



CHAPTER 6 Observations on the Bushmeat Trade

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CHAPTER 6

Observations on the Bushmeat Trade



Red-eared guenons (*Cercopithecus erythrotis*) (red tails) and Preuss's guenons (*Cercopithecus preussi*) (gray tails) displayed for sale in the bushmeat section of Malabo market, Bioko Island.

During field work we carried out in the course of this study, and during our previous visits to the Gulf of Guinea forests, it was apparent that larger animals, especially large rodents, ungulates, and anthropoid primates, are hunted almost everywhere, both with guns (typically 12-gauge shotguns) and wire-snare traps. Gun hunting occurs both during the day and at night, with the aid of acetylene or battery-powered headlamps. Although we did not collect quantitative data during this study, the amount of evidence we observed of hunting activity (e.g., spent shotgun cartridges, active snares) appeared to correlate roughly with the number of animals we observed in the forest. We ultimately concluded that hunting was mostly to blame for the low number of animals we encountered in most forests. A striking example of the impact of hunting is that we observed primates and ungulates most frequently in the Gran Caldera de Luba on Bioko, which has the lowest number of hunters. Animals in this area are also less afraid of people than elsewhere in the Gulf of Guinea forests.

At most sites it is unclear how much hunting is devoted to providing meat for local consumption, and how much is driven by trade. Trade is probably the main driver of hunting in southern Bioko, since human population density is very low there. Because most Bioko inhabitants live on the northern part of the island, and especially in and around the capital of Malabo, much of the game hunted on the island ends up in the Malabo market. Similarly, the area immediately surrounding Korup National Park has a relatively sparse human population, whereas eastern Nigeria to the west of the Cross River is very densely populated. Most of the hunting taking place in and around Korup is therefore probably done for trade. Indeed, we found evidence of a major one-way trade route for bushmeat running through Cross River National Park. The route appears to originate at the Korup enclave of Erat in Cameroon and runs to Ekonganaku on the edge of the Oban Division of Cross River National Park in Nigeria. For instance, over a three-day period in January 2001 Bergl observed the following mammal carcasses being carried on forest trails towards Ekonganaku: 10 *Cephalophus* spp., 6 *Mandrillus leucophaeus*, 4 *Atherurus africanus*, 3 *Hyemoschus aquaticus*, 1 *Cercocebus torquatus*, 1 *Cercopithecus erythrotis*, and 1 *Manis* sp. Much of this meat is apparently sold in a weekly market at Anigeje, on the Oban road about 30 km north of Calabar. From there it is probably widely distributed in the east of the country. More than 100 monkey carcasses, many of them drills, are reported to be sold at this market each week (Eniang, E. & Louk, D., pers. comm.).

Oates visited the Malabo bushmeat market several times in January 2001 and January 2002 and found it to be highly dynamic. Fresh carcasses arrived frequently, at least during the early part of the day, and purchases were also frequent. As a result, a spot check of the carcasses available at a particular moment could provide a significantly different view of the market than a full sampling of the carcasses available throughout an entire day.

In 2001 and 2003, Oates conducted a total of six spot-check samples of the Malabo market. Eric Lombardini of the University

of Pennsylvania and his student associates also conducted 10 spot samples of the Malabo market on different days in 2001. The total carcasses observed during these 16 spot samples are as follows: 143 *Cephalophus monticola*, 104 *Cricetomys emini*, 38 *Cercopithecus erythrotis*, 25 *Atherurus africanus*, 10 *Cephalophus ogilbyi*, 7 *Colobus satanas*, 6 *Manis tricuspis*, 6 *Varanus niloticus*, 4 *Cercopithecus preussi*, 4 *C. pogonias*, 3 *Mandrillus leucophaeus*, 2 *Python sebae*, 2 squirrels, 1 *Procolobus pennantii*, 1 *Dendrohyrax dorsalis*, and 1 *Galago alleni*. The number of carcasses observed per day of *C. monticola*, *C. ogilbyi*, *P. pennantii*, and *M. leucophaeus* is smaller than Fa *et al.* (2000) reported in 1991 and 1996. On the other hand, despite the small size of our sample, we recorded more *C. erythrotis* than did Fa *et al.* in 1996. At first glance, these numbers seem to confirm Fa *et al.*'s speculation that larger primates and Ogilby's duiker are becoming scarcer in the market and thus perhaps are disappearing from Bioko's forests as well.

