



Achieving Target 6 of the Kunming-Montreal GBF in mountains: Inputs from the IPBES Assessment of Invasive Alien Species and their Control

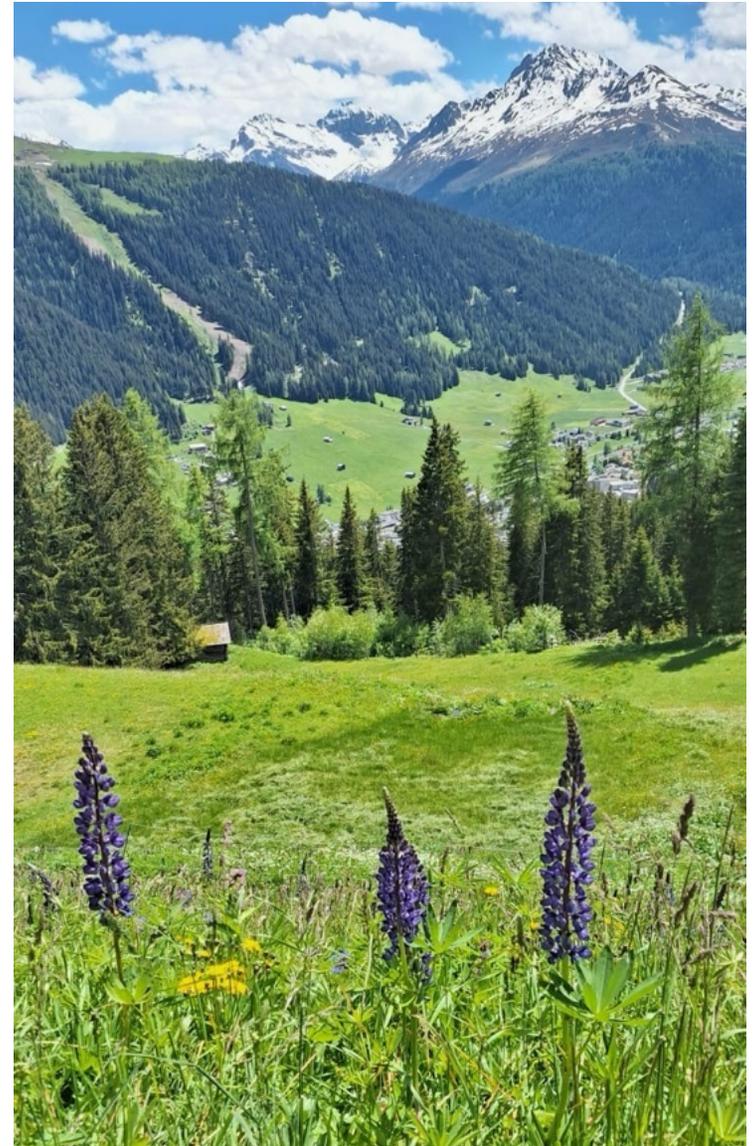
World Biodiversity Forum,
Davos, June 17, 2024

Aníbal Pauchard, Helen Roy, Peter Stoett, Vigdis Vandvik, Hanno Seebens, Tanara Renard, Sylvia Haider & Eduardo Fuentes-Lillo.

Special thanks to Kevin Smith, Aileen Mill from IUCN, IPBES team and the MIREN network.



1. Aim of this talk:
How prepared are we to tackle
Target 6 in mountains?



2. Target 6 - 2030

“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.”



<https://www.cbd.int/gbf/targets>



3. Key messages from The IPBES invasive species report

www.ipbes.net



IPBES Report on Invasive Alien Species and their Control

Developed over 4 years

**Produced by a
multidisciplinary team of 86
experts and many
contributing authors**

Over 13,000 documents reviewed in depth
Various values and knowledge systems considered, drawing on
scientific and grey literature, and information from indigenous
and local knowledge

**Engagement with Indigenous
and local knowledge**

www.ipbes.net/ias



**Produced by a multidisciplinary
team of 86 experts** from 47 countries
and 200+ contributing authors



Curbing the major and growing threats from invasive alien species is urgent and achievable

