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AD HOC TECHNICAL EXPERT GROUP
ON INVASIVE ALIEN SPECIES
Montreal, Canada, 2-4 December 2019

REPORT OF THE AD HOC TECHNICAL EXPERT GROUP ON INVASIVE ALIEN SPECIES

BACKGROUND

1. In decision [14/11](#), paragraph 5, the Conference of the Parties to the Convention on Biological Diversity decided to establish an Ad Hoc Technical Expert Group, with the terms of reference contained in annex II to the same decision, to ensure timely provision of advice on achieving Aichi Biodiversity Target 9, and wherever possible, meet back-to-back with other relevant meetings, and requested the Executive Secretary to convene a moderated open online discussion forum to support the deliberations of the Ad Hoc Technical Expert Group.

2. The Ad Hoc Technical Expert Group on Invasive Alien Species addressed matters not covered by the assessment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). Building on the work of the moderated online forum, and knowledge and experience accumulated in various sectors, the Ad Hoc Technical Expert Group provided advice or developed elements of technical guidance on management measures on invasive alien species to be implemented by broad sectors to facilitate achieving Aichi Biodiversity Target 9 and beyond:

(a) Methods for cost-benefit and cost-effectiveness analysis which best apply to the management of invasive alien species;

(b) Methods, tools and measures for identification and minimization of additional risks associated with cross-border e-commerce in live organisms and the impacts thereof;

(c) Methods, tools and strategies for the management of invasive alien species as it relates to prevention of potential risks arising from climate change and associated natural disasters and land-use changes;

(d) Risk analysis on the potential consequences of the introduction of invasive alien species on social, economic and cultural values;

(e) Use of existing databases on invasive alien species and their impacts, to support risk communication.

3. The [IPBES assessment on invasive alien species](#) covers: (a) concept of invasive alien species; (b) invasive alien species and their impacts; (c) direct and indirect drivers responsible for invasive alien species; (d) environmental, economic and social impacts of invasive alien species; (e) effectiveness of past and current programmes and tools; and (f) future options for the management of invasive alien species.¹

4. The Executive Secretary convened a moderated online discussion forum on invasive alien species (Online Forum) from 1 May to 30 September 2019 (<https://www.cbd.int/invasive/forum2/>) focusing on

¹ See “Scoping for a thematic assessment of invasive alien species and their control (deliverable 3(b) (ii))” ([IPBES/4/10](#)).

the matters that are not covered by the IPBES thematic assessment of invasive alien species. The Online Forum was composed of the following sessions with moderators:

(a) Methods for cost-benefit/cost-effectiveness analysis, moderated by Mr. Peter Robertson (Newcastle University, United Kingdom of Great Britain and Northern Ireland, 1-31 May 2019);

(b) Methods, tools and measures for identification and minimization of risks associated with cross-border e-commerce; moderated by Ms. Christine Villegas (Canadian Food Inspection Agency, Canada, 1-30 June 2019);

(c) Methods, tools and strategies for the management of invasive alien species as it relates to prevention of potential risks arising from climate change and associated natural disasters and land use changes, moderated by Ms. Shyama Pagad (IUCN-SSC-Invasive Species Specialist Group, New Zealand, 1-31 July 2019);

(d) Risk analysis on the potential consequences of the introduction of invasive alien species on social, economic and cultural values, moderated by Mr. Andrew Sheppard (CSIRO, Australia, 1-31 August 2019).

5. Due to its relevance to all sessions, the matter of the “use of existing databases on invasive alien species and their impacts, to support risk communication” listed in the terms of reference for the Ad Hoc Technical Expert Group was considered at all sessions of the Online Forum.

6. The information collected through the Online Forum was summarized in a synthesis report ([CBD/IAS/AHTEG/2019/INF/1](https://www.cbd.int/ahteg/2019/tnf/1)).

7. By notification 2019-078 of 13 September 2019, Parties, other Governments, indigenous peoples and local communities and relevant organizations were invited to nominate experts to the Ad Hoc Technical Expert Group. The experts were selected in accordance with the consolidated modus operandi of the Subsidiary Body on Scientific, Technical and Technological Advice,² taking into account the selection criteria indicated in the notification and the need to ensure equitable geographical distribution and gender balance.

8. With financial support from the Government of Norway, a meeting of the Ad Hoc Technical Expert Group on Invasive Alien Species was convened at the premises of the Secretariat of the Convention on Biological Diversity from 2 to 4 December 2019. The Ad Hoc Technical Expert Group was attended by 15 Government-nominated experts from the following countries: Argentina, Australia, Belarus, Bosnia and Herzegovina, Chile, China, Côte d’Ivoire, Croatia, Cuba, Egypt, Indonesia, Malaysia, Norway, Sweden and South Africa. A representative of the International Plant Protection Convention also participated in the meeting. The following other organizations also participated: Canadian Food Inspection Agency, European Commission, Global Biodiversity Information Facility, International Indigenous Forum on Biodiversity, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, International Union for Conservation of Nature – Invasive Species Specialist Group, Island Conservation, Ministry for Primary Industries (New Zealand), National Institute for Environmental Studies (Japan), Newcastle University (United Kingdom), National Invasive Species Council (United States of America), WWF International, World Customs Organization.

9. A list of participants in the meeting can be found in annex I to the present document.

ITEM 1. OPENING OF THE MEETING

10. The meeting was opened by the Acting Executive Secretary, Ms. Elizabeth Mrema, at 9.30 a.m. on Monday, 2 December 2019. In her opening remarks, Ms. Mrema mentioned the negative impact that invasive alien species had on biodiversity and economies due to increased movements of goods and people, and the serious impact posed by climate change, among others. She welcomed the progress made by Parties on element 9.1 of the Aichi Biodiversity Target 9, referring to the IPBES Global Assessment on

² <https://www.cbd.int/convention/sbstta-modus.shtml>

Biodiversity and Ecosystem Services (2019), and encouraged experts in the room to craft out practical advice that facilitates further progress on Aichi Biodiversity Target 9 by broad sectors.

