

Protected Area Gap Analysis for the Upper Guinea Ecosystem – Contribution to Regional Workshop on Protected Areas in Western and Central Africa

Project background

Presently, 1,130 species of mammals are threatened worldwide with extinction. This is 24% of all mammal species (Hilton-Taylor 2000). The role of protected areas in the prevention of extinction of species has been much debated (Bruner *et al.* 2001; Ghimire & Pimbert 1997). If protected areas are effective in protecting species, one would expect a negative correlation between the area under protected area status and the number of threatened species, i.e. the greater the amount of area protected, the fewer threatened species. A recent analysis however, found no relationship between these variables (Kerr & Burkey 2002).

One explanation for the absence of a relationship between these variables may be that many protected areas exist on paper alone and have very little infrastructure for the prevention of poaching and agricultural encroachment. Bruner *et al.* (2000) however, found that even paper parks are better than no parks at all in protecting biodiversity. Another reason for the lack of correlation between the area under protected area status and the number of threatened species may be that protected areas are not geographically placed in such a way to achieve complete coverage of all species. The placement of most protected areas in Africa occurred in the 1920's (IUCN 1998) and decisions of the location of protected areas were more based on aesthetics, or historical reasons than on the biodiversity value of the location (Kerr & Burkey 2002).

An analysis therefore was undertaken to examine the question of how well the current protected area system covers species of mammals, especially those that are endemic and threatened. The study focuses on two areas: the Guinean Forests of West Africa, and the Congo Basin in Central Africa.

Other Gap Analyses (e.g. Fjeldsda *et al.*, in press) have examined species coverage by overlaying maps of species ranges, protected areas and a grid system in order to determine if a species occurs in any given protected area. If only part of the protected area or the species' range falls within the grid, decisions must be made in order to determine whether the grid is counted or not. These decisions can radically skew the results. For example, Fjeldsda *et al.* (*in press*) found that the number of cells counted as "protected" varied from 12 to 169 based on whether the 10%, 25%, 33% or 50% protected area coverage criteria was used. Using species ranges as a good predictor of the occurrence of a species within a protected area, but generally, this method will tend to overestimate species coverage. Instead, in this analysis, point locality data was used. Not only is this information more accurate, it is a more useful planning tool as practitioners can trace the source of the data, and therefore know the date when any given species was last recorded in a location.

Project goal

The goal of this project was to undertake an analysis that would examine the coverage of mammals within the current protected areas network in West Africa's Upper Guinea Forest Ecosystem and the Congo Basin. The following reports on progress of this project to date. The paper is also intended to help establish a framework for systematically building a protected area system that will be fully representative of the existing biodiversity in Upper Guinea, including adequate coverage for threatened and endemic species in the region. This will be a strategic contribution to CEPF investments on expanding and strengthening protected areas in this priority ecosystem.

Methods

Biogeographic Regions Considered

Myers *et al.* (2000) provides a list of 25 “hotspots” of biodiversity, defined as those with at least 1,500 species of vascular plants as endemics (0.5% of the world’s 300,000 plant species). Myers *et al.* (2000) shows that 35% of vertebrate species and 44% of all vascular plant species are found in these hotspots,



which form only 1.4% of the earth’s surface area. The Guinean Forests are one of these hotspots and extend from the Fouta Djallon in Guinea, through Sierra Leone and Liberia, parts of Côte d’Ivoire, Ghana, Togo, Benin, Nigeria and northeastern Cameroon (Figure 1).

Figure 1. The Guinean Forest Hotspot



The Congo Basin on the other hand is classified as a “wilderness area,” that is, an area greater than one million has, more than 70% intact and with a human population density below 5 people/ km². (Mittermeier *et al.* 2002) The definition for the Congo Basin follows that of the WWF ecoregion, covering all of Gabon, Equatorial Guinea and the Congo, and parts of Cameroon, the Democratic Republic of Congo, Angola, Sudan, and the Central African Republic (Figure 2).