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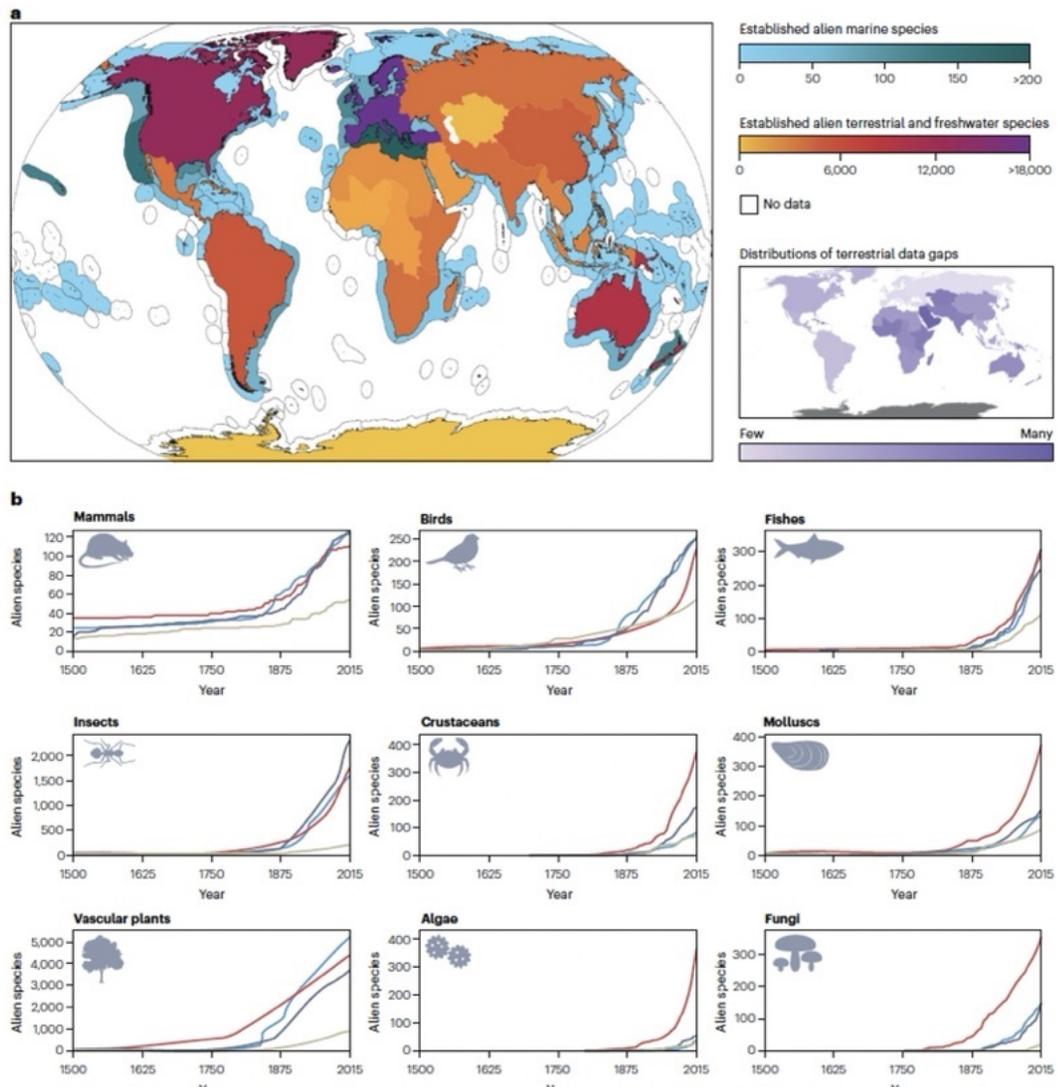
A list of authors and their affiliations appears at the end of the paper

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 Check for updates

Although invasive alien species have long been recognized as a major threat to nature and people, until now there has been no comprehensive global review of the status, trends, drivers, impacts, management and governance challenges of biological invasions. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)



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

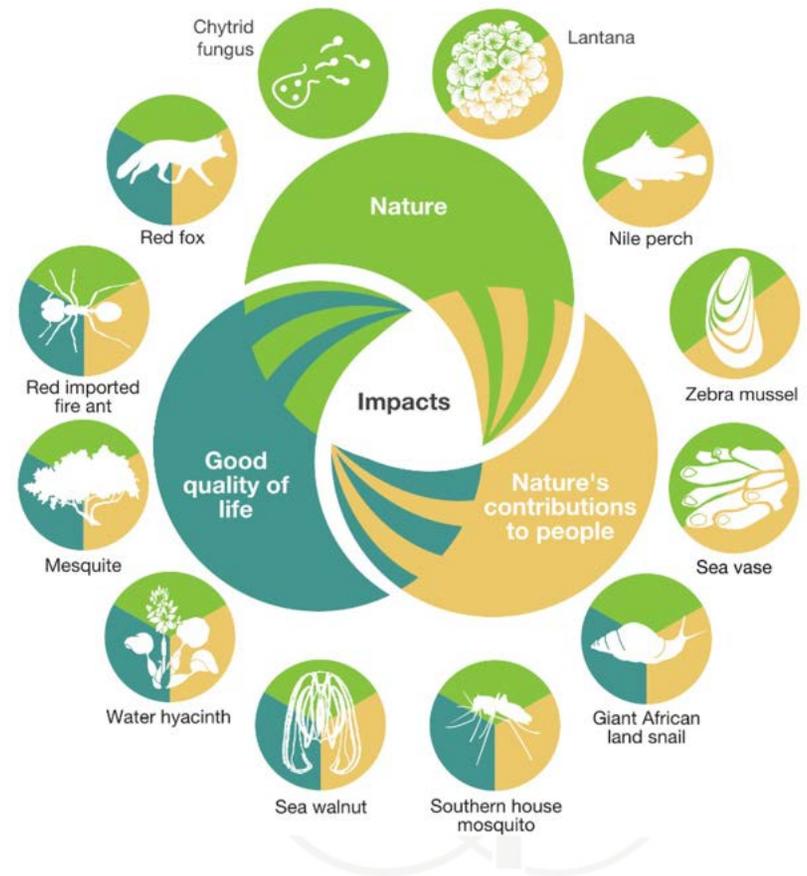
37,000 established alien species have been introduced by human activities worldwide

200 new alien species every year

3,500 invasive alien species, with negative impacts on nature, and also on people

More than 2,300 invasive alien species are found on lands of Indigenous Peoples across all regions of Earth

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A few numbers on impacts

60%

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

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>\$423 billion

is the estimated global annual costs of biological invasions in 2019.

