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Editorial

Tropical Conservation Science: a diverse landscape of conservation issues

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The first issue of *Tropical Conservation Science* in 2010 marks the beginning of the third year of existence for this scientific journal at Mongabay.com. This issue contains eight papers encompassing a truly diverse range of conservation themes: assessment of rodent and bat diversity in fragmented landscapes in southern Mexico; the role of women in traditional farming systems as practiced in home gardens in Bangladesh; sustainable management of wildlife areas in Tanzania; influence of human population density on forest landscapes in the Democratic Republic of the Congo; conservation threats to Sal forests in Bangladesh; conservation of Colombian primates; forest patches for conservation of the golden-headed lion tamarin in Brazil, and the study of howler monkeys as early warning systems for yellow fever outbreaks in the Atlantic forests of Brazil.

An important landmark of this issue is a paper on the role of women in traditional farming systems as practiced in home gardens in Bangladesh. The paper highlights the critical role women play in sustainable use of natural resources, in biodiversity conservation, in sustaining the family well-being and in contributing to the local and regional economy.

In the following paragraphs we provide a brief overview of each paper in this issue.

Barragan *et al.* assessed patterns of diversity, richness, abundance, and dissimilarity in rodent and bat communities for four landscapes on the Isthmus of Tehuantepec in Oaxaca, Mexico, an important geographic region of Mesoamerica with a large number of endemic species. The authors report the highest diversity of rodents in those landscapes with the highest habitat diversity, but this was not the case for bats due to their capacity to move over long distances. Based on their results, the authors argue that the presence of fragments of different habitats in each landscape is important for the persistence of populations of rodents and bats, in spite of ongoing anthropogenic activities. They further suggest that conservation strategies in the biologically rich isthmus regarding rodents and bats should also aim at protecting corridors of arboreal vegetation because these animals benefit from the inter-fragment connectivity provided by these corridors.

Akhter et al. report that home gardens are increasingly recognized as ecosystems for *in situ* conservation of agro-biodiversity; that the conservation of cultivated plants in home gardens not only preserves a vital resource for humankind but also provides significant economic and nutritional benefits for the rural poor, and that home gardens are a common feature in rural Bangladesh where they cover about 0.27 million ha. Based on a study of four rural villages in Sylhet Sadar, Bangladesh, **Akhter et al.** show that women play a key role in the management of home gardens and these play a vital role in providing firewood, fodder, medicine, fruit, and timber. The authors maintain that In Bangladesh, where natural forest cover is less than 10 percent, the home gardens maintained by at least 20 million households represent important strategy for biodiversity conservation. In this context, they emphasize the role women play in management of home gardens with the resulting conservation and sustainable use of natural resources.

Bamba et al. studied the influence of population density on spatial distribution of forests in the Oriental Province in the Congo Basin of the Democratic Republic of the Congo. Using geographic information systems and satellite images, the authors found highly significant correlations between population density and forest fragmentation in their study areas. They conclude that due to the increase in population density and the low socio-economic condition of the population, the forests found in the study areas are under various kinds of pressures and continue to degrade. The authors argue for attention to this problem, but also remark that consideration of the needs of local communities should be part of any conservation initiative. They further stress that the conservation problem in the Oriental Province is of more than local and regional relevance, because the Congo Basin contains the largest forest after the Amazon tropical forest complex.

Stevenson et al. conducted a detailed survey of scientific publication databases aimed at evaluating which species have been well studied, and which species deserve more investigation. Their survey spanned publications from 1900 to 2008 on 25 primate species present in Colombia. The authors report that differences in the Colombian primates' distribution, abundance, ecology, and charisma, among many other things, have led to large variation in the amount and nature of investigations performed on the different species. They argue that basic information on each native primate species is necessary to build adequate conservation plans and that identification of information gaps is critical here. They noticed that the most studied species (such as woolly monkeys, brown capuchins, and red howlers) are usually present where research stations are established, and where long-term studies have been undertaken, but that, in general, research activities in these sites are frequently jeopardized by deforestation, hunting, and illegal armed conflicts. In contrast, species at high risk, such as the spider monkeys in Choco and the Magdalena valley, the gray tamarin, the cotton-topped tamarin, the Caqueta's titi, and the Andean woolly monkey, are poorly documented. The authors conclude that to ensure the conservation of Colombian primates it is not only essential to acquire integral scientific knowledge on each species, but also to protect the forests and ecosystems inhabited by the monkeys.

