
The changing face of invasion science

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Abstract

The phenomenon of biological invasions has intrigued naturalists and biogeographers since at least the mid 18th century. Charles Elton's 1958 book on *The Ecology of Invasions by Animals and Plants* is widely acknowledged as the foundation publication for what became "invasion ecology" and has now morphed into "invasion science". The study of invasions increased rapidly in the 1980s, and has grown exponentially since the turn of the century (e.g. Web of Science lists 67 papers on "invasive species" published in 2000, and 1809 in 2017 – a 27-fold increase).

The extent of biological invasions is growing rapidly in all parts of the world, with no sign of saturation in the accumulation of alien and invasive species in most taxonomic groups. Impacts are also increasing in all ecosystems and many invasive species have caused extinctions, triggered regime shifts, and led to radical changes in ecosystem functioning and the delivery of ecosystem services.

Challenges involved in managing invasions are becoming increasingly complex due to interactions of many factors, including: the large number of invasion pathways for the intentional and accidental movement of species between and within regions; the growing numbers of invasive species that have clearly negative impacts; complex (and often synergistic) interactions between biological invasions and other facets of global change; and the increasing number of stakeholder groups and complex conflicts of interest pertaining to alien species that benefit particular sectors of society but cause negative impacts to others.

Invasion science seeks to understand many things: the pattern of human-mediated movements of species around the world; the factors that mediate the invasiveness of alien species and the invasibility of ecosystems; how humans perceive invasions, attach value to the benefits and costs incurred by alien species, and integrate many factors to decide on management options.

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