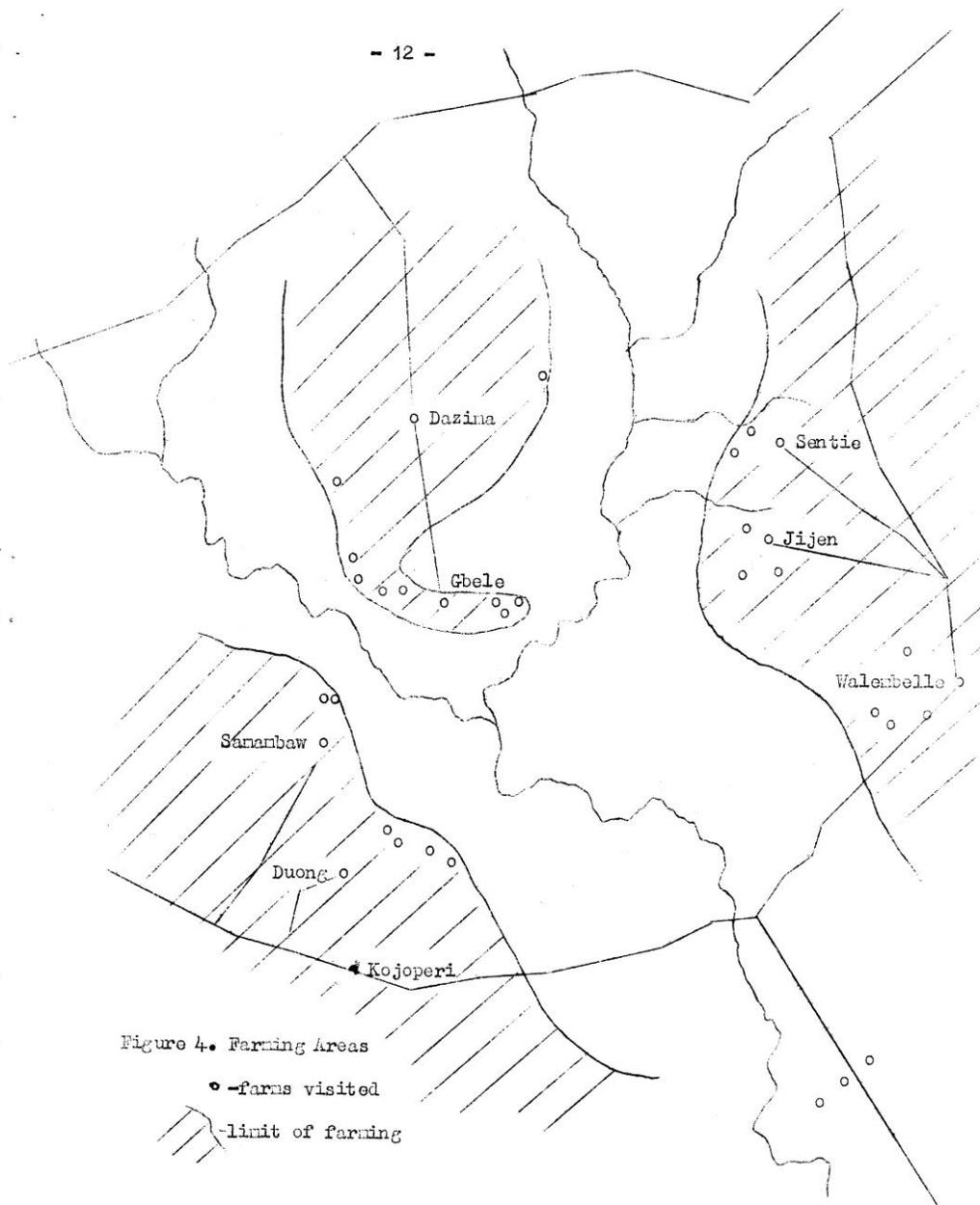


Figure 4. Farming Areas
○ - farms visited
▨ - limit of farming

Figure 4. Farming areas in the Kaulpaw area.

