Invasive Alien Species

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Outline

1. Why do Biological Invasions and Invasive Alien Species matter?

2. CBG T6 indicator

3. Gaps and future

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1. **Why do Biological Invasions and Invasive Alien Species matter?**

2. CBG T6 indicator

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Assessment Report on Invasive Alien Species and their Control

www.ipbes.net

The Intergovernmental Science-Policy Platform on Biodiversity & Ecosystem Services

#InvasiveAlienSpecies Assessment

UN environment programme

unesco

Food and Agriculture Organization of the United Nations

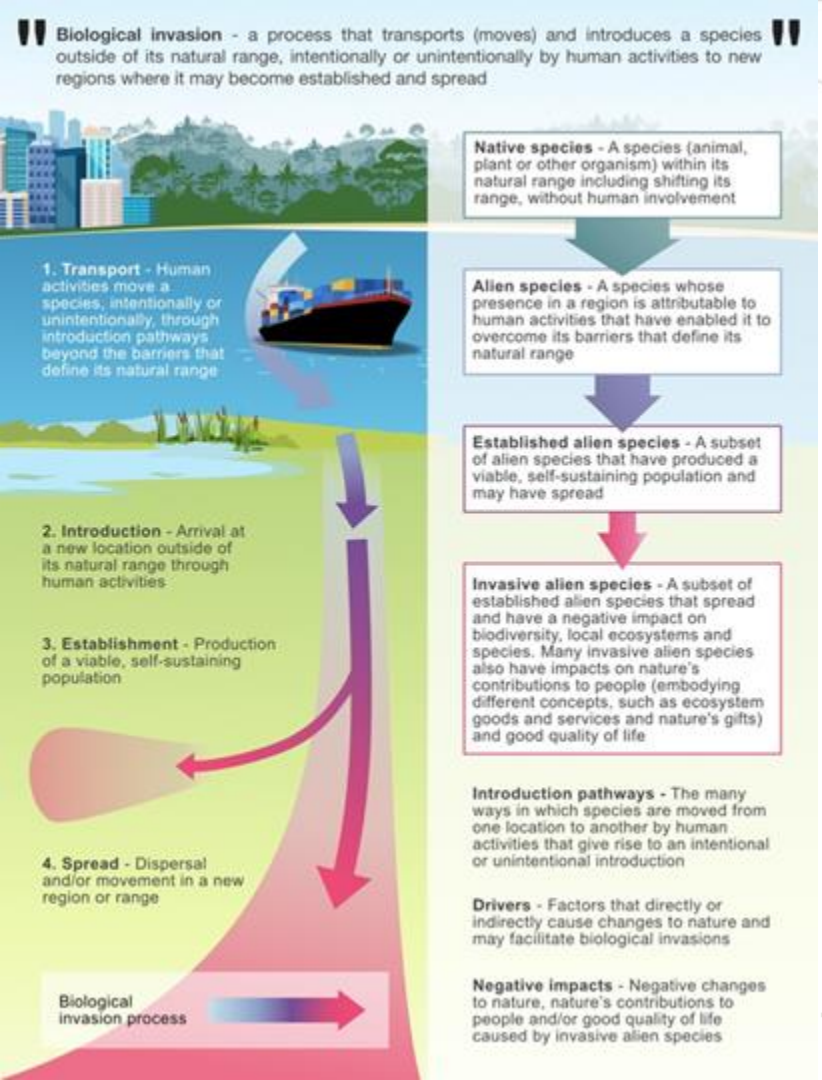
UNDP

1 ■ What are invasive alien species?

Invasive alien species are one of the 5 major drivers of biodiversity loss

Alien species are animals, plants, and other organisms that have been introduced by human activities to new regions

Invasive alien species are a subset of alien species, known to have established and spread with negative impacts on nature. Many invasive alien species also have impacts on people



"Biological invasions" is a term 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.

