

1 / Invasive alien species: data on trends and impacts³



Overview

People and nature are threatened by invasive alien species in all regions of Earth {KM-A1}⁴. More than 37,000 established alien species, including more than 3,500 invasive alien species with documented impacts, have been recorded worldwide (*well established*) {A1}, and the number of alien species is rising globally at unprecedented and increasing rates (*well established*) {B10}.

Invasive alien species are a major direct driver of change, causing biodiversity loss, including local and global species extinctions (*well established*) {A2}. Invasive alien species have contributed solely or alongside other drivers of change to 60 per cent of recorded global animal and plant extinctions (*established but incomplete*) {A2}, and at least 218 invasive alien species have caused 1,215 documented local extinctions of native species across all taxa (*established but incomplete*) {A2}.

The economy, food security, water security and human health are profoundly and negatively affected by invasive alien species {KM-A3}. Nearly 80 per cent of the documented impact of invasive alien species on nature's contributions to people are negative (*well established*) {A4}. Invasive alien species can threaten livelihoods, water and food security, economies and human health (*well established*) {A5}; with 85 per cent of the documented impact of invasive alien species on good quality of life being negative (*well established*) {A5}.

1. This factsheet is part of a series of factsheets, which highlight a selection of key elements on specific themes from the Summary for Policymakers of the IPBES Assessment Report on Invasive Alien Species and their Control. For further information and context, please consult the Summary for Policymakers and Chapters of that Assessment Report.

2. IPBES (2023). Summary for Policymakers of the Thematic Assessment of Invasive Alien Species and their Control of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Roy, H.E., Pauchard, A., Stoett, P., Renard Truong, T., Bacher, S., Galil, B.S., Hulme, P.E., Ikeda, T., Kavileveetil, S., McGeoch, M.A., Meyerson, L.A., Nuñez, M.A., Ordóñez, A., Rahlao, S.J., Schwindt, E., Seebens, H., Sheppard, A.W., Vandvik, V. (eds.). IPBES secretariat, Bonn, Germany. <https://doi.org/10.5281/zenodo.7430692>

3. <https://zenodo.org/doi/10.5281/zenodo.10057013>

4. The references enclosed in curly brackets (e.g., {KM-A1, B10}) are traceable accounts and refer to sections of the Summary for Policymakers of the IPBES Assessment of Invasive Alien Species and their Control. A traceable account is a guide to the section in the summary for policymakers and the chapters that contains the evidence supporting a given message and reflecting the evaluation of the type, amount, quality, and consistency of evidence and the degree of agreement for that statement or key finding.

