Editorial

A first year of Tropical Conservation Science

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With the release of the fourth issue, *Tropical Conservation Science* reaches the first anniversary of its launching. During this first year the four issues published 25 papers plus four editorials, totaling 459 pages. It's important to note that in 84% of the papers published in 2008, the main author was native to the tropics. Twenty-three of the papers published in the four issues of 2008 were written in English. Of the other two, one was in French and one in Spanish.

As of November 2008, the editors of TCS had received 51 submissions. All papers submitted to TCS were subjected to a peer-review process and scored into three categories: accept with minor revision, accept with major revision, and reject. Papers were reviewed by renowned scientists in their areas of expertise. So far 86 scientists (see Appendix 1) have kindly assisted TCS in the peer review and we are grateful for their participation in this process.

We are particularly grateful to **Mr. William Bridges,** Director (Ret.), Pulliam School of Journalism at Franklin College, for copyediting each of the manuscripts written in English and accepted for publication in TCS.

Complementary to the publication of their papers, the authors also kindly prepared popular summaries of their work. These summaries were translated into Spanish, Portuguese, French, and Chinese, if the paper was published in English. Summaries of each paper in each of the five languages were published on the TCS website and used also for press releases and for dissemination through various channels to the global scientific community and to the public at large. Translation of these summaries into Portuguese, French, and Chinese was accomplished with the assistance of graduate students from Brazil, Belgium, and China, who kindly donated their time and effort to this task. Their names are Marina Lapenta, Celine Hauglustaine, Xu Fangfang, and Zhao Jin.

We expect to publish the first issue of Volume 2 of TCS in March 2009. Other complementary projects under development are a special issue on conservation of Mexican ungulates and one on conservation of South American primates. A third proposal, for a special issue on Neotropical tapirs, is under consideration.

During its first year of existence, *Tropical Conservation Science* has been registered in several indexing databases. Its inclusion has been accepted in CAB Abstracts and in the Directory of Open Access Journals (DOAJ). *Tropical Conservation Science* has also been affiliated with EBSCO Publishing databases, (*http://www.ebscohost.com*). EBSCOhost databases are the most used, premium online information resource for tens of thousands of institutions worldwide, representing millions of end users. Currently, TCS is under evaluation in Thomson Scientific (ISI Web of knowledge, Science Citation Index, Web of Science) and in Scopus.

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The fourth issue of *Tropical Conservation Science* (TCS) contains seven papers. Three of these encompass topics such as the intriguing relationship between rural depopulation as a result of urban growth in tropical regions and possible forest recovery in rural areas, the distribution and conservation of a marine mammal population in a wetland system in southeast Mexico, and conservation approaches based on co-management in the Serengeti, East Africa. Four other papers are part of a special section on conservation of Neotropical reptiles and amphibians, written by Latin American herpetologists. These papers evaluate research trends and challenges in conservation of Neotropical herpetofauna, report on the current state of conservation of threatened amphibians of Peru, document patterns of reptile diversity in tropical dry forests in Colombia, and discuss the effectiveness of natural protected areas for the conservation of endangered hylid (tree-frogs) in the Neotropics.

The following paragraphs provide a general overview of each paper in the fourth issue of TCS.

In 2008, the world reaches an invisible but momentous milestone: for the first time in history, more than half its human population, 3.3 billion people, will be living in urban areas. By 2030, this is expected to swell to almost 5 billion [1]. In the continental Neotropics, between 70-80% of the population is already found living in urban areas; in Africa and Asia about 60% of the population lives in rural areas, but urbanization is taking place at a very rapid pace. Asia and Africa, the most rural continents today, are set to double their urban populations to some 3.4 billion by 2030 [2]. Africa already has about 350 million city dwellers—more than the population of Canada and the United States combined [2]. In the case of Europe, Canada, and the USA, about 70-80% of the population lives in urban areas. Over the past 50 years, there have been relatively modest increases in the proportion of the population living in urban areas in Europe (from 52% to 73%) and North America (64% to 77%). But both the absolute numbers and the percentages have increased dramatically in the developing regions of Africa (from 15% to 37%), Asia (17% to 38%), and Latin America and the Caribbean (42% to 75%) [1]. In their paper, **Jacob et al.,** explore the issue of rural depopulation, urbanization, and recovery of tropical forest vegetation. Jacob et al. argue that in several places in the world rural depopulation has resulted in large areas of land being abandoned and that these areas may be important for managers and policy makers who want to conserve biodiversity and ecosystems, while balancing the demands of human development. The authors also point out that this process may lead to ecological homogenization resulting in declines in biodiversity at the local scale.

