We need to strengthen, not weaken, the struggle against harmful invasive species

An ISSG response to recent articles calling us to re-think the struggle against biological invasions

The Invasive Species Specialist Group (ISSG) of the International Union for the Conservation of Nature (IUCN) is a voluntary global network of about 1,000 scientists and practitioners working to mitigate the impacts of biological invasions.

In an article published in Science on March 18th ("Embracing invasives", G. Vince, Science 331, p. 1383) the attempt to mitigate impacts of invasive species in the Galàpagos islands is presented as a general failure, and the article concludes that – even in the Galapagos—"..ecosystem planning must address human needs, such as providing timber, grazing, or shade or limiting erosion, in addition to nurturing biodiversity," and that it is time "..to embrace the aliens". In another article published on April 2nd in the New York Times, Hugh Raffles accused invasive species opponents of being unreasoningly dogmatic, and xenophobic.

We believe that the vision presented in these two articles is, simplistic, and misleading. Both articles describe our actions as a failed policy aimed solely at maintaining pristine ecosystems, mostly through the eradication of all non-native species, with the aim to preserve an unattainable ideal model.

Invasive species scientists and managers are well aware that, in most areas, we deal with modified ecosystems. We are motivated by the escalating loss of biological diversity, a loss that, in the final analysis, will have serious repercussions for all life on this planet, irrespective of "providing timber, grazing, or shade or limiting erosion" as Dr Vince requests. Our concern is based on the accumulation of well-documented cases of severe impacts, including species extinctions and major economic losses. We are driven to reduce the inevitable health impacts to humans, as well as to native and agricultural plants and animals. Invasion specialists are not averse to non-native species as such, and are fully aware that the majority of them do not cause problems, with many being beneficial to our lives. We are concerned about the serious impacts of a small subset of non-native species, which become "invasive," meaning that they cause significant damage.

We are well aware that "pristine" conditions are rare and we do not aim for unrealistic goals. Rather, we take a pragmatic approach to preventing or mitigating the worst impacts of invasives. In so doing we take the preservation of native species in their natural habitats as an inherent "good" that our generation, as the current steward of this remarkable planet, is responsible for passing down to future generations. In particular, native plant species, ones that, over time, evolved mutualistic relationships with the food web of organisms, like pollinators, within the ecosystems they inhabit, by virtue of being capable of photosynthesis, represent a critical first trophic level within those ecosystems.

We all agree that the best way to deal with this threat is through a combination of preventive measures, "early detection and rapid response" to new incursions, with permanent management only as the last option. This approach has been globally adopted by the Convention on Biological Diversity (COP decision VI/23) and by the IUCN (McNeely et al. (eds.) 2001; A Global Strategy on Invasive Alien Species, IUCN Gland, Switzerland, and Cambridge, UK).

We must give priority to prevention, as management is a far more costly alternative. Few would object to the need to prevent the introduction of the West Nile virus, fire ants, rats, mice, termites, and mosquitoes that carry new diseases; or to Dutch-elm disease, the emerald ash borer, the chestnut blight and the chytrid fungus that is currently decimating numerous frog and salamander species; or large numbers of other pests.

Further, presenting the management of invasive species as a general failure is overly pessimistic. There are, on record, an increasing number of successful attempts to remove the most harmful invasive species, with over 1,000 eradications successfully completed worldwide. In many cases, these actions contributed more than any other conservation action to the recovery of threatened species, and to the protection of the livelihoods of many human communities.

Critical, far-flung, bird-nesting areas around the world owe their viability to intensive eradication efforts directed at rats, feral cats, feral goats, invasive plants, and other non-native species. Eleven bird, five mammal, and one amphibian globally threatened species have improved their conservation status as a direct result of eradication programs (M. A. McGeoch et al., 2010. Diversity Distrib. 16, 95).

The Working for Water program in South Africa has been a dramatic success in invasive species control aimed at securing water for the people, and enhancing the productive uses of the land; further, it has employed tens of thousands of the area's poorest inhabitants. Programs to control smothering infestations of water hyacinth in Central Africa are critical to the reduction of its impacts on essential fisheries, to the preservation of access to potable water and water transport, and to the protection of water reservoirs.

As well as having an ecological foundation, the need to strengthen, not weaken, the struggle against harmful invasive species has an economic basis. The annual losses caused by introduced pests in the United States, United Kingdom, Australia, South Africa, India and Brazil have been calculated to be in the range of US$ 300 billion per year. In Europe alone, the economic costs of invasions are estimated at well above 12 billion Euros per year (http://ec.europa.eu/environment/nature/invasivealien/docs/Kettunen2009_IAS_Task%201.pdf).

The global community needs to take concerted action to address this threat. Invasions are growing at an unprecedented rate (in Europe 76% increase in the last 35 years (Butchart et al. 2010, Science 328, p. 1164)). In October 2010, in Nagoya, Japan, representatives from 193 Parties to the Convention on Biological Diversity adopted an historic Strategic Plan for Biodiversity for 2011-2020. It includes a target to prevent, control, and eradicate the most harmful invasive, non-native species as an essential element to the struggle to save native species for future generations. Invasion scientists and practitioners work to achieve this target and make this commitment come true. Merely focusing on the difficulty of the task ahead, or cases of failure, does nothing to sustain our spaceship Earth.

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