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Item 5 (g) of the provisional agenda*

**Work programme of the Platform:
scoping report for a thematic assessment
of invasive alien species****Scoping for a thematic assessment of invasive alien species and
their control (deliverable 3 (b) (ii))****Note by the secretariat****I. Introduction**

1. At its third session, in its decision IPBES-3/1 on the work programme for the period 2014–2018, the Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services approved the initiation of scoping, primarily using virtual approaches, for a thematic assessment of invasive alien species, for consideration by the Plenary of the Platform at its fourth session. Accordingly, a scoping document was developed by the Multidisciplinary Expert Panel, supported by an open access web-based consultation, or e-conference, held from 7 to 25 September 2015. The present note constitutes the scoping document developed by the Panel. Additional information on the e-conference is available in the note by the secretariat on the scoping process on the thematic assessment of invasive alien species and their control (IPBES/4/INF/12).

II. Scope, rationale, utility and assumptions**A. Scope**

2. The objective of the proposed thematic assessment of invasive alien species and their control is to assess the array of such species that affect biodiversity and ecosystem services; the extent of the threat posed by such species to various categories of biodiversity and ecosystem services, including impacts on agrobiodiversity and food, human health and livelihood security; the major pathways for and drivers of the introduction and spread of such species, between and within countries; the global status of and trends in the impacts of such species and associated management interventions by region and subregion, taking into account various knowledge and value systems; the level of awareness of the extent of invasive alien species and their impacts; and the effectiveness of current international, national and subnational control measures and associated policy options that could be employed to prevent, eradicate and control invasive alien species.

3. The Convention on Biological Diversity defines invasive alien species as “species whose introduction and/or spread outside their natural past or present distribution threatens biological diversity” (<https://www.cbd.int/invasive/WhatAreIAS.shtml>).

* IPBES/4/1.

4. The assessment will largely focus on species fitting this definition, especially those with a demonstrable impact on biodiversity and, through their effects on ecosystem services, on human well-being. In addition, however, if the assessment is to be useful for policy formulation, it must assess not only the current impacts of invasive alien species, but also sources of emerging risk, such as the reservoirs of introduced, but currently non-harmful, species existing in many regions, and species native to a region that are shifting in range due to environmental change, including climate change. The assessment must also recognize that invasive alien species are not a purely passive phenomenon. Most of the movement of international species is human mediated or human driven, e.g., through trade. Lastly, the assessment must devise management strategies that are sensitive to the fact that many alien species may be both problematic and useful. Furthermore, some species will be manageable, but others will be intractable and need to be recognized as such. Responses will therefore need to be flexible and pragmatic, including not only strategies for the prevention and management of such species, but also adaptation or coexistence measures.

B. Geographic coverage of the assessment

5. The assessment will be global, encompassing invasive alien species in terrestrial, freshwater and marine ecosystems in the four regions approved for the Platform's regional assessments.

C. Rationale

6. The proposed assessment responds directly to Aichi Biodiversity Target 9: "By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment", as contained in the Strategic Plan for Biodiversity 2011–2020 (<http://www.cbd.int/sp/targets>). It also contributes directly to Sustainable Development Goal 15, target 15.8, of the 2030 Agenda for Sustainable Development: "By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species" (<https://sustainabledevelopment.un.org/post2015/transformingourworld>). Lastly, it will also contribute to the achievement of Aichi Biodiversity Targets 5, 11, 12 and 17, and help to determine priorities for management under these targets. Invasive alien species are acknowledged as major drivers of species extinctions globally; they degrade habitats and have serious impacts on protected areas around the world.

7. Invasive alien species, which include a vast, and rapidly increasing, range of mainly non-native terrestrial, freshwater and marine vertebrates, invertebrates, plants and disease organisms, constitute one of the most serious and rapidly growing threats to biodiversity, ecosystem services and food, health and livelihood security. For many countries, invasive alien species are seen as a more serious threat than climate change. Such species have been responsible for the extinction of native plants and animals, degradation of rare and threatened ecosystems and ecological communities, crop failure and declining agricultural productivity, loss of cultivar and animal breed diversity, and damage to property, infrastructure, native fisheries, tourism and outdoor recreation. The threats to native biodiversity from marine invasive alien species, either from deliberate or accidental introductions (e.g., in contaminated ballast water or as encrusting organisms on ships), are increasingly serious and very poorly understood.

