

## THE NATURE AND ASSESSMENT OF ENVIRONMENTAL IMPACTS CAUSED BY ALIEN SPECIES

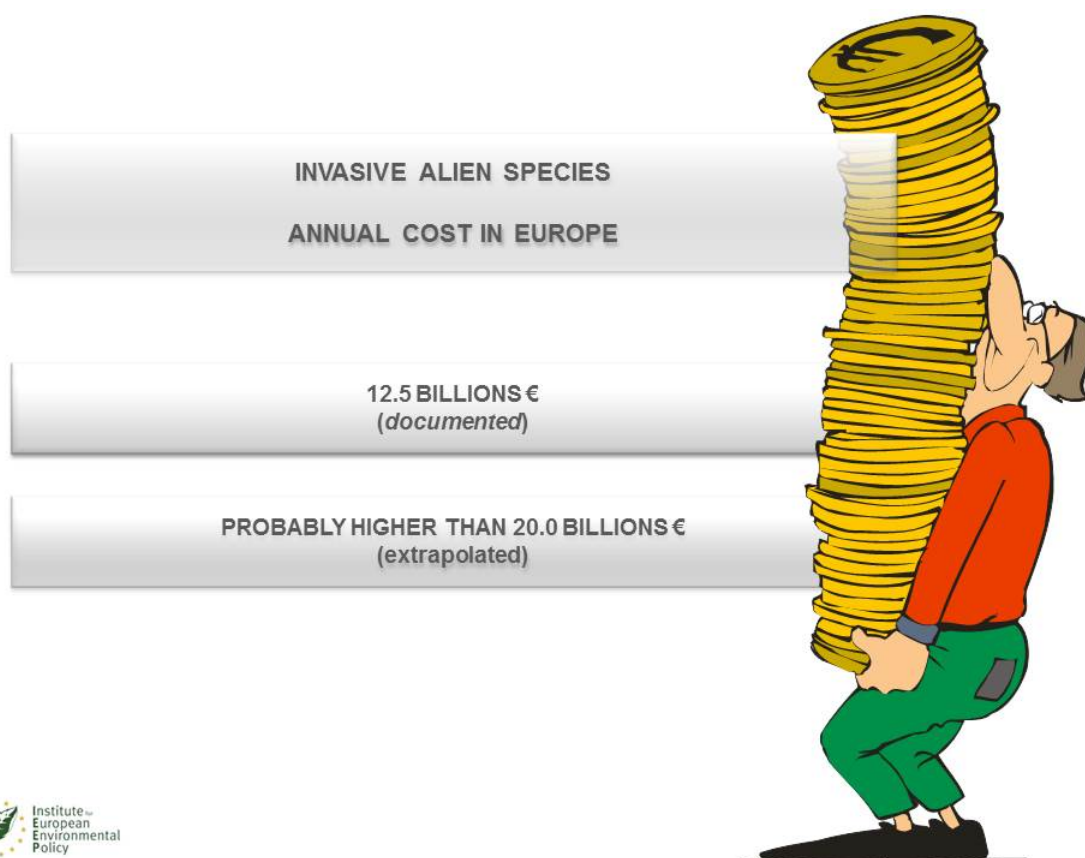
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Alien, exotic, non-indigenous, or non-native species are species that have been transported outside their natural ecological range as a result of human activities.

Most of these species are unable to survive into the new and unfamiliar environment without human intervention but some of them can fully adapt to it, and establish their populations causing significant ecological and economic damages.

These detrimental species are known as “Invasive Alien Species” (IAS), and it is well established that their introduction and spread outside the natural ecological range poses a big threat to biodiversity and economy. It is estimated that there are already over 12,000 alien species in Europe, of which more than 1,300 are invasive. European IAS belong to all main taxonomic groups consisting of mammals, amphibians, reptiles, fish, invertebrates, plants, fungi, bacteria and other micro-organisms, and are found in many different habitats, on land and in fresh-, brackish- and sea-water. Based on documented costs the total monetary impacts of IAS in Europe reaches about 12.5 billion € per year, while a still underestimated but more reliable value has been extrapolated and quantified in 20.0 billion €/y (IEEP, 2008).



The acute increase in international trade, tourism and travelling, house pet commerce, transportation of items, goods, and people, are new, unprecedented ways for living organisms

such as animals, plants and even very small or microscopic creatures to cross country and biogeographic borders.

