Editorial

Controversial issues in tropical conservation science

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The current issue of TCS includes eleven contributions,: one opinion article on wildlife trade policies and 10 research papers. Five of these are studies conducted in Africa and the remaining five are based on investigations carried out in the Neotropics. Below is a general overview of the Opinion article and of the papers in each of these two geographic regions.

The Opinion Article by **K**. **Conrad** stresses that 40 years after CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) ratification, trade bans have become an important principle conservation tool for endangered species, but that while trade bans have helped to sustain populations of certain species, for other species such bans have been less effective. The author points out that a trade ban hands a monopoly on commerce to the black market and this needs attention in conservation approaches supported by CITES.

Africa

E. Gandiwa examines local ecological knowledge (LEK) about domestic and wild animal species among people bordering the northern Gonarezhou National Park (GNP), Zimbabwe, in order to evaluate the possible contribution of LEK to wildlife conservation and management. The study concludes that LEK may serve as a valuable source of ecological information and should be used to complement scientific information for wildlife conservation and management.

Iyongo Waya Mongo et al describe anthropogenic effects on rodent richness, diversity, abundance, and relative density in the Masako Reserve, in the Democratic Republic of the Congo. Richness and diversity of rodent species were high in the edge habitat and low in the primary forest.

Martin et al report that consumption of bushmeat is a problem around many protected areas, but successful mitigation programs are difficult to design, in part because anthropogenic pressures are often treated as uniform. In Eastern Africa, where bushmeat consumption has become a major problem, most studies focus on a single site or single ethnic group. The authors interviewed indigenous inhabitants of Mpimbwe and refugee dwellers in Katumba, western Tanzania, who both hunt in the same ecosystem. More than four-fifths of the sampled population in Mpimbwe consumed bushmeat, whereas just over half did so in Katumba, and frequency of

eating bushmeat was higher in the former. The authors attributed greater consumption of bushmeat in Mpimbwe to a comparative shortage of eggs and pork there, to greater ease of access to large mammals, and to a lower price of bushmeat, pointing out the considerable variation in bushmeat consumption between groups hunting in the same general area.

The causes of spatial distribution gaps for a given species may be either natural (habitat discontinuities) or non-natural (local extinctions, inaccurate knowledge); such species are defined as 'gap species.' **Luiselli et al** analyzed country checklists for African chelonians in order to identify both gap species and gap countries. They also compared patterns observed in chelonians with those observed in African small mammals. Species richness was highest in South Africa, Congo, Nigeria, Tanzania, Angola and Ghana; the countries exchanging the smallest number of species with neighboring countries were South Africa and Congo. The main gap countries were Togo, Benin, and Congo. Moist savannahs, tropical forests, and swamp areas were inhabited by significantly higher numbers of gap species. They suggest that the high number of gap species in Congo, Central African Republic (C.A.R.), and Cameroon may be due to suboptimal research, and in Togo and Benin may depend on the Dahomey Gap. Tropical forests and moist savannahs are the most important habitats for both groups.

Gogarten et al examine a current model that uses the protein-to-fiber ratio of leaves to predict the biomass of small folivorous primates In Kibale, Uganda, the authors tested if the number of infant red-colobus monkeys per female and group size can be predicted based on the leaf chemistry of a habitat. They found that regenerating forests did have trees with leaves with high concentrations of protein and low concentrations of fiber, but there was no corresponding change in the demographic structure of red colobus groups. They also tested whether energy was a potential determinant of these parameters, but found no evidence for its importance. The authors therefore question the model's generality, particularly for conservation and management.

Neotropics

Lima Massara et al studied the maned wolf outside protected areas in in the Brazilian Cerrado. Their examination of fecal samples shows that the maned wolf frequently used both natural and disturbed fields. The diet was composed mostly of small mammals and the plant *Solanum lycocarpum*, similar to what has been found in less disturbed areas. The authors suggest that the maned wolf is an ecologically flexible species that can survive in disturbed areas outside protected areas.

The southwestern Amazonian state of Acre is a bird species-rich region in Brazil, where completion of the Brazil-Peru Interoceanic Highway may alter the distribution, status, and natural history of rare and restricted-range birds, may increase human-wildlife conflicts, and may also bring ecotourism within Acre. Based on field surveys and on interviews of hunters, **J. DeLuca** reports that the vulnerable Blue-headed Macaw (*Primolius couloni*) is uncommon but widely distributed throughout eastern Acre and that the vulnerable Rufous Twistwing (*Cnipodectes superrufus*) appears rare. Local hunters suggest that *H. harpyja* and *M. guianensis* are rare to uncommon and are widely persecuted throughout the study area. The author also points out that there is interest in community-run ecotourism, which may help to promote conservation of these very rare bird species.

The distribution of rare plant species of the tropical forests in the Yucatan Peninsula, Mexico, is poorly known. **Tetetla et al** use the species distribution maps of each species to evaluate the

relationship between rare species richness and Natural Protected Areas (NPA's) in the peninsula. Their results suggest that the current NPAs may preserve the richness of species of low and medium levels of rarity, but not that of the rarest woody species. They urge the establishment of a protected area in the Yucatan peninsula to harbor the rarest species, which are particularly vulnerable to extinction.

The wax palm (*Ceroxylon echinulatum*) is an arborescent, dioecious and slow-growing palm distributed on Andean slopes at 1000-2000 m elevation in Ecuador and northern Peru. **Duarte and Montufar** report that the leaves of wax palm have been traditionally harvested and used for the making of handicrafts during Easter celebrations. The authors investigated if the removal of unexpanded leaves may be the main source of threat to the survival of the species. A two year-long study revealed that leaf growth rate and the number of new leaves produced per individual are not adversely affected by this practice, suggesting that biennial harvesting of one young leaf per individual could be sustainable.

Alves et al investigate the socio-economic role of traditional hunting practices in the northeastern semi-arid region of Brazil. They examined hunting practices in two cities from the semi-arid region, Paraíba state (Brazil). The authors interviewed 37 hunters or users of wild animal products who reported the use of 81 vertebrate species (mostly birds and mammals) in the following use categories: food (42 species); pets (31 species); medicinal (15 species); craft (5 species) and religious purposes (3 species). Twenty-one species were slaughtered because hunters considered them to be dangerous or harmful. The authors point out that hunting and use of wild fauna are ordinary activities in the region and that conservation plans must consider the social and cultural context of the people involved in these activities.

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