ITEM 2. ORGANIZATIONAL MATTERS

11. After brief discussion, Ms. Ntakadzeni Tshidada (South Africa) and Mr. Andrew Sheppard (Australia) were elected co-chairs, unanimously.

12. A representative of the Secretariat presented the provisional agenda prepared by the Acting Executive Secretary ([CBD/IAS/AHTEG/2019/1/1](#)) and clarified the expected outcomes of the meeting requested by the Conference of the Parties in paragraph 5 of decision 14/11 and annex II to the same decision.

13. The Ad Hoc Technical Expert Group adopted the agenda and the organization of work (annex II below) for the meeting on the basis of the provisional agenda, amended to include breakout sessions.

14. The experts introduced themselves and their area of expertise in the field of invasive alien species. The co-chairs invited an IPBES representative, attending as an observer, to brief the Group on the ongoing process of the thematic global assessment of invasive alien species. Mr. Peter Stoett, a Co-Chair of the IPBES thematic assessment of invasive alien species and their control, informed the Group that the assessment would be published in 2023, which was not earlier than the anticipated achievement year of Aichi Biodiversity Target 9. As the impacts of invasive alien species were rapidly increasing, he said that the Ad Hoc Technical Expert Group needed to provide practical advice for enhancing the progress on Aichi Biodiversity Target 9 by broad sectors.

ITEM 3. SYNTHESIS REPORT OF THE ONLINE FORUM ON INVASIVE ALIEN SPECIES

15. The moderators who served during the Online Forum in accordance with decision 14/11, paragraph 13(b), made a presentation on the outcomes of the Online Forum regarding the following topics:

(a) Methods for cost-benefit and cost-effectiveness analysis which best apply to the management of invasive alien species;

(b) Methods, tools and measures for identification and minimization of additional risks associated with cross-border e-commerce in live organisms and the impacts thereof;

(c) Methods, tools and strategies for the management of invasive alien species as it relates to prevention of potential risks arising from climate change and associated natural disasters and land-use changes;

(d) Risk analysis on the potential consequences of the introduction of invasive alien species on social, economic and cultural values;

(e) Use of existing databases on invasive alien species and their impacts to support risk communication.

ITEM 4. ELEMENTS OF TECHNICAL GUIDANCE ON INVASIVE ALIEN SPECIES MANAGEMENT MEASURES TO BE IMPLEMENTED BY BROAD SECTORS

16. Experts discussed draft advice or elements of technical guidance annexed to the background document for the Ad Hoc Technical Expert Group ([CBD/IAS/AHTEG/2019/1/2](#)) in breakout sessions in six groups. Each group was composed of Parties from developing countries, developed countries and expert organizations.

17. In each group, experts discussed and refined the texts based on their expertise and experiences in their countries or regions with transforming technical advice into action by broad sectors to achieve Aichi Biodiversity Target 9 and more.

18. After the breakout sessions on the first day (afternoon) and second day (morning), experts reported back to the plenary on the refined texts for further consideration. Experts suggested that additional advice needed to be developed to ensure the implementation of management measures by broad sectors and facilitation of the process for achieving Aichi Biodiversity Target 9 with the participation of all relevant stakeholders.

19. Some experts participated in multiple groups during the breakout sessions, as appropriate, while ensuring geographic and gender balance across the groups.

20. Towards the end of the second day, a rapporteur from each group reported back on the outcomes of the deliberations. The advice or elements of technical guidance on management measures on invasive alien species from each group were circulated by email to all participants for in-depth examination and for finalization on the third day in plenary. The outcomes are presented in annexes III to VII below.

ITEM 5. OTHER MATTERS

21. Experts and co-chairs advised that elements of technical guidance needed to be addressed by Parties, other Governments and relevant organizations beyond the anticipated achievement year of Aichi Biodiversity Target 9 – 2020 – with actions taken by broad sectors. Participants suggested that, as advice and technical guidance would be implemented beyond 2020, it needed to be considered in a separate process, for example, the Open-Ended Working Group on the Post-2020 Global Biodiversity Framework or other relevant meetings of the Convention, and the Ad Hoc Technical Expert Group at its current meeting should focus on deliberation of practical advices and technical guidance.

ITEM 6. ADOPTION OF REPORT

22. The draft report was circulated to participants via email from 4 December 2019 to 9 December 2019, and comments were received from them during this period which were incorporated into the report, in line with the note by the co-chairs produced over the above-mentioned period. The report will be made available as an information document to the Subsidiary Body on Scientific, Technical and Technological Advice at its twenty-fourth meeting, to be held in Montreal, Canada, from 18 to 23 May 2020. Specific advice or elements of technical guidance on management measures for invasive alien species to be implemented by broad sectors for achieving Aichi Biodiversity Target 9 in the present document will also be incorporated in the note by the Executive Secretary to be submitted for consideration by the Subsidiary Body at its twenty-fourth meeting.

