

DRAFT METHODS FOR COST-BENEFIT AND COST-EFFECTIVENESS ANALYSIS WHICH BEST APPLY TO THE MANAGEMENT OF INVASIVE ALIEN SPECIES

(PROVISIONAL ADVICE PURSUANT TO DECISION 14/11, ANNEX II, PARAGRAPH 1 (A))

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 (CBD/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. Established cost-benefit and cost-effectiveness methods are widely available and already in use in some regions to assist invasive alien species management decision-making, including prioritization. However, these existing analyses typically require detailed information, for example on costs, and may need technical expertise to apply. Including consideration of biodiversity, animal welfare and public acceptability in cost-benefit analyses can also be problematic as, although possible, these are often difficult to represent in simple financial terms.

3. The final decision to eradicate or manage an invasive alien species carries significant costs and risks. While these rapid methods may produce “short lists” of priority species to consider for management, more detailed pilot studies and economic assessments are recommended before commitments to management are made.

4. To support risk management, methods may be required when large numbers of species need to be rapidly assessed, where detailed information is often lacking and where non-monetary based inputs on social and cultural values are required.

A. Multi-criteria methods

5. Multi-criteria methods can be used in circumstances where more detailed, but data-hungry approaches, such as cost-benefit analysis, may be impractical. Multi-criteria methods provide a route to the rapid assessment of options and are already widely used to support invasive alien species decision-making – for example through the risk assessment process. There is scope to use multi-criteria methods more widely to support decision-making to answer questions such as how to prioritize species for management, when to choose between prevention, eradication or long-term management objectives, how to produce rapid assessments of large numbers of species, or how to compare the feasibility of different management options?

6. Multi-criteria decision-making is concerned with structuring and solving decision and planning problems involving multiple criteria. By breaking problems down into their different components they can be used to assess decisions in a transparent and rational manner, they can be rapidly applied to large numbers of cases, and by using expert opinion, or the knowledge of indigenous peoples and local communities with their prior and informed consent, free prior and informed consent or approval and involvement, they can still be applied where published information is lacking. These modelling and methodological tools are designed to find optimal solutions to complex problems where assessment criteria or data are measured in different currencies.

7. Because multi-criteria approaches often operate in the absence of published data, this may raise concerns over the use of opinion or unsubstantiated information. The way in which multiple criteria are combined to support an overall conclusion can also be problematic and is often based on pragmatism rather than a validated approach. Nevertheless, multi-criteria methods and cost-benefit analysis benefit complement each other, for example an initial prioritization based on a large number of options may be undertaken using a multi-criteria approach, but the proposed priorities may then be more fully assessed using a more rigorous approach such as cost-benefit before resources are committed.

B. Advice for actions

8. A coordinated national, subnational and local response strategies should be developed to minimize incursions and impacts of invasive alien species, such as national, subnational and local invasive species strategies and action plans as a part of national, subnational and local 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, including academia and scientific institutions, indigenous peoples and local communities and women and youth at the national, regional and local levels.

9. The best available prioritization methods should be applied to prioritize management of dispersal pathways of invasive alien species within as well as between countries, and for assessing feasibility and cost-effectiveness.

54 These methods should be in a form compatible and complementary to existing approaches to risk assessment. Methods
55 used for risk-prioritization of invasive alien species include cost-benefit, cost-effectiveness and risk analysis.
56 However, the detailed information required to undertake cost-benefit and cost-effectiveness analyses are often in short
57 supply or uncertain, and these analyses require sufficient technical expertise. A number of science-based prioritization
58 methodologies for invasive alien species, horizon-scanning, and impact and management for single or multiple types
59 of invasive alien species have been developed by Parties or independent international science teams and are worth
60 consideration by other countries.

61 10. Knowledge exchange should be promoted, as well as training and capacity-building to apply the best
62 available prioritization methods consistently across environments.

63 11. The best available methods for prioritizing the invasive alien species to be managed and for assessing
64 feasibility and cost-effectiveness, in a form compatible and complementary to existing approaches to risk assessment.
65 Multi-criteria decision-making approaches should be used to support risk-based prioritization for management when
66 information required to undertake cost-benefit and cost-effectiveness analysis is lacking or uncertain.

