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Authors: Sam, Moses Kofi, Lokko, Kwaku Oduro, Akom, Emmanuel, and Nyame, John

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Chapter 12

A rapid survey of large mammals in the Atewa Range Forest Reserve, Eastern Region, Ghana

Moses Kofi Sam, Kwaku Oduro Lokko, Emmanuel Akom and John Nyame

SUMMARY

Large mammals were surveyed at three sites in the Atewa Range Forest Reserve from 7 – 23 June 2006. Altogether, 22 species were recorded with 12, 14 and 15 species observed from Atiwiredu, Asiakwa South and Asiakwa North respectively. Of the species recorded, Pel's flying squirrel (*Anomalurus pelii*) is listed as Near Threatened, Yellow-backed duiker (*Cephalophus silvicultor*), Black duiker (*Cephalophus niger*), Bay duiker (*Cephalophus dorsalis*), Maxwell's duiker (*Cephalophus maxwellii*) and Royal antelope (*Neotragus pygmaeus*) are listed as Lower Risk/Near Threatened, and West palm squirrel (*Epixerus ebii*) is listed as Data Deficient on the IUCN Red List. In addition to these species of international conservation concern, the African civet (*Civettictis civetta*), African palm civet (*Nandinia binotata*), Long-tailed pangolin (*Uromansia tetradactyla*) and Yellow-backed duiker (*Cephalophus silvicultor*) are nationally protected in Ghana. Interviews in selected fringe communities indicated that there could possibly be four other mammal species present in the reserve while five others could be locally extinct. Many illegal activities, especially related to hunting, were recorded during our assessment. It was also noted that deforestation along trail lines being constructed for mineral exploration and occasional illegal farms could be a significant factor affecting the conservation of large mammals in Atewa.

INTRODUCTION

At a time when deforestation is accelerating across Africa, survey information is particularly important for assessing and monitoring the long-term effects of habitat changes. Research and monitoring must anticipate the changes that lie ahead so that wildlife managers can prepare themselves. The challenge for biologists is not only to preserve species and representative biological communities for posterity, but also to conserve ecosystems that are large enough to continue providing the natural products and services that are essential for human communities.

As in many other countries in West Africa, wildlife resources in Ghana have dwindled drastically over the past few decades. This has largely been attributed to the growth in human population and poor enforcement of the country's wildlife laws, which combined has resulted in a virtually uncontrolled bushmeat trade, posing a major threat to biodiversity in general and to wildlife resources in particular. Consequently, many of the country's wildlife species such as duikers (forest antelopes), porcupine, tree pangolin, bare-headed rock fowl, forest elephant and primates have become threatened. Current estimates suggest that at least 20 of the larger mammal species in the forest zone of Ghana are globally threatened (Ntiemoa-Baidu 1987).

The large mammals of the Atewa Range Forest Reserve (Atewa) make an interesting case study for several reasons. The forest reserve belongs to the Upland Evergreen Forest type which is quite restricted in Ghana, with only one other example, Tano Ofin Forest Reserve, in the Ashanti Region of Ghana. The uniqueness of the terrain and micro-climatic conditions therefore predispose the reserve to many interesting fauna and flora.

During this survey, our aim was to investigate the large mammal (mammals larger than bats) population of Atewa using Rapid Assessment Program (RAP) survey methods. Measuring biodiversity is a difficult, expensive and time-consuming task (Hawksworth 1995), and

hardly feasible in the case of most tropical forests. Practical considerations mean that we must use particular groups of organisms as biodiversity indicators (Pearson 1995). For a project of modest duration, large mammals are one important and diverse group that can readily be inventoried. They fulfill most of the criteria listed by Pearson (1995) for a good indicator group for monitoring. According to White and Edwards (2000), as a focal group, large mammals and their signs are most readily visible. They tend to be the most heavily hunted animals and are therefore of special conservation concern. They also tend to be a good index of the overall integrity and conservation status of a region.

METHODS

From 7-23 June 2006 Atewa's large mammals were surveyed at three different sites (Atiwiredu, Asiakwa South and Asiakwa North) using a straight transect of least resistance. To determine the presence of species, visual observations of mammals and other signs of their presence such as tracks, droppings, dung, feeding signs, walking trails and nests were noted. The team also noted evidence of activities such as hunting, illegal farming and other such activities that impact the conservation of large mammals. A species list was generated including species that were observed through direct sightings, sounds and/or animal spoor, from transects of all areas surveyed.

To complement information from transect walks, interviews were conducted in forest fringe communities such as Ankaase and Anyinam to determine the presence or absence of previously recorded mammals. These interviews indicated the possible local extinction of some species previously known to occur in the area. Individuals selected for interview included those with extensive knowledge of the local fauna who had lived in the various communities for many years as well as seasoned hunters. A species list based on interviews with local community members was generated taking into consideration historical presence of recorded species.

