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Conference Abstract

Multifaceted impacts of alien megafauna on ecosystems

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Abstract

Megafauna species, including large mammals, reptiles, and fishes, have been intentionally introduced outside their native ranges due to their charisma and economic values. Given their wide introductions and documented ecological impacts, it is vital to synthesize the existing evidence to advance our understanding of their impact mechanism and magnitude, which could facilitate the development of effective management strategy. Here, we use freshwater megafauna as an example to demonstrate the multifaceted impacts of alien megafauna on the recipient ecosystems based on more than 2000 records systematically identified from published literature. Following the Environmental Impact Classification for Alien Taxa (EICAT and EICAT+) framework, we assessed the impacts of these large alien animals on native species. Moreover, we extracted data related to these species from the InvaPact Database, which applied large language models to identify and categorize alien species impacts, and used the metrics based on the Extended EICAT (EEICAT) framework to quantify their ecological impacts. Our results reveal the profound ecological impacts of over 70 alien megafauna species on the recipient ecosystems worldwide through various mechanisms, leading to changes in habitat structure, biotic interactions, and ecological processes. For example, about 50% of the identified alien freshwater megafauna species with sufficient data to assess their impact magnitude have caused population decline or even local extinction of at least one native species. Our results underscore the complex ecological impacts of alien megafauna and highlight the need for comprehensive assessment that

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consider multiple ecosystem components to advance our understanding of alien species impacts.

Keywords

alien species, biological invasion, ecological impact, EICAT, EEICAT, impact assessment, megafauna

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Conflicts of interest

The authors have declared that no competing interests exist.