67 12. States, sectoral authorities and organizations and subnational governments are encouraged to share
68 information on their best practices regarding tools and technologies for the management¹ of invasive alien species that
69 can be implemented across sectors at all levels.

70 13. *Multi-criteria decision-making* approaches can be used, wherever possible, when applying risk analysis, cost-
71 benefit and cost-effectiveness analyses to support risk-based prioritization. Invasive alien species prioritized by actual
72 or potential impacts using such rapid methods can then be considered in more detail to ensure that management, based
73 on clear objectives, is indeed cost-effective and feasible. Multi-criteria decision-making can consider such aspects as
74 effectiveness, practicality, feasibility, likelihood of success, cost, public acceptability, including to indigenous peoples
75 and local communities, women and youth of proposed actions as well as any unintended negative impacts of
76 management alongside the risks and impacts posed by the targeted invasive alien species, in line with relevant
77 multilateral agreements. These methods involve a structured process and can help resolve issues associated with
78 decision-making and planning that involve multiple criteria and are designed to find optimal solutions to complex
79 problems where assessment criteria or data are measured in different ways. They can also be used with expert
80 elicitation when only incomplete or imprecise information is available.

81 14. Multi-criteria methods to support invasive species prioritization, risk management and decision-making need
82 to be developed further. Opportunities for development include:

83 (a) There is considerable variation in the methods and approaches to prioritization and decision making
84 used in different countries – reviewing the strengths and weaknesses of other approaches to this issue would be
85 valuable;

86 (b) Risk management as part of a larger risk analysis process is widely used in other fields, such as plant
87 health – increased dialogue with experts from these fields would help to develop best-practice;

88 (c) Other considerations will be needed when applying the approach to different management questions;

89 (d) Cases in which multi-criteria methods have been applied to invasive alien species management
90 decision making are still limited – more trials and applications would help refine the approach;

91 (e) Where possible, published quantitative data should be used to underpin decision-making, in order
92 to better identify and access key information.

93 15. It is suggested that guidelines be developed in order to more explicitly include social and cultural values
94 when assessing the costs, benefits and prioritization of management. This could build on existing processes (for
95 example, Socio-economic Impact Classification of Alien Taxa (SEICAT)) and international best practices on
96 stakeholder engagement in decision-making. Decisions and risk analyses should be based on science and should follow
97 international standards agreed under relevant international organizations, such as the agreement on the application of
98 sanitary and phytosanitary measures, as appropriate.

99 16. It is recommended that efforts be made to increase the accessibility of data and vocabulary on management
100 activities across species and ecosystems to support evidence-based management prioritization and decision-making.
101 This will be assisted by the creation of common approaches to sharing and reporting experience and information,
102 common data formats that include information on the taxon, management objective, cost and/or effort, area covered

¹ 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)).

103 and the outcome of management. To promote the production of prioritized lists for action, there is a need for
104 knowledge exchange, training and capacity-building.

105 17. It is recommended that, in communicating risks associated with invasive alien species it be highlighted that
106 these risks can affect biodiversity and the economy of indigenous regions/peoples and local communities as well as
107 public health.

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Annex II

DRAFT METHODS, TOOLS AND MEASURES FOR IDENTIFICATION AND MINIMIZATION OF 111 ADDITIONAL RISKS ASSOCIATED WITH CROSS-BORDER E-COMMERCE IN LIVE ORGANISMS 112 AND THE IMPACTS THEREOF

(PROVISIONAL ADVICE PURSUANT TO DECISION 14/11, ANNEX II, PARAGRAPH 1 (B))

A. Suggested actions for national and/or subnational authorities/border agencies

1. Legislation and policy set by States

116 1. Investigate and evaluate the risks posed by all forms of e-commerce to the introduction and spread of invasive
117 alien species and their parts and, if necessary, develop and implement appropriate risk management activities. See
118 also decision XII/17, paragraph 9 (d).

119 2. Implement when addressing trade with invasive alien species through e-commerce, decision XIII/13,
120 paragraphs 7 and 8 and use the voluntary guidance on devising and implementing measures to address the risks
121 associated with the introduction of alien species as pets, aquariums and terrarium species, and as live bait and live
122 food (decision XII/16) and the supplementary guidance for avoiding unintentional introductions of invasive alien
123 species associated with trade in live organisms (decision 14/11), as relevant.