However, our figures are probably not directly comparable to those reported by Fa *et al.* (2000), who sampled the market between 06:30 and 12:00 hours, six days each week, for eight months in 1991 and 1996, and who claim to have recorded all meat reaching the market on each day of their sample. Our observations strongly suggest that spot samples such as ours represent only part of a day's total number of marketed carcasses. One would thus expect the results of our samples to include significantly fewer carcasses than Fa recorded in his surveys. Yet, for some species, our results are similar to the figures reported by Fa for 1991, and for several species (e.g., *Cercopithecus erythrotis* and *Cephalophus monticola*) our results considerably exceed the results of spot checks by Butynski in 1986 and Fa in 1988 (Butynski & Koster 1990) (see Table 9).

As part of a new bushmeat study, John Fa of the Durrell Wildlife Trust recently finished surveying markets and human nutritional status on both sides of the Nigeria-Cameroon border that extends into our study region. The data from that study were being prepared for publication as this volume was finalized.

Table 9. Number of carcasses seen per visit during spot checks of the Malabo bushmeat market in 1986, 1988, and 2001–2.

Species	Butynski & Koster 1986*	Fa 1988**	Oates & Lombardini 2001–2***
<i>Mandrillus leucophaeus</i>	0.22	0.13	0.19
<i>Cercopithecus erythrotis</i>	0.44	1.33	2.38
<i>C. nictitans</i>	0.22	0.13	0
<i>C. pogonias</i>	0	0	0.25
<i>C. preussi</i>	0	0	0.25
<i>Colobus satanas</i>	0.22	0.20	0.44
<i>Procolobus pennantii</i>	0	0	0.06
<i>Cephalophus monticola</i>	2.56	5.40	8.94
<i>C. ogilbyi</i>	0.22	0.27	0.63
<i>Cricetomys eminii</i>	3.11	3.67	6.50
<i>Atherurus africanus</i>	1.44	0	1.56
<i>Manis tricuspis</i>	0.22	0	0.38

*9 market visits (reported in Butynski & Koster 1990)

