

3/ Invasive alien species affect protected areas and most natural ecosystems³



Overview

People and nature are threatened by invasive alien species in all regions of Earth {KM-A1}⁴.

Some areas, despite being protected for nature conservation or being remote (e.g., high mountains), and also tundra and deserts, are also vulnerable to the negative impacts of invasive alien species {KM-A2, A3}.

Even without the introduction of new species, already established alien species given the opportunity, may continue to expand their geographic ranges and spread into new countries, regions and ecosystems, including remote environments {KM-B2}.

Frequent long-term monitoring of sites ensures early detection of invasive alien species, including re-invasions, and can inform further management actions {KM-C5}.

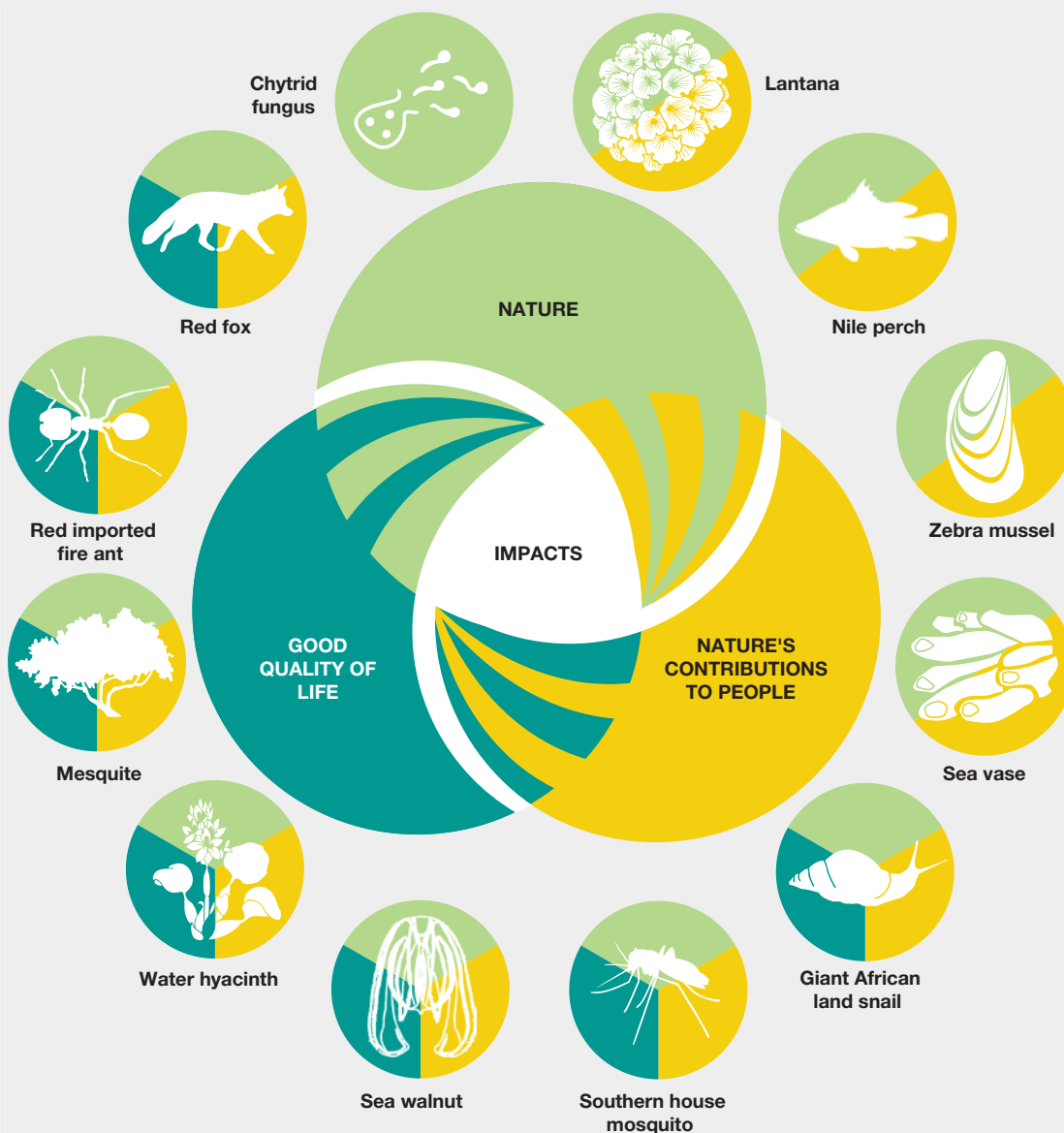
1. This factsheet is part of a series of factsheets, which highlight a selection of key elements on specific themes from the Summary for Policymakers of the IPBES Assessment Report on Invasive Alien Species and their Control. For further information and context, please consult the Summary for Policymakers 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.10057029>
4. The references enclosed in curly brackets (e.g., {KM-C1, B11}) 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.