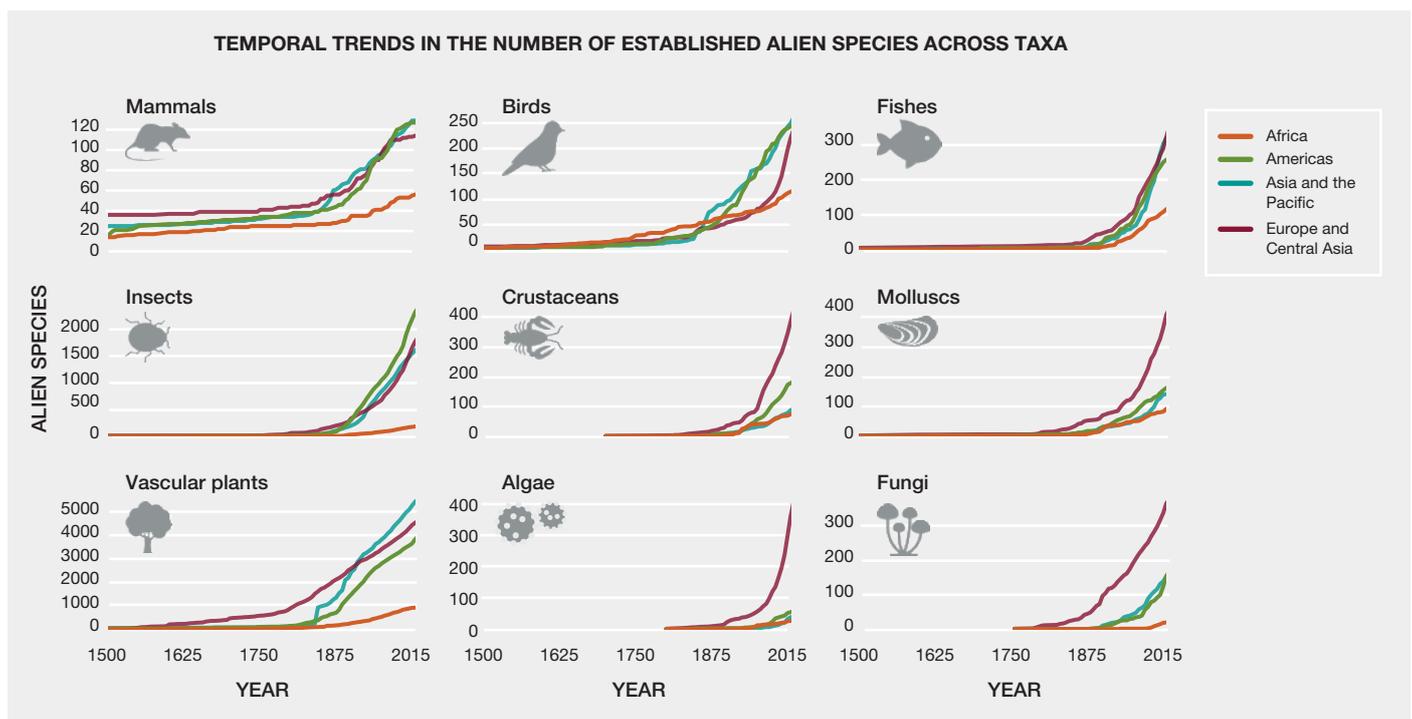
Status, trends and pathways

➤ **Definition:** The term “biological invasion” is used to describe the process involving the intentional or unintentional transport or movement of a species outside its natural range by human activities and its introduction to new regions, where it may become established and spread {Introduction}. Invasive alien species represent a subset of alien species, known to have established and spread with negative impacts on biodiversity, local ecosystems and species {Introduction}. Many invasive alien species also have impacts on people {Introduction}.

➤ **Number of alien and invasive alien species:** More than 37,000 established alien species, including more than 3,500 invasive alien species with negative impacts, have been recorded worldwide (*well established*) {A1}. Although their numbers are likely to be underestimated, to date 1,061 alien plants (6 per cent of all established alien plants), 1,852 alien invertebrates (22 per cent), 461 alien vertebrates (14 per cent) and 141 alien microbes (11 per cent) are known to be invasive (*established but incomplete*) {A1}.

➤ **Trends and scenarios:** The number of established alien species is rising globally at unprecedented and increasing

rates (*well established*) and is expected to continue increasing in the future (*well established*) {B10}. Alien species are being introduced globally at an unprecedented rate; currently, approximately 200 new alien species are recorded every year (*well established*) {A1}. The number of alien species has been rising continuously for centuries in all regions (*well established*) {B10}. Global exploration and colonialism beginning in 1500, with the associated movement of people and goods, and industrialization from 1850 resulted in the transport and introduction of alien species and were historically important {B10}. Increases in global trade since 1950 have resulted in unprecedentedly high and increasing rates of alien species introduction (*well established*) {B10}. Under a “business-as-usual” scenario, which assumes the continuation of past trends in drivers, the total number of alien species is expected to further increase globally, and by 2050 is expected to be approximately 36 per cent higher than in 2005 (*established but incomplete*) {B10}. As trends in major drivers are predicted to accelerate in the future (*well established*) {B10}, the number of alien species is expected to increase faster than predicted under the “business-as-usual” scenario (*established but incomplete*) {B10}.