85%

of impacts on nature and good quality of life are negative

80%

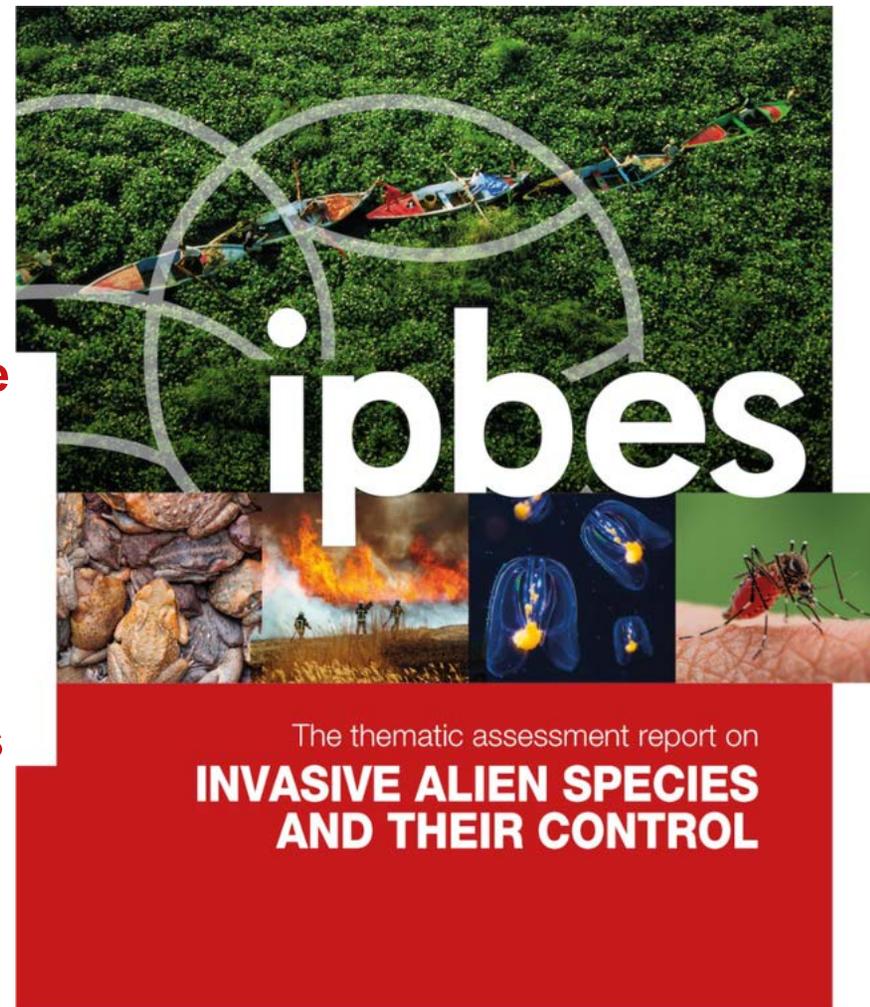
of impacts on nature's contributions to people are negative



There is compelling evidence for immediate and sustained action

With sufficient resources and long-term commitment, preventing and controlling invasive alien species are attainable goals that will yield significant long-term benefits for people and nature.

#InvasiveAlienSpecies Assessment



4. What do we know about biological invasions in mountains?



Mountains in the IPBES invasive species report

Even without the introduction of new species, given the opportunity, many already-established alien species in a region may continue to expand their geographic ranges and spread into new countries and regions (well established) {2.6.1}, including into remote environments such as mountain, polar (i.e., Antarctica and the Arctic) and desert ecosystems (well established) {2.5.2.8, 2.5.2.7, Box 2.7, Box 3.11}.

2.5.2.4 Arctic and mountain tundra

Data and knowledge gaps

No dedicated gap analysis is currently available for Arctic and mountain tundra regions. However, the same regional gaps emerge across taxonomic groups as for global alien richness datasets. In particular, data is missing for most taxonomic groups in the northern part of Asia (Dawson *et al.*, 2017) and research efforts are generally less intensive for animals and plants at higher latitudes (Lenoir & Svenning, 2015). Given that animals and plants are two of the most studied taxonomic groups, this is likely also true for other taxonomic groups such as mosses, lichens, and microorganisms.



