

# Science for Environment Policy

## What are the impacts of invasive alien species?

**The impacts of invasive alien species (IAS)** can take many different forms, from ecological to socio-economic. A new review investigates how to define and quantify 'impact' and discusses the most successful strategies to reduce invasion risk and prevent different impacts.

**Biological invasions** can substantially degrade ecosystems and IAS are listed among the primary causes of global [biodiversity](#) loss. For example, among [aquatic](#) species introduced to six European countries, 69% have had detrimental ecological impacts.

However, defining and quantifying such impacts can be difficult. As a result, the focus of invasion science has recently shifted from impacts on particular species to cumulative impacts on ecosystems, revealing that the effects of an introduction can be many and varied. For example, the predatory flatworm, invasive to the UK, not only reduces numbers of native earthworms, affecting food supply for birds, but also means the [soil](#) becomes less porous, increasing waterlogging. This in turn affects conditions for plants and makes the habitat less suitable for moles.

Furthermore, beyond ecological consequences, economic and sociological factors must also be considered when the impact of IAS is evaluated. For example, when the Japanese tiger prawn became established as an invasive species in the Mediterranean, it was welcomed by local fishermen who benefited from the extra income. However, the invasion led to the extinction of a native species of prawn and therefore was regarded as harmful by conservationists.

Similarly, while the invasion of pine trees throughout the southern hemisphere reduces the quality of litter (dead plant material on the forest floor) and depletes soil biodiversity, these fast-growing trees also support timber industries, benefiting local economies.

Management of impacts and [risks](#) must also be carefully considered. The Convention on Biological Diversity<sup>1</sup> states that prevention of invasive species is the priority response, followed by rapid eradication efforts if needed. Prevention measures can include intercepting species moving across borders. For example, the treatment of ballast water on ships can be used to kill marine organisms and prevent them from spreading to new regions.

If prevention fails, swift action greatly increases the likelihood of successful eradication, the authors of the review note. For example, an eradication effort in California to remove an invasive species of seaweed mounted within six months of invasion was successful in two years. In the Mediterranean, however, several years' delay in eradication efforts allowed the species to spread for thousands of kilometres along the coasts of many southern European countries and the species now cannot be removed with current technologies.

Good management strategies must also include good communication between scientists and the public to improve awareness of the impacts of invasive species on ecosystems, the authors conclude. In particular, increased awareness of the subtler impacts of invaders on the entire ecosystem is needed.



September 2013  
Thematic Issue 41:  
Invasive Alien  
Species

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**Source:** Simberloff, D., Martin, J-L., Genovesi, P., *et al.* (2013). Impacts of biological invasions: what's what and the way forward. *Trends in Ecology & Evolution*. 28 (1): 58-66. DOI: 10.1016/j.tree.2012.07.013

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To cite this article/service: "Science for Environment Policy": European Commission DG Environment News Alert Service, edited by SCU, The University of the West of England, Bristol.

1. <http://www.cbd.int/convention/>