

Basic home range characteristics for the conservation of the African grey parrot in the Korup national park, Cameroon

TAMUNGANG, S.A.^{*1}; AYODELE I.A.²; AKUM Z.E.³

1. Dept of Animal Biology, Faculty of Science, University of Dschang, B. P. 285, Dschang, Cameroon.

2. Dept of Wildlife and Fisheries Management, University of Ibadan, Nigeria.

3. Environmental Consultant, Church Street Limbe, P.O. Box 894, Limbe, S.W. Province, Cameroon.

ABSTRACT

Basic home range parameters that can be used for sustainable conservation of the African Grey parrot (*Psittacus erithacus* Linnaeus) were investigated in the Korup National Park, Cameroon. Parrots were captured, marked, and released. They were then monitored in the study area and beyond, to determine the home range characteristics. From the results, the home range area of the bird was 283.25 sq. km. and the average home range was 10.27km. The home range of this bird extended into secondary vegetation outside the Korup National Park, an area that is threatened by land-based socio-economic activities. The Korup Rainforest can be a very conducive habitat for the sustainable conservation of the African Grey parrot. For this purpose, socio-economic activities that preserve the life of tree species used by the Grey parrot in farmland and secondary forest are recommended.

Key words: Home range, African grey parrot, Korup national park, parrot conservation, bird habitat management.

RESUME

*Les paramètres fondamentaux nécessaires à la conservation du Perroquet gris africain (*Psittacus erithacus* Linnaeus) ont été étudiés dans le Parc National de Korup au Cameroun. Les Perroquets ont été capturés, marqués et libérés; ils ont été ensuite suivis dans la zone d'étude et au-delà afin d'identifier certaines caractéristiques de leur milieu de vie. Les résultats obtenus ont montré que cet oiseau couvrait une superficie d'environ 283,23 km² et parcourait une distance moyenne de 10,27 km. Le milieu de vie de cet oiseau s'étend au-delà du parc de Korup, dans une zone à végétation secondaire très sollicitée pour les activités socio-économiques. La forêt dans le Korup peut donc être un habitat favorable pour une conservation durable du Perroquet gris africain. Nous recommandons ainsi le maintien des arbres présents dans les champs et formations végétales secondaires et qui sont visités en permanence par les Perroquets.*

Introduction

The last few decades have witnessed increasing unsustainable exploitation patterns of rainforests of West Africa (Keast, 1985; IUEP/UNEP/WWF, 1991). Causes of exploitation may vary in greater details from one region to the other, but they are dominantly for timber extraction, hunting of wildlife, road and dam construction, urbanization and land cultivation. In carrying out these activities, hundreds of bird nests, eggs and chicks are destroyed and their food chain is disrupted (Lugo, 1988; Whitmore and Sayer, 1992)

Such unsustainable exploitation of the forest is a major threat to the survival of the African grey parrot in Cameroon today. As patches of its habitats become smaller and more isolated from each other, the African grey parrot, which is known to acquire a large home range (Fry et al, 1988), finds itself restricted to areas that are

too small for its food, shelter and reproductive requirements. Such a parrot in the isolated habitat with restricted size is much more vulnerable to human activities such as poaching, pesticide use and air pollution. Consequences of these activities are parrot population depletion, which can lead to the extinction of the species in the region, if the pressure continues for a long time.

Basic knowledge of home range characteristics of the parrot could be used to determine the size and type of habitat for conserving the bird and its associated resources in Korup National Park and similar protected areas in its endemic region of West and Central Africa. Conserving the African grey parrot and values associated with it is a contribution in consonance with the current global effort in the conservation of biological diversity, thus fulfilling a unique role of the African Rainforests as a repository of genetic resources. The objective of this study was to determine basic home range

NB: Correspondences should be sent to the first author.

parameters of the Grey parrot in the Korup National Park, South western Cameroon.

Materials and Methods

Each African grey parrot was captured using the gum and stick technique (Dandliker, 1992). Birds are usually captured at the roost site at night using this technique. Parrots were captured between the period 3h.00 and 4h.00 and were marked between the period 4h.00 and 5h.00 each night. Captured birds were marked with silver paint. Before any paint could be used on the birds, it was first tested on a plucked feather at home to ensure that it gave the needed contrast, it was indelible in water, and was not poisonous or harmful on the bird. A variety of paints were tested since there was no documented information on markers used on the African Grey parrot. Picric acid is usually used for marking birds (Bibby et al, 1992) but it did not show remarkable colour contrast on the grey and red feathers of the parrot. Pressurized silver paint in cans (usually used on cars and decorative articles) produced the best results. This paint is fast drying and produces light grains on the feathers. Its light reflecting ability in the rainforest is an additional advantage for identifying individually marked parrots.

