

Toward a more effective funding model for conservation

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The world is on the edge of its sixth mass extinction. To counteract this crisis, we need sufficient knowledge of the current vulnerability status of individual species to understand where priorities for interventions and management lie, as well as to develop more efficient mechanisms to conserve threatened species. However, for most species, we have remarkably little knowledge of even basic aspects of their ecology, which undermines our ability to assess their vulnerability or develop management interventions to conserve them. Although the majority of terrestrial vertebrates have been assessed for their extinction vulnerability through the International Union for Conservation of Nature's (IUCN) Red List (ranging from 83% of amphibian species to 100% of birds), taxa such as plants and invertebrates are largely neglected; for example, less than 1% of described insects, the most speciose group on Earth, have been assessed (Hughes et al. 2021). Bridging this knowledge gap requires targeted research investment, but accessing adequate resources remains challenging for the majority of taxa, and focused measures are needed to counteract this imbalance.

Addressing knowledge gaps of the status of species and the threats they face is of paramount importance. Even for the species that have been assessed, the level of information varies, with neglected taxa often represented by generic information, which may fail to capture their true status and their extinction trends (Hughes et al. 2024). This issue reflects two dimensions of the same problem: First, larger and more charismatic taxa are more visible and receive more research efforts, resulting in more robust assessments (Di Marco et al. 2017, Mammola et al. 2020, Caldwell et al. 2024, Fischer et al. 2025). Conversely, less charismatic species (representing over 90% of both species and threatened species) lack equivalent efforts and are therefore not adequately represented by assessments overall but are overrepresented in outdated assessments (figure 1; Guénard et al. 2025). For example, freshwater gastropods represent 30% of recently documented extinctions; birds, 18%; Magnoliopsida, 12% (Magnolias); and Actinopterygii, 10% (ray-finned fishes), but most smaller taxa are poorly documented (figure 1; IUCN 2025). These biases are a result of an unbalanced provision of research funds, with more than 80% of the funds going to vertebrates (Guénard et al. 2025). This divide extends beyond vertebrate versus invertebrate groups, because even within the best funded groups, such as mammals, 86% of the funding goes to five of the least diverse taxa and accounts for around one-third of threatened mammals (Primates, Carnivora, Cetaceans, elephants, and rhinoceros; Guénard et al. 2025). The allocation of funding also does not reflect extinction

vulnerability, and threatened, smaller-bodied taxa rarely receive research funding. Overall, out of approximately 8400 projects examined in a recent review (Guénard et al. 2025), only 6% of the species listed as Threatened received conservation funding, whereas almost 30% of the funds went to nonthreatened species.

Overall, conservation initiatives remain underfunded (Waldron et al. 2013, Cosma et al. 2023). Therefore, given the limited funding available relative to the ever-increasing number of threatened species, using these funds efficiently is essential if we hope to counter the loss of thousands of species in neglected taxa. To do this requires a reassessment of how funds are apportioned, especially in the case of governments that fund international (nondomestic) initiatives and that play a major role in providing funding for this research globally. The current disproportionate allocation of funds to a subset of taxa not only overlooks the data needed to detect or manage declines in these neglected taxa but also dictates which species can be studied by researchers within developing economies, where national funding or other resources may be limited. Consequently, not only does the current approach reinforce the status quo of funding the most well-funded species, it hinders the development of the capacity needed to research neglected taxa. As a consequence, there is a failure to develop the capacity to broaden the spectrum of adequately assessed species and fill these knowledge gaps. As such, ecosystems and regions that lack charismatic taxa (such as subterranean, deep sea, or steppe systems) will not receive adequate research attention because of a lack of funding. Importantly, because more representative conservation status assessments become available, the number of threatened species continues to increase. In just the past 8 years (2018 to 2025), the number of species listed as Threatened has nearly doubled (from 24,422 to 46,418 Threatened species; IUCN Red List 2025). If conservation funding does not increase and remains mainly directed toward a biased subset of species as it has been for decades (Di Marco et al. 2017, Caldwell et al. 2024, Guénard et al. 2025), then the gap in our ability to monitor and protect threatened species will continue to expand, allowing progressively more species to move, undetected, toward extinction.

