

Plant invasions in the Anthropocene

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RE: Birds point the way to incorporating the human-activity hypothesis in invasion biology

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In a recent Perspective, Kueffer (1) raises an important point – that today, in what some term the Anthropocene, human activity has a major role in shaping biotic invasions. Kueffer (2017) suggests that the current paradigm and invasion hypotheses should explicitly address this. The paper focuses on plant invasions. It is important to note that over the past decade, significant progress is being achieved in this space in avian studies across invasion phases, from introduction and establishment through spread to invasion and impact. Multiple case studies now suggest that incorporating human-related factors helps better understand and predict avian invasion, supporting the human-activity hypothesis (2–5) and changing paradigms. We now know that beyond ecological and environmental factors, socio-economic, as well as political and historical factors, can be key in shaping invasions over space and time (3).

For example, socio-political and historic factors, such as economic isolation between Eastern and Western Europe during the Cold War, have been the major factor shaping introduction and richness of alien birds in Europe (6). Correspondingly, recent global scale analyses suggest that human-related factors, such as colonial history and economic factors (e.g., 4) are important in shaping introduced avian species richness. Incorporating these factors when predicting and managing invasions can save time and limited resources. Future work should aim to refine the human-activity hypothesis, developing more detailed predictions and examining different human activities across systems and taxa.

While more detailed information is often available for invasive birds compared with plants and while avian and plant invasions may differ in the relative importance of the factors shaping their outcomes, species from different taxa often invade concurrently, creating synergies that shape invasion outcomes (7–9). Integrated work across taxonomic groups and across multiple spatial scales and regions (e.g., 3) is needed to advance transfer of hypotheses and paradigms.

References

1. C. Kueffer, Plant invasions in the Anthropocene. *Science*. 358, 724–725 (2017).
2. F. Chiron, S. Shirley, S. Kark, Human-related processes drive the richness of exotic birds in Europe. *Proc. R. Soc. B Biol. Sci.* 276, 47–53 (2009).
3. P. Pyšek et al., Disentangling the role of environmental and human pressures on biological invasions across Europe. *Proc. Natl. Acad. Sci.* 107, 12157–12162 (2010).
4. E. E. Dyer et al., The Global Distribution and Drivers of Alien Bird Species Richness. *PLOS Biol.* 15, e2000942 (2017).
5. M. McKinney, S. Kark, Factors shaping avian alien species richness in Australia vs Europe. *Divers. Distrib.* 23, 1334–1342 (2017).
6. F. Chiron, S. M. Shirley, S. Kark, Behind the Iron Curtain: Socio-economic and political factors shaped exotic bird introductions into Europe. *Biol. Conserv.* 143, 351–356 (2010).
7. W. A. Ruscoe et al., Unexpected consequences of control: Competitive vs. predator release in a four-species assemblage of invasive mammals. *Ecol. Lett.* 14, 1035–1042 (2011).
8. D. Simberloff, B. Von Holle, Positive interactions of nonindigenous species: invasional meltdown? *Biol. Invasions.* 1, 21–32 (1999).
9. D. Simberloff, Invasional meltdown 6 years later: Important phenomenon, unfortunate metaphor, or both? *Ecol. Lett.* 9, 912–919 (2006).

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