

The thematic assessment report on
**INVASIVE ALIEN SPECIES
AND THEIR CONTROL**

Key Messages

of particular relevance to

Indigenous Peoples and Local Communities

from the

IPBES Assessment on Invasive Alien Species and their control

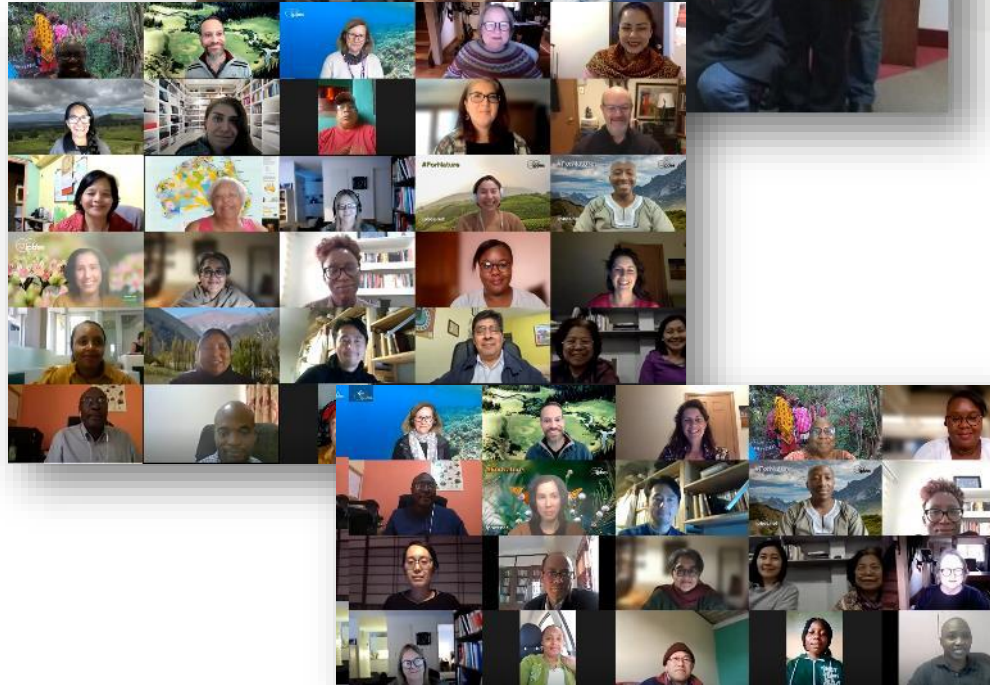


Acknowledgement

Thank you to everyone who participated in the work with Indigenous and local knowledge in the assessment:

- Authors and contributing authors
- Dialogue workshop participants
- Groups and individuals who contributed materials
- Reviewers who submitted comments

The assessment was possible thanks to your knowledge, generosity, time and commitment. We particularly acknowledge the many members of Indigenous Peoples and local communities who participated.



Background to IPBES

The **Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)** is an independent intergovernmental body, established by governments in 2012. It now has 145 members.

The overall **objective** of IPBES is to strengthen the science-policy interface for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development.

The current IPBES work programme (from 2019 to 2030) includes the following **5 main objectives**:

- Assessing knowledge
- Building capacity
- Strengthening knowledge foundations (including **enhancing work with Indigenous and local knowledge**)
- Supporting policy
- Communicating and engaging



IPBES and Indigenous and local knowledge

Since its inception, IPBES has recognised the importance of Indigenous and local knowledge (ILK) to the conservation and sustainable use of ecosystems, and IPBES enshrined work with ILK in its deliverables and objectives.

The IPBES [conceptual framework](#) explicitly considers multiple knowledge systems and types of values.

IPBES has a dedicated task force on ILK and a technical support unit on ILK based at UNESCO.

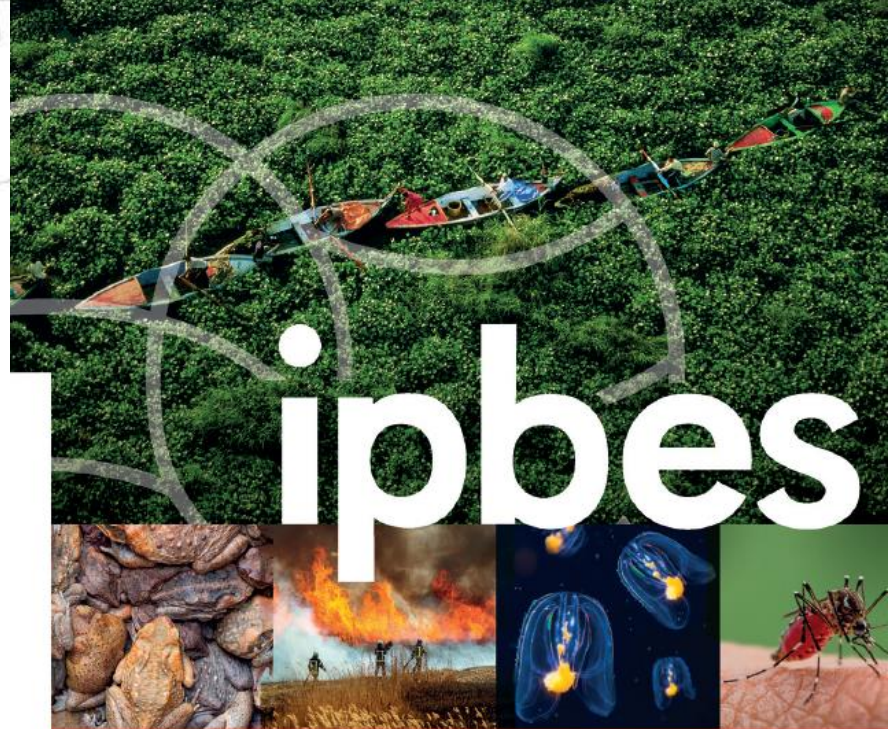
IPBES has developed an “[approach to recognizing and working with ILK in IPBES](#)”, which was approved by the IPBES Plenary at its fifth session in 2017. IPBES has also developed a methodological guidance to enhance implementation of this approach.

From these efforts, IPBES has produced the first global-scale environmental assessments that seek to explicitly and systematically work with ILK.

You can read more about IPBES work with ILK [here](#) and participation by IPLCs [here](#).



The Assessment of Invasive Alien Species and their Control



ipbes

The thematic assessment report on
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The Assessment

The assessment ran for four years from 2019 to 2023

The team consisted of 3 co-chairs and 86 experts with diverse disciplinary backgrounds from 49 different countries across all regions of the world



Aims

The assessment explores **how invasive alien species affect nature and people globally.**

It evaluates:

- **Current status and trends** of invasive alien species,
- **Their impacts** on people and nature and their **drivers**,
- **Key management and policy options** to address the challenges they pose.

The assessment takes into account various knowledge and value systems **including Indigenous and local knowledge.**



The assessment consists of:

- A **summary for policymakers (SPM)**, approved by the IPBES Plenary at its 10th session in 2023 (IPBES 10), available in six UN languages
- **Six chapters**, accepted by the IPBES Plenary at IPBES 10, available in English:
 1. Introducing biological invasions and the IPBES Thematic Assessment of Invasive Alien Species and Their Control
 2. Trends and status of alien and invasive alien species
 3. Drivers affecting biological invasions
 4. Impacts of invasive alien species on nature, nature's contributions to people, and good quality of life
 5. Management: challenges, opportunities and lessons learned
 6. Governance and policy options for the management of biological invasions

These documents are available on the IPBES website [here](#)



Methods for working with ILK

Following the IPBES [approach to recognizing and working with Indigenous and local knowledge](#), the assessment used a variety of methods for working with Indigenous and local knowledge and enhancing participation by IPLCs.

Approaches and methods included:

- A number of authors formed an “ILK liaison group”, tasked with ensuring that ILK was included in individual chapters and in narratives throughout the assessment.
- Key guiding questions for ILK were developed for each chapter
- Extensive review of literature and other materials on ILK
- 4 contributing authors (who write portions of specific text) added to the expertise on ILK.