The failure to provide funds based on the selection of appropriate standards (i.e., threats, vulnerability, knowledge gaps) results in the research landscape only focusing on a subset of taxa. The repeated funding of research on the same species is inherently inefficient. For example, more than US\$73.5 million has been allocated to elephant research alone (more than has been received by all 12,000 reptile species combined), and this figure does not

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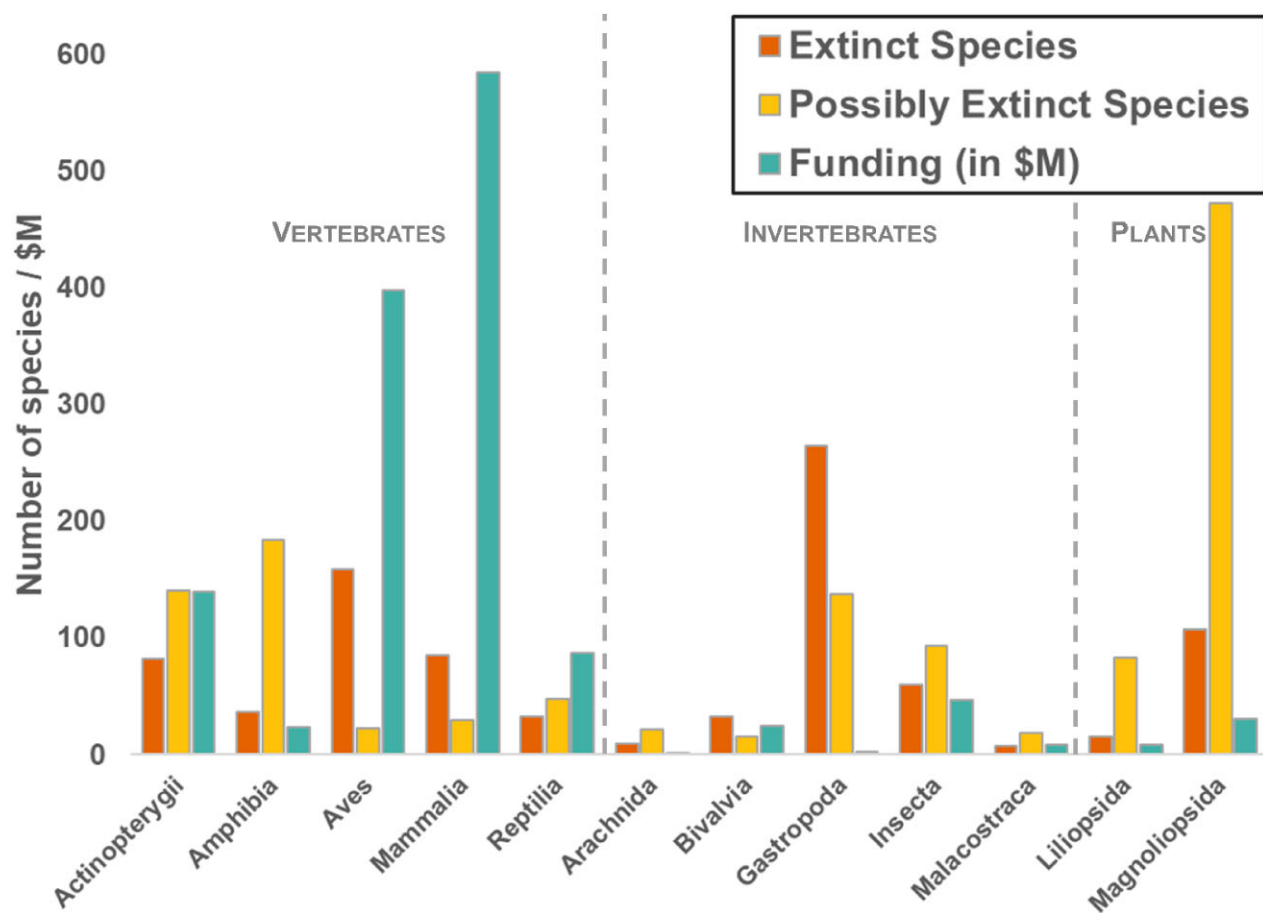


Figure 1. The number of species recorded as extinct or possibly extinct by the IUCN and their respective funding in millions of US dollars. The classes shown are groups with at least five extinctions recorded according to the IUCN. Source: The data are from the IUCN Red List (2025) and from Guénard and colleagues (2025).

include private foundations and specialized nongovernmental organizations. However, elephants have now saturated available habitat in many regions to the point that contraception programs have had to be implemented (Garai et al. 2022, Desink et al. 2023). Continuing to fund research in a species that has already reached capacity cannot be an efficient use of conservation funding, and reducing such inefficiencies in funding allocation would have a greater and more demonstrable impact, enhancing the efficiency and effectiveness of government spending.