8. A large proportion of globally and locally threatened species and ecosystems are at risk from invasive alien species. Habitat loss remains the primary threat to most species, but the impact of invasive alien species is an additional significant threat. Whereas threats such as pollution and land degradation can be directly reduced, invasive alien species constitute "self-replicating pollution" with the potential to cause increasing harm if left unmanaged. The impacts on oceanic islands are serious, with a majority of all extinctions of mammals, birds, amphibians, reptiles, land crabs, land snails and insects being directly or indirectly the result of invasive alien species. They also have a significant impact on economies: worldwide, for example, it has been estimated that the cost of damage from such species in 2001 exceeded \$1.4 trillion, amounting to 5 per cent of the global economy.¹ The use of pesticides to control invasive alien species is also a major cause of the loss of biodiversity, and represents a threat to human health.

¹ Pimentel, D., et al., 2001. "Economic and environmental threats of alien plant, animal, and microbe invasions". *Agriculture, Ecosystems and Environment* 84: 1–20.

D. Utility

9. The rapidly growing threat that invasive alien species pose to biodiversity, sustainable development and human well-being is generally poorly quantified and understood by policymakers. The proposed assessment would raise awareness of the nature and seriousness of the threat posed by such species; identify policies that could be used at the international level and by Governments, the private sector and civil society to help stop the spread of, eradicate or control the impact of invasive alien species. This assessment would highlight how the Platform can add value to policy formulation to address the biodiversity crisis.

10. The assessment will aim to address questions of relevance to policymakers dealing with invasive alien species, such as:

- (a) What progress has been made in tackling the Aichi Biodiversity Targets of relevance to invasive alien species globally?
- (b) What global-level policy initiatives would assist in invasive alien species management?
- (c) What are the obstacles to the uptake of invasive alien species management measures?
- (d) What methods are available for prioritizing invasive alien species threats?
- (e) How can alliances and networks assist in the management of invasive alien species? What role can regional partnerships play?
- (f) Are there perverse policy drivers that unintentionally create risks in relation to invasive alien species?
- (g) How can policymakers decide which issues to tackle first given limited resources?
- (h) Would there be value in developing a database of effective legislation, monitoring and response systems for invasive alien species, and of those countries and other stakeholders in need of capacity-building?
- (i) What are the impacts, risks and benefits of invasive alien species for biodiversity and human well-being?
- (j) How may policy sectors, businesses, non-governmental organizations and other stakeholders would benefit from better management of invasive alien species?

E. Assumptions

11. The proposed assessment will be based on existing scientific literature and national assessments and will draw on the work of existing institutions and networks (see section V on relevant stakeholders and initiatives). The assessment team will also be able to draw upon a list of references of published and grey literature, along with comments assembled during the e-conference scoping process. Levels of confidence, as outlined in the Platform's guide for assessments, will be assigned to all findings. The assessment expert group will be diverse in terms of skills, gender and global coverage.

12. Furthermore, the expert group will endeavour to assess the regional status of invasive alien species by building synergies with indigenous and local knowledge systems, because local communities of farmers, hunters, fishers and other local government officers and experts may hold relevant knowledge regarding the history, pathways, changing impacts and the effectiveness of efforts to manage invasive alien species. The approaches and procedures to work with indigenous and local knowledge outlined in the guide for assessments will inform the assessment process.

13. The assessment expert group will consist of 2 co-chairs, 52 authors and 12 review editors, who will be selected in accordance with the procedures for the preparation of the Platform's deliverables following a call for nominations after approval of the scoping report by the Plenary. The assessment expert group will be supported by a technical support unit (comprising one full-time equivalent Professional staff member).

14. As requested by the Plenary at its third session, the Multidisciplinary Expert Panel, in consultation with the Bureau, has developed a coordinated approach for the regional and subregional assessments and the thematic assessments. Under this approach, ten authors with expertise in invasive alien species have been embedded in each of the expert groups for the four regional assessments. These 40 experts are to contribute both to the regional assessments and, by virtual means, to the thematic assessment of invasive alien species. In addition, two of these ten experts from each of the

regional assessments will be fully integrated, as lead authors, in the expert group for the invasive alien species assessment, in order to ensure full coherence among all the assessments with regard to work on such species.