Methods for working with ILK (continued)

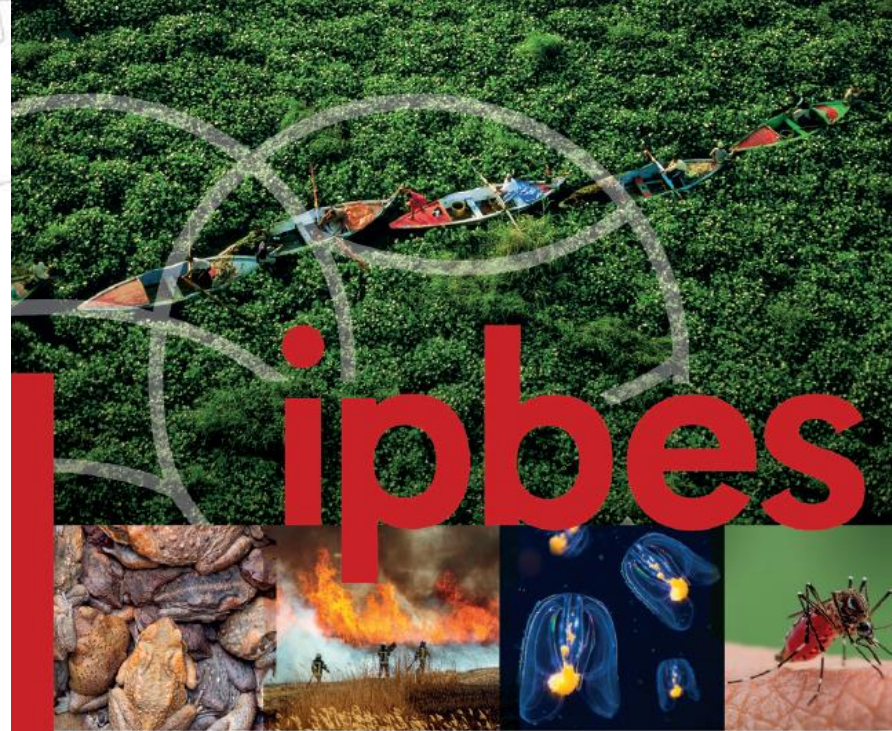
- Three dialogue workshops were held with IPLCs from around the world at key points in the process:
 1. Framing the assessment and key concepts (Nov 2019)
 2. Reviewing the first order drafts (Sep 2020)
 3. Reviewing the SPM (Feb 2022)

Reports from the workshops can be found [here](#).

- An online call for contributions gathered 30 submissions on ILK from around the world.
- Gaps in available information were highlighted to catalyze new research.



Key messages from the summary for policymakers



The thematic assessment report on
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SUMMARY FOR POLICYMAKERS

The summary for policymakers

The summary for policymakers (SPM) summarizes the key findings from across the chapters of the assessment. You can find the SPM in all 6 UN languages [here](#).

The SPM gives key messages, and background information that supports these messages. It is divided into 4 sections:

- A.** Invasive alien species are a major threat to nature, nature's contributions to people, and good quality of life
- B.** Invasive alien species and their impact are increasing rapidly and predicted to continue rising in the future
- C.** Invasive alien species and their negative impact can be prevented and mitigated through effective management
- D.** Ambitious progress to manage biological invasion can be achieved with integrated governance





Presentation of the key messages of particular relevance to Indigenous Peoples and local communities

Key messages and background information in the SPM demonstrate the importance of Indigenous and local knowledge and the crucial role of Indigenous Peoples and local communities (IPLCs) in understanding and management of invasive alien species. Challenges and ways forward are also addressed.

Following requests from IPLCs, these messages and related background information are presented in the following pages, with the aim of making this information more accessible.

The text in the following pages has been taken directly from the SPM, and has not been edited, so it reflects the text that was agreed on by the IPBES member states at the tenth IPBES plenary meeting in 2023.

Section A.
Invasive alien species
are a major threat to
nature, nature's
contributions to
people, and good
quality of life



Key messages:

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

KM-A2 Invasive alien species cause dramatic and, in some cases, irreversible changes to biodiversity and ecosystems, resulting in adverse and complex outcomes across all regions of Earth, including local and global species extinctions

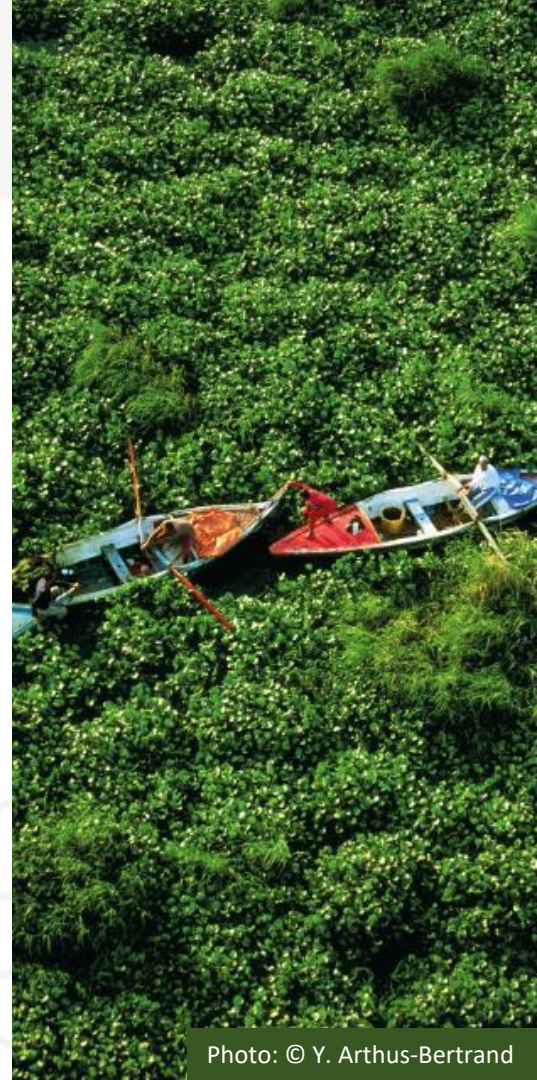
KM-A3 The economy, food security, water security and human health are profoundly and negatively affected by invasive alien species



Key messages (continued):

KM-A4 Invasive alien species can add to marginalization and inequity, including, in some contexts, gender- and age-differentiated impacts

KM-A5 Overall, policies and their implementation have been insufficient in managing biological invasions and preventing and controlling invasive alien species



(A5) Invasive alien species overwhelmingly undermine good quality of life (*established but incomplete*)

Invasive alien species can threaten livelihoods, water and food security, economies and human health (e.g., causing diseases, allergies and physical injuries) (*well established*), with 85 per cent of the documented impacts of invasive alien species on good quality of life being negative (*well established*).

Indigenous Peoples and local communities, ethnic minorities, migrants, poor rural and urban communities are disproportionately impacted by invasive alien vector-borne diseases (*established but incomplete*).

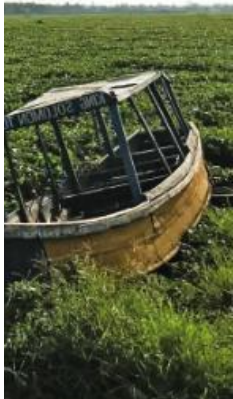


(A5) (continued)

Although there is limited research on the interplay between **gender relations and invasive alien species** (*established but incomplete*), there is some evidence of inequities and marginalization in gender- and age-specific activities where invasive alien species impede access to natural resources or require management (*established but incomplete*).

For example, in Lake Victoria, artisanal fisheries mainly involving men have declined following the introduction, establishment and spread of the invasive alien plant *Pontederia crassipes* (water hyacinth), which has led to the depletion of tilapia (*established but incomplete*).

In East Africa, management of the invasive alien plant *Opuntia* spp (prickly pear) requires repeated weeding by hand, which is often undertaken by women and children and has in many cases become their most time-consuming activity (*established but incomplete*).



(A6) Many invasive alien species have been documented on lands managed, used and/or owned by Indigenous Peoples and local communities (established but incomplete).

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. Indigenous lands in Oceania and North America have particularly high numbers of recorded invasive alien species (*established but incomplete*). However, numbers of invasive alien species are, on average, consistently lower on Indigenous lands compared to other lands (*established but incomplete*).



(A6) (continued)

Many Indigenous Peoples and local communities emphasize the inter-relatedness of the land, water and humans and other species, which can lead to a range of diverse perceptions of specific invasive alien species (*well established*). In some cases, Indigenous Peoples and local communities may consider an invasive alien species a valued part of their nature (*established but incomplete*).

There are also examples where Indigenous Peoples and local communities have created new income sources by relying on invasive alien species (*well established*), but that often occurs through necessity rather than choice.



(A6) (continued)

However, impact reports by some Indigenous Peoples and local communities document 68 per cent negative impacts and 32 per cent positive impacts on **their good quality of life** caused by invasive alien species (*established but incomplete*).

Indigenous Peoples and local communities often have a good understanding of how the complex interactions among drivers facilitate the introduction and spread of invasive alien species on their lands (*established but incomplete*).



(A6) (continued)

For example, Indigenous Peoples and local communities recognize that the use of invasive alien species for food, fibre, income generation or medicinal purposes can cause negative impacts on nature's contributions to people and their good quality of life (*well established*), especially in situations where the native species they traditionally depended on for those benefits have declined (*established but incomplete*).

Impact reports by some Indigenous Peoples and local communities document 92 per cent negative impacts and 8 per cent positive impacts on nature caused by invasive alien species (*established but incomplete*).



(A6) (continued)

Negative impact reports include water security and human and livestock health, as well as acknowledging that invasive alien species limit access to traditional lands, reduce mobility and require increased labour to manage (*established but incomplete*).

Invasive alien species 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, knowledge and cultural practices (*well established*), often leading to general feelings of despair, sadness and stress (*established but incomplete*).