Plans of other departments

Forestry Department: The Forestry Department is presently in the final stages of establishing Bambulo Forest Reserve on the west side of the Kaulpawm River. A line has been cut and pillared as indicated in figure 6. This does not agree with the legal descriptions of the boundary as noted in a letter included in Appendix C. This will be corrected in the near future. This development fits very well with Wildlife Department plans. The Forest Reserve will provide habitat protection along the Kaulpawm River. However, it could also be included in the proposed game reserve to make a larger, more complete and more viable game reserve.

Fisheries Department: At the office in Laura, their major concern is the stocking of ponds and the fisheries in the Black Volta. They knew very little about the Kaulpawm River. Our experience in the area would indicate that the river is an important source of fish protein for local people. The people in Wahabu are primarily fishermen and during our studies in the Gbele area we found several fishing and hunting camps along the river. Fish are caught using nets in the wet season and they are poisoned in the pools that remain in the dry season using DDT. This practice is illegal and very damaging to the fish resource and water quality.

Medical field unit: Dr. Wen, Officer in Charge, discussed with us the medical implications of developing a reserve in the area. Onchocerciasis (river blindness) is present in the area and was found in the villages visited. This may result in a minor problem for department workers stationed at camps along the river. Belhatziasis is also present, but the Kaulpawm River and his tributaries are probably not badly affected since no villages occur along it. Sleeping sickness has not been observed in the area for over a decade. Tsetse flies are rare. A tsetse fly collection team of two men operating in the area collected only 2,430 flies in an entire year. Tsetse flies were not observed by the team, even though the study was carried out during the peak fly season. With increased numbers of wildlife in the area flies may increase, but this is not thought to likely in result in increased medical problems.

