African Biodiversity Explored

Edited by Alfonso Alonso, Michelle E. Lee, Patrick Campbell, Oliver S. G. Pauwels, and Francisco Dallmeier. *Gamba, Gabon: Biodiversity of an Equatorial African Rainforest.* Special *Bulletin of the Biological Society of Washington,* no. 12 (436 pages), January 2006. Available from Alfonso Alonso (alonsoa@si.edu), or via check or money order (price $27) payable to The Custodian of Publications, Biological Society of Washington, National Museum of Natural History, MRC 116, P.O. Box 37012, Washington, D.C. 20013-7012, USA.

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Ever since devouring *The Overloaded Ark* by British naturalist Gerald Durrell, which charmingly portrayed his seat-of-the-pants expedition to Cameroon in the 1950s to collect a menagerie of exotic animals for London's Whipsnade Zoo, I have been determined to visit the rainforests of Central Africa. I finally got the opportunity in 2002, and have since returned twice, as part of an ongoing effort to understand the growing perils of roads and hunting for forest wildlife in Gabon. Reading through *Gamba, Gabon: Biodiversity of an Equatorial African Rainforest*, I was instantly transported back to a region that still resembles the magical wilderness that was once Central Africa.

The Gamba area is an 11,300 km^2 complex of intermingled beaches, swamps, lagoons, lakes, mangroves, upland rainforests, natural and anthropogenic savannas, villages, and densely forested mountains skirting Gabon's southwestern coast. It still retains some of the richest wildlife communities in Africa, including such spectacular species as forest elephants, hippos, forest buffalo, sitatunga, lowland gorillas, chimpanzees, and a dazzling variety of birds, reptiles, and amphibians. This biological cornucopia has managed to coexist relatively harmoniously with oil production and development activities in the region, especially those under the aegis of Shell Gabon, which has made its reduced-impact operations in Gamba something of a benchmark for others to follow. Less conducive to conservation have been the growing impacts of industrial timber operations, which create labyrinths of forest roads that greatly increase the vulnerability of wildlife to commercial hunters.

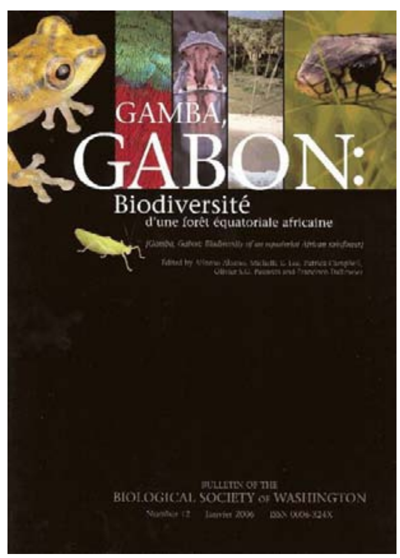
Gamba, Gabon is a collection of essays and articles by researchers working under the auspices of the Smithsonian Institution's Monitoring and Assessment of Biodiversity Program (MAB). MAB's broader mission of science-based conservation involves biodiversity studies in poorly explored regions of the world, local training and capacity building, and conservation education. In Gabon, they have been working cooperatively with local partners, especially Shell Gabon, Shell Foundation, and the Gabonese government, and with a coterie of researchers from African, European, and U.S. institutions, to document the poorly studied wildlife and ecosystems of the Gamba Complex of Protected Areas.

Perhaps the first thing to say about *Gamba, Gabon* is that it is an absolute must-read for anyone contemplating a trip to Equatorial Africa. Each article is replicated in both English and French, the latter the national language of Gabon and several neighboring countries. It is strikingly illustrated, with 32 pages of maps and images by award-winning photographers. These vividly portray the local geography, natural habitats, conservation issues, industrial development, and people of the Gamba region. Equally arresting are the many images of wildlife—fish, arthropods, amphibians, reptiles, birds, small and large mammals—and of MAB researchers and their Gabonese collaborators in the field.