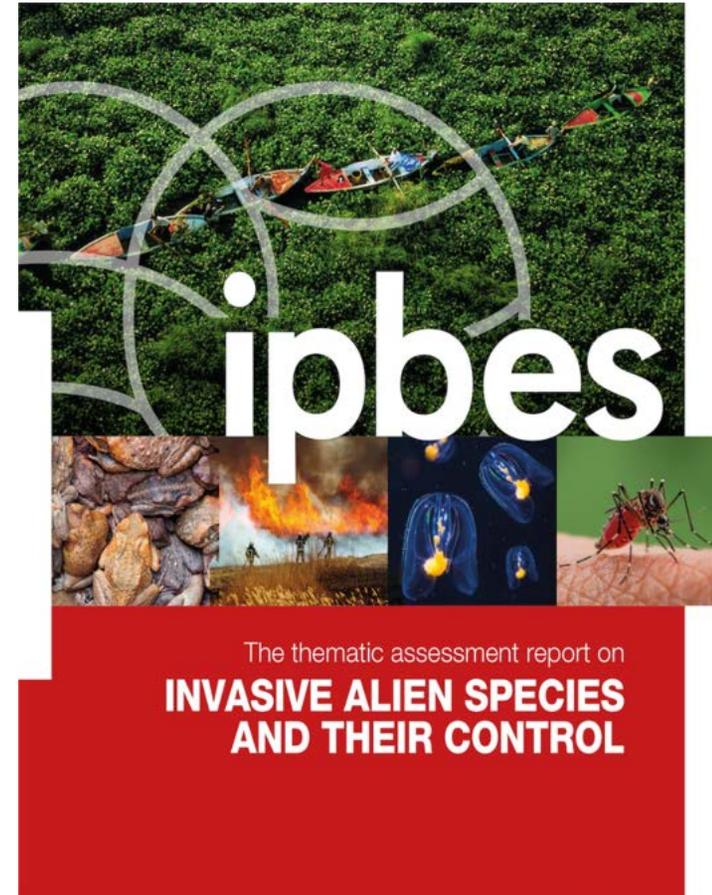
Box 2 7 **Mountain| regions: A global assessment of trends and status of alien and invasive alien species.**

Box 3 11 **Multiple interacting drivers trigger plant invasions in mountains.**



Figure 5 18 *Equus caballus* (horse) invading the native alpine grasslands of the Snowy Mountains National Park in Australia.

IPBES units of analysis	Number of impact records
Tropical and subtropical dry and humid forests	2,664
Temperate and boreal forests and woodlands	3,849
Mediterranean forests, woodlands and scrub	1,248
Tundra and high mountain habitats	205





The Mountain Invasions Research Network (MIREN)

Integrates surveys, monitoring and experimental research on plant invasions into mountains at a global scale. Started in 2005 in Vienna.



Objectives

- *Evaluate* vulnerability of mountains to invasions
- *Analyze* system-specificity of patterns/processes
- *Understand* changes in the mechanisms
- *Predict* consequences of climate change
- *Facilitate* research and management information