To date, there has been limited effort to collate data on funding and, therefore, to align funding needs with funding allocation. Developing a centralized, global funding database for species and ecosystems would greatly enhance our ability to evaluate threats and develop appropriate management plans, as well as allowing more robust assessments as part of the IUCN Red List. Such a database would also facilitate the implementation of the GEF (Global Environment Facility) through its funding to support efforts aligned with the Convention on Biodiversity, including the protection of threatened wildlife, and could even be hosted by the GEF to enable more efficient and targeted provision of funding.

Developing criteria for funding prioritization that accounts for both threat and knowledge gaps would also help ensure we could address the present taxonomic biases. More standardized methods to determine the species most in need of funds and to identify knowledge gaps should be a priority. To achieve this, set criteria for funding should be applied, where species that are supported

by private foundations should be a lower priority for international government funding, unless other benefits, such as at the ecosystem level, can be clearly demonstrated. Assessing global and national lists of priority groups based on data gaps and potential threats would facilitate a more targeted application of funding to species and regions where it can have the greatest impact. For example, 92% of mammal species receive no funding, and so reassigning a large proportion of funding based on assessed threats and known potential actions would redress some of this imbalance and support more species in need. Another issue with the distribution and inefficient use of funding is the myopic focus on small subpopulations within particular countries or regions regardless of the overall geographic range of a taxa. What is needed is a more global view of species distributions, because many commonly funded species have extensive ranges, and therefore, repeated allocations across their range is unlikely to contribute significantly to the conservation of the species. As an example, the Eurasian otter (*Lutra lutra*), a nonthreatened species, which spans three biogeographic realms and over 81 countries, is frequently the focus of grants (Duplaix and Savage 2018), but, simultaneously, many species with limited distributions are being ignored, with potential extinctions undetected because of a lack of funding to study these taxa. Developing a global database that allows the prioritization of species based on key criteria is essential to achieving global conservation targets and, for broadly distributed generalist species, IUCN assessments can facilitate prioritization based on risk and need. Furthermore, because grant panels could

disproportionately represent previously successful grant holders, the risk of unrepresentative expertise, and reiteration of biases may be high; ensuring diverse expertise in panels and reviewers for grants could help counteract this.

Ultimately, although tens of millions of dollars flow toward species-based research for conservation, it is a disturbing reality that the vast majority of threatened taxa are neglected. Counteracting these omnipresent biases in funding is critical if we even hope to reach conservation goals and targets such as those embedded within the Kunming–Montreal Global Biodiversity Framework. Government-funded international programs, in particular, show some of the highest levels of biases toward subsets of taxa such as carnivores and elephants (Guénard et al. 2025). These funding agencies should have the mandate to ensure that funds are allocated where they will have the greatest impact, such as reassessing the thousands of species with outdated assessments (or that are suspected to be extinct) and those for which we have too little data to even make assessments and that may already be extinct. This also includes evaluating who makes these decisions, such as the makeup of grant councils and evaluators to ensure they include diverse expertise, including scientists with experience with a wide range of taxa. The proposed central collation of data across funds would help governments plan their own domestic research funding by complementing external efforts and would therefore fill identified priority gaps. By collating data and targeting these gaps, we have the potential to start to actually build the capacity to reduce knowledge gaps in the longer term and to achieve a more equitable and less biased allocation of funding around the world to conserve the species that most need that protection.

Our key recommendations are to establish a centralized database for all conservation funding with baseline standards of what information needs to be shared; to develop guidelines for funding priorities that account for range size, extinction vulnerability, and knowledge levels; to create national lists of species for which international funding should be targeted (based on the above criteria and endemism); to develop guidance for funding caps for international government funding for the most highly funded species; to prioritize funding for species without or with outdated assessments; and to ensure that evaluation panels have necessary expertise, such as including scientists with diverse taxonomic knowledge, and funding regulations that enable recommendations based on demonstrated need for knowledge.

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Author contributions

AH and BG conceived the work, AH drafted the initial text, BG edited the first draft, All authors contributed to the final draft.

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