(A7) Perceptions of the threat of invasive alien species can vary depending different human perspectives (well established).

Perceptions of specific invasive alien species and their value differ among and within stakeholder groups and Indigenous Peoples and local communities, as different community members can experience different impacts depending on gender, age, livelihood and a multitude of other factors (*established but incomplete*).

Value conflicts arise when invasive alien species are considered to be a major threat by some stakeholders and beneficial by others (*well established*).



(A7) (continued)

An invasive alien species may have been intentionally introduced for a particular purpose, including to mitigate other drivers of change (*well established*) but can have negative impacts on other sectors (*well established*).

For example, introduced pigs are important culturally in Hawaii and are hunted for subsistence, ceremony and recreation, despite causing severe negative impacts by driving and maintaining the spread of invasive alien plants within Hawaiian rainforest (*established but incomplete*).

Divergence of perceptions of invasive alien species can prevent effective decision-making and management (*established but incomplete*).



(A8) Current policy instruments for biological invasions have led to only partial progress towards international Targets on invasive alien species, including Aichi Biodiversity Target 9 and Sustainable Development Goal Target 15.8 (well established).

There are many reasons for the limited adoption, implementation and efficacy of policy instruments, including varying capacity and resources across regions (well established) and lack of coordination, with unclear roles and responsibilities among government agencies, stakeholders and Indigenous Peoples and local communities (well established).



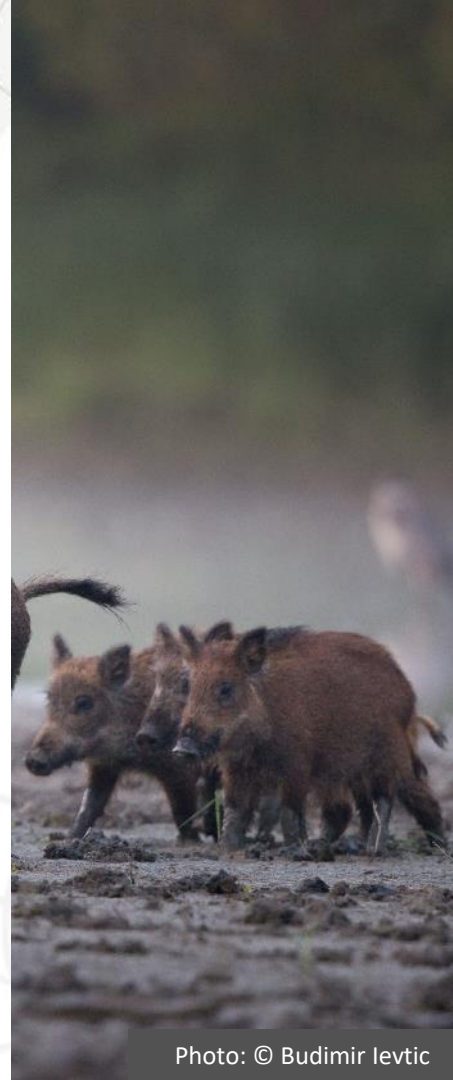
**Section B. Globally,
invasive alien species
and their impact are
increasing rapidly and
predicted to continue
rising in the future**



Key messages:

KM-B1 Many human activities facilitate the transport, introduction, establishment and spread of invasive alien species

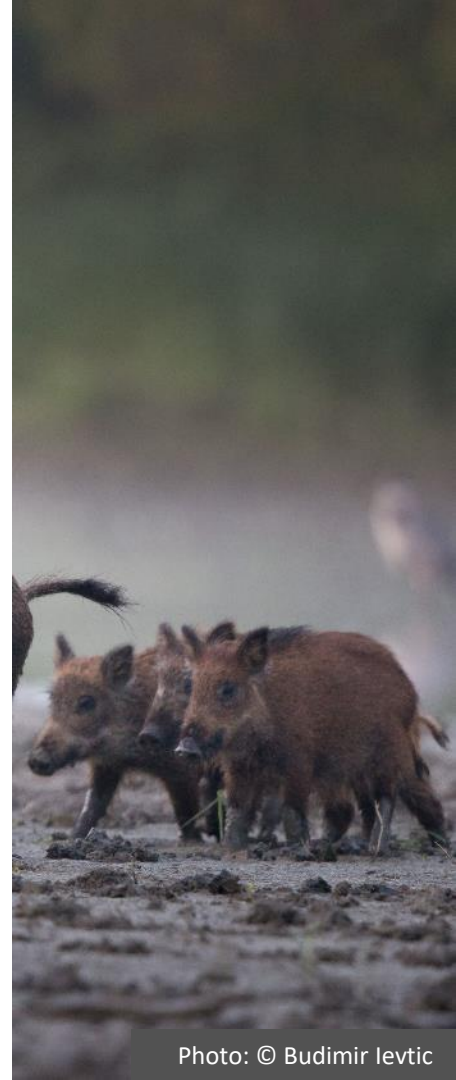
KM-B2 The threats from invasive alien species are increasing markedly in all regions of Earth, with the current unparalleled high rate of introductions predicted to rise even higher in the future



Key messages (continued):

KM-B3 The ongoing amplification of drivers of change in nature may substantially increase the number of invasive alien species and their impacts in the future

KM-B4 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.



Section C. Invasive alien species and their negative impacts can be prevented and mitigated through effective management

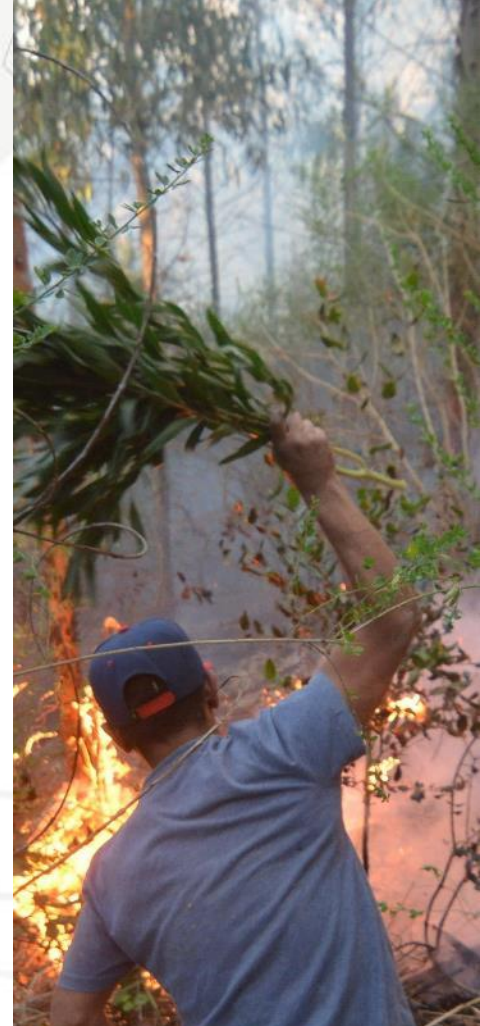


Key messages:

KM-C1 The number and impacts of invasive alien species can be reduced through management of biological invasions

KM-C2 Prevention and preparedness are the most cost-effective options and thus crucial for managing the threats from invasive alien species

KM-C3 Eradication has been successful, especially for small and slow-spreading populations of invasive alien species in isolated ecosystems



Key messages (continued):

KM-C4 Containment and control can be an effective option for invasive alien species that cannot be eradicated for various reasons from terrestrial and closed water systems, but most attempts in marine and connected water systems have been largely ineffective

KM-C5 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



Key messages (continued):

KM-C6 Engagement and collaboration with stakeholders and Indigenous Peoples and local communities improve outcomes of management actions for biological invasions



(C16) There are effective decision-making frameworks and tools that can support management of biological invasions (*well established*).

Frameworks and tools have been developed based on evidence from practice, science and other knowledge systems, including those of Indigenous Peoples and local communities. These can underpin impact assessment, monitoring and prioritization of intentional and unintentional introduction pathways, species and sites for the successful management of biological invasions (*well established*).



(C16) (Continued)

Although many knowledge and data gaps exist, the tools enable management actions to proceed under a risk assessment and risk management framework in line with a precautionary approach, as appropriate, using inclusive decision-making that leads to the review of all the measures (*well established*).



(C19) Eradication has been successful and cost-effective for some invasive alien species, especially when their populations are small and slow-spreading in isolated ecosystems such as islands (established but incomplete)

In addition to the extent of the area invaded, the success of eradication programmes depends on the support and engagement of relevant stakeholders and Indigenous Peoples and local communities (*well established*).

Eradication programmes are aided by a rapid flow of information on the extent and location of invasive alien species, which can be provided by people who live nearby (*well established*).



(C22) Tools and technologies increase efficiencies when managing biological invasions and controlling invasive alien species, with many new options emerging (*established but incomplete*)

Potential benefits and risks of novel technologies can be assessed using a risk assessment and risk management framework in line with a precautionary approach, as appropriate (*well established*). Using this framework in consultation with regulators, stakeholders and Indigenous Peoples and local communities can limit the potential for unintended consequences (*well established*).



