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The predicament of data-deficient species: To save or not to save

Prerana Mordina

Department of Zoology, Ravenshaw University, Odisha, India

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Introduction

Conservation of species has been paramount in maintaining the health of the world's biodiversity and preserving the environment for future generations [1]. Mandated by the United Nations, the International Union for Conservation of Nature (IUCN)'s Red List of Threatened Species has been the cardinal resource for the global conservation status and the extinction risk of biological species since its inception in 1964. The Red List presents not as a singular catalog of living species at risk but as a repository of information encompassing the geographical distribution, habitat, niche, population size, and range of a species along with the potential threats to its existence owing to poaching, illegal trade, habitat destruction or any other anthropological or natural sequelae. This comprehensive information effectively equips conservationists to formulate conservation actions for each species under threat of extinction [2].

The Categories and Criteria of the IUCN Red List further classify high-risk species into a more explicit and comprehensible system comprising nine categories to assess their risk of global extinction, viz, Not Evaluated, Data Deficient, Least Concern, Near Threatened, Vulnerable, Endangered, Critically Endangered, Extinct in the Wild and Extinct. To date, the global conservation status of 163,040 animal, plant, and fungal species has been assessed for the IUCN Red List, of which 45,300 species are threatened with extinction [2]. Even as the conservation of such species progresses expeditiously, the prospective future does not warrant a complete rehabilitation of global biodiversity health. The sheer number of unknown, undocumented species as well as known, data-deficient species is largely accountable for this impediment. Conservation efforts have been prioritized in only a small proportion of known and assessed species whose risk of extinction has been well documented.

About 21,878 species or 13.42% of all species assessed for the IUCN Red List are data-deficient and prevalent across all taxa including vertebrates, invertebrates, plants, and fungi [2,3]. On average, one of six known and assessed species across all regions and taxa are classified as data deficient [4]. Species with uncertain provenance, population status or distribution, threats, few or outdated records, uncertain taxonomy, and newly discovered species are encompassed within this Red List Category [5]. The limited information available for these species often leads to the misrepresentation of these species as unthreatened. Even so, their conservation has been identified to be of particular significance by several authors who reckon that these data-deficient (DD) species may be more threatened by extinction than data-sufficient (DS) species, but the dearth of information on their population and distribution eludes their case [6]. In point of fact, these DD species could belong to any Red List category, from Least concern to nearly extinct, making conservation efforts challenging for conservationists and practitioners, who more often than not tend to overlook such species in analyzing biodiversity impacts and changes [7].

Most conservation efforts are standardized to maintain consistency; nevertheless, applying these standardized protocols to DD species proves challenging owing to their indefinite vulnerability status. Though precautionary measures can be applied to DD species suspected of declining, the extent and implementation of these measures are unwarranted, especially when the target species are being exploited for food, medicines, or other goods to sustain livelihoods. Lack of data also impedes the enforcement of laws against poaching for the luxury health-product market despite conclusive evidence of surging demands [8]. Besides commercial exploitation, incidental damage to biodiversity, such as bycatch in fishing, is also inflicted by anthropological activities [9]. Nevertheless, DD species are largely ignored in most studies on global trade footprints and their effects on biodiversity as well as approaches that translate potential threat levels to numerical conservation indicators and strategies. Sustainable management is even more scarce as conservationists grapple with limited information regarding species population dispersal, the effect of environmental and anthropogenic factors on their decline, and the extent of decline in species. Poor accessibility to various terrains, perpetual long-term monitoring, and the paucity of suitable experts in the field further advance this predicament.

The unprecedented loss of biodiversity over the last few decades has been further accelerated by the deteriorating global climate and planetary health. The recent recurring episodes of extreme weather events like floods, storms, heatwaves, and changing weather patterns have not only set new records in human casualties and economic losses but in the loss of highly sensitive vulnerable habitats prone to disintegrating at the slightest change in temperature, pressure or other environmental factors. Several DD species and species that have not yet been identified may be lost in such cases of environmental hazard. The threat levels faced by DD amphibian species are expected to be comparable to the global average of threatened species [10].

The Red List indexes species based on well-assessed threat levels for individual species since the extinction risk is the prime criterion considered by international and governmental agencies for dispensing necessary funds toward

***Correspondence:** Prerana Mordina, Department of Zoology, Ravenshaw University, Odisha, India, e-mail: preranamordina1993@gmail.com

conservation efforts. Despite the best interests of everyone involved, preserving biodiversity has not been holistic as conservation actions and strategies engage in the conservation of individual species. The Red List must expand its assessment criteria beyond singular species to determine the true state of endangered natural life in any habitat; the assessment and conservation of any one single species cannot ensure the rehabilitation of the entire ecosystem and the preservation of biodiversity. The IUCN Red List Strategic Plan aims for a more comprehensive "Barometer of Life" to assess the conservation status of a further million species and truly grasp the status of the planet's biodiversity by 2030. Though the ambitious project is well underway, the workforce required to complete such a Sisyphean task is simply implausible and unavailable. Conservationists must thus turn to more data-driven assessments of the DD species as the fundamental ecological principles and population dynamics are similar for all life on earth and the information of more well-studied species may aid in determining the conservation status of those under-examined.

Disclosure statement

No potential conflict of interest was reported by the author.

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