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Editorial

Technical and social issues in tropical conservation

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The current issue of TCS includes eight research articles and two short communications. These papers address technical, ecological and social issues in a broad array of conservation topics: past and current trends in land-use patterns in a biologically rich area in northeastern Madagascar; the need to assess sampling biases in tropical logging impact studies; the impact of invasive plants on the reproductive output of native species in the island of Mauritius; reintroduction in Central India of the Gaur, a locally extinct member of the Bovid family; white-tailed deer densities and human factors in tropical dry forests in central Mexico; distribution of lions in northwest Mozanbique; wildlife as insurance against rainfall fluctuations in southeastern Zimbabwe; overexploitation and heavy metal concentrations in two migratory sharks in the southeastern Pacific; the ecology and behavior of the Peruvian night monkey; and superovulation and *in vivo* recovery of embryos in the Aoudad, a species of caprid (goat-antelope) native to rocky mountains in North Africa.

Below are brief accounts of each paper in the current issue.

Thomas F. Allnutt and coauthors mapped recent deforestation and forest disturbance in Masoala National Park, Madagascar, one of the most biodiverse protected forest sites in the country. The authors found the rate of forest change in 2010-2011 within the study area (1.27%) to be higher than annual deforestation rate for all of Madagascar, highlighting an important and persistent problem within Madagascar's largest national park.

Juliana Laufer, Fernanda Michalski and Carlos A. Peres note that selective logging is considered one of the least detrimental modes of anthropogenic disturbance to animal and plant communities, but that there is little agreement about its ecological impacts. The authors evaluated methodological differences in 75 logging impact studies published in the last 26 years and found inconsistencies in sampling methods and in the quality of results reported. They emphasize that information on forest management type, intensity of timber extraction, and detailed description and size of the study area are essential for accurate interpretation of results. The authors provide general guidelines to enhance the usefulness of future logging studies for wildlife conservation in tropical forest regions.

Fabiola Monty and coauthors stress that while the impacts of invasive animals, such as predators, are often rapid and unambiguous, those of invasive alien plants are more debatable due to the difficulty of isolating these impacts from other threats (e.g. harvesting or the fragmentation of

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habitats). They point out that several studies reveal contrasting responses of native species to the presence of invasive plants, and call for a clearer understanding of alien plants' impacts. On Mauritius, an oceanic island in the south-western Indian Ocean, the authors compared the reproductive output of selected native tree species of different sizes in weeded and non-weeded areas. Native species in the weeded area had greater flower bud, flower and fruit production than in a non-weeded management regime. The authors show that invasive plants have direct negative impacts on native species, and that the control of invasive plants can also benefit pollinators and frugivores, for which flowers and fruits constitute vital resources.

Reintroduction is a strategy recommended by the IUCN for recovery of species in areas where they have become locally extinct. **Sankar** and coauthors reintroduced a small population of a mega-herbivore, the Gaur (*Bos gaurus gaurus*), an endangered Bovid species, in Bandhavgarh Tiger Reserve (BTR), Central India. Nineteen gaur (14 females and 5 males) were captured from Kanha Tiger Reserve and translocated to BTR. Of these, 12 animals were fitted with radio collars and monitored for a year (January 2011-January 2012). The authors report a successful adaptation of the reintroduced Gaur, which avoided open mixed forests and agricultural land. Their consolidated range was estimated at 160 km^2

Ramos-Robles and coauthors assessed the relationship between habitat and human factors associated with white-tailed deer density in a tropical dry forest region in Central Mexico. Using line transects, they found that deer density ranged from 0.1 to 2.9 deer/km^2 and that the variables associated with deer density were vegetation basal area, distance to roads, distance to the area with largest human population, slope, aspect and presence of cattle. They conclude that estimated white-tailed deer densities in their study site were lower than in other tropical dry forests.

Jacobson et al., assess the distribution and abundance of lions in northwest Tete Province, Mozambique. They argue that the persistence of wide-ranging carnivores, including the African lion (*Panthera leo*), remains uncertain and that lion populations are declining throughout Africa, most rapidly in locations outside protected areas. Because lions outside protected areas are also the least known and subject to the gravest threats from humans, monitoring of these lion populations is critical. Mozambique contains nearly 10% of Africa's lions, and roughly half of these reside outside protected areas. The authors determined lion distribution from over 60 interviews with local people about wildlife presence. They estimate the presence of about 185 lions in a range covering roughly two thirds of the study area, likely crossing the border with ZambiaThe study concludes that the population may be rebounding from earlier persecution, although it is under threat from habitat loss, poaching, and trophy hunting.

Poshiwa et al., studied the use of wildlife as insurance against rainfall fluctuations in a semi-arid savanna setting in southeastern Zimbabwe. The authors examined the extent to which wildlife income helps to reduce household income fluctuations caused by variations in annual rainfall. After suffering eight years of consecutive droughts, local people´s income turns into negative values, a situation only improved by addition of wildlife plots. The authors point out that wildlife income provides insurance against rainfall fluctuations to local people who do not practice irrigated agriculture. The authors argue that rainfall variability justifies sustainable wildlife management as a buffer for rural people affected by sharp and long-term fluctuations in rainfall.

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Lopez et al., report heavy metal concentrations in two highly-migratory sharks (*Prionace glauca* and *Isurus oxyrinchus*) in the southeastern Pacific waters and comment on public health and conservation. The authors found high levels of lead and low levels of mercury in the meat of 39 blue sharks and 69 mako short fin sharks . They stress that the presence of both metals in the sharks has a toxic synergistic effect that represents a risk for human health. They also conclude that human pollution of shark habitats coupled with overfishing puts populations of these top predators at risk

Shanee et al., report preliminary observations on the behavior and ecology of the Peruvian night monkey (*Aotus miconax*) in a remnant cloud-forest patch in northeastern Peru. Night monkeys, the only nocturnal monkey species in the Americas, are small animals, with adults weighing only about 1 kg. They live in small family groups of up to seven individuals and are one of the least known and rarest of all primates, never studied in the wild until now. The study concludes that the monkeys are able to survive in fragmented areas, giving hope for their conservation in an area with one of the highest deforestation rates in Peru.

Lopez Saucedo et al., studied aspects of the reproductive biology of the Aoudad (*Ammotragus lervia*), a wild ruminant considered the ancestor of domestic sheep and goats. It lives in the North of Africa, but has been introduced for hunting purposes in U.S.A., México and Spain. Its conservation status is declared as vulnerable and little is known about the welfare or reproduction of the natural populations in Africa. The authors synchronized the reproductive cycle of three captive Aoudad females and developed a successful technique to freeze the resulting embryos at Leon's Zoological Park in Mexico. They note that this is the first successful attempt to freeze Aoudad embryos and stress that this type of assisted reproduction technique can maintain healthy African aoudads in captivity with the goal of future re-introduction in their natural habitat.

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