The first site surveyed was Atiwiredu. This site has tree species endemic to Atewa, such as *Aframomum atewae*. *Cola boxiana* and *Chidlowia sanguinea* are two of the most dominant tree species at the site. In this area, ALCOA has been actively prospecting for bauxite. As a result of this, many roads have been constructed to enable transportation of personnel and equipment to the various parts of the site. The forest condition is rated 2 despite this development, indicating that the area is still in good shape.

Asiakwa South was the second site surveyed with a forest condition score 3. Some of the dominant tree species at the site are *Rinorea oblongifolia* and *Hymenostegia afzelii*. It is in slightly better condition than Site 1 in terms of habitat fragmentation, number of roads and automotive noise. This site shows evidence of previous prospecting work and lumbering operations, with clearly demarcated old roads which have given way to the development of forest undergrowth and other opportunistic plants. There are no signs of previ-

ous farming activities. Visibility here was about 10 m.

Asiakwa North was the third site surveyed. One of the most dominant tree species observed at this site was *Rinorea oblongifolia*. Of the three sites, this site had the highest quality habitat (condition score 2) with a fantastic dense evergreen canopy. Although there is evidence of illegal chain-saw activities here, this area contains no lumbering roads and access is restricted to footpaths. Resulting from the intactness of the canopy, the understorey is relatively clear increasing both accessibility and visibility which could be beyond 10 m at this site.

RESULTS

Overall, a total of 140 actual sightings and signs of animals indicating the presence of 22 different mammal species in five families were recorded during transects of the three sites. Rodentia was the most dominant family and accounted for eight of the recorded species while six species each of Artiodactyla and Carnivora were recorded and just one species each of Pholidota and Hydracoidea. Interviews indicated the possible presence of an additional four species in the reserve including Greater cane rat (*Thryonomys swinderianus*), Marsh mongoose (*Atilax paludinosus*), Dwarf mongoose (*Helogale parvula*) and Red river hog (*Potamochoerus porcus*). Interviews also suggested that five other mammals, believed to be present in Atewa but not encountered for over 20 years, are likely to be locally extinct. These include Bongo (*Tragelaphus euryceros*), Ogilby's duiker (*Cephalophus ogilbyi*), Water chevrotain (*Hyemoschus aquaticus*), Giant forest hog (*Hylochoerus meinertzhageni*) and Crested porcupine (*Hystrix cristata senegalica*).

In terms of large mammal observations, the greatest number of records came from Asiakwa North (15 spp.) followed by Asiakwa South (14 spp.) and finally Atiwiredu (12 spp.). Six species were common to all three sites, with nine species recorded at two sites and seven species recorded at only one site (see Table 12.1). Maxwell's duiker (*Cephalophus maxwellii*) was the most frequently observed species and accounted for about one-third (38 observations) of all detections followed by the Brush-tailed porcupine (*Atherurus africanus*) with 21 observations. The indices of animal signs were 2.9/hr, 2.67/hr and 1.41/hr for Asiakwa South, Asiakwa North and Atiwiredu respectively. Asiakwa North recorded the highest index of illegal activity (i.e total number of signs of illegal activities encountered per hour of survey) of 1.87/hr, followed by Atiwiredu with 1.07/hr and Asiakwa South, 1.05/hr.

DISCUSSION

Roads have left the habitats of the Atiwiredu site fragmented. There is also evidence of previous logging of economically important tree species. This has given way to growth of under-canopy plants making accessibility difficult and visibility under the canopy less than 10 m. Some spent cartridges, snares and hunting trails were encountered at this site.

Table 12.1. Preliminary Checklist of the Large Mammals of the Atewa Range Forest Reserve, Ghana and their conservation status.

Species		Sites			Status		Mode of Detection						
Scientific Name	Common Name	Atiwiredu	Asiakwa South	Asiakwa North	IUCN	National	O	H	F	T	D	S	I
RODENTIA													
<i>Anomalurus pelii</i>	Pel's flying squirrel	x			NT		x						
<i>Anomalurus beccrofti</i>	Beccroft's flying squirrel		x				x						x
<i>Cricetomys gambianus</i>	African giant rat	x	x	x			x		x	x		x	x
<i>Atherurus africanus</i>	Brush-tailed porcupine	x	x	x					x	x		x	x
<i>Epixerus ebii</i>	West palm squirrel	x		x	DD				x				x
<i>Euserus erythropus</i>	Western ground squirrel	x	x				x						x
<i>Heliosciurus rufobrachium</i>	Red-footed squirrel	x					x						x
<i>Protoxerus stangeri</i>	African giant squirrel			x					x				x
<i>Thryonomys swinderianus</i>	Marsh cane-rat												x
PHOLIDOTA													
<i>Uromanus tetradactyla</i>	Long-tailed pangolin			x		I	x						x
CARNIVORA													
<i>Civettictis civetta</i>	African civet	x	x			I				x			x
<i>Nandania binotata</i>	African palm civet	x		x		I		x					x
<i>Genetta genetta</i>	Common genet		x						x				x
<i>Crossarchus obscurus</i>	Cusimanse		x	x					x				x
<i>Herpestes naso</i>	Long-snouted mongoose		x	x								x	x
<i>Herpestes sanguinea</i>	Slender mongoose		x	x					x				x
<i>Atilax paludinosus</i>	Marsh Mongoose												x
<i>Helogale parvula</i>	Dwarf mongoose												x
HYRACOIDEA													
<i>Dendrohyrax dorsalis</i>	Tree hyrax	x	x	x				x					
ARTIODACTYLA													
<i>Cephalophus dorsalis</i>	Bay duiker	x	x	x						x	x		
<i>Cephalophus maxwellii</i>	Maxwell's duiker	x	x	x						x	x	x	x
<i>Cephalophus niger</i>	Black duiker			x						x	x	x	x
<i>Cephalophus silvicultor</i>	Yellow-backed duiker			x		I				x			x
<i>Neotragus pigmaeus</i>	Royal antelope	x	x	x						x	x	x	x
<i>Tragelaphus scriptus</i>	Bushbuck		x							x		x	x
<i>Potamochoerus porcus</i>	Red river hog												x
Total		12	14	15									