III. Chapter outline

15. It is proposed that the thematic assessment will be a policy-relevant six-chapter report, as set out below.

16. Chapter 1 will introduce the concept of invasive alien species. It will include terminology and definitions; the risks posed by such species to marine, freshwater and terrestrial ecosystems; invasive alien species in the context of the Platform's conceptual framework; and a brief overview of the importance of understanding perceptions of invasive alien species under different value systems.

17. Chapter 2 will provide a detailed review of the various types of invasive alien species. It will include the means and history of the spread of such species, and their impacts, broken down by region, on biodiversity, the world's ecosystems, ecosystem services and human well-being. Invasive alien species in all major taxonomic groups will be covered. Other issues to be covered in chapter 2 include the areal extent of and trends in loss of biodiversity and ecosystem services, land degradation and loss of food and livelihood security due to invasive alien species in all regions and subregions; assessment of thresholds and scale of change (both positive and negative), including the recent arrival of new invasive alien species; reconciliation of existing information with indigenous and local knowledge; future risks to regions and subregions, including reservoirs of introduced species not currently having an impact (often called "sleeper species"), and cases of native species shifting in range.

18. Chapter 3 will consist of a global assessment of the direct and indirect drivers responsible for invasive alien species. It will assess drivers of change, such as the increased movement of commodities and other materials by sea, air and land transport, due to trade; development policies, including aquaculture, forestry, agriculture; climate change, which is expected to increase the rate and impacts of alien species invasions; land degradation and eutrophication; deliberate introductions, such as the pet and ornamental plant trades; the spread of species for the restoration of degraded ecosystems, or those valued by local communities for firewood and other purposes; and inadequate international and national procedures to manage invasive alien species.

19. Chapter 4 will be a global assessment of the environmental, economic and social impacts of invasive alien species. It will focus on their impact on biodiversity, specific ecosystems and ecosystem services, including non-economic values, e.g., cultural, social and shared, recreational, scientific, spiritual and aesthetic. This will include case studies on the impacts of invasive alien species on biodiversity, ecosystem services and food, health and livelihood security. The chapter will attempt to characterize the diverse degrees of invasive alien species impacts, not just focusing on the most impactful species, in order to obtain a realistic, uninflated assessment of overall impact. The chapter will assess occurrences of introduced species that are useful in some sectors but also have a negative impact on biodiversity and ecosystem services.

20. Chapter 5 will review the effectiveness of past and current programmes and tools for the global, national and local management of invasive alien species. In particular, the chapter will consider and assess past experience of:

- (a) Preventing the international and intranational spread of invasive alien species, including the role of the Convention on Biological Diversity, and the role of trade and economic development;
- (b) The precautionary principle and the precautionary approach in managing invasive alien species; the efficacy of risk assessment as a tool for managing such species;
- (c) National quarantine measures, and of the adoption of systematic biosecurity approaches;
- (d) Managing complexity and intersectoral conflict, e.g., introduced species that are useful and harmful, depending on context and values;
- (e) Uses of social media for the detection and management of invasive alien species outbreaks;
- (f) Eradicating or managing invasive alien species once they are present, including control options such as precision application of pesticides, baits and biological control, depleting populations of such species through use and exploitation, and other practices such as "gene drive" technology. Methods for the ethical control of invasive animals will be documented;

(g) Capacities of different countries to manage invasive alien species, and barriers to the uptake of tools; and

(h) Managing invasive alien species in protected areas.

21. Chapter 6 will explore future options for the management of invasive alien species. It will present options for global awareness-raising, for creating early warning systems on the risks of such species, for building capacity, and for sharing knowledge internationally and regionally on prevention and management. Invasive alien species pose a significant problem for regulators attempting to protect the environment from such species, and the assessment will need to suggest policy solutions for handling complex intersectoral trade-offs. Options such as strengthening international networks and customs controls, developing strategies and procedures for forecasting the spread of invasive alien species, and preventing and controlling such spread will be assessed. The chapter will explore, where possible, the implications of scenarios and models for future invasive alien species trends, recognizing that this is still a comparatively underdeveloped area of the science on such species.

IV. Indicators, metrics and data sets

22. Indicators are values or signs that unambiguously reflect the status, cause or outcome of an object or process and are an important tool in the assessment of biodiversity and ecosystem services. Biodiversity and ecosystem service indicators serve multiple purposes which can broadly be categorized into three key functions: (a) tracking performance; (b) monitoring the consequences of alternative policies; and (c) scientific exploration. Assessments mostly use them for the first two purposes.