Figure 2. The Congo Basin Wilderness Area

List of Protected Areas

We use the 1997 United Nations List of Protected Areas (IUCN 1998) IUCN category I-IV. This list has now been updated and therefore our list will be cross-checked with this new list before publication.

A total of 39 protected areas were examined in the Guinean Hotspot and 58 protected areas in the Congo Basin Wilderness Area. Several alterations were made to the present list, where documentation was available to support these changes

In the Guinean Forest Hotspot:

1. The protected areas of Basile Peal National Park and the Luba Caldera Scientific Reserve on Bioko Island, Equatorial Guinea, were added to the list of protected areas (Law #4 May 22, 2000, Malabo)
2. Okumo National Park and Gashaka-Gumti, Nigeria were added to the analysis

In the Congo Basin Wilderness Area:

3. Dzanga Sangah was included, even though it is listed as category VI (IUCN 1998)
4. At the World Summit on Sustainable Development in September 2002, Gabon’s president Bongo announced the formation of 13 new protected areas. 2002 that will cover more than 30,000km² or almost 11% of the country.
5. Petit Loango, formerly a category IV, is now included in the Loango National Park.
6. Equatorial Guinea’s Monte Allen National Park was created in 2000 (Law #4 May 22, 2000, Malabo)

Point locality data

A literature search on the distribution of mammal species within these protected areas was conducted. Both gray literature (management plans) and papers published in scientific journals were used. Unless the protected area was specifically mentioned in the literature, the species was not recorded as occurring in that area. For example, a statement that a species was known to be distributed in “western Côte d’Ivoire” was not used as evidence that it exists in Tai national park, unless specifically stated.

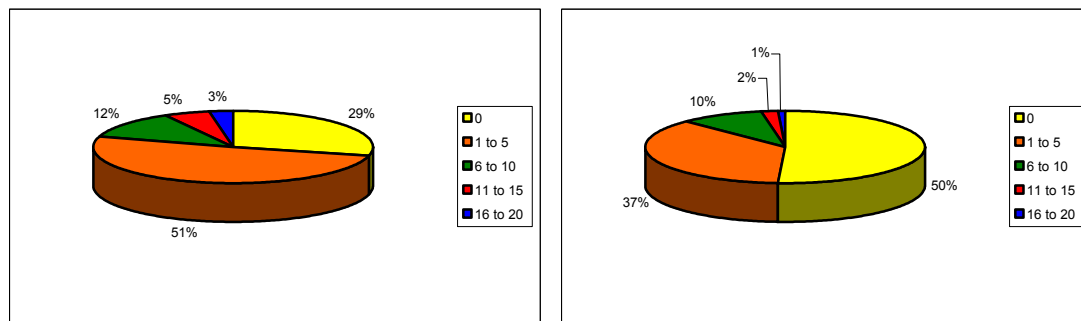
We recognize that there are differences in dates of the records, but note that the record of a species in one locality as opposed to another still means that it has a better chance of occurring in the latter than elsewhere. The number of records is not indicative of proportional representation, but could potentially be a sampling bias. We also recognize that the analysis is not necessarily exhaustive, but is intended to serve as a first cut that can be subsequently expanded or improved upon.

Mammal names were used following Wilson and Reader (1993). Only terrestrial mammals were considered.

Summary of results

A total of 339 species of mammal were determined to occur in the Guinea Forests of West Africa, and 412 species in the Congo Basin Wilderness Area, based on information from Wilson and Reader (1993). The number of endemic mammal species in the Guinean Forest Hotspot (88) is, as expected, far greater than that of the Congo Basin Wilderness area (43)

The current network of protected areas covers 230 of these species, or 71% of all mammal species expected to occur in the hotspot, although 51% of species are only recorded as occurring in one protected area (**Figure 3**). The current protected areas cover only 50% of the 412 mammal species expected to occur in the Congo Basin.



a) Guinean Hotspot

b) Congo Basin Wilderness Area

Figure 3. Percent of species recorded as occurring in protected areas

A total of 60, or 68% of the endemic species are covered by the current protected areas network in the Guinean Hotspot and a total of 17 or 40% of the endemic mammals in the Congo basin are covered by the current protected areas system.