2. Findings of the report

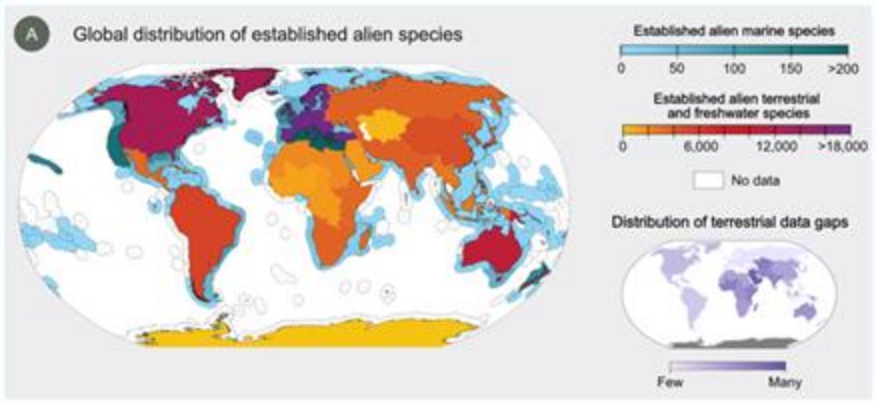
People and nature are threatened by invasive alien species in all regions of Earth

- 37,000 established alien species have been introduced by human activities worldwide
- 200 new alien species every year
- 3,500 invasive alien species, with negative impacts on nature, and also, in some cases, on people
- 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 globally

Invasive alien species are a global threat

Impacts from invasive alien species are reported in the Americas (34%), Europe and Central Asia (31%) and Asia-Pacific (25%), with fewer reported in Africa (7%)

Some areas, despite being protected for nature conservation or being remote, are also vulnerable to the negative impacts of invasive alien species.



75% of negative impacts are reported from the terrestrial realm, especially temperate and boreal forests and woodlands and cultivated areas

14% from the freshwater realm, especially from inland surface waters/waterbodies

10% from the marine realm, especially from shelf ecosystems

Invasive alien species cause dramatic and, in some cases, irreversible changes to nature across all regions of Earth

60% of global extinctions have been caused, solely or alongside other drivers, by invasive alien species

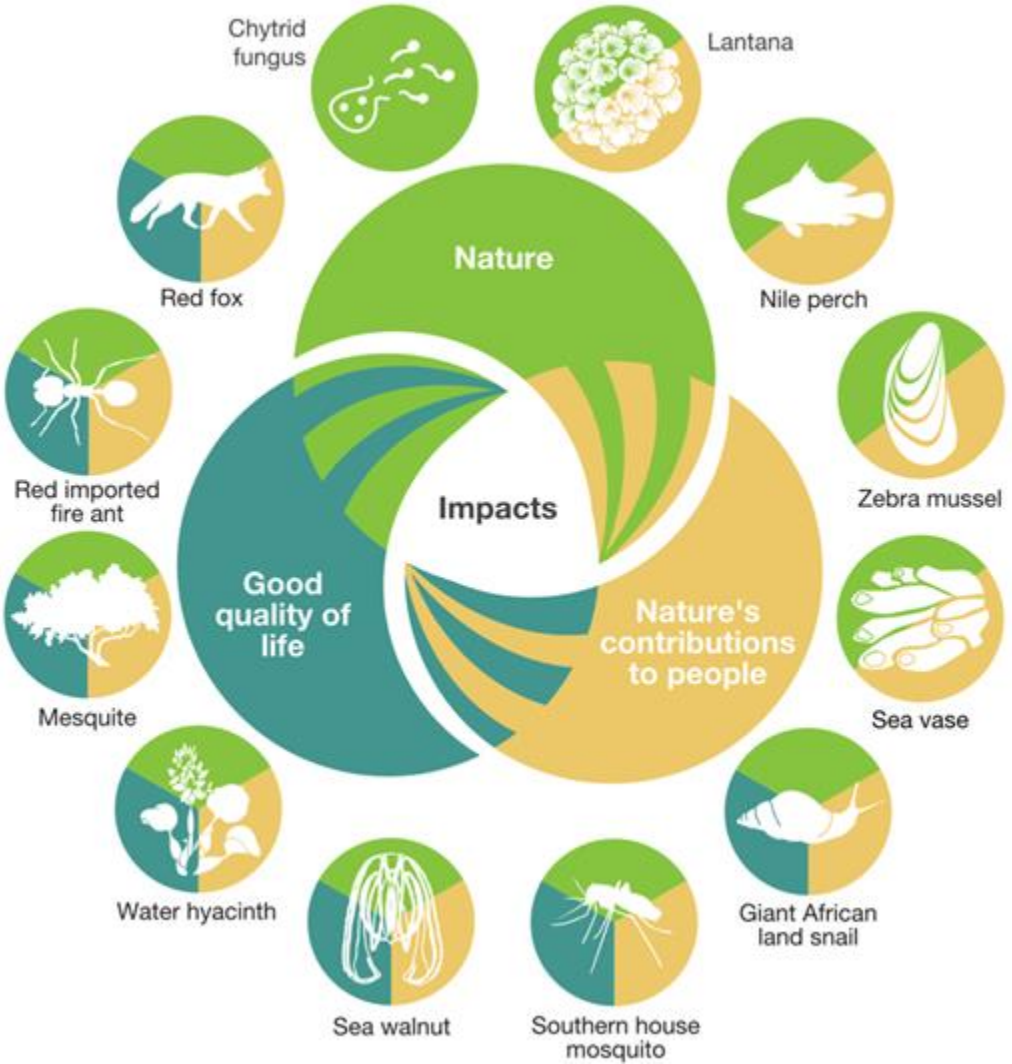
16% of global extinctions have been caused solely by invasive alien species

