Expert elicitation to inform a national threatened species index

(Ethics ID 2018/HE001572)

Project name: *A threatened species index for Australia: development and interpretation of integrated reporting on trends in Australia's threatened species*

Project Team Roles & Responsibilities

Chief Investigator
Ms Tayla Lawrie
Project Manager, Threatened Species Index
Terrestrial Ecosystem Research Network
The University of Queensland
Long Pocket Precinct, Level 5 Foxtail Building #1019
80 Meiers Road, Indooroopilly QLD 4068 Australia

Investigator
Dr Geoff Heard
Science Advisor, Threatened Species Index
Terrestrial Ecosystem Research Network
The University of Queensland
Long Pocket Precinct, Level 5 Foxtail Building #1019
80 Meiers Road, Indooroopilly QLD 4068 Australia

Investigator
Dr Sarah McGrath
Project Officer, Threatened Species Index
Terrestrial Ecosystem Research Network
The University of Queensland
Long Pocket Precinct, Level 5 Foxtail Building #1019
80 Meiers Road, Indooroopilly QLD 4068 Australia

Project Background

Understanding whether, and where, species are declining is crucial for monitoring progress towards global biodiversity conservation targets, justifying management resourcing, and stimulating a targeted response to environmental problems. Many governments, including Australia's, have developed strategies and invested huge resources to recover threatened species. However, prior to this project, there was no coherent and transparent reporting on changes in Australian biodiversity or threatened species. This project maintains and continues to build Australia's National Threatened Species Index (TSX), collating monitoring data on threatened species from across the continent and amalgamating these data to provide a quantitative index of change in threatened species abundance.

The TSX allows for integrated reporting at national, state and regional levels, and enables annual updates on threatened species responses to environmental change and management interventions. The index also enables the Australian Government to report internationally on biodiversity trends.

The Living Planet Index (LPI) is a global biodiversity indicator that quantifies changes in vertebrate abundance to provide an aggregated measure of relative change (Loh et al. 2005). The LPI models population trends derived from different data sources to detect annual changes in species population abundance, and provides an index value relative to a reference year. To date, the LPI has relied predominantly on published datasets of species trends to inform analyses. However, most threatened species monitoring data exist in unpublished databases held by researchers, private conservation agencies and government departments. Australia's Threatened Species Index integrates all available data on the abundance of Australian threatened species into a single overarching database that informs the public, scientists and policy makers about whether our actions to reduce biodiversity loss are working.

Project Design & Research Activities

To collect time-series abundance data from threatened and near-threatened taxa from Australia, the TSX team first created a species list containing all near-threatened, vulnerable, endangered, and critically endangered species, as listed by the International Union for Conservation of Nature (IUCN) and the Australian Government through the Environment Protection and Biodiversity Conservation Act (EPBC). Drawing from internal project knowledge and the knowledge of the wider conservation community in Australia, the TSX team identified potential data providers from across the continent and collated their contact information. A rigorous data provider agreement was established to control access to and handling of threatened species data by employing strict sensitive species policies. Each individual data provider was contacted via email and dataset(s) on one or multiple taxa requested. After receiving datasets from multiple sources and executing data sharing agreements, all data were entered into a MySQL database located on a virtual private server (VPS) to ensure privacy and security.

In order to use these data to produce multi-species trends with the Living Planet Index methodology, data quality and suitability need to be assessed for every species and every dataset (McRae et al. 2017). This ensures that trends produced with the LPI method are not affected by data collected inconsistently, in an unstandardized manner, or with other factors affecting its accuracy at portraying "real" changes in a population's abundance over time. Components of a monitoring program that may affect the accuracy of trends include: 1) standardisation of monitoring method / effort for data provided, 2) overall temporal coverage of data, 3) consistency of monitoring, and 4) monitoring frequency and timing. These kinds of information are rarely included with monitoring dataset metadata. To overcome this barrier, the TSX team developed an approach through which data providers could provide feedback on the results of trend analyses using their data, and through this expert elicitation process, gain valuable information on how these different components of their monitoring program may have affected the reported trend in one or more species.