**15 market visits (report to IUCN, from Butynski & Koster 1990)

***16 market visits (this volume)

REFERENCES CITED

- Achard, F., Eva, H., Glinni A., Mayaux P., Richards, T., & Stibig, H.J. 1998. *Identification of Deforestation Hot Spot Areas in the Humid Tropics*. Ispra, Italy: Joint Research Centre, European Commission.
- Aldrich, M., Bubbs, P., Hostettler, S., & van de Wiel, H. 2000. *Tropical Montane Cloud Forests: Time for Action*. Gland and Cambridge: WWF-IUCN-UNEP.
- Amiet, J.-L. 1971. *Leptodactylon* nouveaux du Cameroun (Amphibiens Anoures). *Ann. de la Fac. des Sciences du Cameroun* 7–8: 141–172.
- Amiet, J.-L. 1972a. Description de cinq nouvelles espèces camerounaises de *Cardioglossa* (Amphibiens Anoures). *Biologica Gabonica* 8: 201–231.
- Amiet, J.-L. 1972b. Description de trois Bufonidés orophiles du Cameroun appartenant au groupe de *Bufo preussi* Matschie (Amphibiens Anoures). *Ann. de la Fac. des Sciences du Cameroun* 11: 21–140.
- Amiet, J.-L. 1977. Les *Astylosternus* du Cameroun (Amphibia, Anura, Astylosterninae). *Ann. de la Fac. des Sciences du Cameroun* 23–24: 99–227.
- Amiet, J.-L. 1978. Les amphibiens anoures de la région de Mamfé (Cameroun). *Ann. de la Fac. des Sciences du Cameroun* 25: 189–219.
- Amiet, J.-L. 1981. Une nouvelle *Cardioglossa* orophile de la dorsale camerounaise: *C. schioetzi* nov. sp. (Amphibia, Anura, Arthroleptinae). *Ann. de la Fac. des Sciences du Cameroun* 28: 117–131.
- Amiet, J.-L. 1983. Une espèce méconnue de *Petrodectes* du Cameroun: *Petrodectes parkeri* n. sp. (Amphibia Anura: Ranidae, Phrynobatrachinae). *Revue suisse de Zoologie* 90: 457–468.
- Ayeni, J.S.O. & Mdaihlhi, M. 2001. The Cameroonian-German (MINEF-GTZ) project for protection of forests around Akwaya (PROFA), South West Province, Cameroon. In A.E. Bassey & J.F. Oates (eds.), *Proceedings of the International Workshop and Conference on the Conservation of the Cross River Gorillas*. Calabar, Nigeria: NCF and WCS.
- Booth, A.H. 1958. The zoogeography of West African primates: A review. *Bulletin de l'I.F.A.N.* 20, sér. A: 587–622.
- Brooks, T., Balmford, A., Burgess, N., Fjeldsa, J., Hansen, L.A., Moore, J., Rahbek, C., & Williams, P. 2001. Toward a blueprint for conservation in Africa. *BioScience* 51: 613–624.
- Butynski, T.M. & Koster, S.H. 1989. Marine turtles on Bioko Island (Fernando Poo), Equatorial Guinea: A call for research and conservation. Washington, DC: WWF.
- Butynski, T.M. & Koster, S.H. 1990. The status and conservation of forests and primates on Bioko Island (Fernando Poo), Equatorial Guinea. Washington, DC: WWF.
- Butynski, T.M. & Koster, S.H. 1994. Distribution and conservation status of primates in Bioko island, Equatorial Guinea. *Biodiversity and Conservation* 3: 893–909.
- Cable, S. & Cheek, M. 1998. *The Plants of Mount Cameroon: A Conservation Checklist*. Kew: Royal Botanic Gardens.
- Caldecott, J.O., Bennett, J.G., & Ruitenbeek, H.J. 1989. *Cross River National Park (Oban Division): Plan for Developing the Park and Its Support Zone*. Godalming, Surrey: WWF-UK.
- Caldecott, J.O., Oates, J.F., & Ruitenbeek, H.J. 1990. *Cross River National Park (Okwangwo Division): Plan for Developing the Park and Its Support Zone*. Godalming, Surrey: WWF-UK.
- Castelo, R. 1994. Biogeographical considerations of fish diversity in Bioko. *Biodiversity and Conservation* 3: 808–827.
- Castroviejo, J., Javier Juste, B., Castelo, R., & Pérez del Val, J. 1994. The Spanish co-operation programme in Equatorial Guinea: A ten-year review of research and nature conservation in Bioko. *Biodiversity and Conservation* 3: 951–961.
- Central Intelligence Agency. 2003. *The World Factbook 2003*. Online. Available: <http://www.cia.gov/cia/publications/factbook>.
- Cheek, M., Mackinder, B., Gosline, G., Onana, J.-M., & Achoundong, G. 2000. The phytogeography and flora of western Cameroon and the Cross River-Sanaga River interval. In E. Robbrecht, J. Degreef, & I. Friis (eds.), *Plant Systematics and Phytogeography for the Understanding of African Biodiversity*. Proceedings of the XVIth AEFTAT Congress, National Botanic Garden of Belgium.
- Collar, N.J. & Stuart, S.N. 1988. *Key Forests for Threatened Birds in Africa*. Cambridge: ICBP.
- Collins, S.C. & Larsen, T.B. 2000. Eight new species and five new subspecies of African butterflies (Rhopalocera) – an ABRI research paper. *Metamorphosis* 11: 57–70.
- deMenocal, P.B. 1995. Plio-Pleistocene African climate. *Science* 270: 53–59.
- Dieterlen, F. & Van der Straeten, E. 1992. Species of the genus *Otomys* from Cameroon and Nigeria and their relationship to East African forms. *Bonn. Zool. Beitr.* 43: 383–392.
- Dowsett, R. J. & Forbes-Watson, A.D. 1993. *Checklist of birds of the Afrotropical and Malagasy regions. Volume 1: Species limits and distribution*. Liege, Belgium: Tauraco Press.
- Ebin, C.O. 1983. An appraisal of the biotic and material resources of some game reserves and wildlife management in Nigeria. Lagos: Report to the Nigerian Conservation Foundation.
- Eeley, H.A.C. & Lawes, M.J. 1999. Large-scale patterns of species richness and species range size in anthropoid primates. In J.G. Fleagle, C. Janson, & K.E. Reed (eds.), *Primate Communities*. pp. 191–219. Cambridge: Cambridge University Press.
- Eisentraut, M. 1973. Die Wirbeltierfauna von Fernando Poo und Westkamerun. *Bonner Zoologische Monographien*, No. 3: 1–428.
- Elgood, J.H., Heigham, J.B., Moore, A.M., Nason, A.M., Sharland, R.E., & Skinner, N.J. 1994. *The Birds of Nigeria: An Annotated Check-List*. 2nd Ed. Tring, UK: British Ornithologists' Union.