1,215 documented local extinctions of native species have been caused by invasive alien species

85% of documented impacts on nature are negative

Impacts of invasive alien species are varied

In addition to their impacts on nature, about 16% of invasive alien species have negative impacts on nature's contributions to people, and about 7% on good quality of life.



What are the mechanisms of impacts on nature?

And also through hybridization, transmission of disease, parasitism, poisoning/toxicity, bio-fouling or other direct physical disturbance, chemical, physical, structural impact on ecosystem and indirect impacts through interactions with other species

Invasive alien species are a major cause of biodiversity loss on islands

- 20% of all impacts are reported from islands
- 90 per cent of documented global extinctions with invasive alien species as one of the major causes are reported from islands
- The number of alien plants exceeds the total number of native plants on more than one quarter of islands
- Islands are also vulnerable to climate change, which can increase the rate of establishment and spread of many invasive alien species

How do invasive alien species impact people?

- Economies, food security, water security, human health and cultural identities are profoundly and negatively affected by invasive alien species

- 80% of documented impacts on nature's contributions to people are negative, with food supply being by far the most frequently reported impact

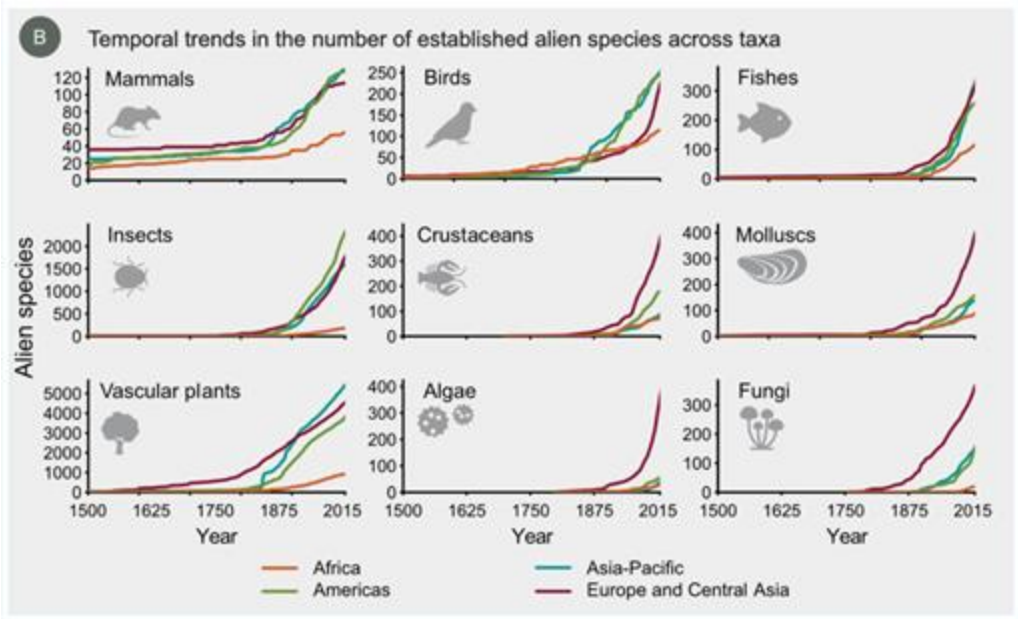
- In 2019, global annual costs of biological invasions were estimated to exceed $423 billion. 92 per cent accrue from the negative impact of invasive alien species on nature's contributions to people or on good quality of life, while only 8 per cent is related to management expenditures of biological invasions.