Human pressures leading to increasing biological impoverishment, habitat fragmentation, and modification of ecological processes affect the persistence of tropical wetland ecosystems. The increasing regional, local, and global spread of hazardous wastes and toxic substances, together with global climate change, ozone depletion, and an increasing human ‘‘ecological footprint,’’ puts wetlands ecosystems and many little-known plant and animal species at further risk. The manatee is a case in point. It is a marine mammal with a restricted geographic distribution in biodiversity-rich tropical coastal wetlands in the Neotropics and in Western Africa. The manatee is listed as endangered on the IUCN Red List. Habitat loss and fragmentation, hunting, collisions with boats, and water pollution, together with coastal development for tourism and/or industrial development, accidental fishing-related mortality, and general human disturbance of wetlands, are listed as major causes of manatee population decline (http://www.iucnredlist.org/details/22103). The Antillean Manatee (*Trichechus manatus manatus*) inhabits riverine and coastal systems in the tropical and subtropical Western Atlantic Coastal Zone from the Bahamas to Brazil, including the Caribbean Sea and Gulf of Mexico. The current population of the West Indian manatee is estimated at less than 2,500 mature individuals and is predicted to undergo a decline of more than 20% over the next two generations without effective conservation actions (*http://www.iucnredlist.org/details/22103*). Although there are long-term studies of the manatee subspecies (*Trichechus manatus latirostris*) occurring in Florida (USA), little is known about the Antillean manatee to the south, specifically in the area of the Gulf of Mexico. This hampers conservation approaches of this marine mammal, as human activity extensively transforms the coastal wetlands. In their paper, **Rodas et al.,** provide information on the distribution of the manatee population in the wetlands of Catazaja in southeast Mexico and on conservation initiatives involving the participation of local human communities. The authors report the presence of manatees throughout the wetland system (60,000 ha), but with higher incidence in some sectors. Rodas et al. also report that results of conservation efforts over several years have been successful to the point that the manatee has become the animal emblem among the human communities in the wetland, celebrated during a yearly manatee festival. Local inhabitants also actively participate in the monitoring and protection of the manatee population.

Conservation of tropical ecosystems is a complex task requiring not only the need for basic information on the distribution, ecology, and state of conservation of its components, but also a delicate articulation of social interests at local, regional, and national levels. In many cases conservation priority, and therefore resources to be invested, vary from locality to locality and from region to region in each country. To achieve a reasonable use of limited resources within the needs of a conservation framework requires various types of approaches, some of which may or may not be viable depending on the historical, geographical, political, and economic contexts of each locality. Equally important are the social and economic costs of conservation to local communities, which in many cases perceive conservation as a liability and as a burden due to competition for land and other resources, property damage, and risk to life [3]. The Serengeti (Tanzania, East Africa)—one of the flagship conservation areas of the world—is a case in point and the focus of the paper by **Kideghesho and Mtoni**. The authors point out that conservation in the Serengeti needs to be approached as co-management involving the sharing of power, responsibilities, and rights and duties between the government and local resource users. They argue for intensive community involvement and reactivation of local traditional institutions in co-management approaches. The authors feel that raising awareness, educating about the legal aspects of conservation, and giving local communities autonomy over conservation decisions will yield positive attitudes among the people toward conservation. They also suggest that this should be paralleled by government bureaucracies becoming more sensitive to community approaches to conservation and good governance.

The Neotropics harbor between 30-50% of the world's reptiles and amphibians—more than 3,000 species for each group. Dramatic declines in reptile and amphibian populations, including population crashes and mass localized extinction, have been noted in the past two decades from locations all over the world, and amphibian declines are perceived as one of the most critical threats to global biodiversity. A number of causes are believed to be involved, including habitat destruction and modification, over-exploitation, pollution, introduced species, climate change, destruction of the ozone layer (ultraviolet radiation has been shown to be especially damaging to the skin, eyes, and eggs of amphibians), and diseases like chytridiomycosis. However, many of the causes of reptile and amphibian declines are still poorly understood, and are a topic of ongoing discussion. This situation is paralleled by a lack of information of the natural history, ecology, and behavior of many species, making conservation approaches difficult. In his paper, **Urbina-Cardona** points out key research trends and challenges in the conservation of Neotropical reptiles and amphibians. For example, while scientific publications on various aspects of reptile and amphibian biology and ecology have increased in recent years, not enough information is being accumulated on all species of interest. The author further indicates that there are still issues of taxonomy that need to be resolved to elevate the precision of conservation assessments, and that more data are necessary on variation of biological and ecological parameters along various spatial and time scales. Similarly, Urbina-Cardona stresses that more information is needed on more taxonomic groups, that the efficiency of natural protected areas in preserving populations and species of reptiles and amphibians merits evaluation, and that current and future conservation challenges need to involve local people.