- Fa, J.E. & Castroviejo, J. 1992. Equatorial Guinea. In J.A. Sayer, C.S. Harcourt, & N.M. Collins (eds.), *The Conservation Atlas of Tropical Forests: Africa*. pp. 161–167. London: Macmillan.
- Fa, J.E., Juste, J., Pérez del Val, J., & Castroviejo, J. 1995. Impact of market hunting on mammal species in Equatorial Guinea. *Conservation Biology* 9: 1107–1115.
- Fa, J.E., Yuste, J.E.C., & Castelo, R. 2000. Bushmeat markets on Bioko Island as a measure of hunting pressure. *Conservation Biology* 14: 1602–1613.
- Figueiredo, E. 1994. Diversity and endemism of angiosperms in the Gulf of Guinea islands. *Biodiversity and Conservation* 3: 785–793.
- Fraser, P.J., Hall, J.B., & Healey, J.R. 1998. *Climate of the Mount Cameroon Region; Long and Medium Term Rainfall, Temperature and Sunshine Data*. University of Wales, Bangor, School of Agricultural and Forest Sciences Publication No. 16. 56 pp.
- Gadsby, E.L. 1989. *Cross River Basin Primate Survey: Stubbs Creek Forest Reserve*. Calabar: Unpublished report, 10 pp.
- Gartlan, J.S., Newbery, D.McC., Thomas, D.W., & Waterman, P.G. 1986. The influence of topography and soil phosphorus on the vegetation of Korup Forest Reserve, Cameroon. *Vegetatio* 65: 131–148.
- Gartshore, M.E. 1984. The status of the montane herpetofauna of the Cameroon highlands. In S.N. Stuart (ed.), *Conservation of Cameroon Montane Forests*. pp. 204–240. Cambridge: International Council for Bird Preservation.
- Gautier-Hion, A., Colyn, M., & Gautier J.-P. 1999. *Histoire naturelle des Primates d'Afrique Centrale*. Libreville, Gabon: ECOFAC.
- Green, A.A. & Rodewald, P.G. 1996. New bird records from Korup National Park and environs, Cameroon. *Malimbus* 18: 122–133.
- Grubb, P. 1990. Primate geography in the Afro-tropical forest biome. In G. Peters & R. Hutterer (eds.), *Vertebrates in the Tropics*. pp. 187–214. Bonn: Museum Alexander Koenig.
- Hall, J.B. 1981. Ecological islands in south-eastern Nigeria. *African Journal of Ecology* 19: 55–72.
- Hamilton, A.C. 1982. *Environmental History of East Africa: A Study of the Quaternary*. London: Academic Press.
- Harcourt, A.H., Stewart, K.J., & Inaharo, I.M. 1989. Gorilla quest in Nigeria. *Oryx* 23: 7–13.
- Hart, T.B., Hart, J.A., & Murphy, P.G. 1989. Monodominant and species-rich forests of the humid tropics: Causes for their co-occurrence. *American Naturalist* 133: 613–633.
- Hearn, G.W. & Morra, W. 2000. *Annual report (July 1999–June 2000) on Beaver College's Bioko Biodiversity Protection Program*. Glenside, PA: Beaver College Biology Department.
- Hilton-Taylor, C. 2000. *2000 IUCN Red List of Threatened Species*. Gland: IUCN.
- Hofer, U., Bersier, L.-F., & Borcard, D. 1999. Spatial organization of a herpetofauna on an elevational gradient revealed by null model tests. *Ecology* 80: 976–988.
- Holland, M.D., Allen, R.K.G., Barton, D., & Murphy, S.T. 1989. *Cross River National Park, Oban Division: Land Evaluation and Agricultural Recommendations*. Chatham, Kent: ODNRI.
- Hugueny, B. & Lévêque, C. 1994. Freshwater fish zoogeography in west Africa: Faunal similarities between river basins. *Environmental Biology of Fishes* 39: 365–380.
