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POLICY PERSPECTIVE

A robust goal is needed for species in the Post-2020 Global Biodiversity Framework

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Abstract

In 2010, Parties to the Convention on Biological Diversity (CBD) adopted the Strategic Plan for Biodiversity 2011–2020 to address the loss and degradation of nature. Subsequently, most biodiversity indicators continued to decline. Nevertheless, conservation actions can make a positive difference for biodiversity. The emerging Post-2020 Global Biodiversity Framework has potential to catalyze efforts to "bend the curve" of biodiversity loss. Thus, the inclusion of a goal on species, articulated as Goal B in the Zero Draft of the Post-2020 Framework, is essential. However, as currently formulated, this goal is inadequate for preventing extinctions, and reversing population declines; both of which are required to

achieve the CBD's 2030 Mission. We contend it is unacceptable that Goal B could be met while most threatened species deteriorated in status and many avoidable species extinctions occurred. We examine the limitations of the current wording and propose an articulation with robust scientific basis. A goal for species that strives to end extinctions and recover populations of all species that have experienced population declines, and especially those at risk of extinction, would help to align actors toward the transformative actions and interventions needed for humans to live in harmony with nature.

KEYWORDS
Aichi targets, biodiversity, conservation, Convention on Biological Diversity, extinction, Global Biodiversity Framework, IUCN Red List, Post-2020, Zero Draft

1 | INTRODUCTION

Human impact is driving a global increase in species extinction risk (the liklihood that a species will go extinct; Díaz et al., 2019), an overall decline in species population abundance, and has led to species' extinction rates (numbers of species extinctions over time) that are at least 10–100 times faster than natural background rates (IPBES, 2019). The importance of reversing these declines is not only recognized from an intrinsic perspective on the value of species persistence, but also more broadly for the fundamental role that populations of species play in the functioning of ecological systems and in the provision of ecosystem services on which humanity relies (Mace, Norris, & Fitter, 2012). For these reasons, species conservation is written into the legislation of national and subnational jurisdictions, and features in many global policy conventions and commitments (United Nations, 2019).

The most notable global commitment to safeguard species to date has been Aichi Target 12 of the Strategic Plan for Biodiversity 2011–2020 (the "Strategic Plan") under the Convention on Biological Diversity (CBD) (Secretariat of the Convention on Biological Diversity, 2011). This states: "*By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained*." Yet, with ongoing declines in species populations, and many species facing extinction, we have failed demonstrably to meet this target (Butchart et al., 2019; Secretariat of the Convention on Biological Diversity, 2020a).

With the Strategic Plan expiring in 2020, negotiations on the development of the Post-2020 Global Biodiversity Framework under the CBD are now well underway. In January 2020, the Zero Draft of the Post-2020 Framework (hereafter, the "Zero Draft") was released, presenting an opportunity for the global community to assess the potential strengths and weaknesses of the proposed action plan beyond 2020 (Secretariat of the Convention on Biological Diversity, 2020b).

For the duration of the Strategic Plan, almost all indicators of the state of biodiversity—especially those relating to species—have continued to decline, thus increasing overall extinction risk (Díaz et al., 2019; IPBES, 2019; Mace et al., 2018). However, a substantial body of evidence reveals that conservation actions, when well-planned and implemented, can stop species from going extinct, slow the rate at which species are driven toward extinction, and halt and reverse population declines (Bolam et al., 2020; Hoffmann et al., 2015; Mace et al., 2018; Monroe, Butchart, Mooers, & Bokma, 2019; Simberloff, Genovesi, Pyšek, & Campbell, 2011). Therefore, if well-constructed, and in light of the biodiversity crisis we are facing, the Post-2020 Framework could be extremely important for shaping policy and directing efforts to halt species loss worldwide.