The wild parrot is dangerous to handle with bare hands as it can wound with its tough beak and sharp claws. For this reason, a small basket was made out of metal frame wrapped with chicken mesh. A parrot was then put into the basket and feather spraying was effected from outside. Caution was taken to ensure that a marked bird was not attracted to predators or driven out of the flock by marking on only specific parts of the body (Marion and Shamiis, 1977). Marking was limited to the

red-tail feathers of the bird as this facilitated the Identification of marked birds in flight.

An average of seven birds were released each night. Thirty birds were released in the rainy season (April-October, 1995) and thirty-two in the dry season (November-March, 1996). This made a total of sixty-two parrots released during the study period (1995-1996). The released birds were then monitored in the study area and beyond (Baumgargher, 1938). For more intensive monitoring activities, Korup National Park Field Staff and villagers were informed to report any parrot seen with an unusual mark on the tail feathers. When a parrot was sighted, the place, activity and time of observation were recorded. A map of the study area was used to trace the distance from where the bird was sighted to where it was released. The distance linking the two points was then calculated and converted to an equivalent distance on land.

Results

The home range area was determined by plotting the location of sighted marked birds on a map. The out-most points on the map were then connected to form a polygon (Odum and Kuenler, 1955). Points 2-14 in Figure 1 represent some of the sites where marked parrots were sighted. Point 1 is the roost where the birds were captured, marked and released. Out of the 13 points recorded, the shortest home range was 2.0 km and the longest was 18km. All the points gave an average home range of 10.27km. The area of the polygon calculated and converted to land area gave a value of 283.25sq.km. This value was taken as the home range area of the African grey parrot in the Korup rain forest.