Current policies have been insufficient in managing biological invasions and preventing and controlling invasive alien species

- Although most countries (80%) have targets for the management of biological invasions within their national biodiversity strategies and action plans
- 83% of countries do not have national legislation or regulations directed specifically toward the prevention and control of invasive alien species.
- Nearly half of all countries (45%) do not invest in management of invasive alien species

The threats from invasive alien species are increasing significantly in every region and across all taxa

- 37% of all known alien species have been reported since 1970
- The number of alien species has been rising continuously for centuries in all regions and is expected to continue increasing in the future



People at the heart of the problem…

- Many human activities facilitate the transport, introduction, establishment and spread of invasive alien species

- If things remain unchanged, by 2050 the total number of alien species globally is expected to be about 36% higher than in 2005.

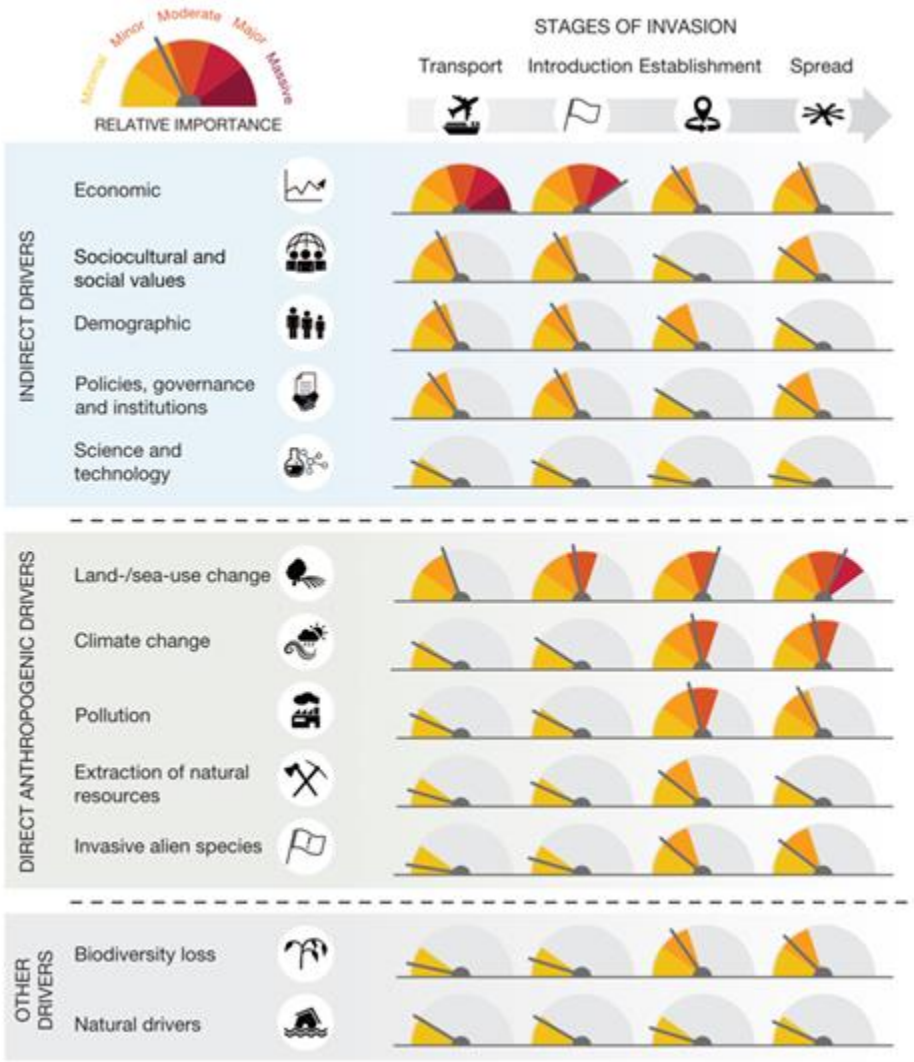
Economic activities, particularly global trade, increasingly facilitate the transport and introduction of invasive alien species