The Zero Draft proposes five outcome goals—three relating to different levels of ecological organization (ecosystems, species, and genetic diversity), and two reflecting the contributions that biodiversity makes to people through its sustainable use and access, and benefit-sharing. To achieve these five goals, the framework proposes 20 action targets—an appropriate and potentially powerful framework. Despite the strength of this framework, however, we are concerned that the goal focusing on species (Goal B), as currently written—"*The percentage of species threatened with extinction is reduced by [X%] and the abundance of species has increased on average by [X%] by 2030 and by [X%] by 2050*"—carries serious risk of failure. It is ambiguous, difficult to monitor, embeds the potential for unintended outcomes, and is not sufficient to prevent extinctions and stabilize populations. It also appears to be misaligned with other international agreements, and risks compromising the achievement of the 2030 Mission and 2050 Vision of the Zero Draft itself. Recently, an updated

version of the Zero Draft, released in August 2020, proposes a reformulation of a goal for species (Secretariat of the Convention on Biological Diversity, 2020c). It is our contention that this embeds the same flaws and risks as the species goal (Goal B) in the initial Zero Draft, and is indeed a backward step as species are no longer considered under a dedicated, standalone goal. Thus, our critique of the original formulation of the goal for species and the alternative we propose is applicable to discussions about newer iterations through this dynamic and ongoing process. There is still time before the Post-2020 Framework is finalized and our aim is to highlight three key problems with the species goal and propose how it might be improved.

2 | ACCEPTING EXTINCTIONS AND EXACERBATING EXTINCTION RISK

Despite three decades of biodiversity policy commitments under the CBD, species continue to be driven extinct. Aichi Target 12 in particular took a clear and bold stance on extinction, stating that: "*By 2020, the extinction of known threatened species has been prevented.…*" Even so, during the 10-year period of nations acting to achieve Target 12, at least four vertebrate species went extinct (IUCN, 2020a). Further, over the last decade, overall levels of extinction risk increased: while 22 species (in groups that have been comprehensively assessed at least twice) improved in status sufficiently to qualify for down-listing to lower categories of threat, more than six times that number (131 species) deteriorated in status sufficiently to qualify for up-listing to higher categories of threat (Figure 1).

Goal B of the Zero Draft is a retreat from Aichi Target 12 regarding extinctions and extinction risk, and could result in unintended outcomes. The proposed goal fails to reiterate an explicit ambition to prevent further extinctions: "*The percentage of species threatened with extinction is reduced by [X%]…*" In other words, contrary to Aichi Target 12, the Zero Draft could be seen as accepting some human-induced extinctions. Indeed, as currently written, Goal B could perversely be achieved by allowing species to go extinct, thus reducing the number of species "threatened" with extinction.

Furthermore, the proposed language in the Zero Draft's Goal B ("*The percentage of species threatened with extinction is reduced by [X%]..*") is problematic for two reasons. First, classification of species as threatened is binary, meaning that this measure is not very sensitive, and does not reflect movement of species between the categories of Vulnerable, Endangered or Critically Endangered (either as a consequence of improvements or deteriorations in status). Hence, this element of the goal could be achieved solely by down-listing a small number of Vulnerable species to Near Threatened or Least Concern (to reduce the proportion of species threatened with extinction by X%), while potentially allowing Endangered and Critically Endangered species to deteriorate in status further. Such a perversity could draw attention and critical resources away from these species more at risk of extinction, toward less threatened species, further imperilling Endangered and Critically Endangered species.