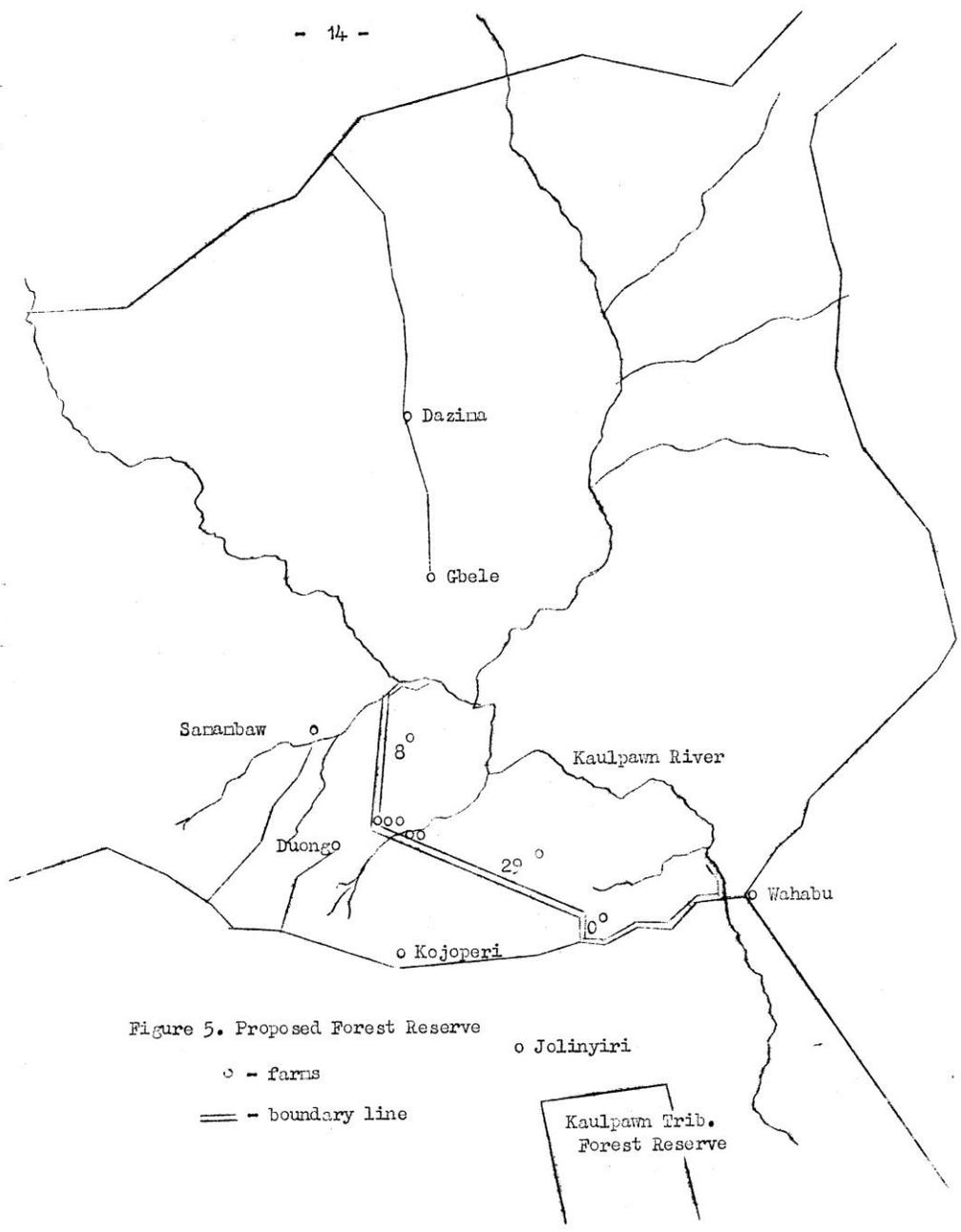


Figure 5. Proposed Forest Reserve

○ - farms

== - boundary line

Kaulpawm Trib.
Forest Reserve

Figure 5. Proposed Forest Reserve.

Veterinary Services: We discussed the area with Dr. H. R. Adjogble, Veterinary Officer for the northwest section at Wa. There are no plans concerning the area other than the construction of tick baths for cattle. As indicated in Table 7, large numbers of cattle are grazed in the area. During the dry season, the Kaulpaw and Telwia River areas are used as watering and grazing areas; primarily by the villages of Gbele, Dazima, Sentie and Jijen.

Table 7. Cattle Numbers (Veterinary Services data, 1970)

Village	Cattle Numbers
Ducie	166
Dazima	243
Gbele	40
Sakule	261
Dandai	42
Bugubelle	448
Wallenbelle	697
Sentie	165
Jijen	227

Agricultural Production Division

Rice Production: Recently the Northern and Upper Regions have been surveyed to locate potential rice production areas. Results of the survey were discussed with Mr. Turkson, the Divisional Agricultural Officer at Tumu. He indicated that the lack of labor precluded any development of rice production in the area for at least a decade.

Cotton Development Board: It was not possible to meet with the officer in charge. He has been asked to read a letter to us on this topic. We have not received his letter to date. It is expected that his comments will be similar to those of the Crop Production Division.

CONCLUSIONS

The Kaulpaw River is a viable wildlife area. In earlier times it was a very productive area, supporting high numbers of wildlife, especially ungulates. Since the 1950's, wildlife populations have been seriously decimated by intensive hunting; leading to the extermination of elephants. Lion and possibly hippo and other species are in danger of extermination. All wildlife in the area is in serious need of protection. At present the department doesn't have the resources to properly enforce wildlife hunting regulations, the best alternative is a reservation of an area which can be properly protected. Such an area should not be viewed as a refuge into which the remaining animals retreat and

remain, rather it should act as an area in which wildlife can be maintained in good numbers so that in the future when the wildlife regulations can be enforced, the reserve can act as a nucleus from which the surrounding area can be repopulated. From this beginning we will then be able to develop intelligent management plans for the use of the wildlife resource in the to a district. Of major long-term interest will be bush meat production. In the wet season, boat trips down the Kaulpawm River to see crocodile and other wildlife has excellent potential as a tourism attraction.