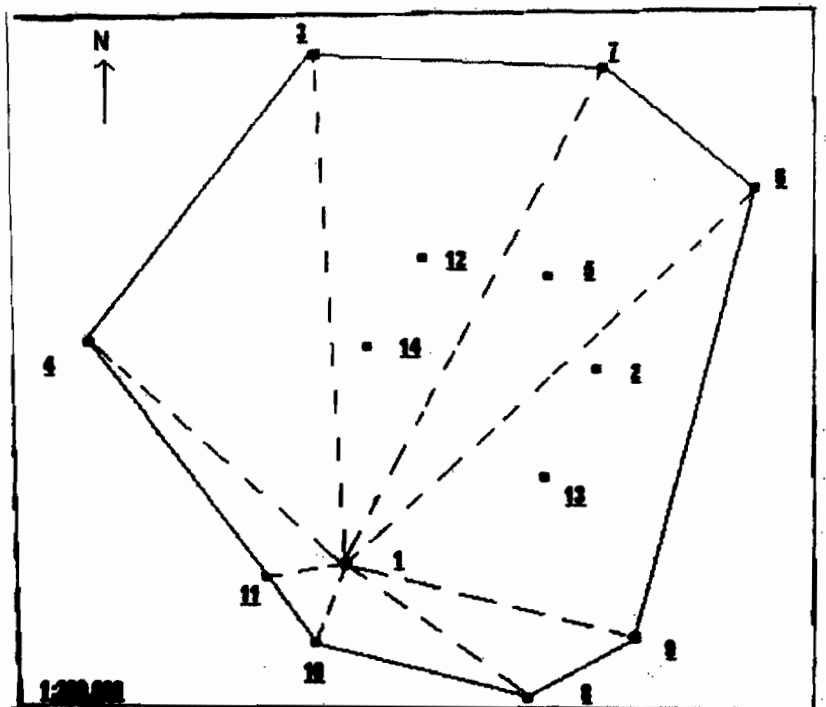


Figure 1: Estimation of Home range of the Grey Parrot in Korup

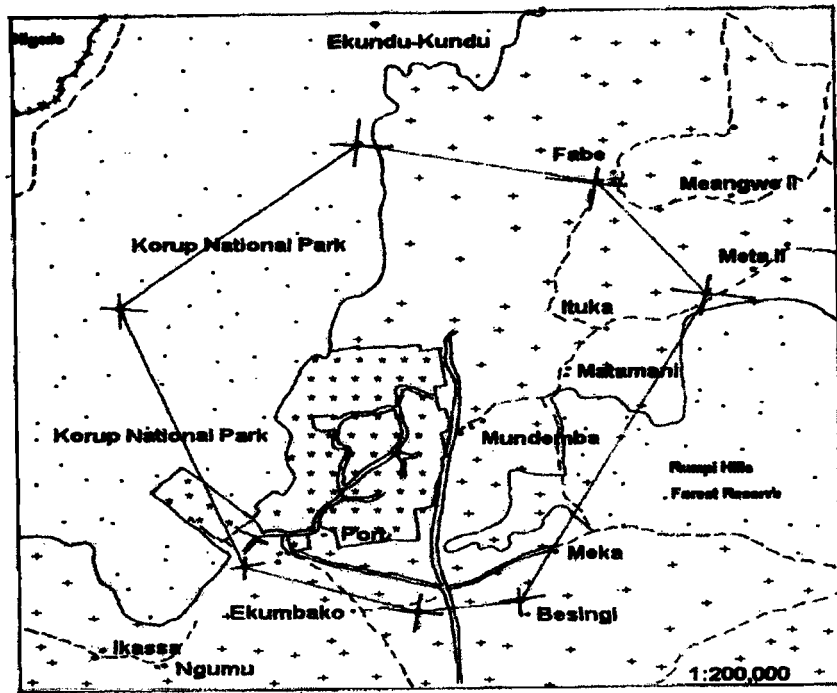


Figure 2: Home range Area of the Grey Parrot in relation to major Vegetation Distribution in Korup Rainforest

Key: ::::: Primary ***** Oil Palm +++ Secondary
 ::::: Vegetation ***** Vegetation +++ Vegetation

Three major vegetation types were identified in the home range area (Figure 2)

-Primary vegetation. It is found dominantly in the Korup National Park and it is relatively not degraded by socio-economic activities.

-Palm vegetation. It is made up of about 90% Oil palm trees of varied ages in a large agro-industrial plantation owned by Pamol du Cameroon. Intensive socio-economic activities take place in this plantation. Parrots were caught, marked and released in this vegetation.

- Secondary vegetation. This is made up of farmland and secondary forest. The vegetation found in this plot appeared in a mosaic pattern as a result of shifting cultivation, road construction, logging and human settlements.

Out of the thirteen sites in which marked birds were sighted, four were in the oil palm tree vegetation, two in the primary vegetation, and seven in the secondary vegetation. The shortest home range distance of 20km was recorded in the palm tree vegetation and the longest distance of 18km was covered in the secondary vegetation plot. It was generally observed that the parrot covered longer distances in the dry season than in the rainy season. Analysis of variance showed a significance difference ($P < 0.05$) between the two seasons. Activity pattern of the bird at the time of sighting indicated that it was seen foraging on six occasions; flight-

related activities were observed on two occasions and playing-related activities on two occasions.

Discussion

Most vertebrates restrict their activities to definite areas at certain periods of their annual cycles. These areas may be termed home ranges. If all parts of the area are defended against individuals of the same species, the guarded area is called a territory (Odum and Kuenzler, 1955). A distinction should be made in this paper between home range and home range area. These two words are often used interchangeably, but we think that they are different. Home range is the distance covered by an animal from its abode (home) for usual activities. Home range area is the total surface space covered by an animal for usual activities from its abode. The total surface of a home range area is obtained by joining the outmost points of the home range to form a structure which is usually a polygon, as described by Odum and Kuenzler (1955).

The African grey parrot is a very mobile bird in the rain forest environment. As a fruit and seed eater, it moves intensively in search of these food types (Fry et al, 1988). Distances covered during foraging are determined by the distribution pattern of food patches in the forest. Related studies have shown that the parrot usually feeds on specific plants at specific periods of the year (annual fruiting cycles of the plant) (Tamungang, and Ajayi, in press).

