

sequencing and bioinformatics facilities globally. We hope this letter serves as a call to the directors of those facilities to recognise the losses of amphibians as one of the most important biological phenomena known to the field of biodiversity and conservation science, and to acknowledge the role their facilities could play in mitigating these contemporary declines. We all know that in evolution there are winners and losers; the challenges that amphibians face are overwhelmingly caused by humans, and investing in amphibian genomics now is a moral imperative by helping to ensure that we do not turn such ancient and successful taxa into today's losers.

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#### Letters

## Active scepticism must drive biodiversity conservation science

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Conservation biology is a mission-driven discipline, a position unique among the life sciences. Conservation academics have the responsibility to convey unbiased, objective science not only to students and peers [1,2], but also to society so that their views and recommendations eventually affect the real world outside the ivory tower. In a recent article in *TREE*, Garnett and Lindenmayer called for a positive attitude when reporting conservation issues, claiming that an actively promoted culture of hope will be decisive for future capacity building [1]. According to the authors, given the human propensity to discard bad news, communicating only the depressing severity of the biodiversity crisis would be counterproductive because it is paralyzing. Although we agree that communication strategies must accommodate human psychology to succeed [2], we believe that neglecting or euphemizing the dramatic impact that humans have on the biosphere, just through fear of the Cassandra syndrome\* when addressing an inconvenient truth, is not an acceptable alternative discourse.

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\* In Greek mythology, Cassandra obtained from Apollo the ability to predict the future. As she refused to have sex with him, he decreed that nobody would believe her predictions. Her predictions, made in a kind of delirious trance, accurately described events to come (the fall of Troy, for instance), but nobody ever took her seriously because of her crazy attitude.

The impact of mankind on the biosphere is immense, and expected to increase further. The main concern of most environmentalists is the continuous degradation of air, water and soil quality, which might eventually be fatal to economy. The environmentalist's perspective is anthropocentric and it situates the emergence of current environmental problems with the beginning of industrialization, although some researchers claim that humans started to modify the atmosphere when agriculture began, several thousand years ago [3]. The focus of conservation biologists is not primarily on the persistence of a single species (i.e. humans), but on all forms of extant life on the planet. From the viewpoint of conservation biologists, the problems arose long before the Neolithic revolution, from when *Homo sapiens* started to emerge from the genus *Homo*. In effect, a growing body of scientific evidence indicates that our ancestors decimated megafauna whenever they colonized different parts of the world [4].

Can one positively communicate the sixth mass extinction, given that the recognition of its ultimate cause implies questioning the very nature of human existence and our self-termed qualification as 'sapiens' ('wise' in latin)? Actually, yes, by insisting on the difference between this sixth mass extinction and the five previous ones during

the Phanerozoic: the factor causing the damage is, for the first time ever, aware of its potential detrimental effects and, simultaneously, is the only possible solution to the problem. However, will this suffice? The difficulty faced by climate environmentalists in convincing the public and politicians of the need to adjust our extravagant consumption patterns to diminish the detrimental effects of simple greenhouse gases on economy and society, gives a measure of the task faced by conservation biologists: advocating against the decimation of a myriad of unique life forms whose existence is ignored by most of us.

A scientific appraisal of conservation successes in light of the immense biodiversity challenges can only conclude that, unless a radical paradigm shift is made, there is little hope for the future [5]. Focusing only on successes might seem appealing: it demotivates nobody and gives academics and politicians the illusion that they could contribute to solving the crisis without questioning their business-as-usual approach. However, this attitude means that humans would fail to address the most disturbing societal and political issues, the solutions of which are essential for our own survival.

We believe that a genuine culture of hope cannot be promoted if the basic constraints linked to human demography and the use of natural resources are ignored or underrated [6]. Not communicating appropriately would simply mean failing to recognize our condition as vulnerable biological organisms isolated somewhere in the Universe, and might lead to even more despair for future generations if they lack the perspective to appraise the gravity of a tricky environmental situation when it occurs.

We therefore urge conservation biologists to keep a sceptical attitude (i.e. neither stupidly optimistic nor de-

pressively pessimistic) [2], while remaining resolutely active not only in the promotion of their science and conservation recommendations, but also in the implementation of their views in real action [7]. Systematically communicating such successfully implemented actions for biodiversity [1,2] will convey optimism and generate self-confidence, even pride, in the stakeholders and researchers [7], while increasing public enthusiasm. Although one cannot hide the fact that we risk losing the global war against the ongoing mass extinction, we have won, and will win, another series of major battles [1]. Global realism and local, successful conservation actions widely advertised might well be the crux for a better acceptance of our mission, a genuine culture of hope and a less dark future for biodiversity.

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#### Letters Response

## Avoiding the fate of Troy: response to Arlettaz et al

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**We agree entirely with Arlettaz et al. [1] that we face an environmental crisis of extraordinary proportions. However, their analysis of how to respond perfectly illustrates our point. In particular, we would transpose their statement 'Although we agree that communication strategies must accommodate human psychology to succeed, we believe that neglecting or euphemizing the dramatic impact that humans have on the biosphere, just through fear of the Cassandra syndrome when addressing an inconvenient truth, is not an acceptable alternative discourse.' to 'Although acknowledging the dramatic impact humans exert on the biosphere, there is no acceptable alternative discourse; to adopting communication strategies that accommodate human psychology.'**

Cassandra's central lesson (see footnote in [1]) is that foretellers of doom alone will always be ignored until too late. What we tried to show was that we have enough understanding of human psychology to avoid Apollo's curse. We need to encourage the millions of people around the world who are working assiduously for conservation to keep going against huge odds. If we can hang on a little longer, perhaps the nations of the world will agree to value biodiversity appropriately, and to respond responsibly to climate change.

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