

## Letter to the editor

### Número especial de ungulados tropicales

## Tropical ungulates special number

Ungulate is a non-taxonomic name for mammals with hooves that are classified in two orders, the Cetartiodactyla (even-toed) and Perissodactyla (odd-toed). Ungulates account for the vast majority of largest herbivores on earth and play essential roles in structuring ecosystems. In tropical forest, ungulates have the highest biomass, overall energy requirements, and rates of specific interaction for any terrestrial wildlife. Ungulates are seed predators, but also disperse seeds large distances, both roles affecting the spatial composition of plant communities in tropical forest. Bovids, deer, tapir, peccaries and pigs are the heaviest animals on the forests, therefore modify the soil when wallowing in mud areas or when searching for food under the floor. Ungulates are also the largest prey for the large carnivores. These roles have led to their characterization as ecosystem engineers, ecological keystones and landscape species and the loss of them affect ecosystems greatly. Further, they provide vital protein to subsistence hunters and their families across the tropics. For example, it is estimated that in the Congo basin bushmeat harvest are 1.2 million metric tons or 645 kg per km<sup>2</sup> per year with ungulates and rodents as the main prey. In Neotropical forest ungulates are always among the top ten prey species for subsistence hunters from Mexico to Argentina and there are human communities where most of meat are provided from peccaries or deer. Some ungulate species also provide cash income worth millions of US dollars annually through meat sales in-country and hide sales internationally, for example Peru is exporting more than 20,000 hides of collared peccary annually. Sport hunting on these species is also widespread. Ungulates also perform some of the most amazing behavior and movement patterns. The wildebeest and zebras large migrations in African savannas, the reindeer movements in the arctic circle, and the white-lipped peccary (Neotropical forest) and bearded pig (Borneo) movements under close canopy tropical forest are unparalleled events in the animal realm.

In this special number we have focused in Neotropical ungulates as the topic of nine articles covering eight species. From the largest of the Neotropical fauna, the Baird's tapir (*Tapirus bairdii*) to one of the smallest deer (*Mazama temama*) this issue bring together some of the latest research that have been done in these species from Mexico to Colombia. Here you will find information on ungulates communities and habitat preferences from two parks of the Colombian Guiana (Gómez *et al.* 2016; this issue); from 13 protected areas of Panama where the fragmentation and hunting pressure is affecting the ungulates communities (Meyer *et al.* 2016; this issue). This issue also contains two interesting articles about the Baird's tapir, an overview of its current distribution and rate of decrease in Guatemala (García *et al.* 2016; this issue) and a close up on the relationship of this species with ephemeral water sources in Calakmul, Mexico (Sandoval-Seres *et al.* 2016; this issue). The white-lipped peccary (*Tayassu pecari*) was also the subject of research in Guatemala where its relative abundance and the group size were examined in relationship with the water availability and in Belize where the follow up of a herd shows the challenges and opportunities of using satellite radiocollars to study this

specie under tropical forest. The Central America Red Brocket deer received the highest attention with three articles examining the relationship of this secretive and rare species with its habitat in the lowlands and flooded areas of Campeche state (Contreras-Moreno *et al.* 2016; this issue), in the Clouded forest of Hidalgo (Muñoz and Gallina 2016; this issue) and in a Mountain chain in Puebla, Veracruz and Oaxaca states (Pérez-Solano *et al.* 2016; this issue).

A general issue that readers will notice from this special issue of *THERYA* is that ungulates in Neotropical forest are suffering great pressure for their survival and factors such as hunting and habitat fragmentation are posing serious risk to their conservation. Some species, such as the white-lipped peccary and the tapir are more sensible to human impact while others, as the collared peccary (*Pecari tajacu*) or the white-tailed deer (*Odocoileus virginianus*) can tolerate some degree of forest perturbation. Red brocket deer, white-lipped peccary and tapir were documented as habitat specialist and require pristine non-fragmented habitat for their conservation. Conserving ungulates will require preserving primary habitat by preventing forest loss and fragmentation, and developing management plans that control subsistence and sport hunting. Another important topic this issue brings is how the use of technological devices in the study of tropical wildlife (radiotelemetry and camera traps techniques, and their analytical models) poses great potential for studying elusive species that moves in large areas within dense forest; the white-lipped peccary studies in this issue are excellent examples of the challenges when studying a large ranging ungulate species.

Despite the high importance of the ungulates in tropical ecosystems in general few scientific attention have received and much less funding that other taxonomic groups such as carnivores or great apes for example. The biodiversity of tropical forest will not be the same if we loss the ecological roles that native ungulates are playing in tropical forest. Floristic composition, predator species population, and even forest floor topography and drainage will change if ungulates are lost to ecosystems.

We invite you to read with attention this special issue and we hope that it will raise your interest to learn more about these amazing mammal species and hopefully we all can work together for their conservation.

**Rafael Reyna**

El Colegio de la Frontera Sur, Unidad Campeche. Av. Rancho, Polígono 2<sup>a</sup> Lerma 24500, Ciudad de Campeche, Campeche, México. E-mail: rreyna@ecosur.mx (RRH).