- There is a strong link between the volume of commodity imports and the number of invasive alien species in a region, and patterns in the global spread of species mirror shipping and air traffic networks
- Biosecurity measures at international borders have not kept pace with the growing volume, diversity and origins of global trade and travel
- Projected growth in international trade and movement of people, including tourism, will lead to further pressure on border inspection regimes and could soon overwhelm the biosecurity capability of most countries

Land- and sea-use change and climate change increasingly facilitate the establishment and spread of invasive alien species

- Land- and sea-use changes may increase the vulnerability of natural ecosystems and alter processes that cause natural disturbance of landscapes (e.g., wildfires)
- Transportation and utility infrastructures can create corridors that facilitate the spread of invasive alien species
- Marine and aquatic infrastructure may alter seascapes and the functioning of marine ecosystems, facilitating the spread of invasive alien species
- 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

Across all biomes, the relative importance of drivers in facilitating biological invasions varies across stages of the biological invasion process



The ongoing amplification of drivers of change in nature may substantially increase the number of invasive alien species and their impacts in the future

- Other drivers of change such demographic, economic, and land- and sea-use change are increasing and can amplify the threats and impacts of invasive alien species

- Climate change will also be a major cause of future increases in the risk of invasive alien species

… People at the heart of the solution

Biological invasions and their adverse impacts can be prevented and mitigated through effective management

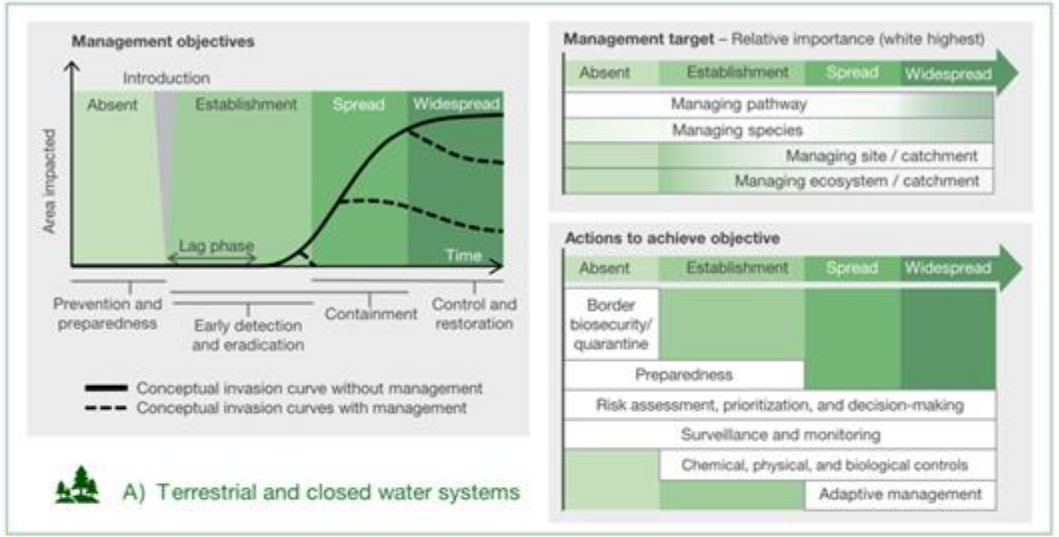
There are 3 management options:

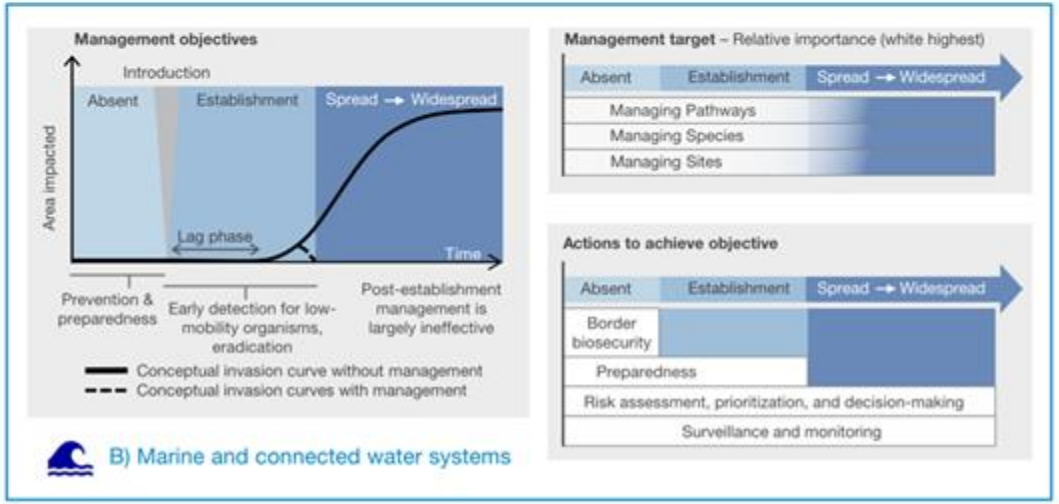
(a) management of pathways of introduction and spread of invasive alien species;

(b) management of target invasive alien species at either local or landscape scales; and

(c) site-based or ecosystem-based management.

Conceptual diagram of management-invasion continuum





Prevention and preparedness are the most cost-effective options

- Prevention can be achieved through pathway management, including strictly enforced import controls, pre-border, border and post-border biosecurity, and measures to address escape from confinement.
- Prevention is particularly important on islands, and it is also critical in marine and connected water systems, where most attempts at eradicating or containing invasive alien species have mostly failed.
- Sustained and adequate funding, capacity building, technical and scientific cooperation and transfer of technology, monitoring, quarantine and inspection facilities are necessary for effective prevention measures.

Prevention and preparedness are the most cost-effective options

- Eradication has been successful, especially for small and slow-spreading populations of invasive alien species, especially in isolated ecosystems
- Containment and control can be an effective option for invasive alien species that cannot be eradicated for various reasons in terrestrial and closed water systems, but most attempts in marine and connected water systems have been largely ineffective
- The recovery of ecosystem functions and nature's contributions to people can be achieved through adaptive management, including ecosystem restoration in terrestrial and closed water systems

Engagement and collaboration with stakeholders and Indigenous Peoples and local communities improves outcomes of management actions for biological invasions, particularly where there are conflicting perceptions of the value of invasive alien species and the ethics of management options

Management actions also benefit from sharing and collaboration across knowledge systems

Preventing and controlling invasive alien species can strengthen the effectiveness of policies designed to respond to other threats to biodiversity and contribute to achieving several Sustainable Development Goals

such as marine biodiversity (Goal 14) and terrestrial biodiversity (Goal 15), food security (Goal 2), sustainable economic growth (Goal 8) and sustainable cities (Goal 11), as well as climate change (Goal 13) and health and wellbeing (Goal 3).



In December 2022, Governments adopted the Kunming-Montreal Global Biodiversity Framework and agreed to:

"Eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by identifying and managing pathways of the introduction of alien species, preventing the introduction and establishment of priority invasive alien species, reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50 per cent by 2030, and eradicating or controlling invasive alien species, especially in priority sites, such as islands" Target 6.