Peru is a mega-diverse country with approximately 500 amphibian species known to date. Field work conducted during the past decade has increased the amount of knowledge on threatened amphibian species in Peru. Such efforts are crucial in view of current population declines worldwide. In their paper, **von May et al.,** document the current state of conservation knowledge on threatened amphibian species in Peru. Their results indicate that more than two-thirds of the evaluated threatened amphibian species (N=83) are endemic to Peru, that threatened amphibians occupy 11 Neotropical ecoregions in Peru, and that most endemic amphibians in Peru occupy only one ecoregion. The authors also point out that almost 40% of threatened amphibians evaluated occur outside of nature preserves, leading the authors to emphasize that habitat conservation in Peru is crucial to protect amphibian species facing human-induced threats. The authors also indicate the importance of setting up locally protected areas, such as municipal reserves or conservation concessions, which could be especially appropriate for conserving endemic species. Their argument is that an extensive network of municipal and private reserves over a broad geographic region can protect a large number of species. They suggest that in this approach, involvement of human communities in amphibian and ecosystem conservation is essential. In sum, the paper by von May et al., is indicative of the value of carrying out regular assessments of risk for the species interests, regularly updating conservation strategies and policies.

An important task in tropical conservation is to understand which species are particularly vulnerable to extinction, and identify the characteristics that put them at risk [4]. Because habitat loss and fragmentation are at the root of the global extinction crisis [5], an extensive collection of literature has developed around profiling species assemblages in fragmented landscapes. It is also clear that species may respond differently to fragmentation, but many species experience direct or indirect negative effects, sometimes resulting in local extirpation in habitat patches. Tropical dry forests are biodiversity rich, have a more restricted geographic distribution than tropical wet forests, and have

undergone, as a result of human activity, a severe process of transformation to human modified landscapes. In the Neotropics, this change has resulted in vast losses of tropical dry forest areas, and in many cases remaining forests are found heavily fragmented. These highly seasonal tropical forests harbor rich assemblages of reptiles, but less is known about them than is the case for tropical wet forests. The paper by **Carvajal-Cogollo and Urbina-Cardona** provides new information on the reptile species assemblages found in forest fragments in the Colombian Caribbean region. They recorded the highest reptile richness in larger forest fragments, but species-area relationship was not apparent, and they also point out that the greatest amount of species exchange was between larger and smaller forest fragments, suggesting that both large and small fragments are important for the persistence of reptile species in the fragmented landscape.

Amphibians are an abundant and diverse component of terrestrial and aquatic food webs in the tropics, and they are thus likely to be important at the ecosystem level. They play important roles in species interaction networks by feeding upon plants and algae and consuming periphyton and detritus [6]. Both adult and larval amphibians can be found in many aquatic habitats including streams, ponds, and wetlands; canopy epiphytes that hold water; and tree holes. They are often the most abundant vertebrates in these systems [6], preying upon small animals and serving as food for larger predators. The Neotropics harbor *ca.* 3,046 amphibian species and their decline from a variety of factors is one of the most critical threats to global biodiversity. In the midst of large-scale population declines and species extinctions, the need for accurate data on amphibian geographic distribution at different geographic scales becomes apparent. In their paper, **Urbina-Cardona and Loyola** consider this problem and use niche-based modeling to generate distribution maps for 16 Neotropical threatened hylids (tree frogs) based on topographic and climatic variables. They further estimate the effectiveness of the network of protected areas in representing these threatened species along the continental Neotropics. One key finding of their investigation is that nine of the 16 species examined have small geographic ranges with only 25% of their potential distribution presently under protection in the Neotropics. Urbina-Cardona and Loyola conclude that niche-based distribution modeling is an innovative analytical approach to evaluate the effectiveness of protected areas, especially in regions lacking comprehensive databases of species distribution.

In summary, the papers in this issue touch on several topics of relevance for biodiversity conservation in the tropics. They report on trends in rural depopulation and urbanization and recovery of vegetation, on marine mammal distribution in a wetland system, on the importance of co-management strategies to generate positive attitudes in local people for conservation of natural protected areas in Africa, and on reptile and amphibian diversity and conservation issues in the Neotropics. As a group, papers in this issue not only provide important insights into human impacts on terrestrial and aquatic ecosystems, but the varied information they report stresses the complexity and magnitude of conservation tasks and the relevance of considering social contexts and local people for effective conservation science.

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Appendix 1. *Tropical Conservation Science* is grateful to the scientists who participated in the peer review process during 2008. Their names are listed below in recognition of their contribution.

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Claude Gascon
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François Feer
Georgina Santos
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Jafari R Kideghesho
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Pierre-Michel Forget
Rafael Loyola
Rene Calderon Mandujano
Rhett Butler
Salvador Mandujano
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Sarva Managala Praveena
Sean Sloan
Sonii David
Stuart Bunting
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Thiago Andre
Tien Ming Lee
Tom Blomley
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