(C23) Stakeholder engagement, capacity-building and sustained resourcing are critical to the success of adaptive management (well established)

A lack of stakeholder participation in adaptive management can lead to negative consequences for good quality of life, especially for Indigenous Peoples and local communities who have adapted by using invasive alien species, that include loss of livelihoods, marginalization and/or gender inequity (*well established*).



(C23) (continued)

The involvement of all stakeholders can be achieved by using an adaptive co-management approach to the process, from decision-making to the implementation of management actions (*well established*).

Adaptive co-management includes capacity-building; co-creation, co-design, co-development and coimplementation; social learning; and broad partnerships (*established but incomplete*).

Collaboratively addressing the management of biological invasions around which there are conflicting values among different sectors, stakeholders and Indigenous Peoples and local communities is a significant global policy challenge (*well established*).



(C24) The knowledge, practices, values and customary governance systems of Indigenous Peoples and local communities can improve management outcomes *(established but incomplete)*

Many communities successfully manage invasive alien species on their lands *(established but incomplete)*, leading to increases in nature's contributions to people *(established but incomplete)*.



(C24) (continued)

Consultation with Indigenous Peoples and local communities, through their free, prior and informed consent, by applying co-design principles for decision-making and actions helps to ensure efficacy of management outcomes at the local level (*established but incomplete*).

Co-delivered biocultural management plans based on shared scientific, technical and Indigenous and local knowledge systems have assisted surveillance and detection, eradication, containment and control of invasive alien species (*established but incomplete*). Such co-governance structures improve quality of life for Indigenous Peoples and local communities (*established but incomplete*).



**Section D.
Ambitious progress to
manage biological
invasions can be
achieved with
integrated governance**



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Key messages:

KM-D1 Through a complementary set of strategic actions, integrated governance can limit the global problem of invasive alien species throughout the biological invasion process and at local, national and regional scales.

KM-D2 The threat of invasive alien species could be reduced with closer collaboration and coordination across sectors and countries to support the management of biological invasions.



Key messages (continued):

KM-D3 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.

KM-D4 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.



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Key messages (continued):

KM-D5 Open and interoperable information systems will improve the coordination and effectiveness of the management of biological invasions, within and across countries

KM-D6 Public awareness, commitment and engagement, and capacity-building, are crucial for the prevention and control of invasive alien species.

KM-D7 There is compelling evidence for immediate and sustained action to manage biological invasions and mitigate the negative impacts of invasive alien species.



(D30) Indigenous Peoples and local communities have invaluable knowledge systems that could contribute to addressing biological invasions (*established but incomplete*), yet their lack of land tenure and access rights can limit the extent to which they are able to take action (*well established*).



(D30) (continued)

Indigenous Peoples and local communities can be partners in co-developing policies and strategies to address biological invasions while giving consideration to the challenge of conflicting perceptions and values in order to achieve consensus on management actions (*established but incomplete*). Participation of Indigenous Peoples and local communities can be enhanced with sufficient legal, political and financial support (*well established*).



(D30) (continued)

Successful strategies respect the knowledge, priorities and rights of Indigenous Peoples and local communities, including customary governance systems, in accordance with national legislation (*established but incomplete*). In cases where the impact of invasive alien species on the quality of life of Indigenous Peoples and local communities is unavoidable, those communities need ongoing support and adequate resources to respond to the challenges of living with invasive alien species (*established but incomplete*).



Gaps in knowledge on invasive alien species of particular relevance to Indigenous Peoples and local communities

IMPLEMENTATION CHALLENGE

POTENTIAL GAIN

Estimated research cost

Estimated scientific challenge

For taking management action

For better understanding biological invasions

Gaps in knowledge on invasive alien species of particular relevance to Indigenous Peoples and local communities

Lack of information on invasive alien species status and trends on land and water managed by Indigenous Peoples and local communities {Box 2.6}

Lack of information on Indigenous and local knowledge, values and culture regarding the drivers and impacts of invasive alien species on land and water managed by Indigenous Peoples and local communities {1.6.7.1, Box 3.12}

Lack of understanding of and mechanisms for sharing knowledge on invasive alien species and their drivers, impacts, management and governance among Indigenous Peoples and local communities and researchers and other outsiders {6.6.1.5}

Lack of consideration of the knowledge and perceptions of Indigenous Peoples and local communities in scenarios and models {1.6.7.3, 4.7.1, 6.6.1.6}



Very low



Low



Intermediate

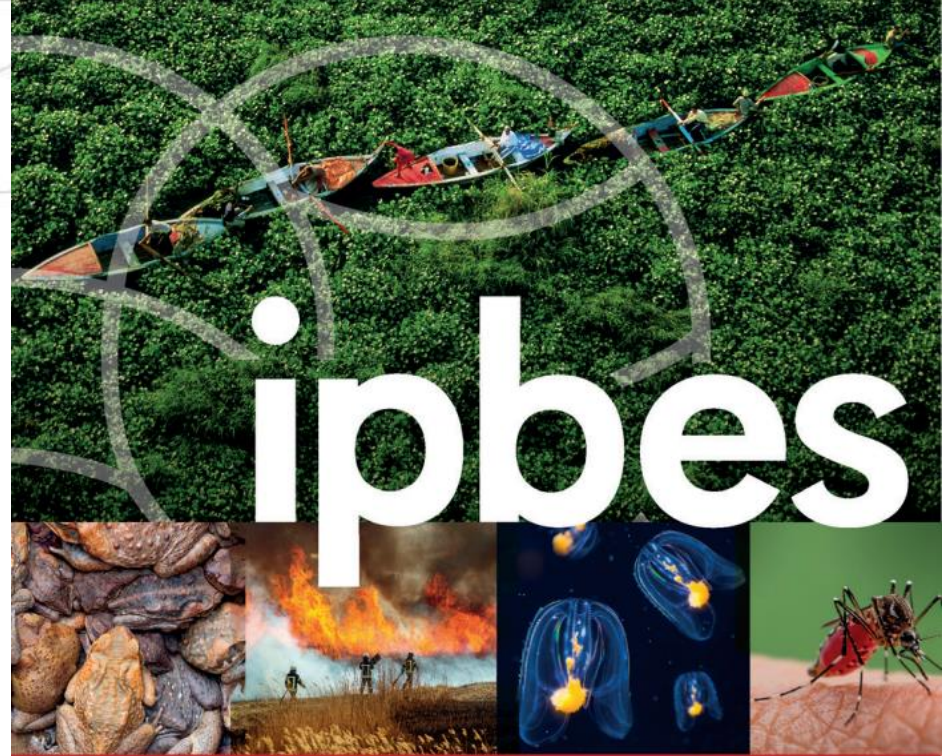


High



Very high

**Further
information
from the
chapters of the
assessment**



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As requested by IPLCs, the following slides provide some additional information of particular relevance to IPLCs from the chapters of the assessment, including case studies, boxes, text and figures. This represents only a small proportion of relevant the text in the chapters themselves.

The full chapters are available at:

<https://www.ipbes.net/ias>



The thematic assessment report on
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Chapter 1: Box 1.13. Indigenous and local knowledge of invasive alien species in names, stories, and songs.

Indigenous and local knowledge of invasive alien species may be embedded in stories, poetry, and songs. A poem from Ethiopia illustrates local understandings of the adverse impacts of invading *Prosopis juliflora* (mesquite, or woyane harar trees) on fodder resources and cattle grazing practices, and their interactions with other drivers of change in nature:

*Cattle from upland, cattle from lowland
Goats from here, sheep from there
Are you [my camels] ever going to have the trees
That you once had all for yourselves?
In the summer, the floods
In the winter the locusts
In the upland the Christians
On the lowland the sorghum fields
In awash the woyane trees
Where should I take you my heart [my she camel]?"*

(Balehegn, 2016)

Chapter 1: Box 1.13. continued

Indigenous and local knowledge of biological invasions may also be embedded in specific names, which may also reveal much about how an invasive alien species is perceived. Most invasive alien species are given new names by Indigenous Peoples and local communities, which may indicate origin or foreignness as well as inclusion in a similar generic category, and can have political undertones. For example, the Kawaiwete of Brazil label the incoming, and more aggressive, hybrid African-European honey bee as a “honey wasp”, in contrast to the benign local “honey bee” (Athayde et al., 2016).