The Kunming-Montreal Global Biodiversity Framework provides an opportunity for national governments to develop or update aspirational, ambitious and realistic approaches to prevent and control invasive alien species

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What Is the CBD T6 Indicator?

CBD T6 refers to Target 6 of the Kunming-Montreal Global Biodiversity Framework (GBF) under the Convention on Biological Diversity (CBD). This target focuses on combating invasive alien species (IAS) through prevention, establishment control, and mitigation of their impacts by 2030.

The Core Objectives of Target 6

Eliminate, minimize, reduce or mitigate

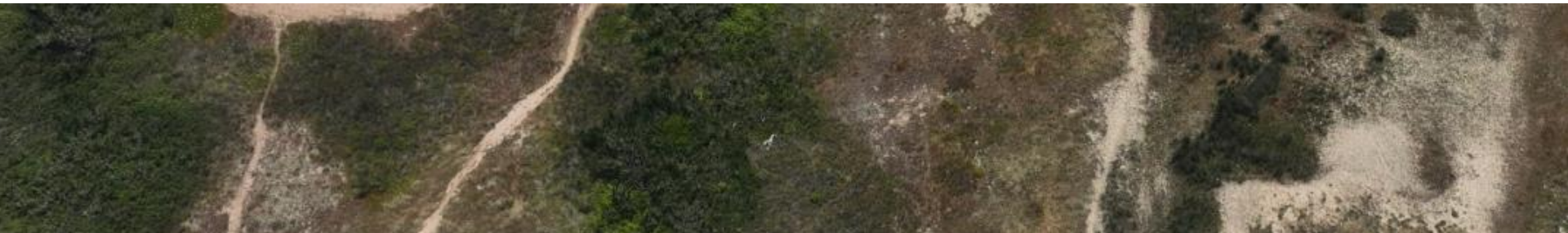
the impacts of IAS on biodiversity and

ecosystems

Identify and manage introduction pathways, such as intentional or accidental routes (e.g., trade, travel, contaminants).

Prevent the introduction and establishment of priority IAS. Cut the rate of introduction and establishment of other IAS by at least 50% by 2030.

Eradicate or control existing IAS, especially in priority sites as islands.



Key Indicator: 6.1 – Rate of IAS Establishment

Headline indicator for Target 6

Indicator 6.1: Rate of invasive alien species establishment

It measures the number of new IAS that become established in each region or country per time unit.

Can be further broken down by taxonomic group, geographical unit (e.g., islands), introduction pathways or impact types.

Component and complementary **indicators**

In addition to the headline metric, the framework includes component and complementary indicators to provide a comprehensive overview.

Core metrics tracking the direct impact and spread of Invasive Alien Species

Rate of IAS impacts

Rate of IAS spread

Number of IAS introduction events

Component and **complementary** indicators

In addition to the headline metric, the framework includes component and complementary indicators to provide a comprehensive overview.

Additional metrics providing broader context and trends related to invasive species

- Number of IAS listed nationally per the Global Register of Introduced and Invasive Species (GRIIS)
- Trends in abundance, temporal occurrences, and distribution of alien species in risk areas
- Red List Index related to IAS impacts

