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Taking it as red: an introduction to the Theme Section on the IUCN Red List of Threatened Species

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ABSTRACT: The IUCN Red List of Threatened Species (www.redlist.org) is a comprehensive list of relative extinction risk for species throughout the world, and it is commonly referenced in the scientific literature. Established in 1963, the IUCN Red List and its Criteria have been revised regularly to make them more scientific and objective. Nevertheless, the aim of the IUCN Red List to establish global standards across varied taxa has generated some controversy, particularly in terms of what is the most appropriate scale for both assessing the threat of extinction and setting conservation priorities for particular species. The papers included in this Theme Section of *Endangered Species Research* focus on the IUCN Red List and provide several recommendations for strengthening this conservation tool.

KEY WORDS: Red List · Criteria · Conservation

The International Union for Conservation of Nature (IUCN) Red List of Threatened Species™ (hereafter IUCN Red List) is regarded as the most comprehensive system of ranking the conservation status of plants and animals (de Grammont & Cuarón 2006, Rodrigues et al. 2006, Vié et al. 2008). The IUCN Red List ranks species based on their relative threat of extinction This, in turn, is derived from the objective application of standardized criteria, although the criteria themselves have undergone various changes and refinements (Mace et al. in press). The IUCN Red List is updated annually and is freely available online at www.iucnredlist.org. The 2008 version of the IUCN Red List was unveiled at the World Conservation Congress in Barcelona in October 2008, and included nearly 45 000 species assessments, almost 3 times the number of species included in the 2000 IUCN Red List, and covered many more taxa than just mammals and birds, which were the focus of the first IUCN Red List data books published in 1966 (Scott et al. 1987). Coverage, however, is not universal; the exclusion of microorganisms has been previously highlighted (Weinbauer & Rassoulzadegan 2007).

The growth of the size and coverage of the IUCN Red List has been mirrored by the growth in its recognition and citation as the primary source of the status of various species. Hoffmann et al. (2008) found an exponential increase in citations of the keywords 'Red List' and 'IUCN' in the published literature up to 2004. However, this kind of keyword search likely underestimates the pervasive use of the IUCN Red List in publications, as many papers routinely state the IUCN Red List status of the species being studied. For instance, we found that nearly 40% of all published papers in *Endangered Species Research* to date (45 out of 116) cited the IUCN Red List; these papers dealt with a variety of different taxa. Data from the IUCN Red List are now being integrated within meta-analytical approaches to create IUCN Red List Indices of specific taxa (Butchart et al. 2004, 2005; see also Brummit et al. 2008).

Publications extolling the utility (Rodrigues et al. 2006, Mace et al. in press) or suggesting limitations of

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the IUCN Red List or its criteria are not new (e.g. Mrosovsky 1983, Groombridge & Luxmoore 1989, Matsuda et al. 1997, Webb & Carrillo 2000, Mace et al. in press). Also, there have been earlier fora for discussing the IUCN Red List (e.g. de Iongh et al. 2003). However, the rapid increase in the use of the IUCN Red List and its increasing authority suggest that it would be timely to reflect critically on the nature of the IUCN Red List. Hence, we conceived this special Theme Section of *Endangered Species Research* as a platform to discuss the utility of the IUCN Red List. We invited manuscripts from a variety of researchers who are familiar with the IUCN Red List and its criteria. We also invited a wide cross-section of Chairs of species Specialist Groups of the IUCN Species Survival Commission; as the Specialist Groups are the primary authors of the individual IUCN Red List species assessments, they have a broad experience in working with the IUCN Red List. The end result is a unique collection of papers that discuss the IUCN Red List with respect to a wide range of taxa, including both plants and animals. Also, in line with the evolving nature of the IUCN Red List (Webb 2008), several papers provide concrete suggestions for how the IUCN Red List can move forward in its evolution as a conservation tool.

Albeit with some overlap, the 9 papers in this collection can be roughly divided into 3 different themes. One group includes papers that address issues concerning the IUCN Red List and specific taxa. For example, Webb (2008) and Godfrey & Godley (2008) highlight the difficulties with applying the IUCN Red List criteria to widely dispersed, long-lived species such as sea turtles. Both papers suggest that alternative strategies are needed for classifying these types of animals, including the possibility of invoking 'critically declined' *in lieu* of 'critically endangered.' Freeman (2008) points to similar problems with long-lived and wide-ranging whale species, and reports on how 2 species with vastly different ranges and population sizes nevertheless share the same classification as vulnerable (facing a high threat of extinction in the wild). The difficulties in applying the IUCN Red List criteria to species are not limited to large, marine animals. Indeed, Komonen et al. (2008) discuss the challenges associated with assessing saproxylic beetles in Fennoscandia, including the possibility that the extinction thresholds defined by the IUCN Red List may not be appropriate for some invertebrates.

Another group of papers looks at the IUCN Red List more broadly, although with a focus on tree species. Brummit et al. (2008) and Newton & Oldfield (2008) highlight the massive number of tree species for which few to no data exist on population size, distribution and/or trends. Yet these types of data are needed when applying the IUCN Red List criteria as presented by the IUCN. Brummit et al. (2008) suggest that one way forward is to use an intermediate step in the IUCN Red List assessment process, whereby groups of species are initially sorted into those that are threatened/possibly threatened with extinction, and those that are not. This would help focus research efforts on those species more likely to be facing extinction. Newton & Oldfield (2008) also consider an intermediate step, in addition to a variety of alternative strategies, for increasing the proportion of tree species assessed using the IUCN Red List criteria. However, they find that the lack of basic data related to life history and trends greatly hinders application of the current IUCN Red List criteria. A final alternative is suggested: the use of a Bayesian belief network (see also Seminoff & Shanker 2008).

The remaining papers highlight the future direction of the IUCN Red List. Mrosovsky & Godfrey (2008) focus on the underlying need to affirm objectivity and transparency in the IUCN Red Listing process to ensure the IUCN Red List assessments are scientifically defendable. Hoffmann et al. (2008) describe the utility of the IUCN Red List, in terms of informing conservation planning and actions for species at risk of extinction. The authors also acknowledge that greater work and improvements are needed before the full potential of the IUCN Red List can be realized in its application to conservation. Finally, Rodríguez (2008) argues that the global approach to the IUCN Red List must to be supplemented with a more directed approach to generate Red Lists at a national level. This in effect would make the IUCN Red List not only taxonomic in approach, but geographic as well. This approach has already been taken in some countries (e.g. Gärdenfors et al. 2001, Keller et al. 2005, de Iongh & Bal 2007, Miller et al. 2007).

Altogether, the papers contained within this issue demonstrate that the IUCN Red List is a major force in current conservation, and its influence is likely to increase in the future. The fact that all of the authors provide suggestions or recommendations for improving and strengthening the IUCN Red List, to maximize its utility, attest to the support that the IUCN Red List enjoys within the conservation community. Surely there are many more topics and issues related to the IUCN Red List that have not been addressed by the present collection of papers. We hope that this Theme Section will inspire other authors to address those topics in future issues of *Endangered Species Research*.

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