124 3. Review existing national and/or subnational legislation, regulations and policies to verify that e-commerce
125 is adequately addressed or make changes as needed to ensure that enforcement actions can be taken, in accordance
126 with decision XIII/13, paragraph 2.

127 4. Establish mechanisms to identify commodities of concern that may be obtained via e-commerce with a focus
128 on high and potential high-risk consignments, such as soils, growing media, and living organisms.

129 5. Consider the use of lists that specify which species may be imported and restrict the remainder, rather than
130 lists that only identify those species whose import is prohibited or restricted, in the interests of preventing the
131 unintended introduction of invasive alien species, and especially in the case of countries that are vulnerable to invasive
132 alien species, such as small island developing States, island countries, and countries with islands. These considerations
133 should be consistent with the guidance contained in decisions XII/16, paragraph 23,² and decision 14/11(a),³ as well
134 as other applicable international obligations and standards, including those recognized by the World Trade
135 Organization Agreement on the General Agreement on Trade in Services (GATS) that are relevant for cross-border e-
136 commerce, as well as in accordance with decisions XII/16, paragraphs 22 and 14/11, paragraph 11(a).

2. Indigenous peoples, local communities and relevant stakeholders' engagement

138 6. In accordance with decision XIII/13, paragraph 7, develop mechanisms, in collaboration with e-commerce
139 stakeholders, for identification of e-commerce traders, their locations and other stakeholders with a view to facilitating
140 inter-agency and multi-stakeholder participation and cooperation.

141 7. Engage with indigenous peoples and local communities, women and youth, as well as the wider community
142 and general public for detection of early incursion, establishment or spread of invasive alien species, including from
143 e-commerce, across traditional lands and waters, as well as the wider community and general public.

144 8. Ensure, in accordance with decision 14/11, paragraph 10, compliance with the sanitary, phytosanitary and
145 veterinary import requirements of importing countries among e-commerce customers and traders by providing quality
146 information on the risks to the customer's country (legal, environmental and health related).

147 9. Strengthen coordination with postal and express courier services to ensure that relevant information on the
148 risks and preventive measures are conveyed to e-commerce users in accordance with decision XII/16, paragraph 24,
149 and taking into consideration decision 14/11, annex I, paragraphs 7, 9-11, 13 and 29.

² Encourages Parties and other Governments (a) to develop and share a list of regulated invasive alien species, based on the results of risk analysis, where appropriate. Decision 14/11, para. 11 (a).

³ States should maintain lists of species with the assessed potential to become invasive and associated with unacceptable risks for biodiversity and make it available through the clearing-house mechanism or other appropriate means. Decision XII/16, para. 23.

- 150 10. Ensure, in collaboration with national and regional trade authorities, that import/export requirements are up-
151 to-date, clear and accessible to e-commerce traders, indigenous peoples, local communities and relevant stakeholders.
- 152 11. Aim to inform both sellers and buyers about potentially invasive alien species, focusing on their legal
153 responsibility. Both social media and specialized media, such as pet magazines/journals/books, especially journals
154 from pet or plant association/society and multi-agency targeted publicity campaigns should be used to disseminate
155 correct information, aiming to shift consumer values (e.g. towards native and non-invasive species) and to change
156 behaviours (e.g. to prevent impulse purchase of invasive alien species) in accordance with decision XIII/13, paragraph
157 7(a).
- 158 12. Encourage, taking into consideration decision XIII/13, paragraph 7, e-commerce platforms and e-payment
159 service providers, postal and express courier services to adhere to national regulations, international standards and
160 guidance on invasive alien species in their operations, in consistency with other international obligations.
- 161 13. Consider implementing the Single Window⁴ approach, which allows the sharing of standardized information
162 and documents with a single-entry point to fulfil all import, export and transit-related regulatory requirements. Its
163 implementation at the national and/or subnational level may facilitate reporting on regulated articles (including live
164 alien organisms with phytosanitary and sanitary risks, and risks to biodiversity), taking into account decision XII/16,
165 paragraph 6, decision XIII/13, paragraph 7(c) and decision 14/11, annex I, paragraph 33.
- 166 14. Establish legal and policy frameworks that allow for the advanced international electronic sharing and
167 exchange of data between all actors involved in the international supply chain, as appropriate, and use these data to
168 triage packages and determine the level of inspection needed (risk-based inspection).

