



DETERMINATION OF THE HOME RANGE OF ENDANGERED DRILL MONKEYS (*Mandrillus leucophaeus* Cuvier, 1904) IN AFI MOUNTAIN WILDLIFE SANCTUARY, NIGERIA

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ABSTRACT

*Home range is an area in the habitat that an animal habitually carries out its daily activities. The endangered drill monkey (*Mandrillus leucophaeus* Cuvier, 1904) is highly terrestrial primate that forages on the forest floor extensively for its food. It is on this note that this study was undertaken to determine the home range of the drill monkeys in Afi Mountain Wildlife Sanctuary, Nigeria. Drill monkeys' groups were followed at reasonable distances to avoid detection by the drills. Garmin 72 GPS was used to record GPS coordinates at first contact, either visually or acoustically as well as the daily distances covered. The study was carried out from January to December, 2020. Drills were encountered eighty-five (85) times either visually or acoustically; it was not possible to document all the encounters using the GPS due to equipment failure or bad weather. Hence only 45% of such encounters were documented. Five (5) large drill groups were identified, three (3) groups with overlapping home ranges in the north and two (2) groups without overlapping home ranges in the south. The home range of the drill groups in the north was 20km² while that of the drill groups in the south was 15km². Statistical test of significance showed no significant ($p=0.05$). It was recommended that further study using other more scientific methods such as the use of drone technology and radio-telemetry are needed for detailed study of drill monkeys home range in the study area.*

Keywords: Drill monkeys, home range, Afi Mountain, Nigeria

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INTRODUCTION

The drill Monkeys (*Mandrillus leucophaeus*) are African's most endangered primates and have been listed by the International Union for the Conservation of Nature (IUCN) as being of highest conservation priority (Oates and Butynsky, 2008). The drill is a large terrestrial forest dwelling member of the cheek pouch sub-family of the old world monkeys and exhibit high sexual dimorphism with adult males weighing thrice as much as adult females, (Astaras, 2009).

Drills have a very restricted range worldwide compared with other primates. The drill considerable restricted range extended north of the Sanaga River in Cameroon to Cross River in southern Nigeria and on the island of Bioko of Equatorial Guinea (Edet and Adeyemi, 2015). The remaining rain forest suitable for the drill within its range is thought not to exceed 50,000km², fragmented in approximately 50 forest fragments (Astaras, 2009), and has been shrinking. Even though the drill monkey is

taxonomically distinct and has been recognized as endangered, it has remained poorly studied. Few studies have ever examined the ecology of wild drills in AMWS and our current understanding of the conservation needs of this species is limited. The only current study of relevance is that of Bukie, *et.al.* (2017a), Edet and Adeyemi (2015). These works looked at separates aspects of drill ecology in relatively short periods. For example, Edet and Adeyemi (2015) only looked at the population of drills in AMWS in a period of six months while Bukie *et al.*, (2017a), assessed the food items consumed by drills of AMWS in a period of two weeks. Hence, this stud assessed the home range of drill monkeys to provide data for improved management of the experimental species in the study area.

MATERIALS AND METHODS

Study Area

The study area is Afi mountain wildlife Sanctuary (AMWS) in Boki Local Government Area of Cross River State Nigeria. It is geographically located between latitudes 6° 10' And 6°30' North and longitudes 8°50' and 9°30' East. The study area is a rocky massif containing several distinct rocky peaks, the highest being about 1500m separated by deeps valleys (Mittermeier *et al.*, 2009). The study area is about 100km², endowed with primary rain forest and provides the sole water shed for the surrounding communities (Ogogo *et al.*, 2010), it was created out of the Afi Forest Reserve to protect and conserve important wildlife species such as the critically endangered Cross River Gorillas and the endangered Drill monkeys. (Figure 1).