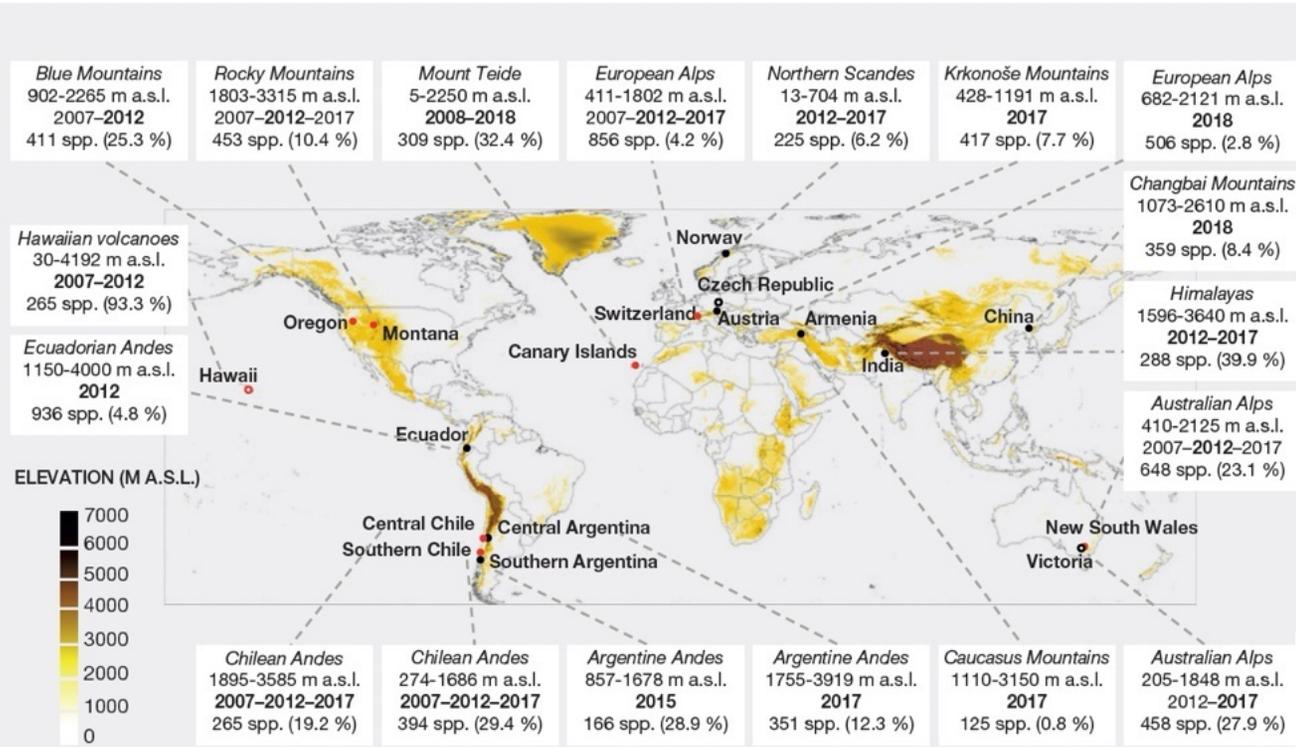


Figure 2 34 **Locations of the MIREN surveys.**

Sites in mountain regions where MIREN surveys have been used to sample and monitor plant invasions across elevational gradients. Source: Haider *et al.* (2022), <https://doi.org/10.1002/ece3.8590>, under license CC BY 4.0.³

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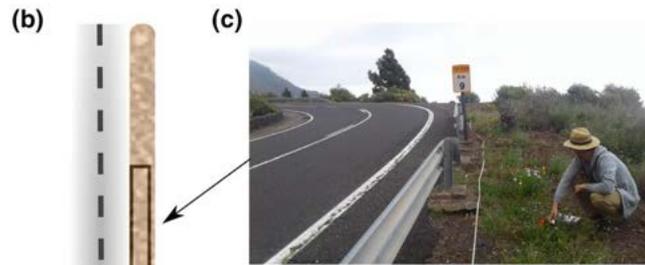
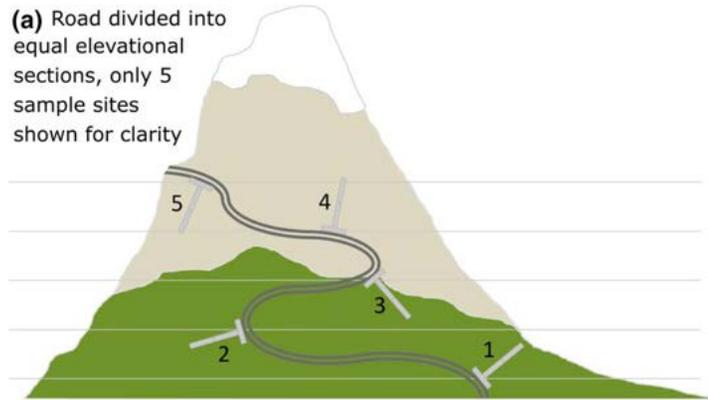
RESEARCH ARTICLE

Think globally, measure locally: The MIREN standardized protocol for monitoring plant species distributions along elevation gradients

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Think globally, measure locally: The MIREN standardized protocol for monitoring plant species distributions along elevation gradients

(a) Road divided into equal elevational sections, only 5 sample sites shown for clarity

