Developing a next-generation global biodiversity indicator to provide improved estimates of trends in wildlife abundance.

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Global biodiversity is in decline (IPBES, 2020). Understanding how wildlife populations respond to anthropogenically induced climate-change, land-use change and other threats is critical to 'bend-the-curve' of biodiversity loss (Mace et al, 2020). The Living Planet Index (LPI) is a global dataset of 28,000 population trends of over 4400 vertebrate species that offers a unique tool for biodiversity assessment. It is used nationally and internationally to assess progress towards biodiversity goals such as the Convention on Biological Diversity's Aichi targets, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Assessment Report, the post-2020 biodiversity framework, and informs the Living Planet Report, WWF's biennial flagship report with an estimated reach of >100 million people

The project will expand the impact and policy-relevance of the Living Planet Index by improving predictive estimates of abundance for countries and regions which at present have too few data to produce indices, and offering new insight into key drivers of change. By jointly modelling regional drivers, threats (including climate and land use changes) and abundance trends, and incorporating spatial and temporal structure into these models, this project will develop a novel methodology for improving predictions of wildlife abundance trends.

The project includes four goals:

1) Quantify and minimize biases caused by data gaps in the Living Planet database to best inform policy in locations with sparse data coverage.
2) Characterize key regional and global drivers of biodiversity change by jointly modelling threat data and population changes.
3) Identify extreme population changes (very rapid increases or declines) characterized as plausible vs unrealistic (eg, changes too rapid for the species' life history), and develop methods to reduce sensitivity of aggregated index assessments to such extremes.
4) Build an easy-to-use and accessible dashboard for Living Planet Index 2.0 that combines improvements from goal 1-3 and directly informs policy-makers and prioritise conservation actions.

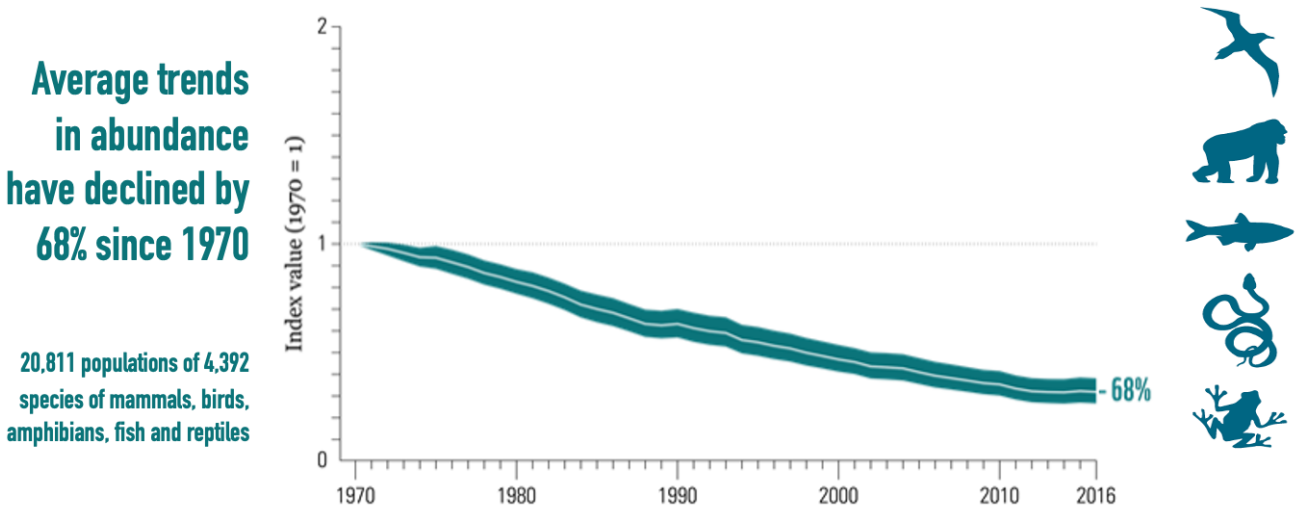

Figure 1 - The global Living Planet Index, a composite indicator of average trends in vertebrate wildlife abundance. The 2020 Living Planet Index shows an average decline of 68% since 1970. (Source: Living Planet Report 2020, WWF/ZSL)

Training opportunities:
This project provides a unique opportunity to work at the interface between biodiversity research, conservation policy and communication. The proposed CASE partnership with the Zoological Society of London (ZSL) provides a unique opportunity to work with their Conservation and Policy department to develop an online platform to communicate the results of the project to conservation practitioners and policy-makers.

Over the course of the PhD, the team at the Institute of Zoology will also produce two Living Planet Reports in collaboration with WWF (World Wide Fund for Nature). The student will have the opportunity to work alongside the team, shadowing us as we produce the report's content, providing a unique opportunity to learn how such large, international reports are produced.

The underlying methods developed in the project will also have impact beyond the Living Planet Index. The existing method (and R package) is already in use by national governments (Canada, Australia) and similar methods are employed by RSPB (Royal Society for the Protection of Birds) and the UK State of Nature Report for their Priority Species Index.

Student profile:
The candidate will have a BSc, and ideally a MSc, degree in ecology, zoology or related field and interest in conservation. They will have experience with quantitative and statistical methods. Familiarity with R, and mixed-effects or Bayesian modelling approaches is desirable.

Funding particulars:
The project benefits from CASE sponsorship from the Zoological Society of London

https://research.reading.ac.uk/scenario/