The Expert Elicitation

The purpose of this expert elicitation is to return to you (the participant, a species monitoring data custodian) species-specific results relevant to the species for which you provided data for input into the TSX. You can access your data by navigating to the corresponding 'Datasets' tab of the TSX data management interface.

We anticipate that the survey form will take no longer than 10 – 20 minutes to complete the compulsory Questions 1-15 and another 10-20 minutes to complete the supplementary questions 16 – 32 which are optional.

The process for completing the survey form is as follows:

1) Conditions and consent

Custodians are asked to read the conditions of this expert elicitation process and provide their consent.

2) Data citation and monitoring aims (Qs 1 to 4)

Custodians are asked to confirm the citation for their provided data. Please answer three additional questions that provide context about your dataset and species.

3) Data summary and processing (Qs 5 and 6)

This section provides a summary of the provided data and explains how the data was processed. Please review the plots, maps and tables in this section and indicate whether you agree with our processing of your dataset.

4) Statistics and trend estimate (Qs 7 to 10)

This section provides some representative statistics from your raw and aggregated data that characterise factors such as time-series length and completeness. Please indicate whether you agree with our statistics for your dataset.

An aggregate trend line for your species has been generated based only on the data you provided and using the methods of the Living Planet Index. Please indicate whether you agree with our trend for your dataset and which year we should use as a reference year.

5) Data suitability (Qs 11 to 15)

This section relates to the suitability of your data for demonstrating trends in population over time. Please provide an assessment of your dataset against each criterion. Please include any additional comments in the free text field at the end of the section.

6) Monitoring program funding, logistics and governance (Qs 16 to 32): OPTIONAL

The final set of questions relate to the monitoring program funding, logistics and governance. We hope to be able to use this information to better describe funding and governance requirements for long-term monitoring of threatened species. These questions are optional but highly valuable for informing species funding needs.

Data Usage & Management

Custodian feedback on the accuracy of the trends we have produced represents best practice for the development of a Threatened Species Index. All answers to these feedback questionnaires will be collated and de-identified, and used to verify the validity of a multi-species index. The process to do this will be to iteratively remove data for which data custodians identified particular issues with either the magnitude of the trend, the slope, or its accuracy. This will identify whether particular data collection/management issues (e.g. monitoring standardisation, consistency, frequency) affect the national threatened species index, as well as provide valuable information to those collecting the monitoring data about the most suitable data formats and monitoring protocols for informing national species trends. Following the publication of the Threatened Species Index, all custodians will be contacted with the final decision about whether or not their dataset was included in the latest multi-species index. Custodians will have the opportunity to review their original responses and discuss data inclusion decisions with the Threatened Species Index team. The questionnaire results in full resolution will be kept strictly confidential.

Risk & Participation

This expert elicitation has been judged low risk, as there is no foreseeable risk of harm or discomfort, and there will be no more than inconvenience to participants to complete the questionnaire. The project also carries a negligible risk of reputational harm, since the information requested from data custodians about existing datasets are non-personal in nature and individual judgements will remain confidential. However, participation in this activity is entirely voluntary and you are free to withdraw without penalty at any time. If you prefer to be contacted via phone or videoconference rather than email to discuss these results, please let us know by emailing or phoning the Project Manager Tayla Lawrie (email: t.lawrie@uq.edu.au, phone: 0476 378 354) and a member of the team will set up a time to complete the survey by phone/videoconference.

This study adheres to the Guidelines of the ethical review process of The University of Queensland and the National Statement on Ethical Conduct in Human Research. Whilst you are free to discuss your participation in this study with project staff, if you would like to speak to an officer of the University not involved in the study, you may contact the Ethics Coordinators on +61 7 3365 3924 / +61 7 3443 1656 or email humanethics@research.uq.edu.au.

Literature Cited

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.

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.