Invasive alien species are a major threat to nature, nature's contributions to people and good quality of life, including in protected areas and most natural ecosystems

People and nature are threatened by invasive alien species in all regions of Earth {KM-A1}. More than 37,000 established alien species have been introduced by human activities across all regions and biomes of Earth {KM-A1}, with new alien species presently being recorded at an unprecedented rate of approximately 200 annually (*well established*) {A1}. A disproportionate number of documented negative impacts has been reported in terrestrial realms, especially in temperate and boreal forests and woodlands and cultivated areas (including agricultural land). About one quarter of documented negative

impacts have been reported from aquatic realms, especially from inland surface waters/waterbodies and shelf ecosystems. (*established but incomplete*) {A1}.

Invasive alien species have been reported in areas protected for nature, some remote areas (e.g., high mountains), and also in tundra and deserts, which emphasizes that these areas, despite being protected for nature conservation or remote, are also vulnerable to the negative impacts of invasive alien species {A3}.



Examples of invasive alien species with a negative impact on nature (green), and, in some cases, also nature's contributions to people (yellow) and/or good quality of life (teal).

Invasive alien species cause dramatic and, in some cases, irreversible changes to biodiversity and ecosystems across all regions of Earth, resulting in adverse and complex outcomes, including local and global species extinctions {KM-A2}. Invasive alien species have contributed solely or alongside other drivers to 60 per cent of recorded global extinctions, and are the only driver in 16 per cent of the documented global animal and plant extinctions (*established but incomplete*) {KM-A2}. Increased biotic homogenization (or loss of biotic uniqueness) of biological communities is a major negative impact of invasive alien species (*well established*) {A2}. The magnitude and types of impacts vary for different invasive alien species and across ecosystems and regions (*established but incomplete*) {KM-A2}.

Invasive alien species can add to marginalization and inequity, including, in some contexts, gender- and age-differentiated impacts {KM-A4}. People with the greatest direct dependence on nature, including those involved in gender- and age-specific activities, such as fishing or weeding, may be disproportionately affected by biological invasions {KM-A4}. More than 2,300 invasive alien species have been documented on lands managed, used and/or owned by Indigenous Peoples, with some negatively affecting their quality of life and cultural identities (*established but incomplete*) {A6}.

Globally, invasive alien species and their impact are increasing rapidly and predicted to continue rising in the future, including in protected areas and most natural ecosystems

The threats from invasive alien species are increasing markedly in all regions of Earth, with the current unparalleled high rate of introductions predicted to rise even higher in the future (*well established*) {KM-B2}. Even without the introduction of new species given the opportunity, many alien species already established in a region may continue to expand their geographic ranges and spread into new countries and regions (*well established*), including remote environments such as mountain, polar (i.e., Antarctica and the Arctic) and desert ecosystems (*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. Increases in global trade since 1950 have resulted in unprecedentedly high and increasing numbers of alien species being introduced (*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 worldwide is expected to increase faster than predicted under the “business-as-usual” scenario (*established but incomplete*) {B10}.

Intentionally or not, many human activities facilitate biological invasions globally (*well established*) {B9}. The ongoing amplification of drivers of change in nature may greatly increase the number of invasive alien species and their impacts in the future {KM-B3}. Climate change, along with the continued intensification and expansion of land-use change may lead to future increases in the establishment and spread of invasive alien species in disturbed habitats and in nearby natural habitats (*established but incomplete*) {B12}.

The magnitude of the future threat from invasive alien species is difficult to predict because of complex interactions and feedback among direct and indirect drivers of change in nature {KM-B4}. Climate change interacting with land- and sea-use change is predicted to profoundly shape and amplify the future threat from invasive alien species {KM-B4}.

Invasive alien species and their impact in protected areas and most natural ecosystems can be prevented and mitigated through effective management

Curbing the rising number of invasive alien species and reducing their spread and impacts are achievable through management actions in the short as well as long term {Introductory paragraph - C}. There are effective decision-making frameworks and tools that can support management of biological invasions (*well established*) {C16}.

Prevention is the best option, but early detection, eradication, containment and control are also effective in specific contexts {Introductory paragraph - C}.

Public awareness and engagement contribute to the effective management of biological invasions (*well established*) {D29}.

Frequent long-term monitoring of sites ensures early detection of new invasive alien species, including re-invasions, and can inform further management actions (*well established*) {KM-C5}. Adaptive management, possibly combining multiple options, will improve management of biological invasions under ongoing climate and land-use change (*well established*) {KM-C5}.

Ecosystem restoration can improve management outcomes, enhancing ecosystem function and resilience to environmental change, including future invasive alien species especially under climate and land-use change (*well established*) {C21}. The

success of any applied adaptive site- or ecosystem-based management approach, including ecosystem restoration, depends on long-term monitoring to assess management efficacy, using ecological and social indicators (*established but incomplete*) {C21}.

Existing evidence of the magnitude and extent of the impacts of invasive alien species supports immediate, strategic and sustained action to successfully address biological invasions (*well established*) {D32}. With sufficient resources, political will and long-term commitment, preventing and controlling invasive alien species are attainable goals that will yield significant long-term benefits for people and nature (*well established*) {KM-D7}. Increasing the availability and accessibility of information and means of implementation and addressing major knowledge gaps on biological invasions, particularly in developing countries, would result in more robust and effective policy instruments and management actions {KM-D7}.