Mode of Detection:

O - observed
H - heard
F - feeding sign
T - track
D - dung
S - specimen
I - interview

IUCN:

NT – Near Threatened
LR/nt – Lower Risk / Near Threatened
DD – Data Deficient

National:

I – included on Schedule I of Ghana Wildlife Conservation Regulation (wholly protected in Ghana).

Asiakwa South shows clear evidence of excessive hunting from people. There were many spent cartridges and different types of wire snares for trapping. This site is also rich in non-timber forest products (NTFPs) and there is evidence of high levels of chewing stick, sponge and cane harvesting from this site. There are no signs of previous farming activities here, however, there were signs of the area having been subject to mineral prospecting in the past.

Asiakwa North is probably the best refuge for large mammals in Atewa. This is revealed in the high number of species seen there. Notwithstanding the promising nature of this site it shows evidence of excessive hunting by local people. A high number of snares, spent cartridges and hunting trails were seen in this site. The hills at this site also serve as the source of many rivers and NTFPs are not frequently harvested here though other forms of illegal activities such as hunting with guns and wire snaring are predominant (Table 12.2).

On the whole, most of the species that were recorded during the RAP survey are those that can be hunted under the Ghana Wildlife Conservation Regulation, LI 685. However four species, Long-tailed pangolin (*Uromanis tetradactyla*), African civet (*Civettictis civetta*), African palm civet (*Nandinia binotata*), and Yellow-backed duiker (*Cephalophus silvicultor*) are species that are listed under Schedule I of the Ghana Wildlife Conservation Regulation and thus are wholly protected in Ghana. In terms of species of global conservation concern, Pel's flying squirrel (*Anomalurus pelii*) is listed as Near Threatened, Yellow-backed duiker (*Cephalophus silvicultor*), Black duiker (*Cephalophus niger*), Bay duiker (*Cephalophus dorsalis*), Maxwell's duiker (*Cephalophus maxwellii*) and Royal antelope (*Neotragus pygmaeus*) are listed as Lower Risk/Near Threatened, and West palm squirrel (*Epixerus ebii*) is listed as Data Deficient under the IUCN categorization of threatened species of the world (IUCN 2006).

CONSERVATION RECOMMENDATIONS

Evidence of more mammal species was found in Asiakwa South and North compared to Atiwiredu. However, Asiakwa North showed a higher level of illegal activities. It is important to address this situation through various conservation education programs and the introduction of alternative/ad-

ditional livelihood ventures after a detailed socio-economic survey has been undertaken.

Mining and other exploitative development not only results in (at least temporary) deforestation, but also increases access to otherwise intact or undisturbed ecosystems. This was confirmed during the surveys through the many illegal activities observed, particularly along access roads and trails developed for exploration. One mining company worker was even seen carrying a shotgun. It is therefore essential that access to forest resources be monitored.

This RAP survey was conducted during the rainy season when *Mapania bakdwinii* and *Leptapisi cochleata* form a carpet covering much of the forest floor making footprints, dung and other signs of animals difficult to see. Undertaking a similar survey during the dry season and sampling additional areas, especially towards the periphery of the reserve would most likely increase the number of mammal species directly or indirectly encountered, thus adding to our species list for the reserve.

Finally, monitoring the effects of forest management regimes on wild animal populations requires that periodic biological surveys be carried out to assess the impact of such forest management regimes on our forest fauna.

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Table 12.2: Illegal activities recorded in the Atewa Range Forest Reserve during the RAP survey.

Illegal Activity	Sites		
	Atiwiredu	Asiakwa South	Asiakwa North
Spent Cartridge	3	9	11
Wire snare	0	5	10
Hunters trail	12	4	12
Illegal farm	3	1	0
Illegal logging/Chain sawing	4	2	4
Totals	22	21	37
Time spent in the field (hours)	20.63	19.98	19.83
Total # of signs per hour of survey	1.07	1.05	1.87