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3. *Monitoring and compliance*

- 170 15. Gather data, taking into consideration decision 14/11, annex I, paragraphs 34-36, and in compliance with
171 national legislation and circumstances, using all available means and tools (e.g. crowdsourcing) to monitor compliance
172 and to evaluate the efficacy of activities that are implemented to mitigate risks associated with e-commerce. The data
173 collected should be used, together with other relevant information including compliance history, and relevant
174 information from indigenous peoples and local communities with their free, prior and informed consent, to inform
175 risk-based inspections and determine if investigation or enforcement action is needed. Data analytics should be applied
176 to discern any abnormal trends and patterns, including potential invasive alien species incursion and impact risks.
- 177 16. Disseminate good practices and risk-based interventions using best practice methods of data analytics to
178 facilitate legitimate e-commerce and, at the same time, identify and stop illicit trade. Wherever possible, prioritize the
179 use of non-intrusive inspection (NII) technologies, and promote the adequacy of existing technologies e.g. scanners,
180 sniffer dogs and other available tools for the detection of invasive alien species, and the further development of
181 automated biosensors to improve efficient detection of prohibited and restricted articles moving through the express
182 courier and postal systems.
- 183 17. Develop and implement training and tools to facilitate appropriate level of monitoring and inspection in e-
184 commerce markets. This could include developing guidance on monitoring of e-commerce platforms and on the
185 issuance of warnings, notices and other enforcement actions when non-compliances are found in e-commerce
186 transactions, and the proper handling of restricted items seized in compliance with national and/or subnational law.
- 187 *B. Suggested actions for web marketplaces (sale platforms) and e-payment service providers, postal and*
188 *express courier services*
- 189 18. Web marketplaces (sale platforms) and e-payment service providers, postal and express courier services are
190 strongly encouraged to:
- 191 (a) Consider the information available from relevant international bodies, national and/or subnational
192 authorities and other sources, regarding the risks (both legal and environmental) posed by invasive alien species and
193 take steps accordingly to make their users aware of them, taking into account decision 14/11, annex I, paragraphs 11-
194 13;

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>).

- 195 (b) Monitor e-commerce taking place within their platforms or jurisdiction and, consistent with relevant
196 national and/or subnational legislation, alert relevant authorities where there is evidence of illegal or otherwise
197 potentially damaging trade in invasive alien species taking place;
- 198 (c) Develop and apply improved management measures to minimize the risks of introduction of
199 invasive alien species through e-commerce, consistent with international and national obligations.
- 200 C. *Suggested actions for international bodies/agreements and cross-jurisdictional collaboration*
- 201 19. International bodies/agreements, in collaboration with regional organizations and national authorities, as
202 relevant, are strongly encouraged to undertake the following:
- 203 (a) Collaborate to share data, information, technology and expertise on e-commerce in potential
204 invasive alien species;
- 205 (b) Draw on guidance from other international bodies, including the ongoing work by the World
206 Customs Organization and in the Bern Convention;
- 207 (c) Continue to monitor e-commerce with potential invasive alien species at the global and regional
208 levels with a view to identifying trends and risks in trade of invasive alien species;
- 209 (d) Prepare guidance to assist national border agencies in responding to non-compliance, considering
210 that both domestic and international actions may be required to respond effectively;
- 211 (e) Improve collaboration between national border agencies in order to enhance opportunities to link
212 existing security initiatives with invasive alien species risk management and targeted (risk-based) inspections. This
213 will also provide a mechanism for timely information-sharing among national border agencies and other relevant
214 ministries/departments on issues related to cross-border e-commerce trade;
- 215 (f) Conduct joint capacity-building activities with relevant organizations, Parties and other
216 Governments and provide technical assistance and resources for implementing existing international guidelines and
217 standards, and developing national and/or subnational regulatory frameworks or measures to address the risks
218 associated with e-commerce for all relevant stakeholders including indigenous peoples and local communities;
- 219 (g) Expand the concept of “authorized economic operators”⁵ (AEO); trusted trader to cross-border e-
220 commerce and include invasive alien species risks in AEO criteria and requirements. Implementing AEO and trusted
221 trader programmes in the e-commerce environment for postal operators, express carriers and e-platforms, which would
222 result in a lower frequency of inspections;
- 223 (h) Establish frameworks that allow for the advanced electronic exchange of data between all parties
224 involved in the international supply chain and use these data to triage packages and determine the level of inspection
225 needed (risk-based inspection).
- 226 D. *Suggested actions for relevant international expert organizations*
- 227 20. Relevant international expert organizations are strongly encouraged to:
- 228 (a) Raise awareness among international, national organizations and e-commerce stakeholders about
229 import/export requirements and what can be done to minimize the risk of introduction and spread of alien and
230 potentially invasive species associated with e-commerce, taking into account decision XIII/13 paragraph 7(a);
- 231 (b) Building on such frameworks as EICAT,⁶ establish an international invasive alien species risk-based
232 labelling system, to be used for all species sold via e-commerce and provide guidance on the handling and care of
233 organisms. On consignments of live alien species, such labelling should include information to enable identification
234 of hazards for biodiversity and the identification of species or lower taxa (e.g., scientific name, taxonomic serial
235 number or its equivalent), taking into account decisions XII/17 and 14/11 as well as the ongoing work of the Economic
236 and Social Council’s Sub-Committee of Experts on the Transport of Dangerous Goods.
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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>