ITEM 7. CLOSURE OF MEETING

23. The meeting was closed at 2.30 p.m. on Wednesday, 4 December 2019.

*Annex I***LIST OF PARTICIPANTS**

African Group	
1. Côte d'Ivoire	Ms. Marie Solange Tiebre
2. Egypt	Mr. Mohamed Reda Fishar
3. South Africa	Ms. Ntakadzeni Tshidada
Asia-Pacific Group	
4. China	Ms. Caiyun Zhao
5. Indonesia	Ms. Titiek Setyawati
6. Malaysia	Ms. Lailatul Jumaiyah Binti Saleh Huddin
Eastern European Group	
7. Belarus	Ms. Tatsiana Lipinskaya
8. Bosnia and Herzegovina	Mr. Samir Djug
9. Croatia	Mr. Aljoša Duplić
Latin American and Caribbean Group	
10. Argentina	Ms. Inés Kasulin
11. Chile	Ms. Paulina Stowhas
12. Cuba	Ms. Marvis Esther Suárez Romero
Western European and Others Group	
13. Australia	Mr. Andrew Sheppard
14. Norway	Mr. Esten Ødegaard
15. Sweden	Ms. Melanie Josefsson
Indigenous peoples and local communities	
16. International Indigenous Forum on Biodiversity	Ms. Christine Grant
Other experts	
17. Canadian Food Inspection Agency, Canada	Ms. Christine Villegas
18. European Commission, European Union	Mr. Spyridon Flevaris
19. Ministry for Primary Industries, New Zealand	Ms. Laura Forrest
20. National Institute for Environmental Studies, Japan	Mr. Makihiko Ikegami
21. Newcastle University, United Kingdom of Great Britain and Northern Ireland	Mr. Peter Robertson
22. National Invasive Species Council, United States of America	Mr. Stanley Burgiel
23. Secretariat of the International Plant Protection Convention	Ms. Barbara Peterson
24. Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services	Mr. Peter Stoett
25. World Customs Organization	Ms. Özlem Soysanli
26. Global Biodiversity Information Facility	Mr. Dmitry Schigel
27. International Union for Conservation of Nature	Ms. Shyama Pagad
28. International Union for Conservation of Nature, Invasive Species Specialist Group	Ms. Sabrina Kumschick
29. Island Conservation	Mr. Gregg Howald
30. WWF International	Mr. Colmán Ó Críodáin

Annex II

ADOPTED ORGANIZATION OF WORK

<i>Date/time</i>	<i>Agenda item</i>
Monday, 2 December 2019	
9.30 a.m. - 1 p.m.	<p>Item 1. Opening of the meeting.</p> <p>Item 2. Organizational matters.</p> <p>Item 3. Synthesis report of the Online Forum on Invasive Alien Species:</p> <ul style="list-style-type: none"> (a) Methods for cost-benefit and cost-effectiveness analysis which best apply to the management of invasive alien species; (b) Methods, tools and measures for identification and minimization of additional risks associated with cross-border e-commerce in live organisms and the impacts thereof; (c) Methods, tools and strategies for the management of invasive alien species as it relates to prevention of potential risks arising from climate change and associated natural disasters and land-use changes; (d) Risk analysis on the potential consequences of the introduction of invasive alien species on social, economic and cultural values; (e) Use of existing databases on invasive alien species and their impacts, to support risk communication. (f) Suggestions made by the Online Forum on the elements of technical guidance.
2 - 4 p.m.	<p>Item 4. Elements of technical guidance on invasive alien species management measures to be implemented by broad sectors. Breakout session in six groups to discuss various elements of technical guidance</p>
4.30 - 5.30 p.m.	Plenary presentations by the six rapporteurs
Tuesday, 3 December 2019	
9 a.m. - 1 p.m.	Item 4 (<i>continued</i>). (<i>Breakout session in six groups continued</i>)
2 - 5.30 p.m.	Item 4 (<i>continued</i>). Plenary presentations by the six rapporteurs
Wednesday, 4 December 2019	
9 a.m. - 1 p.m.	Item 4. Plenary – review of the suggested actions
2 - 2.30 p.m.	<p>Item 5. Other matters.</p> <p>Item 6. Adoption of the report.</p> <p>Item 7. Closure of the meeting.</p>

*Annex III***ADVICE PURSUANT TO DECISION 14/11, ANNEX II, PARAGRAPH 1(A): “METHODS FOR COST-BENEFIT AND COST-EFFECTIVENESS ANALYSIS WHICH BEST APPLY TO THE MANAGEMENT OF INVASIVE ALIEN SPECIES”; AND PARAGRAPH 1(D): “RISK ANALYSIS ON THE POTENTIAL CONSEQUENCES OF THE INTRODUCTION OF INVASIVE ALIEN SPECIES ON SOCIAL, ECONOMIC AND CULTURAL VALUES”**

1. Aichi Biodiversity Target 9 states the need for invasive alien species and pathways to be identified and prioritized and for priority species to be controlled or eradicated. The extended technical rationale for this target (COP/10/INF/12/Rev.1) includes the statement that “Given the multiple pathways for invasive species introductions and that multiple alien species are already present in many countries, it will be necessary to prioritize control and eradication efforts to those species and pathways which will have the greatest impact on biodiversity and/or which are the most resource effective to address.” Accordingly, a clear need exists to develop methods to prioritize invasive alien species and the active management thereof.
2. States should develop a coordinated national response strategy to minimize incursions and impacts of invasive alien species, such as national invasive species strategies and action plans as a part of national biodiversity strategies and action plans. This could include strengthening and coordinating existing programmes, identifying and filling gaps with new initiatives, and building on the strengths and capacities of partner organizations, and indigenous peoples and local communities at the national, regional and local levels.
3. States should apply available prioritization methods shown in their best practices to prioritize management of dispersal pathways of invasive alien species within as well as between countries. To agree on prioritized actions, there is a need for knowledge exchange, training and capacity-building.
4. States should apply available best practice of prioritization methods to assess the feasibility and cost-effectiveness of management that can be rapidly applied to a large number of species, at reasonable cost, without being technically demanding, and in a form compatible with and yet complementary to existing approaches to risk assessment. The online forum identified a variety of methods, including the assessment of risks, costs, benefits and prioritization that are used in different countries and in related invasive alien species management regimes. These include cost-benefit, cost-effectiveness and risk analysis. However, the detailed information required to undertake cost-benefit and cost-effectiveness analyses are often in short supply or uncertain, and these analyses require sufficient technical expertise. A number of science-based prioritization methodologies for invasive alien species, horizon-scanning, and impact and management for single or multiple types of invasive alien species have been developed by Parties or independent international science teams and are worth consideration by other countries.
5. States are encouraged to further submit information on their best practices regarding tools and technologies for the management³ of invasive alien species that can be implemented across sectors at all levels.
6. It is suggested that *multi-criteria decision-making* approaches be used, wherever possible, when applying risk analysis, cost-benefit and cost-effectiveness analyses to support risk-based prioritization. Invasive alien species prioritized by actual or potential impacts using such rapid methods should then be considered in more detail to ensure that management, based on clear objectives, is indeed cost-effective and feasible. Multi-criteria decision-making can consider such aspects as effectiveness, practicality, feasibility, likelihood of success, cost, public acceptability, including to indigenous peoples and local