Of the 339 mammal species, 56 are considered threatened by the IUCN Red List (Hilton-Taylor 2000). A total of 66% of these species were covered by the current protected areas. Of the 412 species in the Congo Basin, only 25 species are considered threatened. The current protected area network covers 18 (72%) of these species.

The endemic species that were most covered by the protected areas in the Guinean Forest were mainly primates and antelope species, whereas the Congo Basin protected areas covered mostly the insectivores and rodents.

A total of 60, or 68% of the 88 endemic species in the Guinean Hotspot are covered by the current protected areas network. If Mount Oku were added to this list of protected areas, this would increase the number of endemic species covered to 75%. By adding Mount Cameroon in Cameroon, this increases the coverage of endemic species to 78%. By adding Mont Lefo or Rumpi Hills in Cameroon, this increases the protected area coverage of endemic species to 80%.

In the Congo Basin, only 17, or 40% of the endemic mammals in the Congo basin are covered by the current protected areas system. By adding the Ituri Forest in the DRC, this increases coverage to 49%. By adding Lomako Forest in the DRC and a protected area on Sao Tome, this increases protected area coverage to 53%.

Objectives satisfied:

This component of the project satisfied the following specific objectives for the overall project:

- Existing data on species records for mammals in protected areas for each country in the Guinean Hotspot and the Congo Basin were synthesized
- The representation of threatened and endemic mammal species, as well as the representation of all mammal species in the existing protected area networks was analyzed
- Gaps in the protected area coverage across the regions were identified
- Based on the information to date: biodiversity-based targets for building an adequately representative regional system were highlighted
- All these results have been summarized into a background paper for the regional workshop on protected areas.
- This background paper was presented by Mohamed Bakarr at the regional workshop on protected areas, held in Kribi during the last week of January 2003. This regional workshop was organized and hosted by the IUCN/WCPA in partnership with all major international conservation NGOs including BirdLife International, CI, WCS and WWF. At this meeting, participants 1) helped update the list of protected areas used in our analysis, 2) contributed to the data on mammal distribution within these protected areas, and 3) reviewed the methodology that was used in this analysis.
- A further analysis on the coverage of mammal species specifically in World Heritage Sites in West and central Africa has been conducted
- The contents of this chapter have also been incorporated now into a final chapter for publication for the World Parks Congress.

References

Bruner, A., Gullison, R.E., Rice, R.E. and Fonseca, G.A.B. 2000. Effectiveness of Parks in protecting tropical biodiversity. *Science* 291:125-128.

Fjeldsa, J., Burgess, N.D. and Lerk, H.M. *In press*. Will Africa's protected areas network conserve Africa's threatened mammals.

Hilton-Taylor, C. 2000. *2000 IUCN Red List of Threatened Species*. IUCN, Gland and Cambridge.

Kerr, J.T. and Burkey, T.V. 2002. Endemism, diversity, and the threat of tropical moist forest extinctions. *Biodiversity Conservation* 11: 695-704.

Mittermeier, R.A., C.G. Mittermeier, P.Robles Gil, J.D. Pilgrim, W.R. Konstant, G.A.B. da Fonseca, and T.M. Brooks (Eds.) 2002. Wilderness: Earth's last wild places. CEMEX, Mexico.

Myers, N.W., Mittermeier, R.A., Mittermeier, C.G. da Fonseca, G.A.B. and Kent, J. 2000. Biodiversity hotspots for conservation priorities. Nature 403:853-858.

Wilson, D. E., and D. M. Reeder eds). 1993. Mammal Species of the World. Smithsonian Institution Press, 1206 pp.

For more information about this project, please contact:

Rebecca Kormos
Research Fellow, Center for Applied Biodiversity Science
1310 Meadowbrook Road
Ojai, CA 93023, USA
Tel: 1.805.646.0724
E-mail: r.kormos@conservation.org