The core of MAB's original efforts in Gamba involved intensive biodiversity surveys by substantial teams of specialists in five eclectic locations: (1) the greater Gamba area, a coastal basin that includes white-sand beaches, the massive Ndogo Lagoon (the largest in Africa), savanna-woodland mosaics, rainforest, farmlands, and villages; (2) Rabi, a site dominated by mature rainforest with some oil and logging activities; (3) Toucan, a somewhat drier rainforest site with nearby villages; (4) Loango National Park, a coastal zone with beaches, lagoons, savanna, and rainforest; and (5) Moukalaba-Doudou National Park, which spans an elevational gradient from lowland swamp forest to dense rainforest clinging to steep cliffs and upland granites. These areas mirror the complex array of habitats and ecosystems in the Gamba region. The great diversity of species the scientists encountered was partly a consequence of the remoteness of their study areas, and it is apparent that the logistics of working in the more far-flung locations was occasionally nightmarish.

Most of the articles in *Gamba, Gabon* are taxonomically based and geographically crosscutting, in that they integrate findings from the five intrepid field surveys. The book begins with an overview of the Gamba complex and its environments (Michelle Lee et al.), accompanied by a discussion of ecological indicators and threats to the region (Francisco Dallmeier et al.). This is then followed by articles on floristic structure (Patrick Campbell et al.), orchid diversity (Tariq Stevart & Vincent Droissart), freshwater and lagoon fish (Victor Mamonekene et al.), amphibians (Marius Burget et al.), reptiles (Olivier Pauwels et al.), sea turtles (Alexis Billes et al.), birds (George Angehr et al.), small mammals (Carrie O'Brien et al.), bats (Rogelio Rodriguez et al.), arboreal and larger terrestrial mammals (Sally Lahm & Jean Pierre Tezi), very large mammals (Major Boddicker), and humpback whales (Howard Rosenbaum & Tim Collins). A further chapter summarizes a study of the karyology and chromosomal evolution of selected small mammals (Ashley Primus et al.).

The investigators made many important findings and met more than a few surprises. Among these were the highest diversities of reptiles and amphibians ever encountered in Gabon, the presence of numerous wildlife species of critical conservation concern, and sites with large concentrations of locally endemic species. Especially important were the realizations that certain habitat mosaics provide critical areas for elephants and other wildlife during seasonal resource bottlenecks, and that the Gamba Complex of Protected Areas functions as an important corridor for seasonal migrations of large mammals and anadromous fish between coastal and inland areas. The Gamba region is also ecologically connected at much larger scales, supporting a host of globally migratory species, including Paleotropical and Palearctic birds, sea turtles, certain marine fish, and humpback whales.



Gamba, Gabon is an excellent, cutting-edge introduction to the wildlife and ecosystems of Equatorial Africa. Gabon is today at a crossroads between heavy development pressures on the one hand, and new initiatives to markedly expand its national park system and promote ecotourism, on the other. MAB's landmark efforts to distribute this book widely in Gabon, to train Gabonese scientists, and to display the region's natural treasures to a global audience, should help to build the local support that is so crucial for sustaining Gabon's fledgling conservation initiatives.

Conservation Corridors: Practitioners lead the way

Anderson, A. B. and C. N. Jenkins. 2006. *Applying Nature's Design: corridors as a strategy for biodiversity conservation.* Columbia University Press, New York. ISBN 0-231-13411-8, 231 pp.

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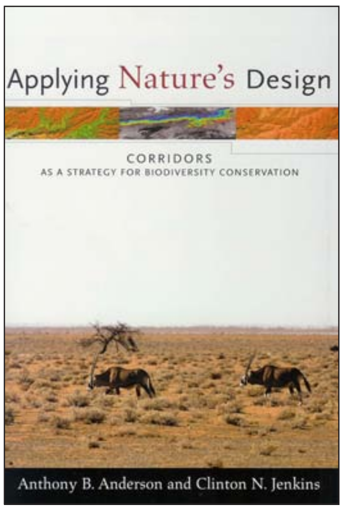
When it comes to conservation corridors there is a large disparity between the worlds of theory and practice. The theoretical field is more than 25 years old. It has abundant datasets on wildlife using and moving through habitat corridors but little data on *the big science question*—do corridors contribute immigrants to otherwise insular populations? Hence many academics have recommended waiting until more evidence is available. Practitioners, however, have observed increasing fragmentation, urbanization and soaring land values and recognized that waiting is simply not an option. They have taken the corridor concept and implemented it. In synthesizing the experiences of some of these conservation managers, Anderson and Jenkins have, in their book *Applying Nature's Design*, identified many new ideas and approaches to corridor science.



