Agreement on the Conservation of Albatrosses and Petrels

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The emergence of ecological traps in marine ecosystems: the case of seabirds and fisheries

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SUMMARY

The unprecedented rate at which humans are altering ecosystems is increasingly causing animals to choose poor-quality habitats as a result of misleading cues. This phenomenon, known as “ecological trap”, decreases the resilience of populations and increases the risk of extinction. Nonetheless, the ecological trap framework has received little attention in marine environments, particularly concerning the interaction of seabirds and fisheries. Bycatch for seabirds primarily occurs because they are attracted to fishing vessels to feed on trophic subsidies such as baits, discards, and catches. However, the underlying mechanism of ecological traps has not been widely used to frame this problem globally, beyond the junk-food hypothesis. In this study, we aimed to analyze the interaction between the scavenging behavior of seabirds and bycatch in fisheries, and the effect of the slow-fast continuum of life history on the occurrence of ecological traps for seabirds. Through a systematic review of the literature and Bayesian multilevel models, accounting for phylogenetic relatedness (341 species), we show a clear preference–performance mismatch in which slow-lived seabirds, such as albatrosses, are more likely to utilize trophic subsidies from fisheries, and these species (scavengers and slow) are more likely to be threatened by bycatch (IUCN). Adding to the recent evidence that ecological traps are a relevant phenomenon in marine ecosystems, we suggest that traps should be one of the main mechanisms explaining the interactions between seabirds and fisheries. Furthermore, ecological traps could become a key theoretical framework to navigate towards ecosystem-based management of fisheries. Specifically, ecological traps could help raise awareness about the severity of the problem, increase the efficiency of management and conservation initiatives (e.g., through mechanistic models), and enforce mitigation measures.