(see chapter 1 for more information

<https://www.ipbes.net/ias>)

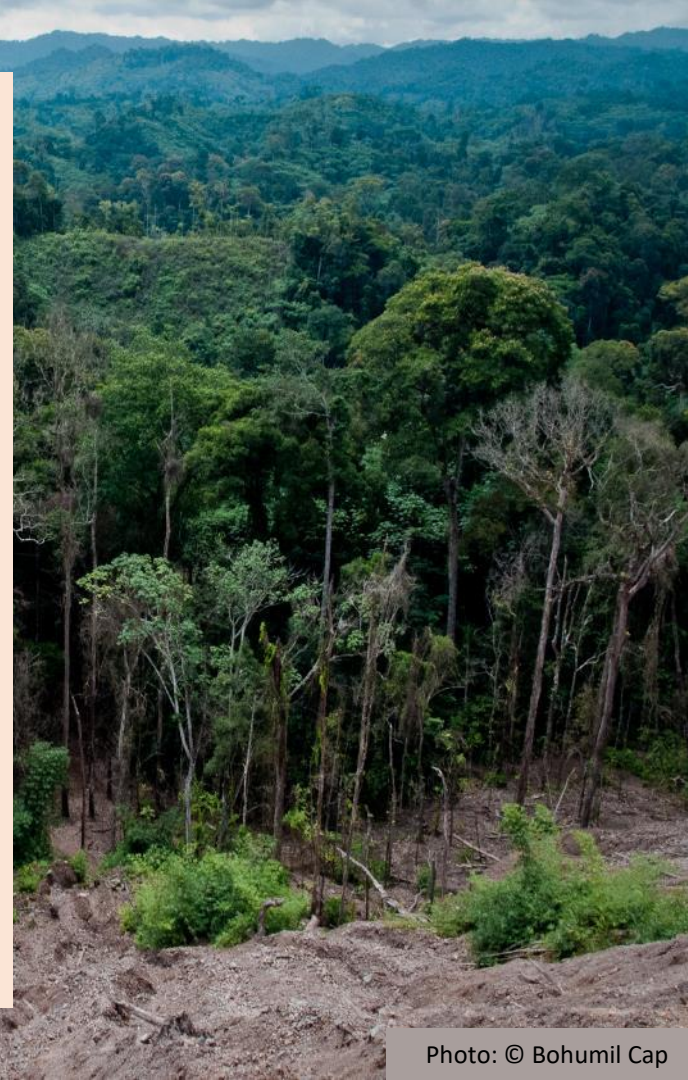


Chapter 2: Executive summary paragraph 7:

The number of established alien species is consistently lower on land managed by Indigenous Peoples (*established but incomplete*) {Box 2.6}. Indigenous Peoples' lands are often remote and host more natural habitats compared to other lands, but that has not protected them from alien species introductions. A total of 6,351 established alien species and 2,355 invasive alien species have been recorded worldwide on Indigenous Peoples' land (*established but incomplete*) {Box 2.6}. Hotspots of biological invasions on Indigenous lands with high numbers of established alien species are found on all inhabited continents but especially in Australasia, North America, and Europe (*established but incomplete*) {Box 2.6}, regions that have the highest established alien species numbers in general. Invasive alien species affect the livelihoods and good quality of life of Indigenous Peoples and local communities worldwide (*established but incomplete*) {Box 2.11}. However, most available studies on lands of Indigenous Peoples and local communities and on good quality of life focus on woody vascular plants, while much less information is available for the effects of other taxa, particularly microbes and insects (*established but incomplete*) {Boxes 2.6 and 2.11}.

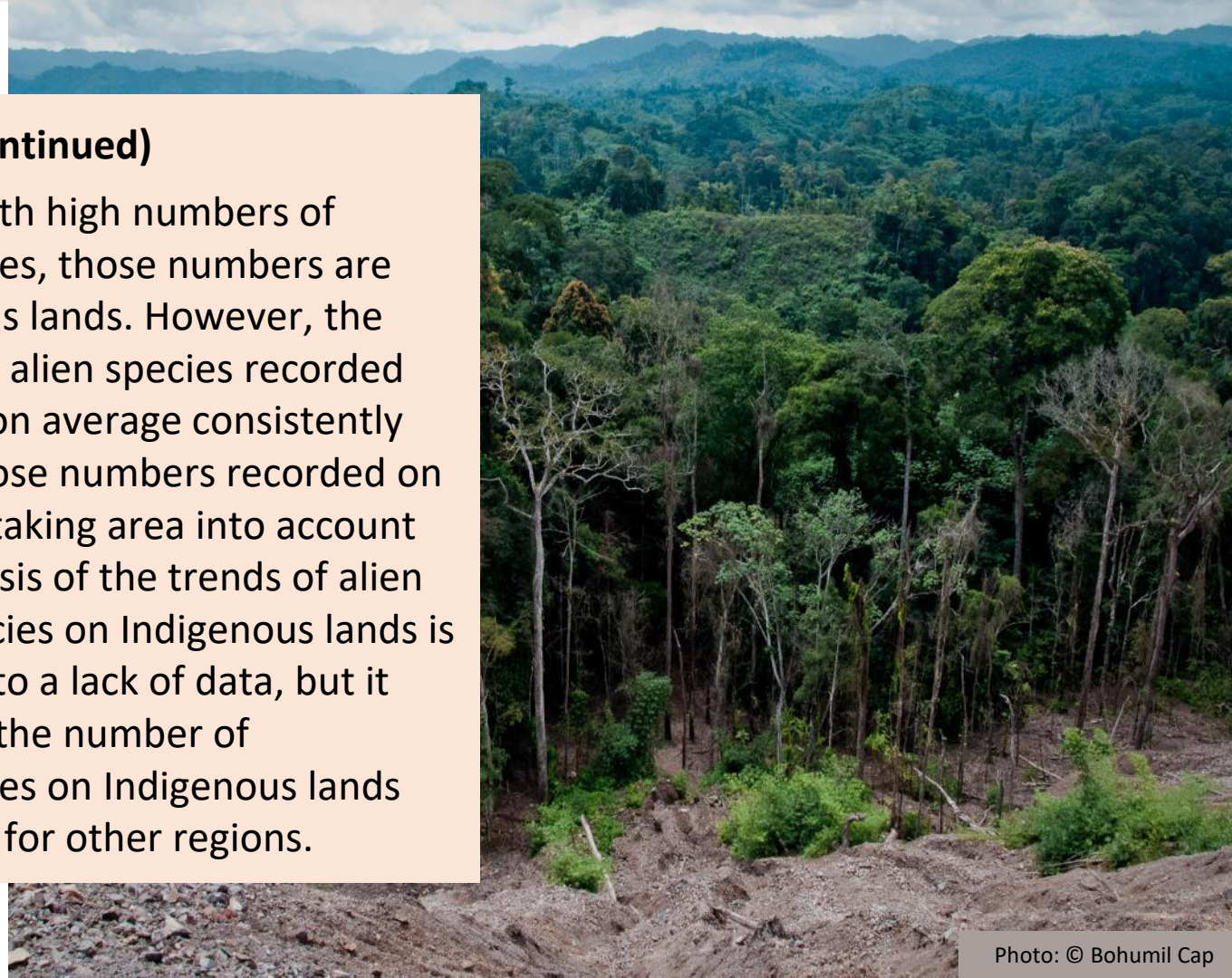
Chapter 2: Box 2.6. Land managed, used or owned by Indigenous Peoples and local communities: A global assessment of trends and status of alien and invasive alien species

This analysis revealed that, in total, 6,351 established alien species have been recorded on Indigenous lands, which is 34% of all established alien species recorded worldwide in this data set. The number of invasive alien species according to the GRIIS database amounts to 2,355 (56% of the total number globally) on these lands, although it could not be determined whether the invasive alien species pose any impact on these lands. The number of established alien species recorded on Indigenous lands is highly correlated with the total number of established alien species of the same country.



Chapter 2: Box 2.6 (continued)

That is, in countries with high numbers of established alien species, those numbers are also high on Indigenous lands. However, the number of established alien species recorded on Indigenous land is on average consistently lower compared to those numbers recorded on other lands also after taking area into account (Figure 2.29). An analysis of the trends of alien and invasive alien species on Indigenous lands is currently missing due to a lack of data, but it seems very likely that the number of established alien species on Indigenous lands increased as observed for other regions.