The authors introduce 8 case studies of small- or large-scale corridors from Brazil, Costa Rica, Canada, USA, Malaysia, Netherlands, India and Nepal. In reading these case studies the first thing you recognize is that corridor implementation is only partly about species mobility and habitat requirements, and mostly about socio-economic issues. This is because the most powerful force acting on both the landscape and the successful implementation of corridors are the people that inhabit it. Linkages between parks generally occur through private lands, and it is only through meeting the landholders' needs first can we then consider those of wildlife. The scope of some of these case studies is frightening; for example, one of the landscape corridor case studies presented in this book covers a forested area of 34,000 km² between Nepal and India, where 6 million people depend on subsistence agriculture.

In their synthesis chapter, Anderson and Jenkins have identified major issues associated with implementing corridors: the obstacles, building support, effective incentives and management. Obstacles to creating corridors are generally caused by a perceived conflict over limited resources, and one of the interesting observations made in the book is that resistance to corridors is greatest in places where property rights are most clearly defined. Not only are private landowners suspicious of any restriction but groups such as pastoralists, petroleum interests, timber and mining companies have also reacted strongly to any limitations of their use of public lands.

Leadership of motivated people with vision is essential to building support from these interest groups for the successful implementation of corridor projects. Local leadership is critical, although international NGO's such as World Wide Fund and The Nature Conservancy have been effective in either directly financing corridor projects in Brazil and Costa Rica or leveraging support from other sources. Educating and encouraging the involvement of local landholders and government agencies is also crucial, and the team-building abilities of an individual can make all the difference to the success of these initiatives.

So what are the incentives that motivate people to become involved in corridors? In Brazil, the Atlantic forest case study discusses raising public awareness about biodiversity loss, and in this case the highly attractive and endangered lion tamarin species have motivated some landowners of large properties to protect their forests. Greater assistance was required by farmers of small allotments to move away from damaging shifting cultivation to agroforestry practices. Corridor initiatives hired community extension officers and technicians to educate farmers and provided seedlings for fruit, timber, fuel, and fodder including native tree species. In other case studies technical expertise in sustainable forest extraction and ecotourism was also required.

Financial incentives can motivate most people. The case studies in this book have covered the spectrum of ways landholders can be assisted, from direct purchase of land or development rights (easements) to deductions or waiving of land taxes for people who put their land aside for conservation. Funding these programs can be very innovative. For example in Costa Rica, a 5% sales tax on fossil fuels has generated funds to compensate landholders to keep their forests intact. This program (Costa Rican National Forestry Fund) appears to work successfully for the educated landholders, but poor farmers may be disadvantaged by the costs and bureaucratic paperwork.

Other chapters that will be appreciated by students include a general review of corridor design literature and a discussion on the theoretical foundations of corridors (here the authors have followed the original outline of Andrew Bennetts' (1999) *Linkages in the Landscape*, IUCN). The book is well written but at times the structure is a little awkward. At the rear of the book there is an excellent in-depth description of the case studies that is preceded by the synthesis chapter. At times I needed more information about the case studies to help me evaluate the findings in this chapter (for example size of the corridor, number of landholders etc.), and moving between the case studies and the synthesis chapter meant I was frequently losing my place. It might have been easier if the authors had written a few sentences about each site in the beginning of the chapter so it would be possible to read the chapter without stopping. In all I think Anderson and Jenkins have provided a very thoughtful book that demonstrates how important socio-economic issues are to the conservation of habitat on private lands and how innovative the approaches of practitioners have been in implementing corridors in real world landscapes.