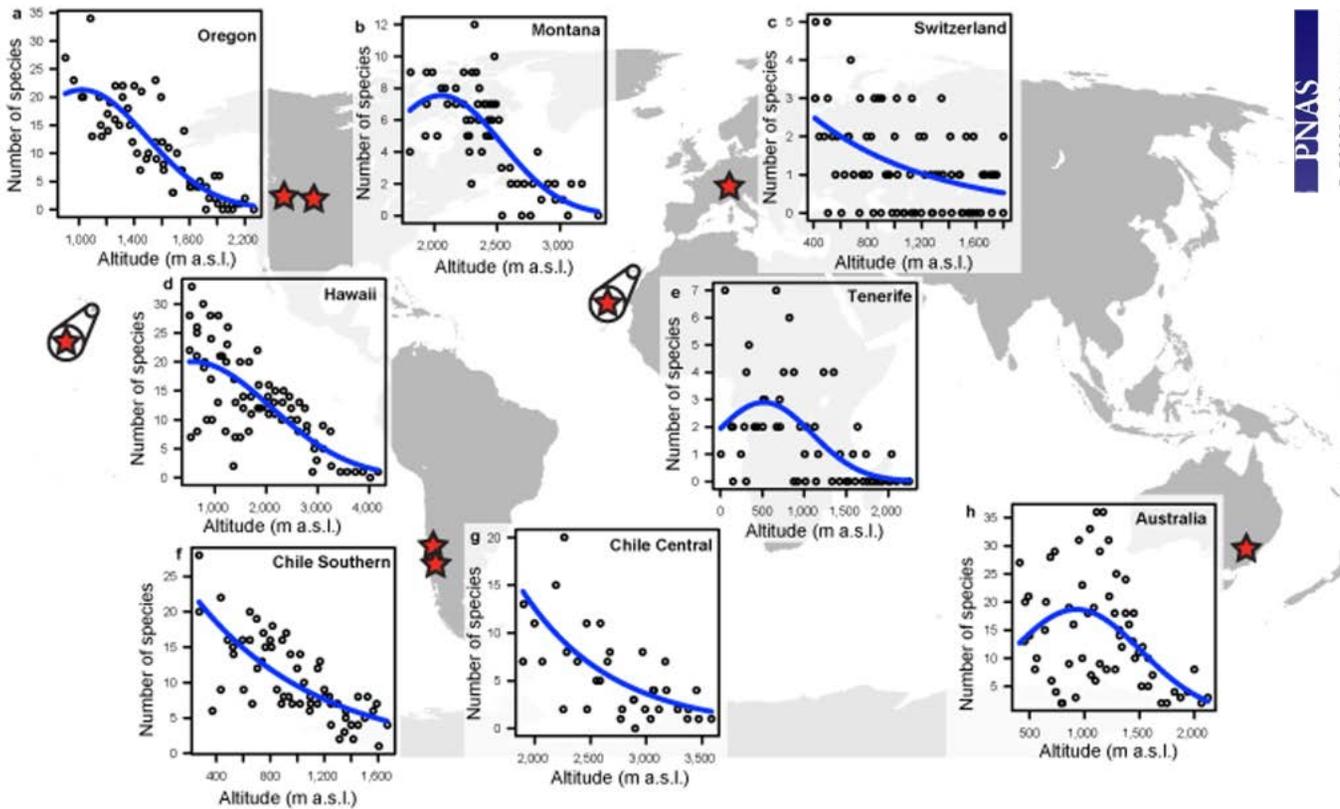


Sample site consisting of 3 plots of 2 m x 50 m
Plot 1: parallel to roadside
Plot 2: perpendicular and centered at 25 m from plot 1
Plot 3: centered 75 m from plot 1

Road ↑
Disturbed roadside area



How consistent are elevational nonnative species richness patterns?



PNAS Assembly of nonnative floras along elevational gradients explained by directional ecological filtering

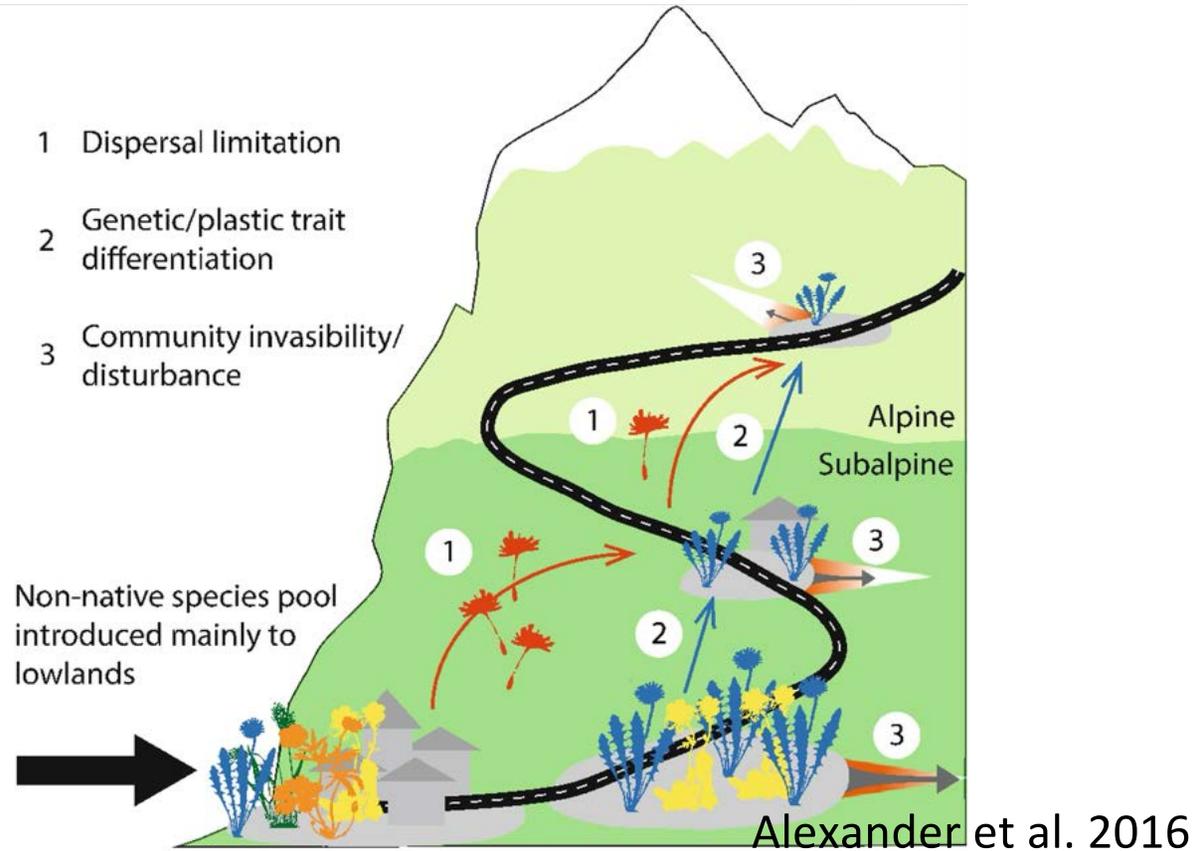
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- Species richness decrease with elevation in all regions.
- Peak richness always in lower third of the elevational range.