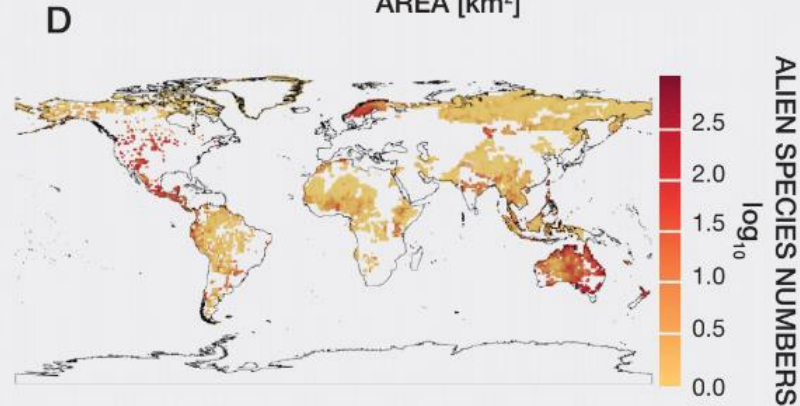
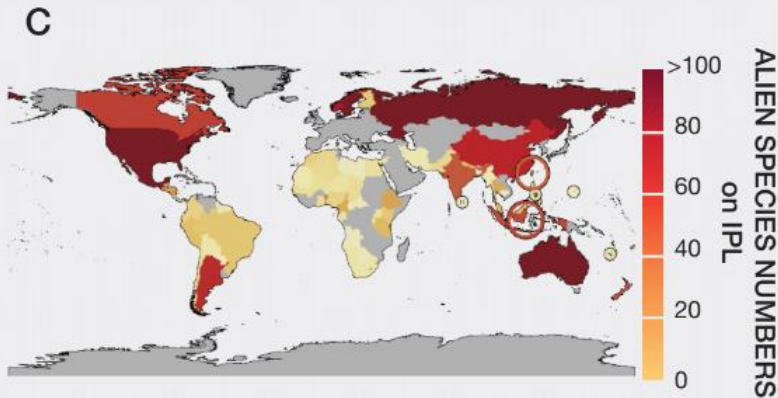
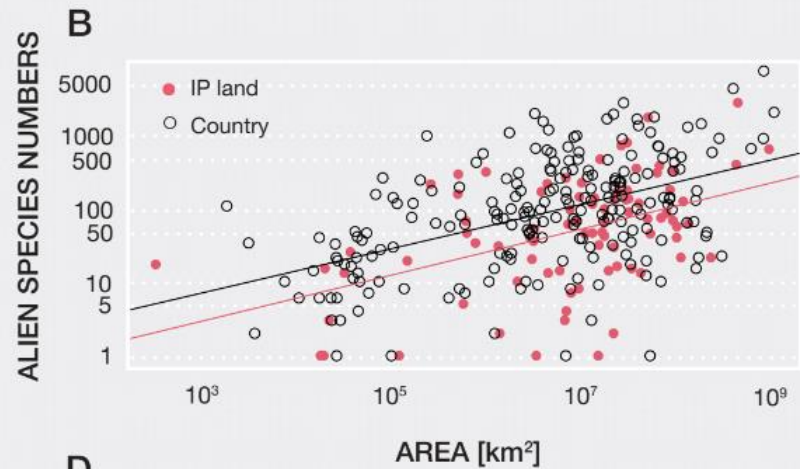
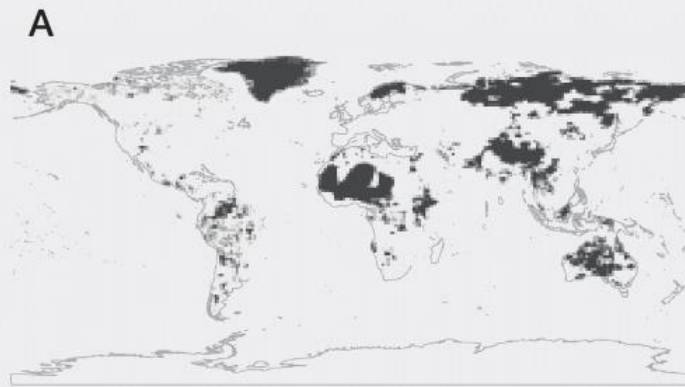


Figure 2.29 (from Box 2.6 in chapter 2): Invasive alien species on Indigenous Peoples' land. (A) Land managed, used or owned by Indigenous Peoples. (B) Species-area relationships for established alien species per country (circles) and per area of Indigenous lands (IP) lands (dots), showing a consistently lower number of established alien species on Indigenous lands. (C) Number of alien species on Indigenous lands per country. (D) Number of established alien species on Indigenous lands per grid cell. A data management report for this figure is available at <https://doi.org/10.5281/zenodo.7615582>

Chapter 3: Executive summary paragraph 9

Many Indigenous Peoples and local communities have a good and holistic understanding of the drivers facilitating invasive alien species on their lands (*well established*). Indigenous Peoples and local communities point to how policies, governance and institutions aimed at improving livelihoods and the environment may inadvertently cause the introduction of invasive alien species (*established but incomplete*). For example, they report that promotion of alien species for food, fibre, income generation, or medicinal purposes may act as a driver facilitating biological invasions (*well established*), and such invasions can be especially facilitated in situations where native biodiversity, including species they traditionally depended on for these benefits, have declined (*established but incomplete*). ... Indigenous Peoples and local communities also identify challenges of land tenure and access rights as significant factors limiting the extent to which they can address invasive alien species on their lands (*established but incomplete*). (see chapter 3 for more information <https://www.ipbes.net/ias>)



Chapter 3: Excerpt from Section 3.2.5. Policies, governance and institutions

Indigenous Peoples and local communities have also reported that national policies limiting land tenure and access rights can be significant drivers of invasive alien species on their lands (IPBES, 2022b). Indigenous Peoples and local communities will often monitor and manage the numbers of invasive alien species and their impacts on their lands and waters (Chapter 5), but their ability to do this is greatly reduced if they do not have access or clear ownership of the lands and waters. Access is indeed crucial for monitoring and management, and land tenure can be essential for communities to actively manage their environments. Moreover, many Indigenous Peoples and local communities actively defend their lands from encroachment by industry and other disruptive influences that can also be drivers for invasive alien species (e.g., deforestation; section 3.3.1). Lack of clear land tenure or access rights can also prevent Indigenous Peoples and local communities from effectively defending their lands against this environmental degradation, which can in turn lead to an increase in invasive alien species. Indigenous Peoples and local communities have also noted that lack of access to lands and waters and lack of land tenure can lead to communities leaving.

(see chapter 3 for more information <https://www.ipbes.net/ias>)



Chapter 3: Box 3.6. National and international policies resulting in the introduction and spread of *Prosopis juliflora* (mesquite), as reported by Indigenous Peoples and local communities

In Botswana, Ethiopia, India, Jordan and Kenya, Indigenous Peoples and local communities have reported the intentional introduction of *Prosopis juliflora* (mesquite) by governments and associated international programs with the aim of halting land degradation, controlling desertification and deforestation and improving the good quality of life of the local communities (Al-Assaf et al., 2020; Becker et al., 2016; Haregeweyn et al., 2013; Linders et al., 2020).



Chapter 3: Box 3.6 continued:

In Kenya for instance, the Chamus pastoralists report that *Prosopis juliflora* was introduced twice: first in 1973 through a government initiative; and 10 years later, through the Fuelwood Afforestation Extension Project, a joint initiative from the Food and Agricultural Organization (FAO) and the Government of Kenya (Becker et al., 2016). In Ethiopia, the Afar recall that the species was introduced in the 1980s in state farms and settlements to improve the microclimate, provide shade, halt land degradation, provide fuel wood, as a source of pods for fodder, and to increase sustainability of livelihoods in the Afar region of Ethiopia (Linders et al., 2020). In India, Indigenous Peoples and local communities report that *Prosopis juliflora* was introduced to ameliorate saline soils, and as a source of timber, fuelwood and fibre in the latter half of nineteenth century; and that the species was later promoted by the government from the 1970s onward to combat desertification and soil salinization in North-West India (Duenn et al., 2017).



Chapter 4: Executive summary paragraph 9

Indigenous Peoples and local communities report more negative than positive impacts caused by invasive alien species, especially on water resources, human health and health of livestock and access to traditional lands (*well established*) {4.6.1}. Indigenous Peoples and local communities report ten times more negative than positive impacts caused by invasive alien species on nature (92 per cent negative, 8 per cent positive) (*well established*) {4.6.1}. Impacts on nature, often affect the deep kinship connection that many Indigenous Peoples and local communities have with nature (*well established*) {4.6.3}. When considering nature's contributions to people, reports are more balanced (55 per cent negative to 45 per cent positive) (*well established*) {4.6.2}. Two-thirds (68 per cent) of the impacts on the good quality of life of Indigenous Peoples and local communities have been documented as negative, compared to one-third (32 per cent) that have been documented as positive (*well established*) {4.6.3}. Invasive alien species have frequently been documented to cause the loss of access to and mobility within traditional lands, leading to harder labour requirements (*well established*) {4.6.3}. Negative impacts on the health of Indigenous Peoples and local communities can be direct (e.g., injury) and indirect, including general feelings of despair and stress.

Chapter 4: Section 4.6

REVIEW OF IMPACTS OF INVASIVE ALIEN SPECIES FOR INDIGENOUS PEOPLES AND LOCAL COMMUNITIES

This section presents the results of a systematic cross-chapter review on Indigenous Peoples and local communities and invasive alien species.

4.6.1 Impacts on nature as documented by Indigenous Peoples and local communities

4.6.2 Impacts on nature's contributions to people as documented by Indigenous Peoples and local communities

4.6.3 Impacts on good quality of life of Indigenous Peoples and local communities

4.6.4 Indigenous Peoples and local communities: comparing positive and negative impacts of invasive alien species

4.6.5 Interactions between impacts and trends, drivers, management documented by Indigenous Peoples and local communities

(see chapter 4 for more information <https://www.ipbes.net/ias>)

Chapter 4: Box 4.14. Impacts of emerald ash borer on Kanienkehá:ka (Mohawk) and W8banaki (Abénakis) Nations lands and the interaction with proposed policy responses

Contributing authors: Lynn Jacobs and Edgar Blanchet of Kahnawá:ke

The emerald ash borer is an invasive beetle from Asia whose lifecycle is dependent on ash trees. This invasive alien species was first discovered near the Great Lakes region of North America in 2002 and has since spread widely, killing millions of ash trees in North America. Many Indigenous nations have a special relationship to the ash tree, especially *Fraxinus nigra* (black ash – *Maahlakws* in AIn8ba8dwaw8gan (w8banaki language) and *éhsa* in Kanien'kéha (Mohawk language)).