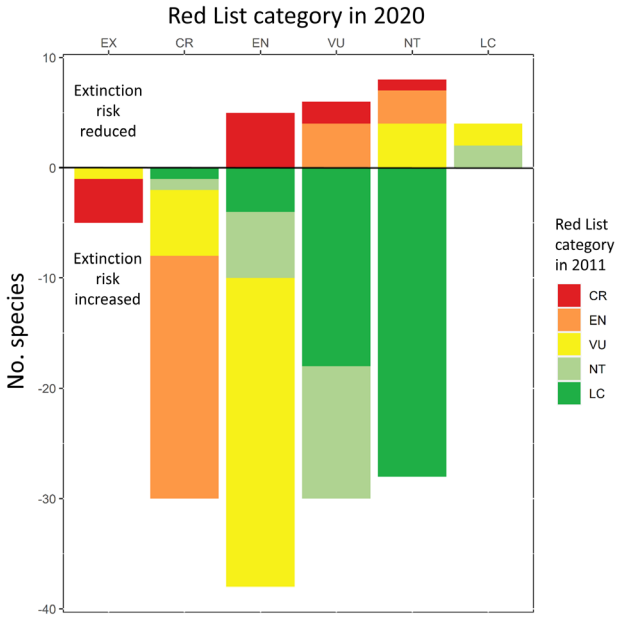

FIGURE 1 Since the Strategic Plan for Biodiversity 2011–2020 and its 20 Aichi Biodiversity Targets came into force in January 2011, there have been nearly six times as many species that qualified for up-listing to a higher category of extinction risk on the International Union for Conservation of Nature (IUCN) Red List than qualified for down-listing to a lower category of extinction risk. This figure is based on data from comprehensively assessed species groups (birds, mammals, amphibians, corals, and cycads) and on genuine recategorizations (i.e., excluding those resulting from improved knowledge, corrections, revised taxonomy, etc.) (Butchart et al., 2005; IUCN, 2020b). For some taxa, the period between repeated Red List assessments spanned the end of one decade and the start of the next (e.g., 2008–2012 for birds). To account for this, we randomly sampled the relevant proportions of genuine changes to assign to each decade (e.g., three-quarters of the genuine changes for birds from the period 2008–2012 were assigned to the decade 2000–2010, and one-quarter to the decade 2011–2020). This random sampling was repeated 1,000 times using a bootstrapping approach, and we used the mean number of respective category transitions from these iterations to represent up-listings and down-listings for each decade. The values for each taxon group were summed and plotted. IUCN Red List categories EX = Extinct, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern. For illustrative purposes, Extinct here includes species classified as Extinct in the Wild, or Critically Endangered and tagged as Possibly Extinct or Possibly Extinct in the Wild. For limitations of the IUCN Red List, see the Monitoring Progress section of the main text.

Second, changes in the proportion of species threatened with extinction can, in part, be explained by non-genuine reasons, for example through revisions in taxonomy, reassessment of Data Deficient species, improved knowledge, and the addition of newly assessed species in less well-known groups. Hence, each time the proportion is reported, it would be necessary to communicate and explain changes in the baseline (2020) values for the proportion too. While the Red List Index (Butchart et al., 2004, 2005, 2007) takes account of non-genuine reclassifications to show trends in survival probability driven by genuine improvement or deterioration in extinction risk, it cannot be simplistically converted into trends in the percentage of species threatened with extinction.

3 | THE ABUNDANCE COMPONENT IS AMBIGUOUS

Functional increases in species' populations are fundamental to threatened species recovery. Another essential aim of conservation is maintaining and where necessary recovering the populations of species to prevent them from declining or becoming threatened, given the key role they may play in the function of ecosystems and the delivery of ecosystem services (Gaston, 2010). Concern over population declines of invertebrates (Sánchez-Bayo & Wyckhuys, 2019), and common vertebrate species (Ceballos, Ehrlich, & Dirzo, 2017), highlight the importance of including population abundance as a key component of any species-focused goal.

However, the current wording of this element of the goal "*the abundance of species has increased on average by [X%] by 2030 and by [X%] by 2050*" contains two unhelpful ambiguities. First, "abundance of species" can be interpreted as the number of species; the appropriate terminology should be "population abundance of species." Second, the target could be perversely met through facilitating increases in population abundance of invasive alien species, while allowing native species to decline, so it is important to specify that the focus is on native species.