Feeding, breeding and roosting activities are major parameters that determine the home range of the Af-

rican Grey parrot in a given place and time. The parrot has a very high affinity for oil palm fruits in the dry season. This might have contributed to the short home range of the bird during this season since its roost was found in the oil palm plantation. Related studies have indicated that animals occupying deteriorated habitats acquire larger home ranges than those in good habitat conditions (Owen, 1971). As good habitats can provide the required habitat resources, there is no need for distant movements. This is evident from the mail range area (283.25sq.km) and an average home range (10.27km) of the parrot. This justifies that the Korup rainforest is rich in habitat resources of the parrot and thus, justifying its conservation in the forest. Similarly, in Guinea Bisau, flocks of 6-10 African Grey parrots flew up to 5km across the sea to feed on a neighbouring island (Fry et al, 1988). In a related study, Skead (1974) estimated that the Brown-necked parrot (*Poicephalus rubustus*) could fly up to 90km from its roost to feed on a coastal bush. This distance could be very long for the African Grey parrot as it is not a good flier. Anderson (1981) stated that habitat requirements of wildlife species vary since conditions necessary for survival depend on the ability of the species to adjust to changing habitat conditions. The African Grey parrot is indeed adjusting to changing conditions of the vegetation in the Korup National Park Support Zone due to socio-economic exploitation. The parrot uses the three major vegetation types at varying periods of the year for habitat resources exploitation. The oil palm trees provide dominantly food and roosting facilities. A related study in the same area (Tamungang and Ajayi, in Press) show that secondary vegetation provides more food resources to the Grey parrot than primary forest. This could be the reason why the parrot was sighted more in the secondary vegetation than the other two types. However, the secondary vegetation is the most socio-economically exploited site in the study area. The Grey parrot is therefore a vulnerable victim of these socio-economic activities.

Conclusion

The Grey parrot had an average home range of 10.27km and a home range size of 283.27 sq.km. The home range of the parrot extended into the support zone of the National Park. As such, Grey parrot conservation cannot be limited only in the park; the extended home range outside the park area has to be considered. Socio-economic activities that preserve the life of tree species frequently used by the parrot (such as *Ceiba pentandra*, *Terminalia superba*, *Millie excelsa*, *Pycnanthus angolensis*, etc) in the support zone of the Korup National Park are

encouraged. However, this may be difficult as land-based socio-economic activities outside the park are difficult to control. The parrot is, therefore, a vulnerable victim of such socio-economic activities. Grey parrot conservation education is highly recommended to the people of the Korup region, so as to reduce parrot-human conflicts.

Acknowledgements

Messrs Ayumba Henry and Ndi Titus were very good Field Assistants. Thanks to the North of England Zoological Society, Britain and Mr Eugene Tamungang, for their financial support to this study. Thanks also to villagers in the Support zone of the Korup National Park and staff of the Korup Project Mundemba, for assisting in many ways towards the success of the study. Dr Dean Lindstrom and Mrs Estella Tamungang worked on the manuscript.

References

- ANDERSON, S.H. (1981). *Managing Our Wildlife Resources*. Edition. Prentice Hall, New Jersey.
- BAUNGARTHER, A.M. (1938). Experiments in feather marking on the Eastern tree sparrow for territory studies. *Bird Banding* (9):124-135.
- BIBBY, C.J.; BURGESS, N.D. AND HILL, D.A. (1992). *Bird Census Techniques*. Academic Press, London.
- DANDLIKER, D. (1992). *The Grey Parrot in Ghana. A report on CITES project S-SO, October, 1992*.
- FRY, C.H.; KEITH, S. AND URBAN, F.M. (1988). *The Birds of Africa*, Vol. 3. Academic Press, London.
- IUCN/UNEP/WWF (1991). *Caring for the Earth. A Strategy for Sustainable Living*. Gland, Switzerland.
- KEAST, A. (1985). *Tropical Avifauna. An Introductory Conspicuous*. In: *Conservation of Tropical Forest Birds*, ICBP Tech. Pub. No. 4P3-32.
- LUGO, A.E. (1988). *Estimating the Reduction in the Diversity of Tropical Forest Species*. In: *Biodiversity*. E.O. Wilson (Ed). Nat. Academic Press, Washington, D.C.
- MARION, W.R. AND SHAMMIS, J.D. (1977). *An annotated bibliography of bird marking techniques*. *Bird Banding* (48) 42-61.
- ODUM, E.P. AND KUENZLER, E.J. (1955). *Measurement of territory and home range size in birds*. *Auk* (72) : 125-137.
- OWEN, O.S. (1971). *Natural Resources Conservation. An Ecological Approach*. Macmillan Company, New York.
- SKEAD, C.J. (1974). *The overhead flights and the feeding habits of the Cape Parrot in the Eastern Cape Province*. *Ostrich* (35): 202-223
- WHITEMORE, T.C. (1980)Ed. *Tropical Deforestation and Species Extinction*. The IUCN Commission on Ecology. Chapman & Hall, London.

Received: 18/9/2001

Accepted: 30/12/2001