Chapter 4: Box 4.14 continued

Black ash is used in traditional arts such as basketry. In the past and still today, the loss of access to black ash due to land privatization, environmental pressures, and the emerald ash borer has had a significant impact on basket making. In turn this results in a loss of traditional knowledge and language about this important cultural practice. More than handicraft, basketry represents a symbol of cultural resilience for many nations.

The practice survived despite all odds and the many obstacles that colonization and governmental restrictions have imposed over centuries. The art of basket making is embedded in Kanien'kehá:ka and W8banaki culture, identity, and spirituality. It has also been an important source of income for generations and continues today.

(see chapter 4 for more information <https://www.ipbes.net/ias>)



Chapter 4: Box 4.17. The impacts on cultural species, cultural sites, cultural relationships and health of Indigenous peoples and local communities, revealed through Indigenous and local knowledge and cross-cultural research in Australia's Northern Territory.

Cross-cultural research (using methodologies from different knowledge systems), was used in Arnhem Land, at the northeast corner of Australia's Northern Territory, to investigate invasive ungulates (buffalo, donkeys, pigs, cattle and horses) trampling and grazing on traditional bush food resources and impacting water quality at several culturally significant wetlands. Wetlands provide Indigenous Peoples with drinking water, medicines and bush foods, including *Eleocharis dulcis* (Chinese water chestnut) and *Nymphaea* spp. (water lilies), and is host to aquatic fauna, including *Chelodina rugosa* (northern snake-necked turtle), which is an important seasonal source of protein (Fordham et al., 2006; Ens, Fisher, et al., 2015).

(see chapter 4 for more information <https://www.ipbes.net/ias>)



Chapter 4: Box 4.18. How impacts on nature's contributions to people and impacts of management affect good quality of life for Indigenous Peoples and local communities

A majority (61%) of the studies reviewed have documented that Indigenous Peoples and local communities suffer yield losses due to the invasion of fall armyworm. The crop yield loss estimates range from 10% in Malawi to as high as 58% in Zimbabwe. Most of the yield loss estimates are related to maize production, but the FAO also found that *Spodoptera frugiperda* has caused 6% and 2% millet and sorghum production losses, respectively, at the national level in Namibia (FAO, 2018).



Chapter 4: Box 4.18 continued

As noted by Rwomushana et al. (2018), this decline in yield losses could be due to build-up of natural enemies, climatic factors, improved management or the possibility that farmers are getting better at estimating *Spodoptera frugiperda*-induced yield loss. It should be mentioned that most of the yield loss estimates were based on farmers' perceptions, which may have overestimated true losses (Baudron et al., 2019) even when controlling for potential confounding factors in a regression framework, documented *Spodoptera frugiperda*-induced yield losses are nearly 12 per cent (Baudron et al., 2019; Kassie et al., 2020).



Chapter 5: Executive summary paragraph 7

Adaptive management, wherever possible led by stakeholders and Indigenous Peoples and local communities, promotes wide acceptance and capacity-building, and optimization of management success (*well established*) {5.2, 5.3, 5.6}. Failure to engage with Indigenous Peoples and local communities, especially those who are adapted to and use invasive alien species, in planning and implementing management actions can reduce good quality of life through loss of livelihoods, marginalization and/or gender inequity (*well established*) {5.2.1, 5.3.1.3, 5.4.4.2, 5.6.1.1, 5.6.1.2}. Broad and inclusive engagement improves planning, decision-making and undertaking management actions (*established but incomplete*) {5.2.1, 5.5.1.2}. This engagement is best achieved through partnerships around co-design, codevelopment and co-implementation and social learning (*established but incomplete*) {5.2.1, 5.4.4.3, 5.6.2.1}. Management programmes are most successful when their goal stretches beyond invasive alien species suppression to include restoring ecosystem resilience and nature's contributions to people (*established but incomplete*) {5.5.6}.



Chapter 5: Excerpt from Section 5.2.1. Stakeholder community engagement and knowledge sharing frameworks for developing communities of practice

Indigenous Peoples and local communities often have different motives for engagement than other stakeholders (Supplementary material 5.1), and manage biological invasions for multiple purposes which are closely related to each other (IPBES, 2022b). It may be noted that spirituality is an overarching motivation for Indigenous Peoples and local communities to protect their land and assets from invasive alien species, even though this is often underreported (IPBES, 2022b; Chapter 4, section 4.6). Therefore, they can provide unique knowledge and management response capacity (Bach et al., 2019; Kannan et al., 2016; Madegowda & Rao, 2014). These stakeholder community engagement systems can be highly context specific (e.g., low vs. high income countries, periurban vs. rural situations, terrestrial vs. marine environments, public vs. private, etc.) but are vital to create co-developed communities of practice around effective community-led responses that support prevention, preparedness (Glossary; section 5.4.2), rapid response and widespread control.



Chapter 5: Box 5.8. Case study: Eradication of five species of invasive alien vertebrates in the archipelago of French Polynesia

On six islands of the archipelago of French Polynesia, a project was undertaken in 2015 to eradicate five species of invasive alien vertebrates: *Rattus exulans* (Pacific rat), *Rattus rattus* (black rat), *Felis catus* (cat), *Oryctolagus cuniculus* (rabbits) and *Capra hircus* (goats). The project was successful on five of the six islands (Pacific rats survived at one site). A management plan was developed and implemented that aimed to restore populations of the endangered *Pampusana erythroptera* (Polynesian ground dove), *Nesofregetta fuliginosa* (Polynesian storm-petrel) and *Aechmorhynchus parvirostris* (Tuamotu sandpiper), as well as other native plant and animal species.



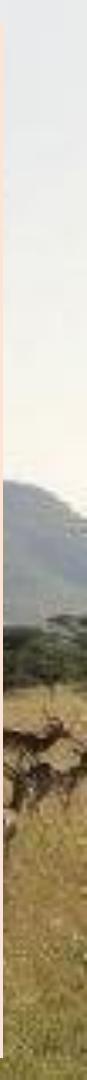
Chapter 5: Box 5.8. continued

International and local conservation non-governmental organizations as well as local communities were involved from the planning phase to the execution of the management actions. Although implementation was challenging, this collective approach proved more cost-effective than if each island had been targeted individually. Effective engagement of stakeholders was key for the success of the project.



Chapter 5: Box 5.15. Surveillance and management of invasive alien species by Indigenous Peoples and local communities - A case study of The Bukusu community in Kenya

The Bukusu community notifies an elder when a new plant species is first found in their environment. A council of elders confirms the detection and quarantine is imposed. A date is then set for a ritual ceremony to determine whether management of the plant should proceed. At the ceremony, a sheep is slaughtered at the detection site and its stomach contents together with samples of plant shoot (called *Lufufu*) are mixed in water which the elder places on and around the plant while some ceremonial statements are made. On the 3rd day the *Lufufu* leaves are checked to see if they are dry, following which the plant is uprooted and burnt. If the leaves are still healthy the plant is considered good for the native ecosystem, given a local name and its uses and applications are defined based on similar local plant species. If a new animal species is detected (whether *Esang'i*- the eaten animal species or *Esolo*- a non- eaten animal species) the council of elders identify its foot prints and a child is given a mixture of *Kulandula* plant to put in the foot prints as the elders curse the animal never to return since its effects to the native ecosystem, economy and livelihoods are not known (Wanzala et al., 2012).



Chapter 5: Excerpt from Section 5.3.1.3. Implementing site-based and ecosystem-based management programmes

A review of 76 relevant case studies suggested that the majority of the management conducted by Indigenous Peoples and local communities is species-based (Supplementary material 5.1). Therefore, some Indigenous Peoples and local communities have developed knowledge and culture that are critical for motivating species-based actions and prioritizing targets, in many cases utilizing available resources as part of local management. In Canada, *Fraxinus nigra* (black ash) is threatened by the invasive alien beetle *Agrilus planipennis* (emerald ash borer). The Indigenous Kahnawake People use *Fraxinus nigra* trees for basket making, which has increased the public demand for conserving *Fraxinus nigra* (IPBES, 2020). In Hawaii, traditional gatherers of native ferns for cultural practices incorporate manual control of invasive alien plants to manage the fern resource (Ticktin et al., 2006).