Mountains: A summary of species movement



Natives species also using roads to move up and down (Lembrechts et al. 2015)

5. How ready
are we
for Target 6 in
mountains?



Essential needs for Target 6

Eliminate, minimise, 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 areas, such as islands.

<ul style="list-style-type: none">• List of IAS species• Knowledge of potential new invaders• Pathway assessment• Knowledge of priority areas/ habitats	<ul style="list-style-type: none">• Knowledge of IAS impacts on biodiversity and ecosystem services• Method to prioritise IAS species• Assessment of effectiveness of management measures	<ul style="list-style-type: none">• Methods to prevent entry and establishment of new species• Knowledge of how to manage/ control / eradicate	<ul style="list-style-type: none">• Monitoring of introduction and establishment rates (indicators)
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In a preliminary questionnaire, we ask MIREN members how “your mountain region” was prepared to record these Target 6 indicators.

North America Rocky Mountains

Alps

European Alps

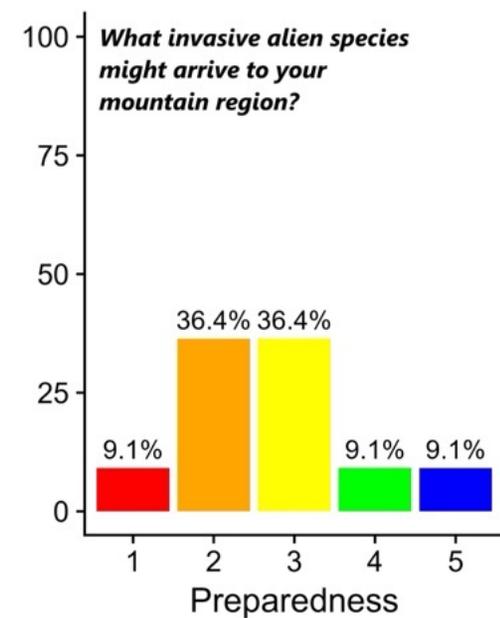
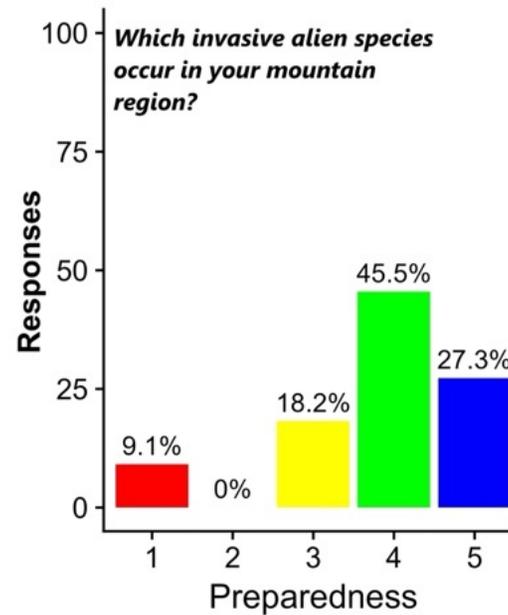
Southern African mountains