4 | OTHER OBJECTIVES ARE COMPROMISED

The Zero Draft's Goal B is currently misaligned with broader international and societal goals. For example, Sustainable Development Goal 15 (Target 15.5) seeks to halt biodiversity loss by 2030 (United Nations, 2019), which does not accord with the currently proposed species goal (Goal B). Additionally, as written, Goal B potentially conflicts with other goals and action targets captured in the Zero Draft. For example, a direction of resources toward Vulnerable species, allowing unabated declines in Endangered and Critically Endangered species, could, in some cases, have adverse implications for the function of ecosystems (compromising Goal A with its aim of no net loss of ecosystem integrity) (Gascon et al., 2015). For instance, in Madagascar the extinction of 17 lemur species and reduction in population of many others that are now highly threatened has had a substantial impact on forest function through the loss of seed dispersal (Federman et al., 2016). Similarly, the Critically Endangered Lowland Gorilla (*Gorilla gorilla gorilla*) plays an important role through the regular deposition of seeds in open canopy environments where light is not a limiting factor for seedling growth and survival (Petre et al., 2013). Due to their decline, forests devoid of large frugivores are thought to be strongly impacted through changes in population dynamics of plants, leading to shifts in plant community structure, composition and to reduced tree diversity (Petre et al., 2013). Human-induced extinction of species, which is not prevented by Goal B, would also result in a loss of genetic diversity (Spielman, Brook, & Frankham, 2004), contrary to Goal C. Reductions in populations and/or extinctions will also reduce the benefits from the use of genetic resources through potential missed opportunities for sustainable use (Goal D), or for new medicines or increased scientific understanding (Goal E) (Luck, Daily, & Ehrlich, 2003).

Perhaps most importantly, Goal B does not align with the Zero Draft's own 2030 Mission "To take urgent action across society to put biodiversity on a path to recovery for the benefit of the planet and people." Potentially compromising Critically Endangered and Endangered species and allowing species to go extinct will not put biodiversity on a "path to recovery." This also jeopardizes our ability to live "in harmony with nature," a key tenet of the 2050 Vision.

5 | AN IMPROVED GOAL FOR SPECIES

Given the limitations we identify for Goal B of the Zero Draft, we propose the following revised wording for a species-focused goal in the Post-2020 Framework:

> *"Human-induced species extinctions are halted from 2020 onwards, the overall risk of species extinctions is reduced by 20% by 2030 and is zero by 2050, and the population abundance of native species is increased on average by 20% by 2030 and returns to 1970 values by 2050."*

This revised goal takes the necessary bold stance on species extinctions (consistent with Aichi Target 12) by

stating "*Human-induced species extinctions are halted from 2020 onwards."* Even under Aichi Target 12, some extinctions occurred, but it is also clear that conservation action prevented many more extinctions (Bolam et al., 2020). We argue that any relaxation on the expectations of nations to prevent extinctions would be a failure in response to the biodiversity crisis. We have specified "human-induced" extinctions, as a tiny fraction of extinctions may be caused by geological events (volcanoes, tsunamis, etc.) and other natural events that are not feasible to mitigate (e.g., those events and perturbations that generate the "background" rate of species extinction through the geological record). Additionally, we note that some species may be considered at high risk of extinction through an "extinction debt" owing to anthropogenic processes in recent history (Tilman, May, Lehman, & Nowak, 1994). However, we contend that beyond 2020, nations should aspire to halt and reverse the trajectory of even these most imperilled species—a challenging undertaking, but one that is not insurmountable should the transformative change that the Zero Draft calls for be embraced by Parties to the Convention. By extension, we also suggest that even the species at highest risk of extinction can be recovered with sufficient resources, improved understanding, and transformative change in the way we manage the environment.

We interpret the CBD Vision for 2050 of living "in harmony with nature" to mean that no known species is threatened with extinction. To achieve this vision by 2050, a demonstrable reduction in extinction risk is required by 2030. The goal we propose requires a quantifiable gauge for improvement by 2030 as a means by which to check whether we are "on the path to recovery." As such, the revised goal we propose embeds and allows for the tracking of global extinction risk: "*the overall risk of species extinctions is reduced by 20% by 2030 and is zero by 2050*." Given that extinction risk in comprehensively assessed groups (mammals, birds, amphibians, corals, and cycads) has increased by 4–5% per decade since 2000, we propose that reversing this trend, and further reducing extinction risk by 20% is arguably an appropriate milestone toward eliminating human-induced extinction risk (and by association, human-induced extinctions of species captured under the Red List) by 2050, accepting that this will require substantial ambition and can only be achieved with transformative change (as called for in the Zero Draft). Nevertheless, we recognize that CBD Parties may opt for greater or lesser ambition by 2030 on the pathway to the 2050 vision. Importantly, achieving the milestone of an overall reduction in extinction risk of 20% by 2030 should be driven by improvements in species across all risk categories from Near Threatened through to Critically Endangered and Extinct in the Wild. This is because focussed efforts in the decade to 2030 to stabilise and recover a subset of threatened species should not perversely lead to an increase in the extinction risk of other threatened species, by, for example, diverting resources and attention away from them. We also note that the reduction in extinction risk needs to be measured against the same set of species, as is implicit in the Red List Index methodology (Butchart et al., 2007).