- Hutchinson, J., Dalziel, J.M., & Keay, R.W.J. 1954. *Flora of West Tropical Africa*. Vol. 1, Part 1. London: Crown Agents.
- Hutchinson, J., Dalziel, J.M., & Keay, R.W.J. 1958. *Flora of West Tropical Africa*. Vol. 1, Part 2. London: Crown Agents.
- Hutterer, R., Dieterlen, F., & Nikolaus, G. 1992. Small mammals from forest islands of eastern Nigeria and adjacent Cameroon, with systematical and biogeographical notes. *Bonn. Zool. Beitr.* 43: 393–414.
- Hutterer, R. & Schlitter, D.A. 1996. Shrews of Korup National Park, Cameroon, with the description of a new *Sylvisorex* (Mammalia: Soricidae). In *Contributions in Mammalogy: A Memorial Volume Honoring Dr. J. Knox Jones, Jr.* pp. 57–66. Museum of Texas Tech University.
- Iremonger, S., Ravilious, C., & Quinton, T. (eds.). 1997. *A Global Overview of Forest Conservation*. CD-ROM. Cambridge: WCMC & CIFOR.
- IUCN. 2002. *2002 IUCN Red List of Threatened Species*. Online. Available: <http://www.redlist.org>. 14 August 2002.
- Jensen, F.P. & Stuart, S.N. 1984. The origin and evolution of the Cameroon montane forest avifauna. In S.N. Stuart (ed.), *Conservation of Cameroon Montane Forests*. pp. 28–37. Cambridge: International Council for Bird Preservation.
- Juste, J.B. & Fa, J.E. 1994. Biodiversity conservation in the Gulf of Guinea islands: Taking stock and preparing action. *Biodiversity and Conservation* 3: 759–771.
- Keay, R.W.J., Onochie, C.F.A., & Stanfield, D.P. 1964. *Nigerian Trees*, 2 vols. Ibadan, Nigeria: Federal Department of Forest Research.
- King, S. 1994. Utilisation of wildlife in Bakossiland, West Cameroon. *Traffic Bulletin* 14: 63–73.
- Kingdon, J. 1990. *Island Africa: The Evolution of Africa's Rare Animals and Plants*. London: Collins.
- Larsen, T.B. 1995a. *Butterfly Research in the Oban Hills, Cross River National Park*. Calabar: Oban Hills Programme, Second Interim Report.
- Larsen, T.B. 1995b. *A Provisional Annotated List of the Butterflies of the Obudu Plateau*. Obudu: WWF-CRNP Okwangwo Programme.
- Larsen, T.B. 1997a. Butterflies of the Cross River National Park – diversity writ large. Proceedings of workshop on *Essential Partnership – The Forest and the People*, Cross River National Park, Calabar, Nigeria. pp. 229–235.
- Larsen, T.B. 1997b. An annotated list of the butterflies known from the Obudu Plateau (eastern Nigeria). Proceedings of workshop on *Essential Partnership – The Forest and the People*, Cross River National Park, Calabar, Nigeria. pp. 213–228.
- Larsen, T.B. 1997c. *Korup Butterflies – Diversity Writ Large*. Report on a butterfly study mission to Korup National Park in Cameroon during January and February of 1997. Report to WWF-UK and Korup National Park.
- Lawson, D.P. 1993. The reptiles and amphibians of the Korup National Park Project, Cameroon. *Herpetological Natural History* 1: 27–90.
- Letouzey, R. 1968. Notes phytogéographique du Cameroun. *Encyclopédie Biologique* 49, 508. Paris: P. Lechevalier.
- Litt, A. & Cheek, M. 2002. *Korupodendron songweanum*, a new genus and species of Vochysiaceae from West-Central Africa. *Brittonia* 54: 13–17.