³ This refers to the “application of measures to prevent the introduction of, control or eradicate invasive alien species” (see [CBD/IAS/AHTEG/2019/1/2](#), para. 13(e)).

communities, of proposed actions as well as any unintended negative impacts of management alongside the risks and impacts posed by the targeted invasive alien species. These methods involve a structured process and resolving issues associated with decision-making and planning that involve multiple criteria and are designed to find optimal solutions to complex problems where assessment criteria or data are measured in different ways. They can also be used with expert elicitation when only incomplete or imprecise information is available.

7. It is suggested that guidelines be developed in order to more explicitly include social and cultural values when assessing the costs, benefits and prioritization of management. This could build on existing processes (for example, Socio-economic Impact Classification of Alien Taxa (SEICAT)) and international best practices on stakeholder engagement in decision-making. New Zealand has the most developed system — *mātauranga Māori* — which incorporates cultural values and perspectives in the management of invasive alien species. In this system, indigenous peoples and local communities are involved in the governance of invasive alien species management when treasured, sacred culturally and spiritually significant (*taonga*) species are at risk. This system is worthy of emulation.

8. It is suggested that efforts be made to increase qualitative and quantitative knowledge and data on socioeconomic and cultural impacts of invasive alien species on communities and society, including indigenous peoples and local communities, and methods to use this knowledge when prioritizing invasive alien species for impact and management feasibility and likelihood of success. It will be important to define socioeconomic, cultural and community well-being criteria in order to collectively evaluate such impacts, for example how the impacts of invasive alien species on treasured, sacred, culturally and spiritually significant native species can be measured and impact thresholds understood and addressed.

9. It is suggested that efforts be made to increase the accessibility and standardization of data and analysis on past management activities across species and ecosystems to support evidence-based management prioritization and decision-making. Standardized guidelines for vocabulary and how to collate and report on such data should be developed, including species, management objective, cost and/or effort, area covered, and outcome of management actions. This will assist in the creation of common approaches to sharing and reporting experience and information.

10. Enhanced risk communication is essential to facilitate dialogue and understanding between and among stakeholders, who may include the general public and indigenous peoples and local communities. Risk communication seeks to reconcile the views of all interested parties in order to achieve a common understanding of the risks posed by invasive alien species, develop credible risk management options and consistent regulations, and promote awareness of issues concerning invasive alien species.

*Annex IV***ADVICE PURSUANT TO DECISION 14/11, ANNEX II, PARAGRAPH 1(B): “METHODS, TOOLS AND MEASURES FOR IDENTIFICATION AND MINIMIZATION OF ADDITIONAL RISKS ASSOCIATED WITH CROSS-BORDER E-COMMERCE IN LIVE ORGANISMS AND THE IMPACTS THEREOF”****A. Suggested actions for national authorities/border agencies***1. Legislation and policy set by States*

1. States should evaluate the risks posed by all forms of e-commerce (including illegal e-commerce activities) to the introduction and spread of invasive alien species and, if necessary, develop and implement appropriate risk management activities.
2. States should review existing national legislation, regulations and policies to verify that e-commerce is adequately addressed or make changes as needed to ensure that enforcement actions can be taken.
3. States should establish mechanisms to identify commodities of concern that may be obtained via e-commerce with a focus on potential high-risk consignments, such as soils, growing media, and living organisms.
4. It is suggested that States consider the use of lists that specify which species may be imported and restrict the remainder, rather than lists that only identify those species whose import is prohibited or restricted, in the interests of preventing the unintended introduction of invasive alien species, and especially in the case of countries that are vulnerable to invasive alien species, such as small island developing States, island countries, and countries with islands. These considerations should be in compliance with the multilateral agreements and guidelines, including the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures.

2. Stakeholder engagement

5. States need to develop mechanisms, in collaboration with e-commerce stakeholders, for identification of e-commerce traders, their locations and other stakeholders with a view to facilitating inter-agency and multi-stakeholder participation and cooperation.
6. States need to engage with indigenous peoples and local communities for detection of early incursion, establishment or spread of e-commerce-derived invasive alien species across traditional lands and waters.
7. States need to promote compliance with the sanitary, phytosanitary and veterinary import requirements of importing countries among e-commerce customers and traders by providing quality information on the risks to the customer's country (both legal and environmental) posed by the by-passing of such requirements.
8. Relevant international organizations need to strengthen coordination with postal and express courier services to ensure that relevant information on the risks and preventive measures are conveyed to e-commerce users.
9. Trade authorities of States need to ensure import/export requirements are up-to-date, clear and accessible to e-commerce stakeholders. This can be accompanied by additional guidance and examples of best practice to assist e-commerce stakeholders to comply with the requirements. Public awareness and information campaigns should aim to inform both sellers and buyers about invasive alien species, focusing on their legal responsibility. Both social media and specialized media, such as pet magazines/journals/books, especially journals from pet or plant association/society and multi-agency targeted publicity campaigns should be used to disseminate correct information, aiming to shift consumer

values (e.g. toward native and non-invasive species) and to change behaviours (e.g. to prevent impulse purchase of invasive alien species).