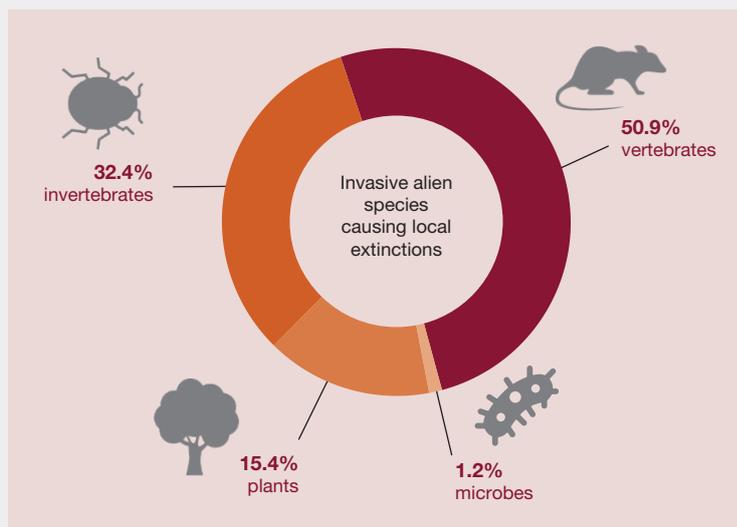


Temporal trends in the number of established alien species from 1500 to 2015 shown for mammals, birds, fishes, insects, crustaceans, molluscs, vascular plants, algae and fungi, for the various IPBES regions.

➤ **Pathways & drivers:** Intentionally or not, many human activities facilitate biological invasions globally (*well established*) {B9}. The increase in the transport and introduction of invasive alien species worldwide is primarily influenced by economic drivers, especially the expansion of global trade and human travel (*well established*) {B11}. Accelerated establishment and spread of invasive alien species within countries are primarily driven by direct drivers, notably changes in land- and sea-use (*well established*) {B12}. Interactions among drivers are amplifying biological invasions (*well established*) {B13}. Climate change will further exacerbate the establishment of some invasive alien

species and will be a major cause of future establishment and spread {KM-B3}. Biodiversity loss can reduce the resilience of ecosystems to invasive alien species, with subsequent feedback facilitating the establishment and spread of other invasive alien species (*well established*) {B13}. Indirect drivers also interact with one another. For example, sociocultural changes may lead to increased rates of infrastructure development through urbanisation, and these interactions may further influence the rate and magnitude of change in land- and sea-use and other direct drivers that may in turn facilitate biological invasions (*well established*) {B13}.

Impacts on nature

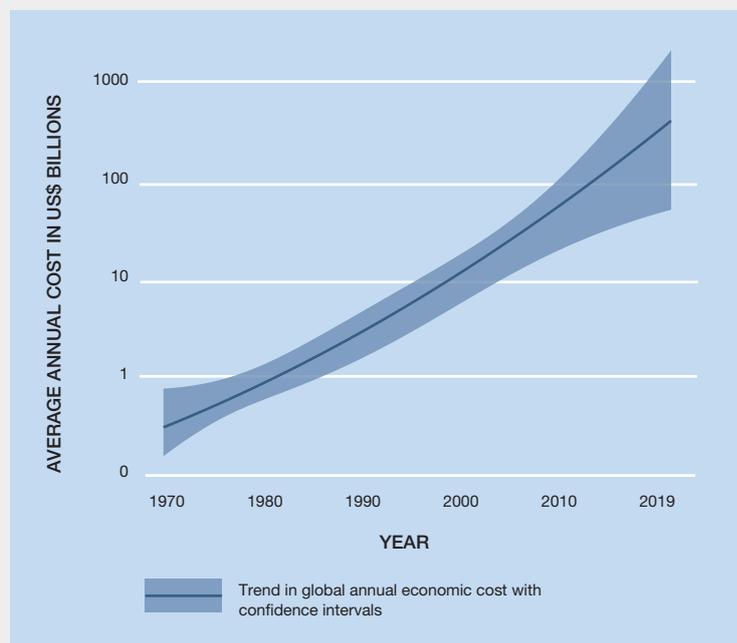


The taxonomic distribution (i.e., plants, invertebrates, vertebrates and microbes, including fungi) of the percentage of invasive alien species documented as causing local extinctions of native species.

Biological invasions are a major direct driver of change, including local and global species extinctions (*well established*) {A2}.