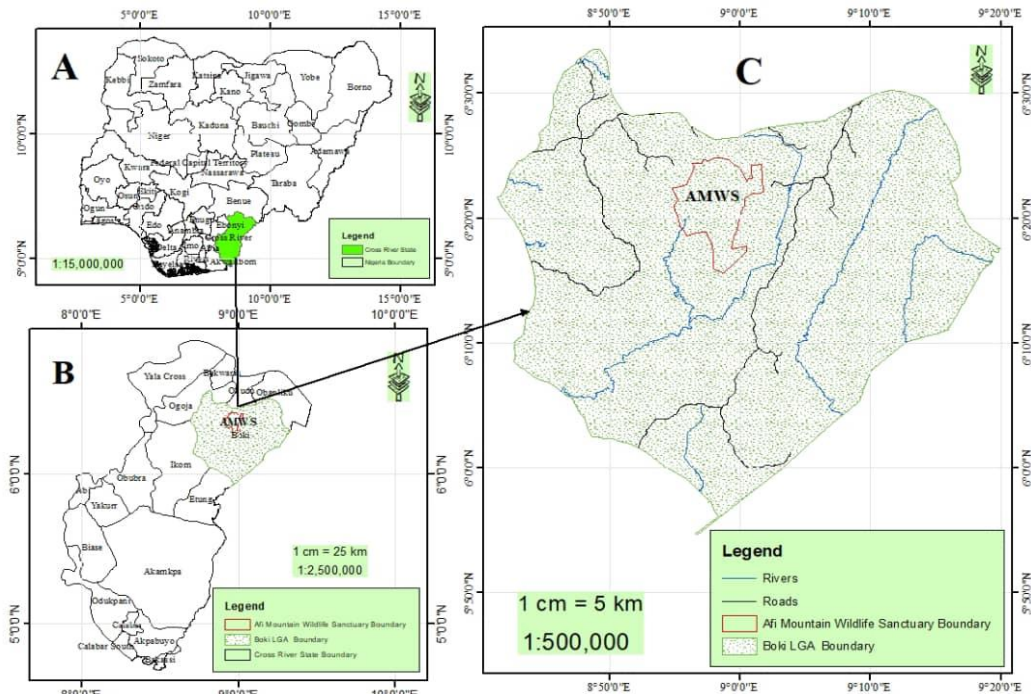


Figure1: Map of Nigeria A, showing Cross River State and map of Cross River B, showing the study area C.

Data Collection

Data on drill monkey's home range was collected based on a 6 or 9 hours daily observation of the drills, as carried out by Astaras (2009) during drills survey and Hoshino (1985) during mandrill's survey in Cameroon. In this study, the drill group (s) were followed at close proximity as possible, without detection, until the dusk. The research team usually starts tailing the drill group

(s) as early as 6.00 a.m., on the days that the sky was clear or whenever the sky was clear on days that it rained the previous night, (if the team camped in the drill sleeping site). Or whenever the drill groups (s) are encountered. With the help of the Garmin7, GPS, the daily distance traveled by the group was determined. determine the home range of the drills in this study, the identified drill groups were followed and their

parts or trail marked, with the help of the GPS. When this was not available, the traditional way of marking by bending vegetation over or making a mark on nearby tree or object was used.

Data Analysis

The coordinates at first-contact (visual or auditory) with a group were recorded using a Garmin GPS (with Arc Pad 6.0), and subsequently, the distance and GPS coordinates recorded at intervals to make the parts and distance travelled by the drill group (s). All points were imported into Arc View 3.3 GIS software. And the results presented in figures.

RESULTS

The results of the home range of drill monkeys at AMWS are presented in Figures 2, 3 and 4. Figure 2, show the visual and audio encountered locations (N= 85), while Figure 3, show the home range of the encountered groups in the north and south sites respectively, and Figure 4, show the

location of some illegal farms in the study area. Figure 2, indicated that of the eighty-five (85) times drills were encountered either by visual or audio, it was not possible to document all the encounters using the GPS due to equipment failure or bad weather. Hence only 45% of such encounters were documented as illustrated on figure 2. Figure 3; illustrate the home range of five large groups of drill monkeys in the study area. Three of the large groups were encountered in the north with overlapping home ranges, while two of the large groups were encountered in the south without overlapping home ranges. In the north, the average daily travel of the three drill groups was 1.5km, 2.0 km and 2.1 km respectively. While in the south, the average daily travel of the two groups was 1.0 km and 1.5 km respectively. The average home range of the three groups in the north was approximately 40 km², while the average home range of the two groups in the south was approximately 20 km².

