Amphibians in a Changing World: A Global Look at Their Conservation Status

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Currently, more than 40% of extant amphibian species are threatened with extinction and a quarter of them still lack information to be classified as threatened, being therefore enlisted as Data Deficient by the International Union for the Conservation of Nature (IUCN) (*1,2*). Furthermore, amphibians are the greatest underrepresented group in the global network of protected areas (PAs) worldwide.

A decade ago, some studies showed that around 17% of amphibian species lived completely outside of protected areas (*3*). Obviously, the underrepresentation of amphibians in protected areas is much higher for range-restricted species that inhabit highly human-modified landscapes. Even in face of this worrying scenario, since 2004 not a single update has been published showing amphibian species represented inside PAs at the global scale. Actually, there is a large gap of information, especially if we consider that today data on the distribution of many amphibian species are available, and the areas covered by PAs has increased over the last ten years from 11% to more than 13% worldwide (*4*).

We have recently filled this gap by publishing a new and comprehensive overview on the ability of the global network of PAs to protect amphibian species (*5*). We also offered new information about the overlap of species' distributions with different types of human land-use around the globe. In this study, we considered different amphibian taxa and geographic regions, making a particular distinction between gap species (*i.e.*, those completely outside PAs) and range-restricted species (*i.e.*, those with geographic distributions smaller than 10,000 km2) (*5*).

Our analyses revealed that almost 25% of all amphibians, which is more than 1,500 species, still remain totally outside protected areas. Moreover, 1,119 species have less than 5% of their geographic distribution represented in protected areas. Although we have more protection (about 10% more area designated as protected and 13,000 additional reserves), the proportion of amphibian species falling outside these protected areas has also increased. In reality, only a few designated reserves perform by avoid species loss or reducing species' extinction risk.

While this situation seems to be paradoxical, it was actually expected due to how protected areas are selected. Within governments and all administrative levels authorities tend to establish residual reserves, that is, reserves located in places where human interests are minimal. These places play a minor role in protecting biodiversity, given that threated species are precisely where human impacts are higher.

This is why continents harboring a large proportion of gap species (such as Latin America, Asia and Africa) are being highly im-

pacted by human activities. On average, 65% of every gap-species' distribution is now inside human-modified landscapes. Africa has the largest proportion of species affected by human impacts with only 16% of gap species' free from human influences. In several key
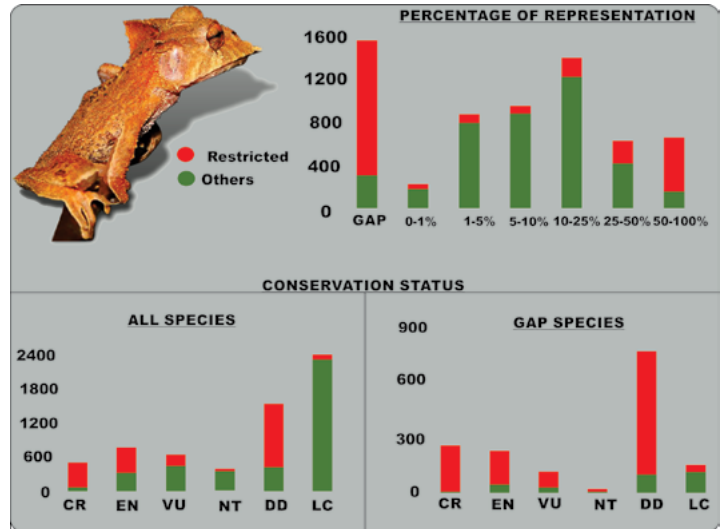

Fig. 1: Histograms showing the percentage of the distribution of the species included in PAs for each species and the number of species assigned to each IUCN status when considering all species and only the gap species. All histograms discriminate range-restricted species. Amphibian species: *Hemiphractus bubalus*.
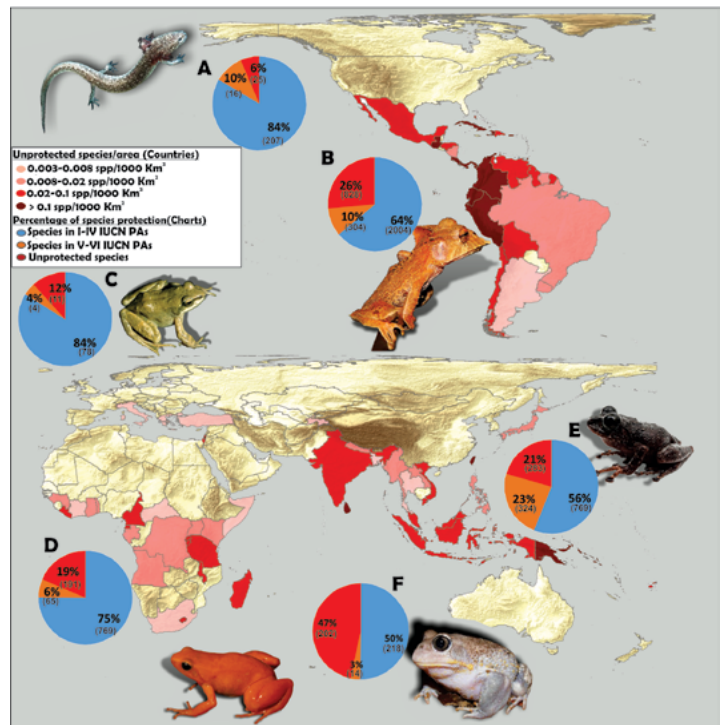