23. The assessment will review the use and effectiveness of existing indicators, such as those developed by the Biodiversity Indicators Partnership, and will explore other possible indicators that could be used.

24. The assessment will survey the availability of data, recognizing that the scoping process indicated that such data are likely to be very patchy globally. Where possible, the assessment will be carried out at the country scale, or at a more detailed “actionable” scale when appropriate. Data collection and structuring should allow disaggregation based on relevant variables such as environment or system, and taxa.

V. Relevant stakeholders and initiatives

25. Important stakeholders for this assessment will include policymakers who deal with biodiversity and borders. For such stakeholders, there needs to be a strong focus in the assessment on the benefits for countries and their people, including human well-being, of managing the risks of invasive alien species. However, because these species are often the result of intentional movement of species, or of human-driven processes such as trade, important stakeholders will also include international trade organizations, border officials and agencies involved in the intentional movement of species such as those in the forestry and agriculture sectors. Much invasive alien species management must be conducted at the local level. The assessment findings will therefore need to be communicated through context-sensitive material to a broad range of audiences at various scales, including indigenous and local knowledge holders. In addition, public demand for novel pets and ornamentals is a rich source of invasive alien species and many Governments will probably need support in communicating with this important risk-creating sector. Useful communication materials stemming from the assessment could also include training material for natural resource managers, and case studies of successful invasive alien species management plans. The assessment will consider the benefits of building an invasive alien species global support network to help share expertise and experience. Maintaining capability and continuity in the long term has been a significant issue for many countries in the past; the assessment will need to explore mechanisms to address that.

26. Important sources of information and solutions will be sought from stakeholders such as the International Union for Conservation of Nature/Species Survival Commission (IUCN/SSC) Invasive Species Specialist Group, the IUCN Invasive Species Initiative, BirdLife International’s invasive alien species programme, CAB International, the Global Invasive Alien Species Information Partnership (an initiative supported by the secretariat of the Convention on Biological Diversity), the Food and Agriculture Organization of the United Nations, especially its agriculture, aquaculture and forestry divisions, the secretariat of the Convention on Wetlands of International Importance, Especially as Waterfowl Habitat (Ramsar Convention), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Health Organization, the International Plant Protection Committee, and other relevant international and regional expert bodies.

VI. Capacity-building

27. The list of priority capacity-building needs approved by the Plenary at its third session will be used in the proposed invasive alien species assessment.

28. During the scoping process on invasive alien species, it was found that the Platform could make an important contribution by promoting the development and strengthening of human capital and institutional infrastructure to deal with these species. During the process it was also recognized that there were large differences between countries in their capacities to manage such species, and that many would need help in developing such capacity. The process showed that efforts to reduce the impact of invasive alien species will not be successful unless they are coordinated and supported across each country's government agencies. This is especially challenging in cases where such species are being promoted because of their economic benefits (e.g., invasive aquaculture species). The Platform could help to develop a governance model and capacity that take into consideration all these factors and stakeholders.

29. Capacity-building on invasive alien species will aim to improve human, institutional and technical capacities in the long term for the informed and effective implementation and use of assessments, for the development and use of policy support tools and methodologies, and for improving access to necessary data, information and knowledge. It will draw upon the findings of the assessment, aiming to improve the science-policy interface. An important capability may well be the expertise to carry out assessments of existing and potential invasive alien species threats for any development or project and, based on these assessments, develop biosecurity plans and species management plans.

30. The assessment will identify gaps in scientific and other skills that are hindering the sound management of invasive alien species, including in relation to taxonomy, expertise in biotic impact assessment, active adaptive management, structured decision-making, systematic conservation planning and known response and management approaches (eradication, integrated pest management and biological control) and associated infrastructure. In order to support citizen science, publicly available data and analytical tools, of which many exist, can easily be made available to the countries that need them without significant costs being incurred.

VII. Process and timetable

31. The proposed process and timetable for preparing the assessment report, including actions, milestones and institutional arrangements, are set out below.