We propose as the third element of the goal: "*and the population abundance of native species is increased on average by 20% by 2030 and returns to 1970 values by 2050*." This specifies average abundance of all species populations (recognising that some population declines for very common or overabundant species will be offset by increases in others, and that we refer to the geometric mean of relative abundance across all species, so a small increase in a common species will not compensate for a large decrease in a rare species) and to native species (recognising that increases in invasive alien species are not desirable). Increases in population sizes should occur only within or contiguous to (to allow for climate tracking) the native ranges of species, and that such population maintenance/increases be considered across all species that have experienced declines, and not just those that are listed as threatened with global extinction. This element of the goal aims to promote the overall recovery of depleted populations, and we recognize that average population abundance is a crude, but pragmatic, means of quantifying this. It should therefore be complemented by the establishment of specific targets for recovering populations set on a species-by-species basis (e.g., at a national scale) relative to the declines that they have experienced. Efforts should also be made to identify and target actions in particular on promoting population recovery for those species that play key ecosystem roles and are of particular ecological significance. Average population abundance as measured by the Living Planet Index has declined by 60% since 1970 (McRae, Deinet, & Freeman, 2017), which is the earliest time-point with sufficient data for global trends to be assessed. Therefore, we suggest the aim should be to recover populations to at least their 1970 baseline, with "20% by 2030" being a potential milestone for tracking progress, and larger proportional increases required after 2030. We do note, however, that these targets should be iterative, and revised over time as more information becomes available on historical abundances, and demography of species.

The release of the Zero Draft in January 2020 has already generated a great deal of discussion and critique around what is needed for species in a Post-2020 world (Secretariat of the Convention on Biological Diversity, 2020d). We suggest that the formulation of the goal suggested here best addresses the deficiencies of the language proposed in the Zero Draft, while capturing the key tenets of the

TABLE 1 Proposed species goal for the Post-2020 Global Biodiversity Framework broken into each element, and how it can be monitored

Component	Revised goal	Quantifiable indicator
Extinctions	*Human-induced species extinctions are halted from 2020 onwards…*	IUCN Red List
Extinction risk	*…the overall risk of species extinctions is reduced by 20% by 2030 and is zero by 2050…*	Red List Index
Abundance	*….and the population abundance of native species is increased on average by 20% by 2030 and returns to 1970 values by 2050*	Population indices

various alternatives that have been proposed to supersede it. Crucially, it is clear, measurable, avoids perverse incentives for unintended outcomes, and embeds outcomes that are consistent with the Vision and Mission of the Post-2020 Framework.

6 | MONITORING PROGRESS

Progress toward the revised goal that we propose can be monitored and tracked at a global scale using the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (for documenting extinctions), the Red List Index (for tracking levels of extinction risk) and robust population indicators (for tracking average population abundance), which were appropriately highlighted in the Zero Draft as key indicators for measuring progress toward achieving Goal B (Secretariat of the Convention on Biological Diversity, 2020b; Table 1). The Red List Index measures trends in overall species extinction risk, based on population and range size and trends as quantified by IUCN Red List Categories (Butchart et al., 2004, 2005, 2007). The 2030 goal would be achieved if the current Red List Index value increased by 20% (as a Red List Index value of 1 equates to all species qualifying as Least Concern, while an index value of 0 equates to all species qualifying as Extinct). We suggest measures of extinction risk are used rather than extinction rate, to allow for proactive conservation action, and because extinction rate is difficult to measure over relatively short periods of time. The abundance component of the revised goal can be quantified using population indices, of which the best-known include the Wild Bird Index (Gregory & van Strien, 2010) and the Living Planet Index (Loh et al., 2005; McRae et al., 2017).