Fig. 2: Map showing the number of unprotected species per unit area in the world's countries and pie charts with the percentage of species occurring in different protected area management categories. This figure is illustrated with an amphibian species from each continent: *Eurycea latitance* (North America), *Hemiphractus bubalus* (Latin America), *Rana pyrenaica* (Europe), *Mantella aurantiaca* (Africa), *Helioporus australiacus* (Oceania) and *Philautus umbra* (Asia).

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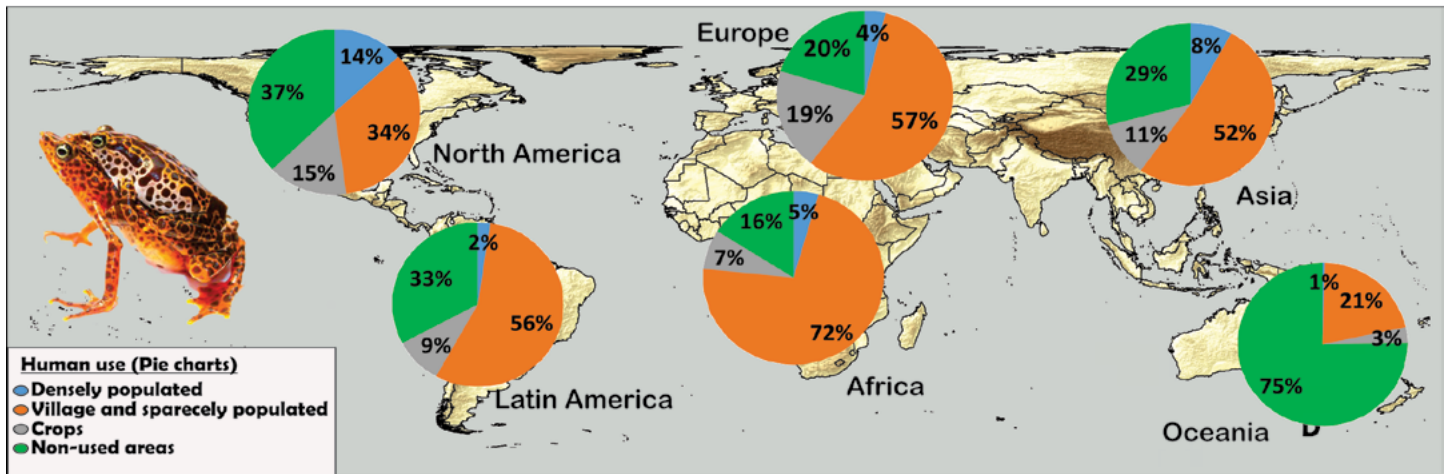
Fig. 3: Percentage of spatial overlap between species' geographic distribution and different types of human land use in the world's continents. Amphibian species: *Atelopus certus.*

regions (such as part of tropical Andes, Southeast Asia and central Africa), the combined effect of low levels of protection and a steady human influence will inevitably aggravate the current crisis scenario for amphibians by further declines and extinctions. Tenacity must be shown by the public and the scientific community to urgently implement conservation policies, including governmental and social initiatives aimed at strategically expanding the current network of Protected Areas for greater conservation purposes.

More than area protection, we need reserves that make a difference for conservation. That is, new protected areas should be established where they would produce the largest impact on amphibian conservation. By impact, we mean an explicit evaluation (or simulation) of what would have happened if there had been no conservation intervention or establishment of protected areas (*6*). Only with such evaluation we will be able to estimate the real impact new reserves would have on amphibian conservation. In addition, growing the size of the global network of protected areas will not be enough, as we observed.

Furthermore, it is important to note that 45% of gap species are currently classified as Data Deficient by the IUCN. Many of these species inhabit highly disturbed environments. Data Deficient species are usually ignored or considered as species of least concern in conservation policies, plans and recommendations (*2*). Hence, it is essential to increase our knowledge on many biological aspects of these species, such as taxonomy, systematics, demography, ecology, natural history and threats, in order to generate adequate conservation policies.

This brief overview highlights important issues, which can potentially increase the current crisis faced by amphibians, but points out several challenges and opportunities towards creating more comprehensive amphibian conservation strategies in the next decade. It is essential to consider amphibians when developing conservation policies that lead to the implementation and management of new protected areas. It is critical to increase funding for scientific research to expand our knowledge of amphibian species, especially on those tropical key topics mentioned above.

Finally, we need to start planning for positive impacts of conservation intervention, carefully measured and monitored, so we can foster the establishment of protected areas that will make a real difference in avoiding amphibian species loss and reducing their extinction risk. With that in mind, and the new and improved protected areas strategies established, we are hopeful that amphibian conservation will reach a vastly improved level of animal species conservation and protection worldwide.

References:

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