<i>Date</i>	<i>Actions and institutional arrangements</i>
2016	<p>First quarter</p> <p>The Plenary, at its fourth session, approves the conduct of the thematic assessment of invasive alien species and their control coupled with the regional assessments of biodiversity and ecosystem services, asks for offers of in-kind technical support for the assessment and requests the Bureau and the secretariat to establish the necessary institutional arrangements to put in place technical support</p> <p>The Chair, through the secretariat, requests from Governments and other stakeholders nominations of experts to prepare the assessment report</p>
	<p>Second quarter</p> <p>The secretariat compiles the list of nominations</p> <p>The Panel selects the assessment co-chairs, coordinating lead authors, lead authors and review editors, using the approved selection criteria set out in decision IPBES-2/3 (IPBES/2/17, annex)</p> <p>Meeting of the management committee (co-chairs, head of the technical support unit, and Multidisciplinary Expert Panel/Bureau members) to select remaining expert team and respective roles (i.e., coordinating lead authors, lead authors and review editors) and prepare for first author meeting</p> <p>Selected nominees contacted, gaps filled and list of co-chairs, authors and review editors finalized</p>
	<p>Second/early third quarter</p> <p>First author meeting with 59 participants: co-chairs, coordinating lead authors and lead authors, 8 liaison experts involved in regional assessments (two experts for each of the four regional assessments), Panel/ Bureau members.</p>
	<p>Fourth quarter</p> <p>Zero order drafts of chapters prepared and sent to secretariat (technical support unit)</p>

<i>Date</i>	<i>Actions and institutional arrangements</i>	
2017	First quarter	First order drafts of chapters prepared and sent to secretariat (technical support unit) Compilation of chapters into a first order draft (6 weeks)
	Second quarter	First order draft of collated regional and subregional invasive alien species assessments sent for expert review (6 weeks, June/July) Collation of review comments by secretariat (technical support unit) for first draft sent to authors (2 weeks)
	Early third quarter	Second author meeting (39 participants) including: 8 liaison experts involved in the regional assessments, Panel/ Bureau members, co-chairs, coordinating lead authors and review editors
	Third quarter	Second order drafts of chapters and first order draft of summary for policymakers prepared (5–6 months)
2018	First quarter	Second order draft of the assessment and first order draft of the summary for policymakers sent for Government and expert review (2 months)
	First quarter	Collation of review comments for second order draft of the assessment and first order draft of the summary for policymakers sent to authors (2 weeks)
	Second/early third quarter	Third author meeting (71 participants: co-chairs, coordinating lead authors, lead authors, review editors and Panel/Bureau members)
	Third/fourth quarter	Final text changes to the assessment and the summary for policymakers (6 months)
2019	First quarter	Translation of the summary for policymakers into the six official languages of the United Nations (1 month)
	First quarter	Submission of the assessment, including the translated summary for policymakers, to Governments for final review prior to Plenary session (6 weeks)
	First quarter	Final Government comments on the summary for policymakers for consideration by authors prior to next Plenary session
	May (to be confirmed)	Plenary to approve or accept the thematic assessment of invasive alien species, including the summary for policymakers

VIII. Cost estimate

32. The table below shows the estimated cost of conducting and preparing the assessment report.

<i>Year</i>	<i>Cost item</i>	<i>Assumptions</i>	<i>Estimated costs (United States dollars)</i>
2016	Meeting of co-chairs and secretariat/technical support unit	Meeting costs (1/2 week, 5 participants, in Bonn)	0
	First author meeting (participants: co-chairs, coordinating lead authors, lead authors, liaison experts and Panel/Bureau members)	Travel and DSA (3 x \$3,750)	11 250
		Venue costs (1 week, 59 participants) (25 per cent in kind)	18 750
	Technical support	Travel and DSA (45 x \$3,750)	168 750
2017	Second author meeting (participants: co-chairs, coordinating lead authors, review editors, liaison experts and Panel/Bureau members)	1 full-time equivalent Professional position (50 per cent in kind)	75 000
		Venue costs (1 week, 39 participants) (25 per cent in kind)	7 500
	Technical support	Travel and DSA (30 x \$3,750)	112 500
		1 full-time equivalent Professional position (50 per cent in kind)	75 000

<i>Year</i>	<i>Cost item</i>	<i>Assumptions</i>	<i>Estimated costs (United States dollars)</i>
2018	Third author meeting (participants: co-chairs, coordinating lead authors, liaison experts, review editors and Panel/Bureau members)	Venue costs (1 week, 71 participants)	18 750
		Travel and DSA (54 x \$3,750)	202 500
	Technical support	1 full-time equivalent Professional position (50 per cent in kind)	75 000
	Dissemination and outreach		117 000
2019	Participation by the two co-chairs and two coordinating lead authors in the seventh session of the Plenary	Travel and DSA (3 x \$3,750)	11 250
Total			893 250