10. The Single Window⁴ approach allows the sharing of standardized information and documents with a single-entry point to fulfil all import, export and transit-related regulatory requirements. Its implementation at the national level may facilitate reporting on regulated articles (including live alien organisms with phytosanitary and sanitary risks, and risks to biodiversity).

11. States should establish legal and policy frameworks that allow for the advanced international electronic sharing and exchange of data between all actors involved in the international supply chain and use this data to triage packages and determine the level of inspection needed (risk-based inspection).

3. Monitoring and compliance

12. States need to gather data using all available means and tools (e.g. crowdsourcing) to monitor compliance and to evaluate the efficacy of activities that are implemented to mitigate risks associated with e-commerce. The data collected should be used, together with other relevant information including compliance history, and relevant information from indigenous peoples and local communities with their free, prior and informed consent, to inform risk-based inspections and determine if investigation or enforcement action is needed. Apply data analytics to discern any abnormal trends and patterns including potential invasive alien species incursion and impact risks.

13. States need to apply non-intrusive inspection (NII) technologies and disseminate good practices and risk-based interventions using best practice methods of data analytics to facilitate legitimate e-commerce and, at the same time, identify and stop illicit trade. The use of scanners, sniffer dogs and other available tools, and the further development of automated biosensors can improve efficient detection of prohibited and restricted articles moving through the express courier and postal systems.

14. States and relevant organizations need to develop and implement training and tools to facilitate appropriate level of monitoring and inspection in e-commerce markets. This could include developing guidance on monitoring of e-commerce platforms and on the issuance of warnings, notices and other enforcement actions when non-compliances are found in e-commerce transactions, and the proper handling of restricted items seized in compliance with national law.

B. Suggested actions for web marketplaces (sale platforms) and e-payment service providers, postal and express courier services

15. Web marketplaces (sale platforms) and e-payment service providers, postal and express courier services:

(a) Should consider the information available from relevant international bodies, national authorities and other sources, regarding the risks (both legal and environmental) posed by invasive alien species and take steps accordingly to make their users aware of them;

(b) Should monitor e-commerce and, consistent with relevant national legislation, alert relevant authorities where there is evidence of illegal or otherwise potentially damaging trade in invasive alien species taking place;

(c) Need to develop and apply improved management measures to minimize the risks of introduction of invasive alien species through e-commerce, consistent with international obligations.

⁴ A single window is defined as a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfil all import, export, and transit-related regulatory requirements (see <http://www.wcoomd.org/~media/wco/public/global/pdf/topics/facilitation/activities-and-programmes/tf-negotiations/wco-docs/info-sheets-on-tf-measures/single-window-concept.pdf>).

C. Suggested actions for international bodies/agreements and cross-jurisdictional collaboration

16. International bodies/agreements undertaking cross-jurisdictional collaboration should undertake the following:

- (a) Collaborate to share data, information, technology and expertise on e-commerce in potential invasive alien species;
- (b) Draw on guidance from other international bodies, including the ongoing work by the World Customs Organization and in the Bern Convention;
- (c) Continue to monitor e-commerce in potential invasive alien species at the global and regional levels with a view to identifying trends and risks in trade of invasive alien species;
- (d) Prepare guidance to assist national border agencies in responding to non-compliance, considering that both domestic and international actions may be required to respond effectively;
- (e) Improve collaboration between national border agencies in order to enhance opportunities to link existing security initiatives with invasive alien species risk management and targeted (risk-based) inspections. This will also provide a mechanism for timely information-sharing among national border agencies and other relevant ministries/departments on issues related to cross-border e-commerce trade;
- (f) Conduct joint capacity-building activities with relevant organizations and provide technical assistance and resources for implementing existing international guidelines and standards, and developing national regulatory frameworks or measures to address the risks associated with e-commerce for all relevant stakeholders including indigenous peoples and local communities;
- (g) Expand the concept of “authorized economic operators”⁵ (AEO); trusted trader to cross-border e-commerce and include invasive alien species risks in AEO criteria and requirements. Implementing AEO and trusted trader programmes in the e-commerce environment for postal operators, express carriers and e-platforms which would result in a lower frequency of inspections;
- (h) Establish frameworks that allow for the advanced electronic exchange of data between all parties involved in the international supply chain and use these data to triage packages and determine the level of inspection needed (risk-based inspection).

D. Suggested actions for relevant international expert organizations

17. Relevant international expert organizations:

- (a) Should raise awareness among international organizations and e-commerce stakeholders about import/export requirements and what can be done to minimize the risk of introduction and spread of alien and potentially invasive species associated with e-commerce;
- (b) Building on such frameworks as EICAT,⁶ establish an international invasive alien species risk-based labelling system, to be used for all species sold via e-commerce and provide guidance on the handling and care of organisms. On consignments of live alien species, such labelling should include information to enable identification of hazards for biodiversity and the identification of species or lower taxa (e.g., scientific name, taxonomic serial number or its equivalent).