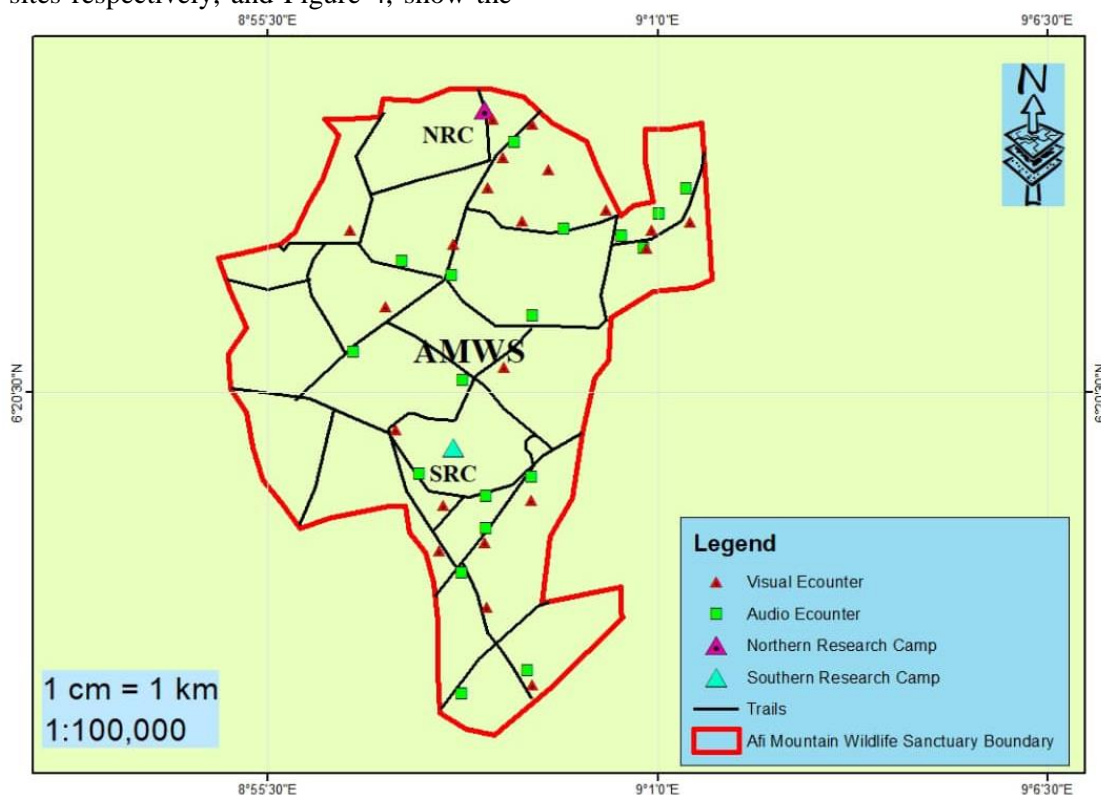


Figure 2: Visual and Audio encountered recording of drill monkeys at AMWS (N= 85)

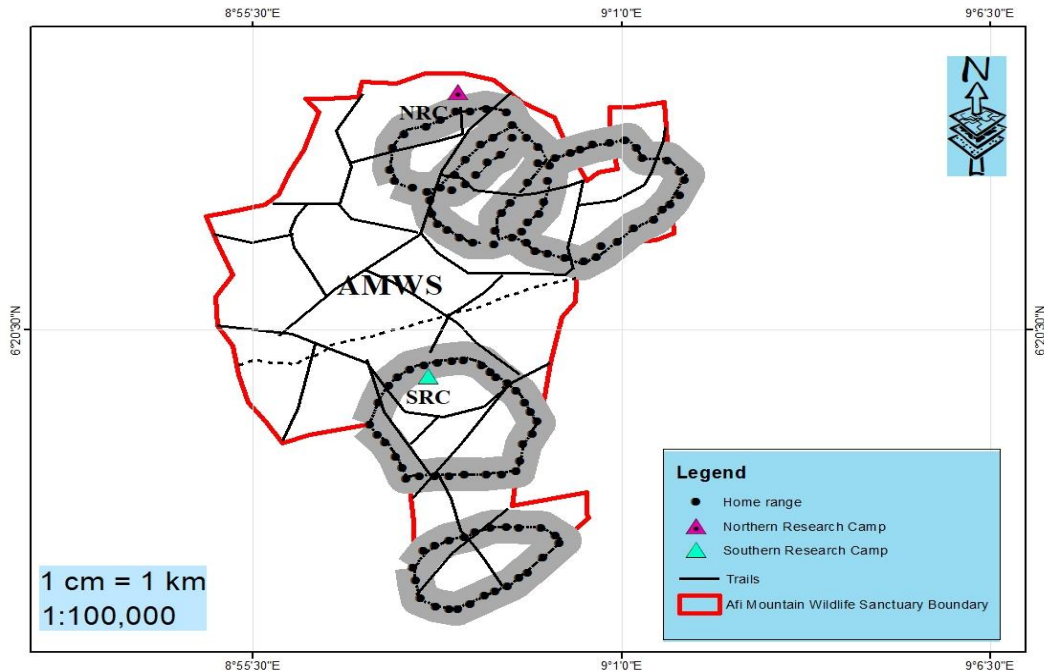


Figure 3: Home Range of Drill Monkeys' groups at AMWS (N= 5)

