

Gaps in the evidence of where and how human activities threaten species globally

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This review involved a rigorous search and screening of over 14,000 articles, looking for geographic maps of where threatening human activities directly impact wild species of animals and plants around the world (i.e. threat maps). Large gaps in available evidence were found among different locations, threats, and taxonomic groups. The accompanying database presents a valuable tool for planning conservation actions at any spatial scale and preventing species extinctions globally.

Why is this Evidence Synthesis Needed?

Under the newly adopted Kunming-Montreal Global Biodiversity Framework, it is imperative that we successfully reduce threats to wild species and prevent their extinction. In order to plan conservation actions which reduce threats to species, knowledge is needed on where particular threats impact wild species. Due to a lack of standardized terminology, the rapid expansion of conservation literature, and large variety of research subjects (e.g. geographic locations, taxonomic groups, and methodologies), makes finding evidence on where threats impact species is increasingly difficult. Our study overcame this challenge by implementing a systematic approach of searching for, sorting, and cataloguing such evidence (i.e. threat mapping literature). In doing so, we identified potential sources of bias among the geographies, taxonomic groups and threats studied and highlighted important avenues for future research.

This Collaboration for Environmental Evidence systematic map describes the current distribution of threat mapping literature by collecting data on the methodological, taxonomic, and geographic extent of existing articles that mapped threats to animal or plant species at any spatial scale anywhere in the world.

Main Findings

What studies are included?

1,069 studies (published 2000 – 2020) presented a geographic map of where threatening human activities (such as agriculture, hunting, and residential or commercial development) impact wild animal or plant species.

Bias among geographies

75% of the threat maps found were produced at a national scale or below. Countries with very low numbers of studies (0 or 1) are more common in areas of South America, Africa, and Asia. Meanwhile, 15% of all threat mapping studies globally are performed in the USA.

Bias among species groups

Studies on animals are three times more numerous and are more taxonomically specific than studies on plants. There are also twice as many studies on the terrestrial realm as on both aquatic realms (freshwater and marine) together.

Bias among threats

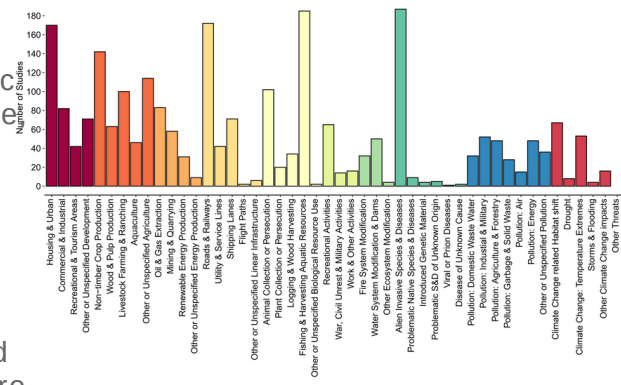
Alien invasive species and Roads & Railways are the most frequently mapped threats and are relatively well-mapped across the world. Otherwise, even overall well-mapped threats such as agriculture & aquaculture, residential and commercial development, and biological resource use, show large differences in the abundance of studies among geographic regions.

What are the Implications of the Review Findings?

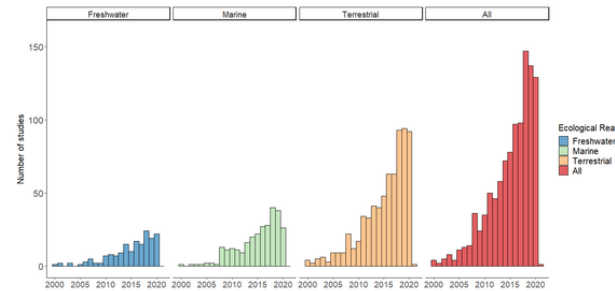
This new study reveals large gaps in our understanding of where and how human activities threaten wild species around the world, with implications for how conservation actions are planned and prioritised to reduce the rate of species extinctions.

Previous attempts to observe the global distribution of threats to species have relied on globally available data that don't account for the knowledge gained from local-scale studies and don't represent the full scope of human activities that can threaten species across terrestrial, freshwater, and marine realms. Our finding, that 75% of threat maps are produced at a sub-national scale, reinforces the need to use the findings of smaller-scale studies to inform our global understanding of where species are directly at risk to avoid overlooking large quantities of valuable evidence.

This study is an important first step to understand what is known about where and how human activities threaten wild species globally and identify where future research is urgently needed. However, further critical appraisal and extraction of the magnitude of threats for each study are necessary to translate the evidence into threat reduction activities. Reproducing the analyses for non-English languages and making further efforts to identify grey literature could also fill some of the gaps in threat mapping found. Therefore, the systematic map and corresponding database of articles presents a valuable starting point for evidence-based decision-making for threat reduction at local and national scales.



The number of threat mapping articles that mapped each threat.



The number of threat mapping articles published in each year by ecological realm.

Synthesis Time Frame

The review authors searched for studies published between 2000 and 2020 and the review was published in July 2022.

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