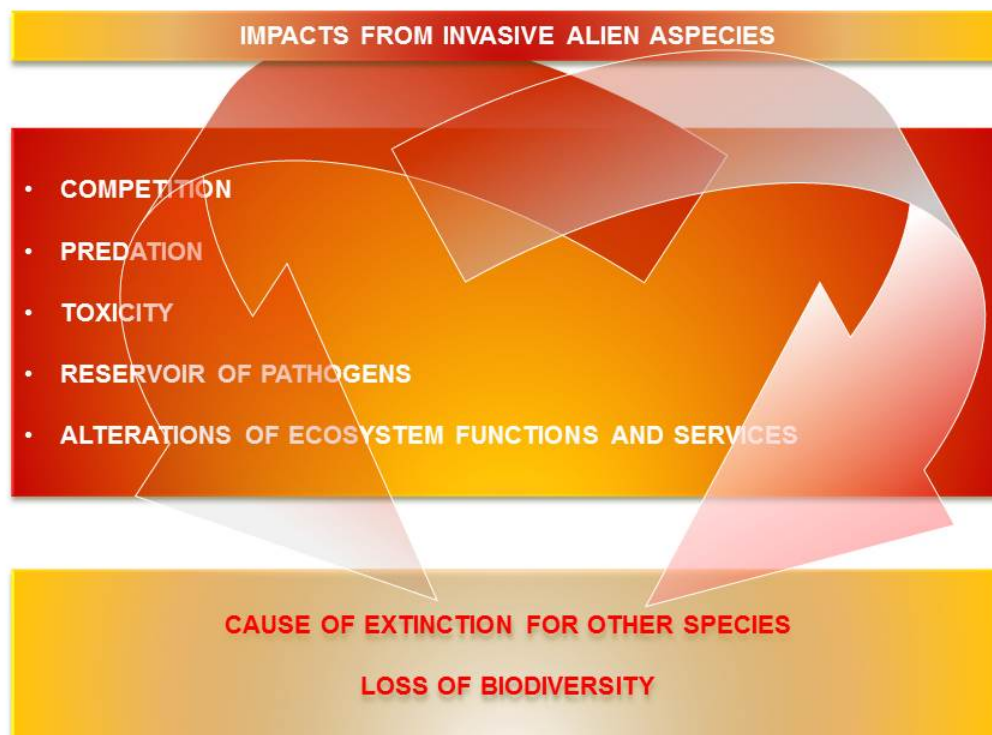
*“World trade has become the primary driver of one of the most dangerous and least visible forms of environmental decline: thousands of species are hitchhiking to new homes aboard ships, planes, and trains and in the process are degrading ecosystems, threatening public health, and costing billions of dollars annually” (Bright, 1999).*

The so-called “globalization” backed by climate change is largely responsible for the introduction and diffusion of non-native species in regions which are definitely different from their natural habitats.

IAS are considered the second cause of biodiversity loss after habitat destruction, and in particular an analysis of the International Union for Conservation of Nature (IUCN) *Red List* (list of threatened species, and the world's most comprehensive inventory of the global conservation status of plant and animal species) shows that *“... they are the second most common threat associated with species that have gone completely extinct, and are the most common threat associated with extinctions of amphibians, reptiles and mammals ...”*.

Moreover, IAS are a serious obstacle to the conservation and sustainable use of biodiversity, they are responsible of numerous health problems (e.g. allergies and skin damages), they reduce yields from agriculture, forestry and fisheries, they cause land degradation, and can lead to decline in recreational or cultural heritage values associated with landscape and natural beauties.

Europe looks at the proliferation of IAS as to an emerging issue, assessing IAS introductions as one of the main recorded causes of biodiversity loss and serious damage to economy and health.



IAS have been defined “*pathogens of globalization*” (Bright, 1999) and also “*biological pollutants*” (Elliot, 2003). Unlike chemical substances they reproduce, diffuse autonomously, and can rapidly adapt to environmental changes. Their impact can increase during time also after their introduction has reached its end.

“*Alien species invasions are regarded as one of the most powerful instruments by which humans transform the planet*” (Simberloff et al., 2012), they cause homogenization, “*McDonaldization*” of ecosystems, to the point that according to Rosenzweig (2001) this process will lead Earth to a future “*Homogocene*” era.

There is a growing need for befitting initiatives and efforts to reach the common, social goal of the protection of natural environments and native species. These actions start with the dissemination of knowledge and information to raise awareness of different actors and stakeholders, including citizens, to allow for prevention and proper management of alien species.



If “... *alien species are one of the major agents of human-accelerated global change (they threaten biodiversity, alter ecosystem structure, functions and services, inflict large economic costs and cause serious problems to human health) ...*” (Mazza et al., 2013), it is important to outline that the loss of biodiversity is not only a loss of habitat and species but also of connections and traditions related to ecosystem services and the territory. The defense and valorization of biological diversity has a higher and more considerable significance than the simple protection of the environment. It

includes in fact the protection of stories, cultures, social, and identity values of the local communities. When we lose biodiversity we can say we lose a piece of our own identity.

## References

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