Tools & Resources

GRIIS – Global Register of Introduced and Invasive Species

EICAT – Environmental Impact Classification for Alien Taxa

Global Invasive Species Database

CABI Invasive Species Discovery Tool & Horizon Scanning Tool

CBD technical guides and training materials

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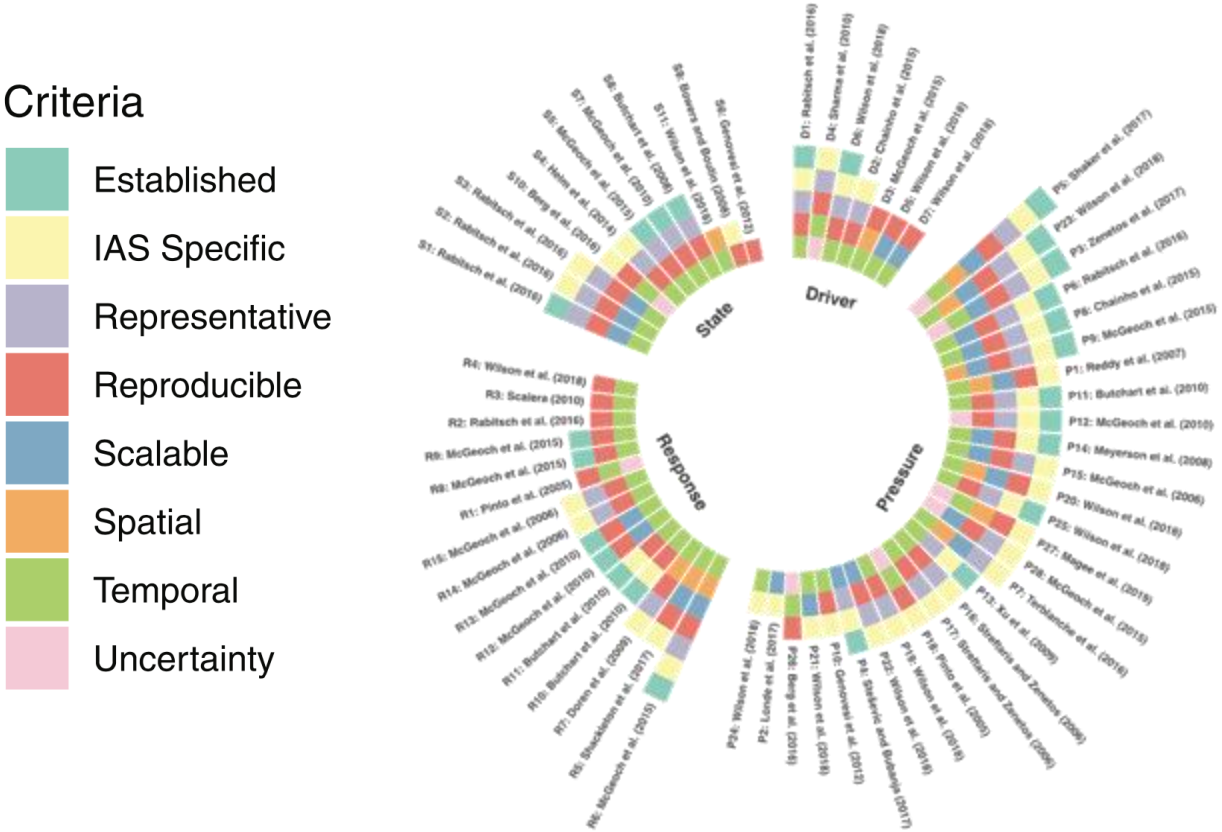
Eight desirable properties (criteria) for reporting on **IAS goals and targets** with **policy relevance and scientific validity**

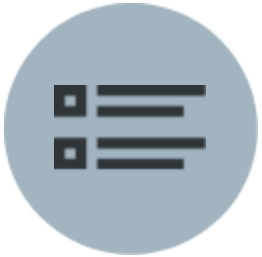


Number or richness of alien or invasive alien taxa, applied to marine (P3), freshwater (P5), and terrestrial systems (P23), in the Mediterranean Sea, the United States, and South Africa, respectively.

J.R. Vicente, A.S. Vaz, M. Roige, M. Winter, B. Lenzner, D.A. Clarke, M.A. McGeoch. Existing indicators do not adequately monitor progress toward meeting invasive alien species targets. Conserv. Lett., 15 (5) (2022), Article e12918, 10.1111/conl.12918

Improving indicators for measuring and reporting on progress toward global biodiversity targets

INVESTMENT:
Sustained investment for national and global reporting.



FRAMEWORKS:
Use multiple indicators within DPSR (Driver-Pressure-State-Response) and ToC (Theory of Change) frameworks.

DATA QUALITY:
Include measures of uncertainty and spatial information.

DATA BIAS:
Overcome data biases using resources like the GRIIS database.

MONITORING:
Track effectiveness of management interventions.

coop4CBD

Thank you for your attention!

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