Due to limitations imposed by the surrounding human settlement areas, the area suggested for reservation can act only as a dry season refuge for wildlife. It is expected that wildlife, especially Roan Antelope and Hartebeest, will move out of the reserve and into the higher areas in the wet season. The only evidence of these species was found in higher areas and a similar movement into higher areas occurs in Mole National Park. An important part of protection work in the area will be the enforcement of the close season, especially in the Dazima area. At present we have no reliable information on potential season movements, but wet season movement will likely extend as far north as Liria.

Shifting agriculture is practiced in the area and therefore each village requires rather large areas for agriculture. The boundaries for the proposed reserve take these problems into consideration. The cattle that present graze in the area present a major problem. It should be possible to shift the cattle Dazima to areas to the north and west along the Kaulpawm River. The cattle in Sentie could be grazed in the upper reaches of the Yelwia River. However finding alternative grazing for cattle in Jijen will be more difficult though they too could be grazed on the Telwia River north of the proposed reserve.

RECOMMENDATIONS

The proposed boundaries of the other reserve are indicated in figure 6. They are based on the following considerations:

- Providing sufficient agricultural land around each village.
- Creating as large enough area where it is possible to ensure that poaching activity will have a minimal effect on the major wildlife concentration areas along the rivers.
- Creating a viable wildlife area that will require minimal costs for protection.

The area should be gazetted is indicated in Figure 6.

Metes and bounds description included in original report.