239 **DRAFT METHODS, TOOLS AND STRATEGIES FOR THE MANAGEMENT OF INVASIVE ALIEN**
 240 **SPECIES AS IT RELATES TO PREVENTION OF POTENTIAL RISKS ARISING FROM CLIMATE**
 241 **CHANGE AND ASSOCIATED NATURAL DISASTERS AND LAND USE CHANGES**

242 **(PROVISIONAL ADVICE PURSUANT TO DECISION 14/11, ANNEX II, PARAGRAPH 1 (C))**

243 1. The interactions of climate change, associated changes in land and marine ecosystems and biological
 244 invasions will have profound consequences for biodiversity. These interactions are considered and potential responses
 245 enumerated in CBD/AHTEG/IAS/2019/1/2.

246 2. Climate change is aiding increased rates of (and risk of spread of many alien species). Human adaptations to
 247 climate change will alter land-use and increase disturbances in the ecosystem that, in turn, facilitate the establishment
 248 of alien species.

249 3. Not all invasive alien species incursions are successful, nor will all invasive alien species benefit from climate
 250 change, as some may become less abundant under particular changing climates. Some invasive alien species will
 251 decline in importance while some currently low impact alien species may become significant invasive alien species.

252 4. Climate change may exacerbate existing problems and impacts of invasive alien species, with both direct and
 253 indirect impacts on biodiversity and socioeconomic values. Changing ocean currents will have huge impacts on
 254 species movements in marine environments as well as influence climatic conditions on land. Loss of permanent sea
 255 ice is opening up new sea transport routes and shipping in the Arctic is creating greater probability of invasive alien
 256 species introduction and establishment in the Arctic terrestrial and marine environments.

257 5. Climate change is associated with more frequent extreme weather events like cyclones and flooding. Extreme
 258 weather events cannot only transport invasive alien species to new areas, but also cause disturbances in habitats which
 259 enable invasive alien species to establish themselves and spread. Climate-induced extreme weather events can also
 260 lead to sudden human population movements and displaced people can inadvertently transport invasive alien species.

261 6 Prevention and management of invasive alien species under climate change becomes an even greater
 262 challenge with climate change. New prioritization actions will be required.

263 7 For more information on tools that support management of invasive alien species in the face of climate
 264 change.⁷

265 **A. Prediction**

266 8. Managing the impacts of invasive alien species on biodiversity and ecosystem services requires knowledge
 267 of the manner in which the actual and potential impact will vary as a result of climate change so that management
 268 priorities can be adapted accordingly.