⁵ See also WCO *Compendium of Authorized Economic Operator Programmes* (2019), <http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/facilitation/instruments-and-tools/tools/safe-package/ao-compendium.pdf?db=web>

⁶ IUCN *Environmental Impact Classification for Alien Taxa*, <https://ipbes.net/policy-support/tools-instruments/environmental-impact-classification-alien-taxa-eicat>

Annex V

ADVICE PURSUANT TO DECISION 14/11, ANNEX II, PARAGRAPH 1(C) “METHODS, TOOLS AND STRATEGIES FOR THE MANAGEMENT OF INVASIVE ALIEN SPECIES AS IT RELATES TO PREVENTION OF POTENTIAL RISKS ARISING FROM CLIMATE CHANGE AND ASSOCIATED NATURAL DISASTERS AND LAND USE CHANGES”

A. Prediction

1. Managing the impacts of invasive alien species on biodiversity and ecosystem services requires knowledge of the manner in which the actual and potential impact will vary as a result of climate change so that management priorities can be altered accordingly.
2. States, organizations and other stakeholders are strongly encouraged:
 - (a) To undertake horizon scanning to forecast/predict future changes in actual and potential risks and impacts of invasive alien species arising from climate change;
 - (b) To identify changes in invasive alien species pathway risks arising from climate change. Climatically similar regions posing the greatest current mutual risks today are likely to change in the future along with changes in trade and the movement of people between these regions;
 - (c) To prioritize invasive alien species on the basis of potential direct and indirect impacts arising from climate change;
 - (d) To identify additive or synergistic effects of climate change on new potential invasive alien species introductions into pristine and invaded communities;
 - (e) To determine and prioritize for action sites at the greatest risk from climate change and invasive alien species, including offshore and mainland islands, mountaintops and coastal environments critical for supporting threatened and endangered species;
 - (f) To apply climate models to understand the potential negative and positive impacts of invasive alien species on biodiversity and ecosystem services arising from climate change, and to further develop models for use on a broad scale by developing countries;
 - (g) To develop better methods to integrate (i) climate change models, (ii) land-use scenarios and (iii) trends in trade with invasive alien species data analysis to improve prediction capability;
 - (h) To define scenarios to understand where invasive alien species may indirectly increase the impacts of climate change on biodiversity and ecosystem services by transforming ecosystems;
 - (i) To modify/fine-tune invasive alien species risk analysis, and identify potential “sleeper” alien species⁷ (including disease vectors) that are likely to become more invasive as a result of climate change;
 - (j) To study and validate identified high-risk sleeper species. This can be done by using such approaches as sentinel sites to monitor changes in abundance and impacts of such sleeper species or growing these species under containment in areas with climates similar to those expected in the future;
 - (k) To identify ecological thresholds for step-change loss of community resilience under climate change;
 - (l) To identify invasive alien species that are likely to benefit under increased CO₂ levels, extreme event frequency, fire regimes of increased frequency and intensity, high salt-water incursions,

⁷ Sleeper alien species: alien species whose population persistence is limited by the current climate and which are expected to exhibit greater rates of establishment as a result of climate change.

changes in ocean currents and changes in precipitation patterns, and prioritize management to prevent their spread and impacts, including humane methods of eradication and control;

(m) To improve knowledge of the risks of invasive alien species adapting to new environmental conditions, including rapid evolution and hybridization.

B. Planning and prevention

3. States are encouraged, in collaboration with experts:

(a) To develop climate change relevant risk analysis for prioritising invasive alien species for management (e.g. fire enhancing weeds, vines, saline tolerant invaders);

(b) To develop and implement management strategies to eradicate, contain or control high ranking sleeper species before they can respond to climate change;

(c) To monitor the spread and impact of high-ranking sleeper species, particularly in sites or regions where biodiversity and ecosystem services are likely to deteriorate rapidly under climate change. Best-practice approaches using, for example, remote sensing or sensor networks are suggested to be undertaken;

(d) To minimize the potential of biological invasions or develop spatial response planning for areas in which communities are threatened with a high risk of extreme weather events (e.g. relocate zoos, botanical gardens, exotic aquaculture facilities from extreme-event-prone areas);

(e) To adapt current pathway management with a view to reducing changes in risks arising from climate, including predicted associated changes in trade and movement of people;

(f) To engage all sectors, including agriculture and public health agencies and industries, in invasive alien species planning activities where climate change risks are cross-sectoral;

(g) To raise public awareness of changing invasive alien species threats arising from climate change and encourage the participation of the public and all relevant sectors in response planning.

C. Management

4. It is suggested that States take the following actions:

(a) Apply adaptive management approaches to future prioritized management actions arising from climate change and share the information with other Parties to improve outcomes;

(b) Take steps to increase the long-term functional resilience of threatened ecosystems and habitats to climate change, extreme weather events and natural disasters and associated invasive alien species incursions, particularly for islands and coastal systems;

(c) Undertake containment, eradication or control of invasive alien species in areas that could act as non-native sources for spread into identified vulnerable areas and/or native communities;

(d) Collate existing knowledge into international online databases to allow the interoperable collection and dissemination of data and knowledge on the effectiveness of actions to mitigate impacts of invasive alien species arising from climate change. An example of such a database is the Database of Island Invasive Species Eradications (DIISE).⁸ This and others should be developed and populated by States;

(e) Develop and integrate invasive alien species management strategies into “threatened climate vulnerable species movement-assisted translocation actions” to avoid unintended consequences.

⁸ <http://diise.islandconservation.org>.