- Louette, M. 1981. The birds of Cameroon: An annotated check-list. *Verhandl. Kon. Acad. Wetensch. Lett. Schone Kunst. Belg.* 43: 1–218.
- Maisels, F.G., Cheek, M., & Wild, C. 2000. Rare plants on Mount Oku summit, Cameroon. *Oryx* 34: 136–140.
- Maisels, F.G., Keming, E., Kemei, M., & Toh, C. 2001. The extirpation of large mammals and implications for montane forest conservation: The case of the Kilum-Ijim Forest, North-west Province, Cameroon. *Oryx* 35: 322–331.
- Maley, J. 1996. The African rain forest – main characteristics of changes in vegetation and climate from the Upper Cretaceous to the Quaternary. *Proceedings of the Royal Society of Edinburgh* 104B: 31–73.
- Maley, J. 2002. A catastrophic destruction of African forests about 2,500 years ago still exerts a major influence on present vegetation formations. In M. Leach, J. Fairhead, & K. Amanor (eds.), *Science and the Policy Process: Perspectives from the Forest*. pp. 13–30. IDS Bulletin, Vol. 33, No. 1.
- Maley, J. & Brenac, P. 1998. Vegetation dynamics, palaeoenvironments and climatic changes in the forests of western Cameroon during the last 28,000 years. *Review of Palaeobotany and Palynology* 99: 157–187.
- Maley, J., Livingstone, D.A., Giresse, P., Thouveny, N., Brenac, P., Kelts, K., Kling, G., Stager, C., Haag, M., Fournier, M., Bandet, Y., Williamson, D., & Zogning, A. 1990. Lithostratigraphy, volcanism, paleomagnetism and palynology of Quaternary lacustrine deposits from Barombi Mbo (West Cameroon): Preliminary results. *Journal of Volcanology and Geothermal Research* 42: 319–335.
- Moreau, R.E. 1966. *The Bird Faunas of Africa and Its Islands*. London: Academic Press.
- Newbery, D.McC. & Gartlan, J.S. 1996. A structural analysis of rain forest at Korup and Douala-Edea, Cameroon. *Proceedings of the Royal Society of Edinburgh* 104B: 177–224.
- Ngandjui, G. & Blanc, P.C. 2000. Biogeographie et biodiversité: Aires protégées et conservation des mammifères au Cameroun. *Biogeographica* 76: 63–77.
- Nichol, J.E. 1999. Geomorphological evidence and Pleistocene refugia in Africa. *Geographical Journal* 165: 79–89.
- Oates, J.F. 1986. *Action Plan for African Primate Conservation: 1986–90*. Stony Brook, NY: IUCN/SSC Primate Specialist Group.
- Oates, J.F. 1988. The distribution of *Cercopithecus* monkeys in West African forests. In A. Gautier-Hion, F. Bourlière, J.-P. Gautier, & J. Kingdon (eds.), *A Primate Radiation: Evolutionary Biology of the African Guenons*. pp. 79–103. Cambridge: Cambridge University Press.
- Oates, J.F. 1996. *African Primates: Status Survey and Conservation Action Plan*. Revised edition. Gland: IUCN.
- Oates, J.F. 1999. *Myth and Reality in the Rain Forest: How Conservation Strategies are Failing in West Africa*. Berkeley: University of California Press.
- Oates, J.F., McFarland, K.L., Groves, J.L., Bergl, R.A., Linder, J.M., & Disotell, T.R. 2003. The Cross River gorilla: Natural history and status of a neglected and critically endangered subspecies. In A.B. Taylor & M.L. Goldsmith (eds.), *Gorilla Biology: A Multi-disciplinary Perspective*. pp. 472–497. Cambridge: Cambridge University Press.