Zeigler et al. remark that the golden-headed lion tamarin (GHLT; *Leontopithecus chrysomelas*) is one of many primate species endemic in the Brazilian Atlantic forest, where deforestation is a significant threat. Large forest patches may be especially important for the survival of this endangered arboreal primate, which maintains large home ranges at low population densities. In their study, **Zeigler et al.** aimed to determine the number and location of forest patches that are large enough to support a population of GHLTs with a low risk of extinction and high genetic diversity despite the potential negative effects of fire and disease. Although the authors found multiple large forest patches in their study area, only one patch was large enough to support a population of GHLTs with high genetic diversity under the highest level of threat from fire and disease. The authors point out that only one federally protected reserve is known to currently support GHLTs within the species' range, while continuing deforestation, land conversion, and construction projects such as the PETROBRAS pipeline are real and major threats to the remaining GHLT habitat.

Bicca-Marques et al. report on the conservation impact on howler monkeys of an outbreak of yellow fever. Such an outbreak (2008-2009) caused the death of seven people and over 2,000 howler monkeys in the state of Rio Grande do Sul, Brazil, spreading panic among the human population. The authors report that fear of the disease and misinformation about its relationship with howler monkeys led inhabitants of several regions to exterminate these primates from the forests near their homes. The authors further report on a conservation campaign to mitigate the negative reaction of the public toward howler monkeys. Their cardinal principle in addressing the public was that howler monkeys play an important role in fighting yellow fever via the surveillance of virus circulation; the authors stressed that the monkeys were not responsible for the re-emergence of this African infectious disease, its transmission, or its fast spread through the highly fragmented landscape of the state of Rio Grande do Sul. They also described how such concepts resulted in the information campaign, "Protect our Guardian Angels," launched to inform the public and the media about the actual relationship of these regionally threatened primate species to the disease. The campaign is run and supported by educational, scientific, governmental (health- and environment-related), religious institutions, and NGOs, an alliance in favor of biodiversity conservation and public health that has been effective in changing public attitudes.

Rahman et al. studied the tropical moist deciduous sal (*Shorea robusta*) forests of central Bangladesh, a unique and critically endangered ecosystem. They point out that anthropogenic destruction coupled to natural impacts and overexploitation of forest resources has caused severe damage to the Sal forest ecosystem. **Rahman et al.** indicate that while sal is usually harvested for construction works, fuel wood, timbers, tannins, pillars, and furniture-making purposes, in recent times rubber monoculture development and expanding commercial fuel-wood plantations have become important pressures. They suggest that silvicultural systems must be improved to promote effective regeneration of sal forests and that sustainable alternatives to forest-based livelihoods as home gardening, forest product-based small cottage industry, beekeeping, and poultry farming should be explored.

Current approaches to natural resources conservation emphasize active participation of local communities in conservation activities. Participatory conservation is hence a joint initiative of governments, local communities, and other stakeholders such as non-governmental organizations. With this concept in mind, the study by **Paolo Wilfred** examines wildlife management areas (WMAs) in Tanzania. WMAs are areas of community land in which local people have usage rights over the wildlife resources. It is envisaged that through WMAs local people will develop the sense of wildlife ownership, and realize the actual and potential benefits of wildlife conservation. His paper presents some factors that need to be given due attention in the current interest in WMAs in Tanzania, and indeed elsewhere in Africa. The following issues are highlighted by the author: historical background of WMAs in Tanzania; destruction of wildlife habitat due to human land-use activities such as agriculture in the areas with WMA projects; human population density in relation to wildlife resource use-pressure, and natural resource use diversification and access considerations in the wildlife management areas. The author concludes by recommending these things: simplification of the WMAs' formation process in order to quicken and promote positive outcomes from their predetermined objectives; frequent monitoring in the areas with WMA projects; promoting conservation awareness among local communities, and increasing local capacity building towards ensuring sustainable access and utilization of the natural resources in the WMAs.

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