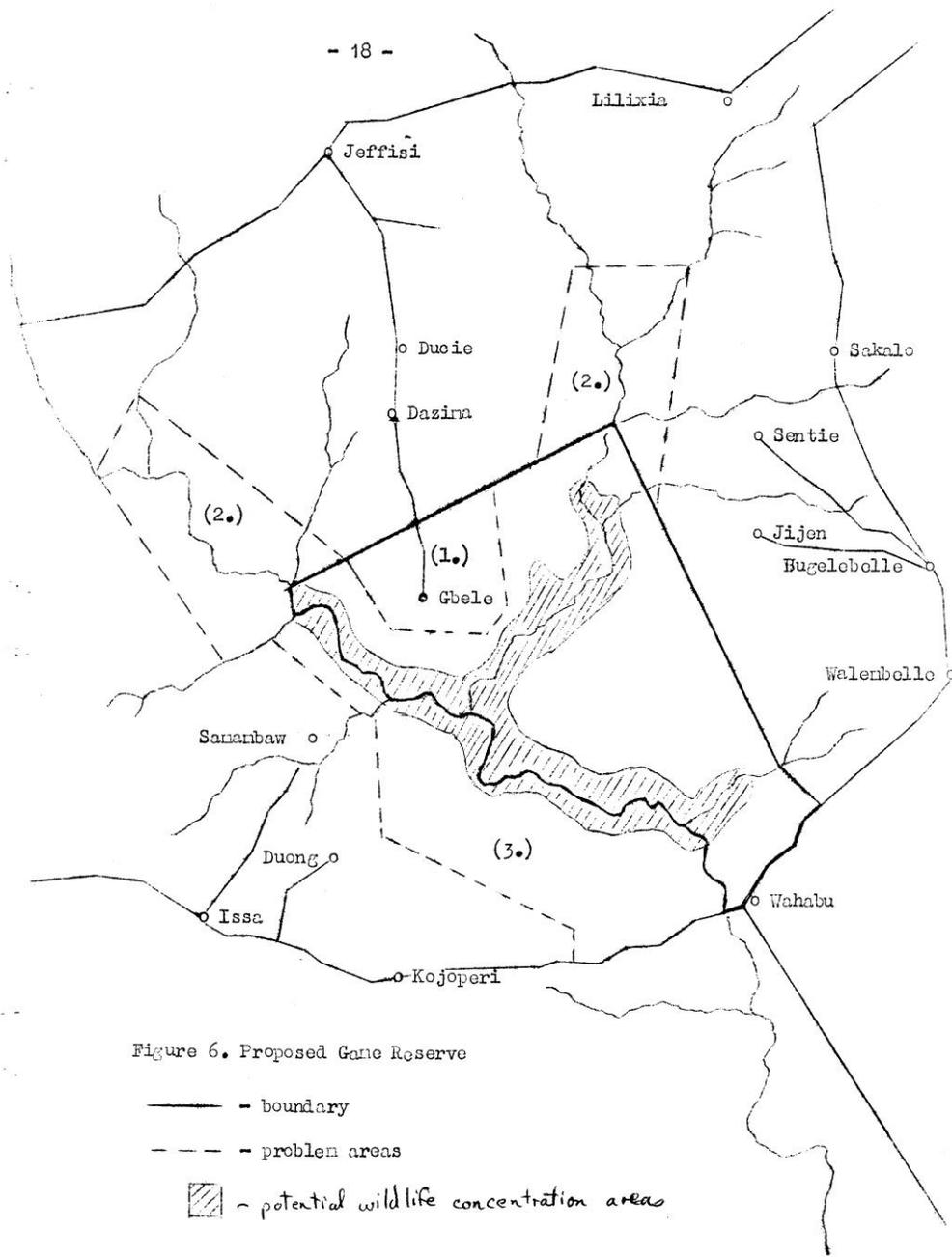


Figure 6. Proposed Game Reserve

- - boundary
- - - - - problem areas
- ▨ - potential wildlife concentration areas

Figure 6. Proposed Game Reserve.

There is no general name for the area therefore it is suggested that it be called a Gbele Game Reserve after the village located in the center of the area.

Problem areas are indicated by dotted lines in Figure 6 with a number corresponding to the numbers below.

1. The village of Gbele (20-30 people) should be relocated outside the proposed reserve. This is necessary for the creation of a viable reserve. Demarcation to exclude this village would split the reserve into three narrow areas. A reserve of this shape and size would be a minimally viable wildlife area and as such its establishment as a reserve should not be considered at this time. The Tumu-Koro has agreed to provide land for these people if they are moved. The problems associated with such a move have been discussed with the Regional Social Welfare officer in Boglatanga.
2. Two extensions to the north are possible, no farming occur immediately along the river on either side. However to protect these long narrow areas would require a minimum of four additional anti-poaching camps. This is as many as the rest of the reserve requires. For this reason, extensions in this direction are not recommended. However, further work on wildlife movements may indicate that these are important migration corridors and it may be necessary in the future to extend and reserved in this direction.
3. The reserve could be made into a much more viable unit if the proposed Forest Reserve on the west side of the Kaulpawm River was included in the game reserve. I would suggest the extension indicated in figure 6. If the area is to remain as a Forest Reserve, this extension should be suggested to the Forestry Department.

Literature cited

- Anon. 1968. A land and water survey of the Upper and Northern Rgions. Ghana. FAO report.
- Jamieson, B. 1970. A faunal survey of the Samole area, Mole Game Reserve. Unpubl. Report, Dep't of Game and Wildlife, Ghana.
- Jamieson, B. 1971. A faunal survey of the Dwija Arm area in Digya National Park Unpubl. Report, Dep't of Game and Wildlife, Ghana.
- Jamieson, B. 1972. Final Report, Faunal Survey Team, 1970-72. Unpubl. Report, Dep't of Game and Wildlife, Ghana.*

Appendices (not included)

- Appendix A. Staff requirements for the reserve
Appendix B. Support facilities
Appendix C. Correspondence

Post survey time....