D. National and international cooperation

5. States and relevant international organizations should integrate pathway and invasive alien species risk based multi-criteria prioritization approaches into all levels of planning to obtain multiple benefits and shared outcomes, including the following:

(a) National and international climate mitigation and adaptation strategies, environmental impact assessments, and response planning activities;

(b) Other relevant conventions (e.g. United Nations Framework Convention on Climate Change, Convention on the Conservation of Migratory Species of Wild Animals) and providing relevant United Nations implementing agencies with policy guidance;

(c) National and international commitments and actions under the Sustainable Development Goals;

(d) Market incentive programmes and other actions funded by multilateral agencies or forums, such as the Global Environment Facility, the Clean Development Mechanism and the Green Climate Fund.

6. It is suggested that relevant international organizations organize training for governmental and non-governmental development assistance agencies and operatives engaged in disaster relief, to identify invasive alien species and undertake rapid response with appropriate measures, such as quarantine, emergency response, eradication, containment and control.

*Annex VI***ADVICE PURSUANT TO DECISION 14/11, ANNEX II, PARAGRAPH 1(E) “USE OF EXISTING DATABASES ON INVASIVE ALIEN SPECIES AND THEIR IMPACTS, TO SUPPORT RISK COMMUNICATION”**

1. It is essential that States maintain and curate data sets on invasive alien species distribution, impact and management action and relevant knowledge. States should share relevant publicly available data with the key global data aggregators in order to support processes under the Convention on Biological Diversity on invasive and alien species.
2. States should seek formal participation and ensure bidirectional data streams between data holders and generators through the national data portals (where applicable) to the global-level aggregators. Country membership status, capacity, resources and other aspects should be understood by all Parties. Open access to data and seamless integration of this data between data tools used by stakeholders is an imperative for better management and monitoring of this threat. This will (a) increase data flows necessary for CBD level analysis and international decision-making and (b) open opportunities for national capacity-building and resourcing.
3. States should agree on shared data standards even if languages differ between data portals to facilitate data sharing. It is also important to obtain free, prior and informed consent from indigenous peoples and local communities before obtaining data from them or from their lands;
4. States should support real-time data sharing (made easy by agreed data standards) to strengthen invasive alien species prevention and management systems and implement early detection and rapid response.
5. States should strengthen the representation of invasive alien taxa, such as marine, invertebrates, microorganisms and fungi in existing databases and collect and integrate DNA sequence data into existing databases, where applicable. This could be facilitated through collaboration between expert working groups to collate existing databases using existing standards.
6. States should encourage existing global invasive alien species data providers, such as IUCN-Invasive Species Specialist Group (IUCN-ISSG), Global Biodiversity Information Facility (GBIF) and CABI, to also provide information on best practices in producing policy and regulatory mechanisms and codes of conduct to address activities that lead to the introduction and spread of alien and invasive species. This included activities such as aquaculture, pet trade and aquarium trade. Further, IUCN-ISSG and partners should be encouraged to index collate and archive the development of policy response indicators within the Biodiversity Indicators Framework (BIP) and Sustainable Development Goal indicator 15.8.1. Additionally, existing databases, such as ECOLEX and FAOLEX, should be made searchable using filters, for example “alien” and “invasive alien species”.
7. States should support the ongoing maintenance of the Global Registry of Introduced and Invasive Species (GRIIS) and other expert networks focused on collation and curation of new and existing data. When GRIIS achieves global coverage in 2020, this will assist identification and prioritization of species to achieve Aichi Biodiversity Target 9.
8. States should support the establishment and continuity of national membership in GBIF, which includes setting up the national node. GBIF should ensure global growth and central open access to the global biodiversity data, including occurrence data on invasive alien species. National coordination of data streams is essential for timely, comprehensive and fair availability of the occurrence data on invasive alien species from multiple sources.
9. States should take advantage of and contribute to the CABI Invasive Species Compendium, which is an encyclopedic resource of scientific information on invasive alien species to help inform decision-making.

10. It is suggested that States, in collaboration with experts, extend impact assessment frameworks (e.g. EICAT and SEICAT) to develop science-based policies and prioritization of invasive alien species management actions. These approaches could be used to develop appropriate impact-risk-based labelling for transport of consignments containing living organisms.

11. To achieve Aichi Biodiversity Target 9 and beyond, data standardization and sharing will be required. This is dependent, however, on the quality and efficiency of data streams from national (via regional, thematic) to global database systems. Many initiatives are available to achieve this on the basis of the advice given above.

*Annex VII***ADDITIONAL ADVICES AND TECHNICAL GUIDANCE****A. Advice on the use of sanitary and phytosanitary measures**

1. The application of sanitary and phytosanitary (SPS) measures to regulate import/export of alien organisms at the national level requires close collaboration between national authorities and other relevant ministries and departments. Some countries closely coordinate their activities on import requirements for alien organisms among relevant ministries and agencies, including national plant protection organizations and the veterinary authorities (e.g., coordination in Australia between the Department of Agriculture and the Department of Environment and Energy).
2. Environmental authorities, national plant protection organizations and veterinary authorities should be advised to establish strong partnerships with national, regional and local governments in connection with mandates for alien species management. This will help prevent the introduction of invasive alien species and support early detection, rapid response and effective management. Such partnerships could include collaboration in setting national priorities, completing risk assessments, carrying out surveillance, developing response plans, sharing information and exchanging expertise.
3. A large number of the international standards that are recognized by the World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) are relevant for protecting biodiversity. These SPS measures should be applied more widely, not only in the context of agriculture, but also to protect the health of fish and wild fauna and of forests and wild flora.
4. A number of guides, manuals and training materials have been developed under the International Plant Protection Convention (IPPC) to build capacity and support the implementation of international standards. These materials should be used to raise awareness and build capacity among partner organizations to address the issue of invasive alien species.
5. There is a need for capacity-building among developing countries, making available the necessary resources for implementing existing IPPC international guidelines and standards and developing national regulatory frameworks to address the risks associated with invasive alien species.
6. Regional cooperation and partnerships should be further developed to support the achievement of Aichi Biodiversity Target 9 and beyond, through regular coordination and communication, identification of common priorities and alignment of efforts on a regional basis. This could be supported through IPPC by using the model of regional plant protection organizations to foster cooperation on invasive alien species.
7. A key gap that needs additional attention and potentially guidance is wildlife pathogens (including hosts and vectors) and other organisms that do not meet the IPPC definition of quarantine pests, the pathogens causing diseases listed under the World Organization for Animal Health (OIE) and other organisms (e.g. invasive ants) that are not covered by IPPC or OIE.
8. As countries adopt different approaches in regulating invasive alien species (e.g., lists of restricted, prohibited and allowed species or hybrid lists), guidelines could be developed on how such approaches can be implemented in compliance with the SPS Agreement, with a view to facilitating the development of better regulation and ensure transparency.