Andes

Australian Alps

Andes

Himalaya



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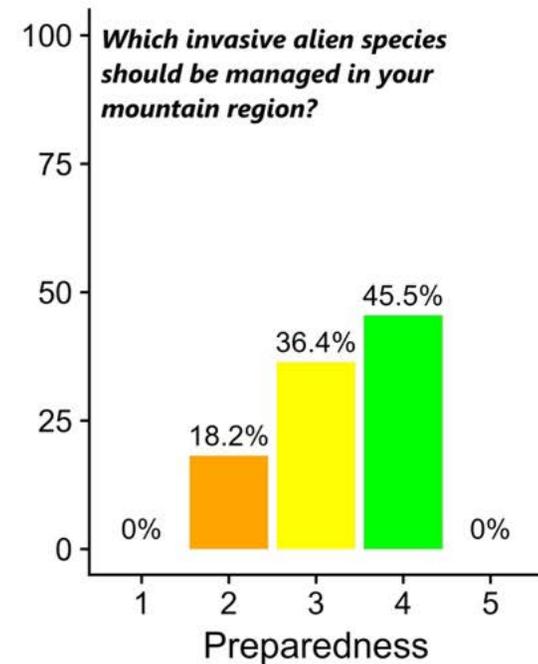
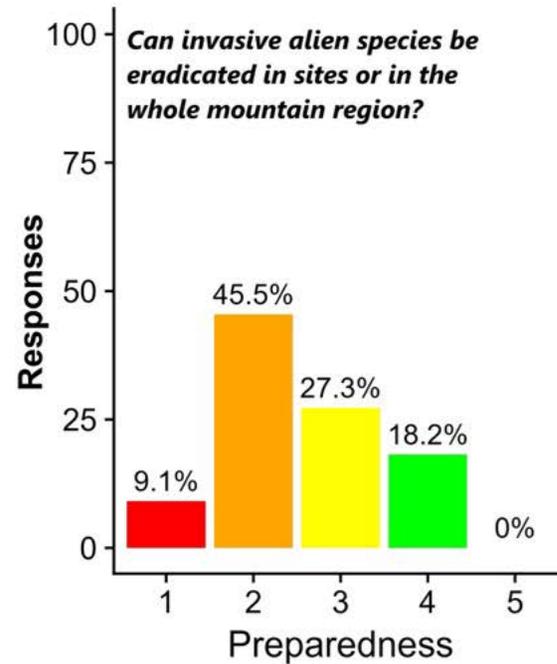
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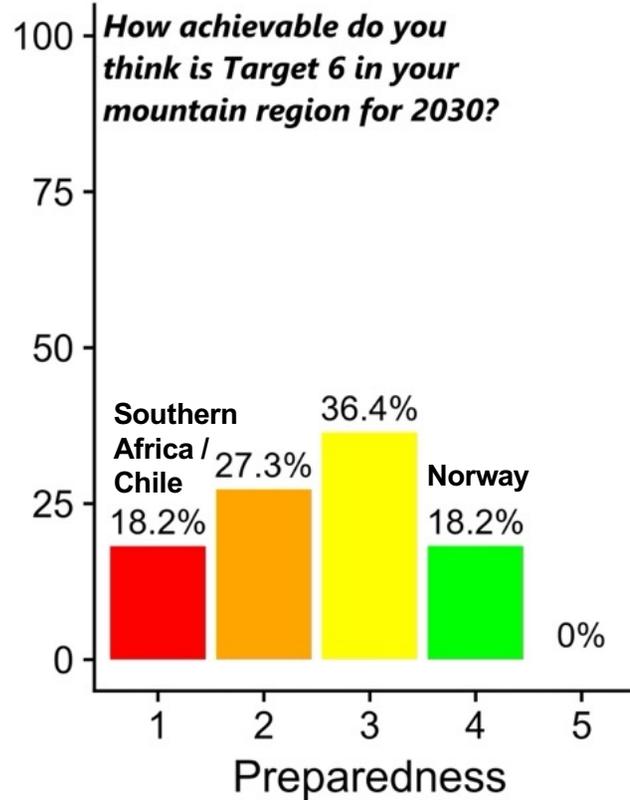
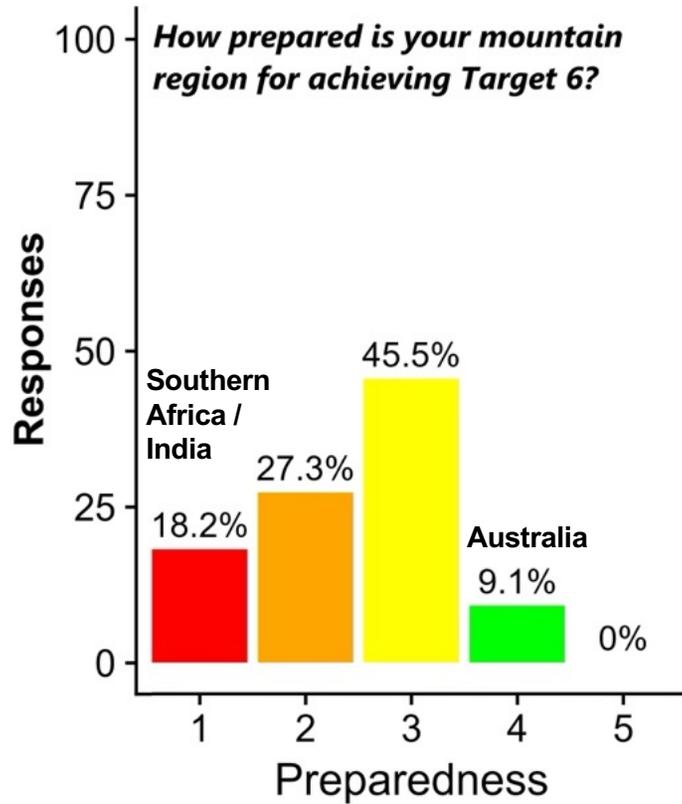
Australian Alps

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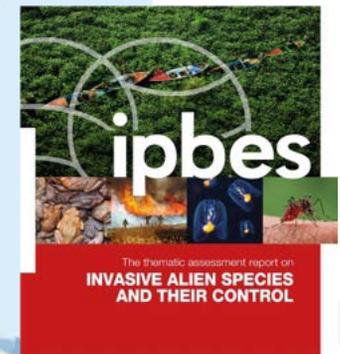
Are we prepared for Target 6 in mountains?



Overall, tremendous variability in how confidence scientists feel about the chances to reach Target 6.

Strategic actions to achieve integrated governance of biological invasions

How would this look in mountains?



#InvasiveAlien

Conclusions: Target 6 in mountains

1. Biological invasions are a major issue everywhere and mountains are no exception.
2. We have increasing evidence of the problem.
3. Target 6 is ambitious and there is important variation in how prepared we are depending on our region.
4. We have the tools/knowledge to tackle biological invasions but we need to integrate mountains in the picture.





¡Gracias!

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