Some invasive alien species have a profound ecological impact that spans various levels, from individual species and communities to whole ecosystems, resulting in complex undesirable and in some cases irreversible outcomes when the system has crossed a threshold beyond which ecosystem restoration is not possible (*well established*) {A2}. Invasive alien species have contributed solely or alongside other drivers of change to 60 per cent of recorded global animal and plant extinction, while invasive alien species are the only driver attributed to 16 per cent of documented global extinctions (*established but incomplete*). At least 218 invasive alien species have caused 1,215 documented local extinctions of native species across all taxa (*established but incomplete*) {A2}.

Impacts on nature's contributions to people

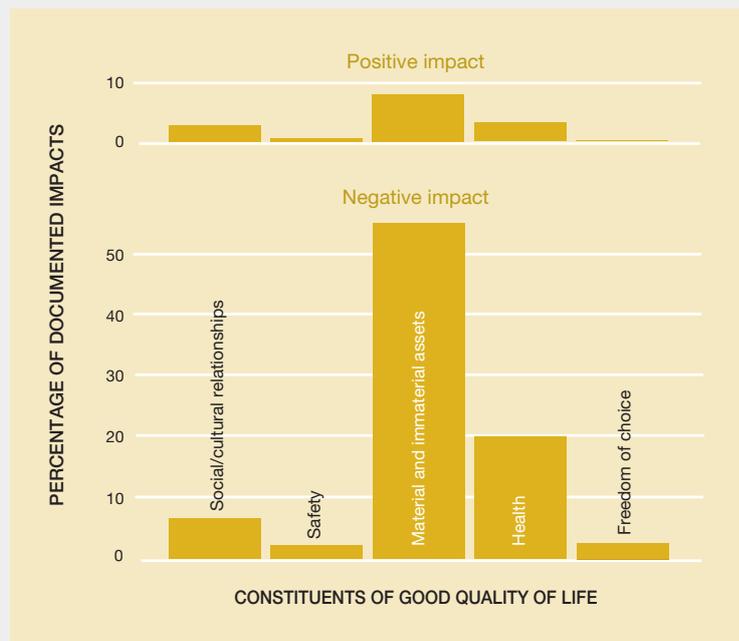


Growth of the documented average annual economic cost of biological invasions.

Invasive alien species adversely affect the full range of nature's contributions to people, imposing an economic burden (*well established*) {A4}.

Nearly 80 per cent of the documented impacts of invasive alien species on nature's contributions to people are negative (*well established*) {A4}. Reduction in food supply is by far the most frequently reported impact across all taxa and regions (*well established*) {A4}. In terrestrial systems, invasive alien plants are the taxonomic group most frequently reported as having a negative impact (*well established*) {A4}. In coastal areas, invasive alien invertebrates are the most frequently reported taxonomic group with an impact on nature's contributions to people (*well established*) {A4}. In 2019, global annual costs of biological invasions were estimated to exceed \$423 billion, with variations across regions, but this is likely a gross underestimation (*established but incomplete*) {A4}. Ninety-two per cent of this cost is attributed to the damage that the invasive alien species have caused to nature's contributions to people and good quality of life; only 8 per cent is related to the management expenditures for biological invasions (*established but incomplete*) {A4}. The documented global economic cost of biological invasions has increased fourfold every 10 years since 1970 and is anticipated to continue rising (*established but incomplete*) {B10}.

Impacts on good quality of life



Percentage of the number of documented positive and negative impacts of invasive alien species on the constituents of good quality of life.

Biological invasions overwhelmingly undermine good quality of life (*established but incomplete*) {A5}. Invasive alien species can threaten livelihoods, water and food security, economies and human health (e.g., causing diseases, allergies and physical injuries) (*well established*) {A5}; with 85 per cent of the documented impacts of biological invasions on quality of life being negative (*well established*) {A5}. Invasive alien species can also serve as vectors for infectious zoonotic diseases that can lead to epidemics (*well established*) {A5}. Biological invasions can add to marginalization and inequity, including, in some contexts, gender- and age-differentiated impacts {KM-A4}. Biological invasions can also adversely affect the autonomy, rights and cultural identity of Indigenous Peoples and local communities (*established but incomplete*) through the loss of traditional livelihoods and knowledge (*well established*) {A6}.