B. Advice on management-specific pathways*1. Inter-basin water transfer and navigational canals*

9. States that have not already done so should consider ratification and application of relevant international maritime agreements (e.g. the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention), mentioned in paragraph 25 of decision VIII/27, and the Guidelines for the control and management of biofouling mentioned in paragraphs 29 and 30 of decision VIII/27) in order to diminish the spread of invasive alien species through new shipping routes opening up as a result of climate change.

10. States should enhance regional cooperation on planning, monitoring and data exchange on invasive alien species specifically related to inter-basin water channels to establish early warning and rapid response systems.

11. States should include measures to prevent the introduction and spread of invasive alien species in the procedures for planning, development and management of the inland waterway infrastructure. Relevant organizations, indigenous peoples and local communities, and other stakeholders, including local fishers and other groups that are dependent on the waterways (e.g., boaters, recreational boat users, outfitters), should be consulted and engaged when planning and designing such measures.

2. International aid programmes

12. Developing countries need capacity-building, resource mobilization and information sharing for assessing and managing the invasive alien species risks associated with international aid programmes.

13. Aid agencies should ensure that any initiatives/projects/programmes/agreements avoid the introduction of invasive alien species into the area.

Emergency relief, aid and response

14. Environmental authorities should consult the relevant enforcement agencies to comply with the SPS Agreement or the country's quarantine regulation to prevent risk of biological invasions associated with emergency relief, aid and response.

15. Documenting any case of invasive alien species in aid-recipient countries should be initiated across broad sectors.

16. States should incorporate the risk of invasive alien species into emergency response strategies.

17. States should identify aid-provider and aid-recipient responsibilities to avoid any invasive alien species introduction through contaminants in aid transports and transfers.

3. Air transport

18. The Secretariat and relevant organizations should engage groups of stakeholders at all levels to develop standards to prevent hitchhiker or stowaway species arriving by air.

19. The Secretariat should further collaborate with IPPC, OIE, ICAO, WCO and IATA, with input from relevant stakeholders, to develop harmonized operating standards related to air cargo.

20. States should avoid the introduction and spread of invasive alien species through the transport of living organisms, in accordance with the guidance annexed to decisions XII/16 and 14/11.

4. Tourism

21. Parties, in collaboration with travel operators and non-governmental organizations, should develop awareness programmes and campaigns to educate tourists, tourism agencies and policymakers on the risk of invasive alien species, and strategies and techniques to minimize risks.

22. Parties should prioritize minimizing the impact of touristic activity to prevent the introduction and spread of invasive alien species, taking into account vulnerable ecosystems, such as island ecosystems and protected areas.

23. The Secretariat should collaborate with the World Tourism Organization to consider joint efforts in addressing tourism as a major possibility for introducing invasive alien species and the management thereof.

C. Advice on capacity-building activities

24. The Secretariat should include capacity-building specifically in invasive alien species management and incorporate such elements into the general capacity-building programme under the Convention.

25. States should also establish training programmes at the international, national or regional level by inviting broad sectors, especially academics and scientific expert organizations and other relevant organizations, including indigenous peoples and local communities.

26. It is suggested that the Secretariat provide advice on the evaluation of existing capacity and develop training packages for relevant topics, such as taxonomy, ecology, invasion biology, risk analysis, management of priority species and pathways. This should include data management to apply international data standards within national government agencies.

27. Building on the previous work done by the Secretariat in compiling the toolkit⁹ to facilitate the achievement of Aichi Biodiversity Target 9, the Ad Hoc Technical Expert Group recognizes the need to develop technical resources, including technical manuals written in plain language for broad sectors, as follows:

(a) Taxonomic identification of organisms, e.g. DNA barcoding, artificial-intelligence-aided identification and citizen science;

(b) How to apply sanitary and phytosanitary measures to prevent spread of invasive alien species;

(c) How to publish and use data on invasive alien species using international data standards to ensure cross-linking national and regional and global thematic databases;

(d) Best practices published on successful eradications, and other useful information resources on technical advice on websites;

(e) How to use shared information on invasive alien species for national and regional policy-setting and implementation;

(f) How to apply classical biological control agents against invasive alien species;

(g) How to apply an ecosystem-based approach to control invasive alien species;

(h) Multi-criteria decision support manual for policymakers;

(i) If needed, a model regulatory act on invasive alien species with shared responsibility among broad sectors;

(j) Management manuals for broad sectors to communicate on invasive alien species among different stakeholders, including indigenous peoples and local communities.

⁹ A toolkit to facilitate Parties to achieve Aichi Biodiversity Target 9 on invasive alien species (Prototype)
<https://www.cbd.int/invasive/cbdtoolkit/>