Chapter 5: Excerpt from Section 5.3.1.3. continued

In a different approach, management can be done through utilization of targeted invasive alien species. For example, the Indigenous Maya Kaqchikel community in Guatemala has recognized the negative impacts of *Pseudopanax laetevirens* (sauco tree or saúco cimarrón in Spanish) and community control efforts have included developing alternative uses for *Pseudopanax laetevirens*, including in food and medicine, which has improved awareness of the benefits and impacts of the tree, helping to limit its spread (IPBES, 2020). Similarly, the loss of native vegetation for livestock feed in various local communities in East Africa (Kenya and Tanzania) from the invasion of the *Prosopis juliflora* (mesquite) tree since the 1970s led to the development of alternative uses of it for firewood and livestock food supporting livelihoods.

(See chapter 5 for more information <https://www.ipbes.net/ias>)



Chapter 6: Executive summary paragraph 7

Committed engagement with stakeholders and Indigenous Peoples and local communities can benefit the management of biological invasions by improving understanding and awareness, social learning, collaboration, surveillance and data generation (*well established*) {6.2.3.3, 6.4.2.1, 6.7.2.6}. Inclusive engagement can help build policy and management plans to address biological invasions that are coherent, legitimate and reflect local environmental and cultural realities. Adaptive-collaborative governance can foster collaboration and coordination grounded in disciplinary integration, experimentation, monitoring, the use of the best available technology and social learning (*established but incomplete*) {6.2.3.3, 6.4.3}. Engagement activities can be explicitly linked with the measurement and monitoring of management actions through national strategies aimed at enhancing respect for Indigenous Peoples and local communities' knowledge, rights and priorities (*established but incomplete*) {6.4.1, 6.4.3.2}. Biocultural community protocols developed by Indigenous Peoples and local communities can frame how they wish to be engaged in the activities that impact them (*established but incomplete*) {6.4.3.2}. ...

(continued in chapter 6, see: <https://www.ipbes.net/ias>)

Chapter 6: Section 6.4 ENGAGEMENT AND COLLABORATION WITH STAKEHOLDERS AND INDIGENOUS PEOPLES AND LOCAL COMMUNITIES

The engagement of stakeholders and Indigenous Peoples and local communities can help construct coherent policy and management plans that are appropriate to local environmental and cultural realities...

6.4.1 Reasons for inclusive engagement

6.4.2 Options for improving engagement with invasive alien species-related activities

6.4.3 Coordination, collaboration and Indigenous Peoples and local communities

6.4.4 Governance networks for collective action

(see chapter 6 for more information <https://www.ipbes.net/ias>)

Chapter 6: Excerpt from Section 6.4.3.2 Co-production of Indigenous Peoples and local communities planning and Biocultural community protocols

Many cases (70 per cent of reviewed cases) suggest that, even where collaborations between outsiders and Indigenous Peoples and local communities are reported to be successful, they do not necessarily consider Indigenous and local knowledge and governance. Some cases report that outsiders tend to focus instead on teaching Indigenous Peoples and local communities about management of invasive alien species using scientific methods. This can cause the loss of knowledge and important cultural practices of Indigenous Peoples (Sillitoe, 1998), as well as undermine long-term management success. There are however positive examples of the inclusion of Indigenous and local knowledge, community governance and institutions in the management of biological invasions. For example, forest scientists partnered with Indigenous Peoples and local communities in Michigan, United States to co-design invasive alien species control experiments using traditional ecological knowledge (Poland et al., 2017). Indigenous Peoples and local communities were involved in decision-making processes for weed control in Western Australia. Rangers consulted Indigenous Peoples and local communities' elders about their work eradicating weeds and used "place centred" methods (Bach et al., 2019).

Chapter 6: Excerpt from Section 6.4.3.2 continued

Overall, key aspects that Indigenous Peoples and local communities have highlighted in relation to successful co-production and co-management include respect for community knowledge, institutions and protocols, allowing enough time to build trusting relationships, and broad distribution of benefits from biological invasion management, which do not need to be financial and can include capacity-building in research and management.

Some Indigenous and local communities have developed biocultural community protocols, documents that consider their values, procedures and priorities to frame how they wish to be engaged in projects that impact them. They set out rights and responsibilities under customary, state and international law as the basis for engaging with other stakeholders (Natural Justice, 2022). Biocultural community protocols could be a foundation for discussions with communities on policies related to managing invasive alien species and restoring ecosystems. For instance, in Hawaii, a biocultural community protocol has been developed to support the successful ecosystem restoration of the Pu'uwa'awa'a Community-Based Subsistence Forest Area (Kamelamela et al., 2022).



Chapter 6: Excerpt from Section 6.4.3.2 continued

Co-production of planning and decision-making, or support of existing Indigenous Peoples and local communities' invasive alien species management systems could indeed benefit communities beyond biological invasions management. It provides recognition of their knowledge systems and incentives to continue or revitalize traditional monitoring, management and knowledge transmission and simultaneously enhances the efficacy of biological invasions management (IPBES, 2021, 2022).

(see chapter 6 for more information

<https://www.ipbes.net/ias>)



Degrees of confidence

In the SPM messages, the degree of confidence is given in brackets for each main finding. This is based on the quantity and quality of evidence and the level of agreement regarding that evidence. The evidence includes data, theory, models and expert judgement.

The summary terms to describe the evidence are:

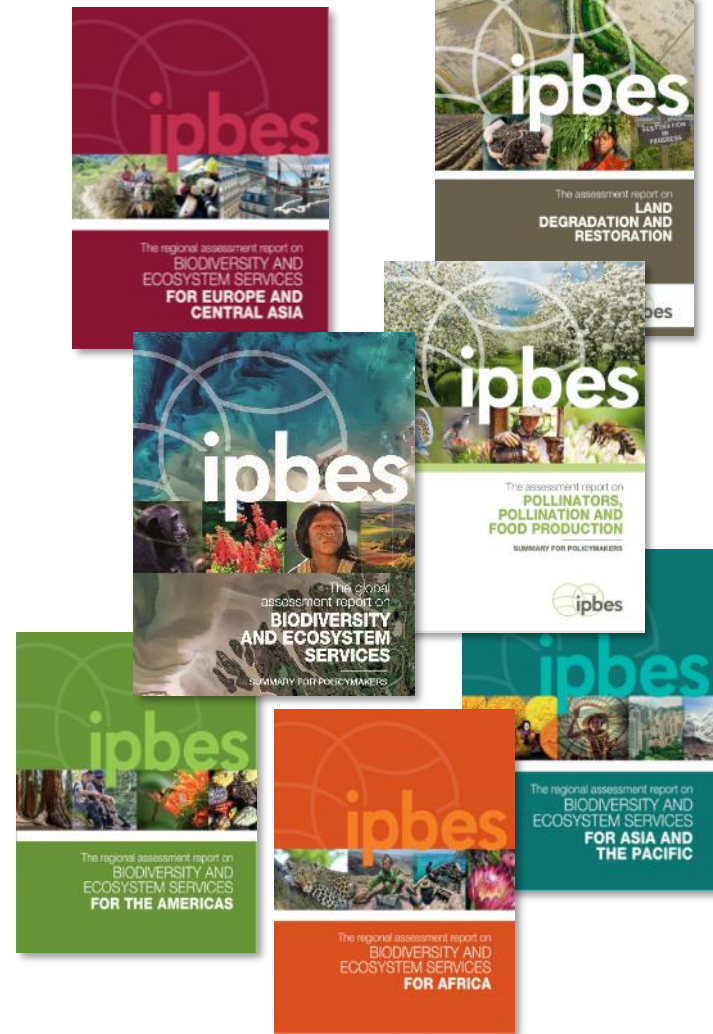
- **Well established:** comprehensive meta-analysis or other synthesis or multiple independent studies that agree.
- **Established but incomplete:** general agreement although only a limited number of studies exist; no comprehensive synthesis and/or the studies that exist address the question imprecisely.
- **Unresolved:** multiple independent studies exist but conclusions do not agree.
- **Inconclusive:** limited evidence, recognizing major knowledge gaps.



Other IPBES assessments

Assessments of biodiversity and ecosystem services are some of the main deliverables from IPBES. Completed, ongoing and upcoming assessments are as follows:

- [Pollinators, Pollination and Food Production](#) (delivered 2016)
- [4 Regional Assessments](#): the Americas, Europe and Central Asia, Africa, and Asia-Pacific (delivered 2018)
- [Land Degradation and Restoration](#) (delivered 2018)
- [Global Assessment](#) (delivered 2019)
- [Values and Valuation of Nature](#) (delivered in 2022)
- [Sustainable Use of Wild Species](#) (delivered in 2022)
- [Nexus of Biodiversity, Water, Food and Health](#) (to be delivered in 2024)
- [Transformative Change and Options for Achieving the 2050 Vision for Biodiversity](#) (to be delivered in 2024)
- [Business and Biodiversity](#) (to be delivered in 2025)



The background is a dark teal color. It features several decorative elements: a cluster of overlapping circles in the center-left, and several stylized leaf shapes in various shades of white and light teal scattered across the top and bottom. The text 'ipbes' is centered in a white, lowercase, sans-serif font.

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