The Red List Index and established population indices are useful measures of species extinction risk and abundance, and the former can be disaggregated for national reporting (with this being possible for the latter where data allow). However, they have limitations. Red List Categories are broad (reducing sensitivity), many species are classified as Data Deficient (adding quantified uncertainty), and relatively few groups have been comprehensively assessed multiple times for the IUCN Red List and hence included in the Red List Index (limiting representativeness) (IUCN, 2020a, 2020b). Meanwhile, many of the input data for the Living Planet Index appear to be from populations measured because they are known *a priori* to be declining, and so the indicator may not yield robust insight into population trends of all species. The effects of combining population time series from single sites, from portions of species ranges (e.g., countries), and from across the entirety of species ranges are also unclear. Therefore, the effectiveness of these metrics should be enhanced through greater monitoring of species populations (particularly in countries with a disproportionate lack of information) and expanded numbers of species regularly assessed for the IUCN Red List (thereby increasing its geographic and taxonomic coverage, given that only 120,000 species have been assessed to date). Increasing the frequency of reassessments for the IUCN Red List would also help to mitigate time-lags before status changes are reflected on the IUCN Red List (Butchart, Akcakaya, Kennedy, & Hilton-Taylor, 2006). This requires much more substantial investment in biodiversity monitoring than is currently the case.

Other metrics of extinction risk and abundance may also be used and may be more appropriate for regional and national scales (Buckland, Yuan, & Marcon, 2017). For example, the most robust measures of abundance are those based on structured samples across all populations for given regions and taxonomic groups, like the Wild Bird Index (Gregory, Skorpilova, Vorisek, & Butler, 2019). While effective, these are still highly restricted geographically and taxonomically. Improved monitoring to underpin more rigorous, scalable indices will better allow us to track progress toward achievement of the quantifiable elements of the revised goal that we propose.

We note that meeting this goal will require mitigating key threats to species. These are, principally, unsustainable agriculture, unsustainable exploitation (including logging, fisheries and hunting/gathering wild species), the negative impacts of invasive alien species, pollution, commercial and residential development, and increasingly, climate change (IUCN, 2020a; Maxwell, Fuller, Brooks, & Watson, 2016). The proposed action targets 1–6 in the Zero Draft largely cover these actions. However, to prevent extinctions, recovery actions and active interventions will be urgently needed for many of the most highly threatened

species, for which mitigating external threats alone will be insufficient to prevent their extinction. Such species are frequently reduced to populations that are not demographically or genetically viable, and so require emergency actions. Examples include translocation, assisted colonization, captive breeding and release for animals and propagation for fungi and plants, and targeted recovery actions such as supplementary feeding and breeding site provision (Cochrane, Crawford, & Monks, 2007; Comizzoli & Holt, 2019). Therefore, we recommend that an additional target should be included in the Post-2020 Framework to promote implementing emergency, proactive species recovery actions above and beyond threat alleviation for those species whose survival and recovery requires such actions.

7 | CONCLUSION

The revised species goal we propose is ambitious, unambiguous, can be readily communicated, and comprises quantifiable elements against which nations can transparently measure their progress. Post-2020, we must halt any further extinctions, reduce the extinction risk of those species that are threatened, and recover and maintain populations of species in their native range at levels to ensure their survival and the continued functioning of ecosystems. To be "on a path to recovery" by 2030, and "living in harmony with nature" by 2050, we must take decisive action for biodiversity from 2020. A clear and adequate goal for species conservation is fundamental to these efforts.

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AUTHOR CONTRIBUTIONS

JEMW conceived the idea. BAW with the support of JSS and JEMW led the writing of the manuscript. BAW, MW, SHMB, and JSS developed Figure 1. All authors contributed to the preparation of the manuscript, and approved the final version for submission.