- Oates, J.F., White, D., Gadsby, E.L., & Bisong, P.O. 1990. Conservation of gorillas and other species. Appendix 1 to *Cross River National Park (Okwangwo Division): Plan for Developing the Park and Its Support Zone*. Godalming, Surrey: World Wide Fund for Nature, United Kingdom.
- Obot, E. 2000. Saving the green gold: Nigerian Conservation Foundation in Cross River National Park, Okwangwo Division. *Naturewatch* (NCF, Lagos) January 2000: 28–29.
- Parker, H.W. 1936. The amphibians of the Mamfe Division, Cameroons – I. Zoogeography and systematics. *Proceedings of the Zoological Society of London* (1936): 135–163.
- Pérez del Val, J. 1996. *Las Aves de Bioko, Guinea Ecuatorial: Guía de Campo*. León, Spain: Edilsa.
- Pérez del Val, J., Fa, J., Castroviejo, J., & Purroy, F.J. 1994. Species richness and endemism of birds in Bioko. *Biodiversity and Conservation* 3: 868–892.
- Perret, J.-L. 1966. Les amphibiens du Cameroun. *Zool. Jarhb., Abt. Syst.* 93: 289–464.
- Perret, J.-L. 1977. Les *Hylarana* (Amphibiens, Ranidés) du Cameroun. *Revue suisse Zool.* 84: 841–868.
- Petrides, G.A. 1965. *Advisory Report on Wildlife and National Parks in Nigeria, 1962*. Bronx, NY: American Committee for International Wildlife Protection.
- Powell, C.B. 1995. Wildlife Study I, Contract E-00019, Final Report. Submitted to Environmental Affairs Department, Shell Petroleum Development Company of Nigeria, Port Harcourt.
- Powell, C.B. 1997. Discoveries and priorities for mammals in the freshwater forests of the Niger Delta. *Oryx* 31: 83–85.
- Reid, G.McG. 1989. *The Living Waters of Korup Rainforest: A Hydrobiological Survey Report and Recommendations, with Emphasis on Fish and Fisheries*. WWF Report No. 3206/A8:1.
- Reid, J.C. 1989. Floral and faunal richness of Oban Division of Cross River National Park and list of flora and fauna of the Calabar Oban Area. Appendix 7 to *Cross River National Park (Oban Division): Plan for Developing the Park and its Support Zone*. Godalming, Surrey: WWF-UK.
- Richards, P.W. 1996. *The Tropical Rain Forest: An Ecological Study*. 2nd Ed. Cambridge: Cambridge University Press.
- Rodewald, P.G., Dejaifve, P.-A., & Green, A.A. 1994. The birds of Korup National Park and Korup Project Area, Southwest Province, Cameroon. *Bird Conservation International* 4: 1–68.
- Sarmiento, E.J. & Oates, J.F. 2000. Cross River gorillas: A neglected subspecies. *American Museum Novitates* no. 3304, 55 pp.
- Sayer, J.A., Harcourt, C.S., & Collins, N.M. (eds.). 1992. *The Conservation Atlas of Tropical Forests: Africa*. IUCN/Macmillan.
- Schiøtz, A. 1963. The amphibians of Nigeria. *Vidensk. Medd. Fra Dansk naturh. Foren.* 125: 1–92.
- Schiøtz, A. 1966. On a collection of Amphibia from Nigeria. *Vidensk. Medd. fra Dansk naturh. Foren.* 129: 43–48.
- Schiøtz, A. 1999. *Treefrogs of Africa*. Frankfurt am Main: Edition Chimaira.