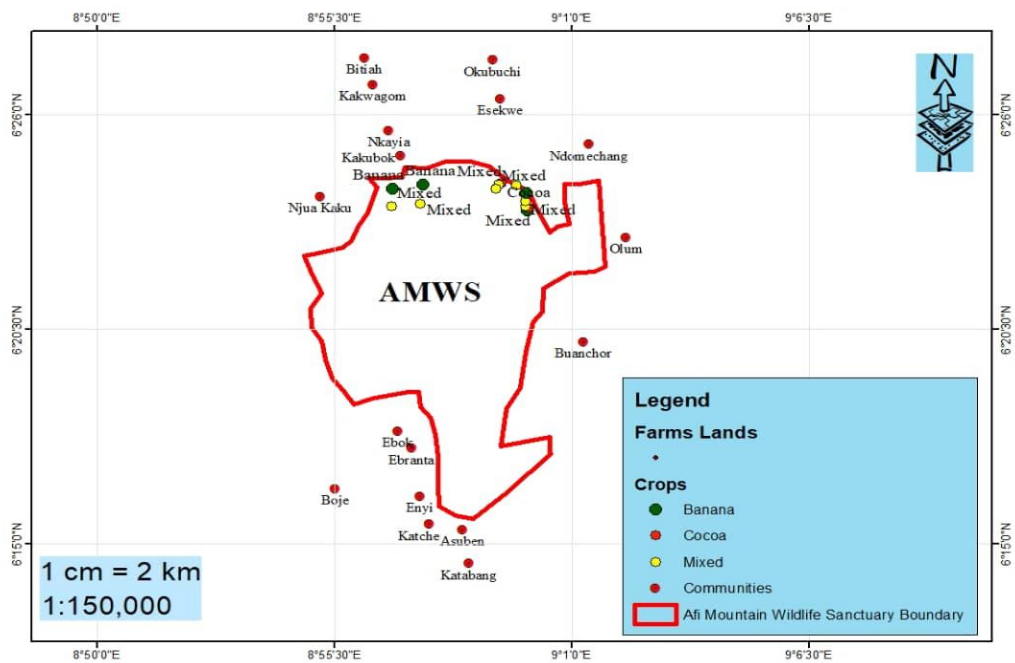


Figure 4: Map of the study area, showing the location of some illegal farms (N= 10).

DISCUSSION

In this study, drill monkeys home range was reported based on a 6-hour foraging day as reported for the drills in Cameroon by Astaras (2009). Figures, 2 and 3. Although it was difficult to differentiate between groups, a minimum of five groups utilized the 100km² of the study area.

In four occasions two groups were encountered either at nearly the same time by different teams or within the same day by one team but at distances ≥ 5 km. The large daily movements of drills and the overlapping nature of home ranges, of the three groups in the north are similar to what was reported by Hoshino (1985), whose estimate

was based on a set of assumptions that mandrill home ranges in Campo were between 5 and 28 km². Astaras (2009), reported that the home range of drills in Korup National Park, Cameroon was 10-20km², whereas in this study, the home range of drills in AMWS was estimated at 20km² in the north and 15km² in the south. Although the home range data are largely similar, the minor differences in this study could be due to factors such as food availability, habitat disturbance such as illegal farms which was also reported by Bukie et al. (2017b) and threats in the two sites. Although, the home range of drills in the north and south of AMWS was 20km² and 15km² in the two sites, statistical test of significance showed

no significant difference in the home ranges of drill monkeys in the two sites.

CONCLUSION

In conclusion, drill monkeys home range in the study area were largely similar and the minor differences could have been due to factors such as food availability, habitat disturbance and anthropogenic threats in the two sites.

RECOMMENDATION

It was therefore recommended, further study using other more scientific methods such as the use of drone technology and radio-telemetry are needed for detailed study of drill monkeys home range in the study area.

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