DATA ACCESSIBILITY STATEMENT

IUCN data used to create Figure 1 for comprehensively assessed species and on genuine recategorizations are available on request from Stuart.Butchart@birdlife.org.

CONFLICT OF INTEREST

The authors declare no competing interests.

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REFERENCES

Bolam, F. C., Mair, L., Angelico, M., Brooks, T. M., Burgman, M., Hermes, C., … Rodrigues, A. S. L. (2020). How many bird and mammal extinctions has recent conservation action prevented? *Conservation Letters*, e12762.

Buckland, S. T., Yuan, Y., & Marcon, E. (2017). Measuring temporal trends in biodiversity. *Advances in Statistical Analysis*, *101*, 461–474.

Butchart, S. H. M., Akçakaya, H. R., Chanson, J., Baillie, J. E. M., Collen, B., Quader, S., … Hilton-Taylor, C. (2007). Improvements to the red list index. *PLoS One*, 2, e140.

Butchart, S. H. M., Akcakaya, H. R., Kennedy, E., & Hilton-Taylor, C. (2006). Biodiversity indicators based on trends in conservation status: Strengths of the IUCN Red List Index. *Conservation Biology*, *20*, 579–581.

Butchart, S. H. M., Miloslavich, P., Reyers, B., Subramanian, S. M., Adams, C., Bennett, E., … Singh, G. S. A. (2019). Assessing progress towards meeting major international objectives related to nature and nature's contributions to people. Secretariat of the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services, Germany.

Butchart, S. H. M., Stattersfield, A. J., Baillie, J., Bennun, L. A., Stuart, S. N., Akçakaya, H. R., … Mace, G. M. (2005). Using Red List Indices to measure progress towards the 2010 target and beyond. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *360*, 255–268.

Butchart, S. H. M., Stattersfield, A. J., Bennun, L. A., Shutes, S. M., Akçakaya, H. R., Baillie, J. E. M., … Mace, G. M. (2004). Measuring global trends in the status of biodiversity: Red List Indices for birds. *PLoS Biology*, *2*, e383.

Ceballos, G., Ehrlich, P. R., & Dirzo, R. (2017). Biological annihilation via the ongoing sixth mass extinction signaled by vertebrate population losses and declines. *Proceedings of the National Academy of Sciences of the United States of America*, *114*, E6089–E6096.

Cochrane, J. A., Crawford, A. D., & Monks, L. T. (2007). The significance of ex situ seed conservation to reintroduction of threatened plants. *Australian Journal of Botany*, *55*, 356–361.

Comizzoli, P., & Holt, W. V. (2019). Breakthroughs and new horizons in reproductive biology of rare and endangered animal species. *Biology of Reproduction*, *101*, 514–525.

Díaz, S., Settele, J., Brondízio, E. S., Ngo, H. T., Agard, J., Arneth, A., … Zayas, C. N. (2019). Pervasive human-driven decline of life on Earth points to the need for transformative change. *Science*, *366*, eaax3100.

Federman, S., Dornburg, A., Daly, D. C., Downie, A., Perry, G. H., Yoder, A. D., … Baden, A. L. (2016). Implications of lemuriform extinctions for the Malagasy flora. *Proceedings of the National Academy of Sciences of the United States of America*, *113*, 5041–5046.

Gascon, C., Brooks, T. M., Contreras-MacBeath, T., Heard, N., Konstant, W., Lamoreux, J., … Molur, S. (2015). The importance and benefits of species. *Current Biology*, *25*, R431–R438.

Gaston, K. J. (2010). Valuing common species. *Science*, *327*, 154–155.

Gregory, R. D., Skorpilova, J., Vorisek, P., & Butler, S. (2019). An analysis of trends, uncertainty and species selection shows contrasting trends of widespread forest and farmland birds in Europe. *Ecological Indicators*, *103*, 676–687.

Gregory, R. D., & van Strien, A. (2010). Wild bird indicators: Using composite population trends of birds as measures of environmental health. *Ornithological Science*, *9*, 3–22.