- Schmitt, K. 1996. Botanical survey in the Oban Division, Cross River National Park. Calabar: Oban Hills Programme, Cross River National Park-WWF.
- Stattersfield, A.J., Crosby, M.J., Long, A.J., & Wege, D.C. 1998. *Endemic Bird Areas of the World: Priorities for Biodiversity Conservation*. Cambridge: BirdLife International.
- Stiassny, M.L.J., Schliewen, U.K., & Dominey, W.J. 1992. A new species flock of cichlid fishes from Lake Bermin, Cameroon with a description of eight new species of *Tilapia* (Labroidei: Cichlidae). *Ichthyol. Explor. Freshwaters* 3: 311–346.
- Struhsaker, T.T. 2001. Africa's rain forest parks: Problems and possible solutions. Report to Center for Applied Biodiversity Science, Conservation International, Washington, DC.
- Sunderland, T.C.H., Mboh, H., Comiskey, J.A., Besong, S., Fonwebon, J., & Dione, M.A. 2002. *The Vegetation of the Takamanda Forest Reserve, Cameroon*. Unpublished draft report to the Smithsonian Institution, Washington, DC.
- Terborgh, J. 1999. *Requiem for Nature*. Washington, DC: Island Press.
- Teugels, G.G., Reid, G.M., & King, R.P. 1992. Fishes of the Cross River Basin (Cameroon-Nigeria): Taxonomy, zoogeography, ecology and conservation. *Annales de le Musée Royal de l'Afrique Centrale. Sciences Zoologique* 266. 132 pp.
- Thomas, D.W. 1984. Vegetation in the montane forest of Cameroon. In S.N. Stuart (ed.), *Conservation of Cameroon Montane Forests*. pp. 20–27. Cambridge: International Council for Bird Preservation.
- Thys van den Audenaerde, D.F.E. 1967. The freshwater fishes of Fernando Poo. *Verh. K. vlaamse Acad. Wet. Lett. Sch. Kunst. Belgie (Wet.)*, Jg. 29, no. 100. 167 pp.
- Trewavas, E. 1974. The freshwater fishes of Rivers Mungo and Meme and Lakes Kotto, Mboandong and Soden, West Cameroon. *Bulletin of the British Museum (Natural History), Zoology* 26: 331–419.
- Trewavas, E., Green, J., & Corbet, S.A. 1972. Ecological studies on crater lakes in West Cameroon: Fishes of Barombi Mbo. *Journal of Zoology, London* 167: 41–95.
- Tye, H. 1984a. Geology and landforms in the highlands of western Cameroon. In S.N. Stuart (ed.), *Conservation of Cameroon Montane Forests*. pp. 15–17. Cambridge: International Council for Bird Preservation.
- Tye, H. 1984b. The climate of the highlands of western Cameroon. In S.N. Stuart (ed.), *Conservation of Cameroon Montane Forests*. pp. 18–19. Cambridge: International Council for Bird Preservation.
- Usongo, L. 1997. Annotated list of known mammals of Korup National Park. Unpublished report in library of Korup National Park, Mundemba, Cameroon.
- Verheyen, W.N., Hulselmans, J., Colyn, M., & Hutterer, R. 1997. Systematics and zoogeography of the small mammal fauna of Cameroun: Description of two new *Lophuromys* (Rodentia: Muridae) endemic to Mount Cameroun and Mount Oku. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique. Biologie* 67: 163–186.
- Vick, G.S. 1999. A checklist of the Odonata of the South-west Province of Cameroon, with the description of *Phyllogomphus corbetiae* spec. nov. (Anisoptera: Gomphidae). *Odontologica* 28: 219–256.
- Walter, H. 1973. *Vegetation of the Earth in Relation to Climate and Eco-Physiological Conditions*. New York: Springer-Verlag.
- Waltert, M., Lien, Faber, K., & Mühlenberg, M. 2002. Further declines of threatened primates in the Korup Project Area, south-west Cameroon. *Oryx* 36: 257–265.
- Werre, J.L.R. 2000. Ecology and behavior of the Niger Delta Red Colobus monkey (*Procolobus badius epieni*). Unpublished Ph.D. thesis. NY: City University of New York.
- White, F. 1983. *The Vegetation of Africa*. Paris: Unesco.
- Whitmore, T.C. 1975. *Tropical Rain Forests of the Far East*. Oxford: Oxford University Press.
- Wieringa, J.J. 1999. *Monopetalanthus* exit. A systematic study of *Aphanocalyx*, *Bikinia*, *Icuria*, *Michelsonia* and *Tetraberlinia* (Leguminosae, Caecalpinioideae). *Wageningen Agricultural University Papers* 99–4. 320 pp.
- Williams, P.H. 2000. *WORLDMAP*. Vers. 4.20.12. London: Natural History Museum.