Hoffmann, M., Duckworth, J. W., Holmes, K., Mallon, D. P., Rodrigues, A. S. L., & Stuart, S. N. (2015). The difference conservation makes to extinction risk of the world's ungulates. *Conservation Biology*, *29*, 1303–1313.

IPBES. (2019). *Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Germany: Bonn.

IUCN. (2020a). The IUCN red list of threatened species [WWW Document]. The International Union for Conservation of Nature. Retrieved from https://www.iucnredlist.org/

IUCN. (2020b). Red List Index [WWW Document]. Retrieved from https://www.iucnredlist.org/assessment/red-list-index

Loh, J., Green, R. E., Ricketts, T., Lamoreux, J., Jenkins, M., Kapos, V., & Randers, J. (2005). The Living Planet Index: Using species population time series to track trends in biodiversity. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *360*, 289–295.

Luck, G. W., Daily, G. C., & Ehrlich, P. R. (2003). Population diversity and ecosystem services. *Trends in Ecology & Evolution*, *18*, 331–336.

Mace, G. M., Barrett, M., Burgess, N. D., Cornell, S. E., Freeman, R., Grooten, M., & Purvis, A. (2018). Aiming higher to bend the curve of biodiversity loss. *Nature Sustainability*, *1*, 448–451.

Mace, G. M., Norris, K., & Fitter, A. H. (2012). Biodiversity and ecosystem services: A multilayered relationship. *Trends in Ecology & Evolution*, *27*, 19–26.

Maxwell, S. L., Fuller, R. A., Brooks, T. M., & Watson, J. E. M. (2016). Biodiversity: The ravages of guns, nets and bulldozers. *Nature*, *536*, 143–145.

McRae, L., Deinet, S., & Freeman, R. (2017). The diversity-weighted living planet index: Controlling for taxonomic bias in a global biodiversity indicator. *PLoS One*, *12*, e0169156.

Monroe, M. J., Butchart, S. H. M., Mooers, A. O., & Bokma, F. (2019). The dynamics underlying avian extinction trajectories forecast a wave of extinctions. *Biology Letters*, *15*, 20190633.

Petre, C.-A., Tagg, N., Haurez, B., Beudels-Jamar, R., Huynen, M.-C., & Doucet, J.-L. (2013). Role of the western lowland gorilla (Gorilla gorilla gorilla) in seed dispersal in tropical forests and implications of its decline. *Biotechnology, Agronomy, Society and Environment*, *17*, 517–526.

Sánchez-Bayo, F., & Wyckhuys, K. A. G. (2019). Worldwide decline of the entomofauna: A review of its drivers. *Biological Conservation*, *232*, 8–27.

Secretariat of the Convention on Biological Diversity. (2011). Strategic Plan for Biodiversity 2011–2020 and the Aichi Targets (Secretariat of the Convention on Biological Diversity) [WWW Document]. Retrieved from https://www.cbd.int/sp/

Secretariat of the Convention on Biological Diversity. (2020a). GBO 5 Review [WWW Document]. Retrieved from https://www.cbd.int/gbo5/review/

Secretariat of the Convention on Biological Diversity. (2020b). Zero Draft of the Post-2020 Global Biodiversity Framework.

Secretariat of the Convention on Biological Diversity. (2020c). Update of the Zero Draft of the Post-2020 Global Biodiversity Framework.

Secretariat of the Convention on Biological Diversity. (2020d). CBD/WG2020/2/L2—Preparation of the Post-2020 Global Biodiversity Framework.

Simberloff, D., Genovesi, P., Pyšek, P., & Campbell, K. (2011). Recognizing conservation success. *Science*, *332*, 419.

Spielman, D., Brook, B. W., & Frankham, R. (2004). Most species are not driven to extinction before genetic factors impact them. *Proceedings of the National Academy of Sciences of the United States of America*, *101*, 15261–15264.

Tilman, D., May, R. M., Lehman, C. L., & Nowak, M. A. (1994). Habitat destruction and the extinction debt. *Nature*, *371*, 65–66.

United Nations. (2019). Sustainable development goals. Retrieved from https://www.undp.org/content/undp/en/home/sustainable-development-goals.html

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