269 9. States, organizations and relevant stakeholders, taking into account, among other things, decision 14/5, are
 270 strongly encouraged:

271 (a) To undertake horizon scanning to forecast/predict future changes in actual and potential risks and
 272 impacts of invasive alien species arising from climate change;

273 (b) To identify changes in invasive alien species pathway risks arising from climate change.
 274 Climatically similar regions posing the greatest current mutual risks today are likely to change in the future along with
 275 changes in vectors and pathways, including changes in trade and the movement of people between these regions;

276 (c) To prioritize invasive alien species on the basis of potential direct and indirect impacts in the context
 277 of climate change;

278 (d) To identify effects of climate change on new potential invasive alien species introductions or
 279 pathways of introductions and establishment into pristine and invaded communities;

280 (e) To determine and prioritize for action sites at the greatest risk from climate change and invasive
 281 alien species;

282 (f) To prioritize efforts to maintain ecosystem goods and services, as well as ecosystem structures and
 283 functions on sites at the greatest risk from climate change and invasive alien species;

⁷ See the synthesis report of the Online Forum (CBD/IAS/AHTEG/2019/1/INF/1).

- 284 (g) To apply climate models to understand the impacts of invasive alien species on biodiversity and
285 ecosystem services arising from climate change, and to further develop models for use on a broad scale by developing
286 countries;
- 287 (h) To develop better methods to integrate (i) climate change models, (ii) land-use scenarios and
288 (iii) trends in trade with invasive alien species data analysis to improve prediction capability;
- 289 (i) To define scenarios to understand where invasive alien species may indirectly increase the impacts
290 of climate change on biodiversity and ecosystem services by transforming ecosystems;
- 291 (j) To modify/fine-tune invasive alien species risk analysis, and identify potential alien invasive
292 species⁸ (including disease vectors) that remain only casual under current conditions without significant impact; and
293 are likely to become established and/or invasive and have an increased impact due to rapid population growth as a
294 result of climate change;
- 295 (k) To identify and study potential future invasive alien species that can establish and spread and have
296 an increased impact as a result of climate change. This can be done by using such approaches as sentinel sites to
297 monitor changes in abundance, spread and impacts of such species or by carrying out trait- and impact-based risk
298 assessments;
- 299 (l) To identify invasive alien species that are likely to benefit under increased CO₂ levels, rising
300 temperatures, increased frequency of extreme events, fire regimes of increased frequency and intensity, high salt-
301 water incursions, changes in ocean currents and changes in precipitation patterns, and prioritize management to
302 prevent their spread and impacts, including humane methods of eradication and control;
- 303 (m) To improve knowledge of the risks of invasive alien species adapting to new environmental
304 conditions, including rapid evolution and hybridization;
- 305 (n) To identify impacts of invasive alien species arising from climate change on biodiversity and
306 ecosystem services;
- 307 (o) To ensure the meaningful participation of indigenous peoples and local communities, use of their
308 biocultural indicators, early identification and warning systems and traditional knowledge in the development of
309 predictions of invasive alien species under climate change with their “free, prior and informed consent” or “free, prior
310 informed consent” or “approval and involvement”, depending on national circumstances.

311 **B. Planning and prevention**

- 312 10. States are encouraged, in collaboration with experts, subnational government, indigenous peoples, local
313 communities and relevant stakeholders:
- 314 (a) To develop climate change relevant risk analysis for prioritizing invasive alien species for
315 management (e.g. fire enhancing weeds);
- 316 (b) To develop and implement management strategies to eradicate, contain or control high ranking
317 potential alien species and introduced or established invasive alien species before they can respond to climate change.
318 Those strategies should be object of an appropriate risk analysis, in order to avoid unnecessary biosafety concerns;
- 319 (c) To monitor the spread and impact of all established and potential alien species, particularly in sites
320 or regions where biodiversity and ecosystem services are likely to deteriorate rapidly under climate change. Best-
321 practice approaches using, for example, remote sensing or sensor networks are suggested to be undertaken;
- 322 (d) To minimize the potential of biological invasions or develop spatial response planning for areas in
323 which communities are threatened with a high risk of extreme weather events (e.g, relocate zoos, botanical gardens,
324 exotic aquaculture facilities from extreme-event-prone areas);
- 325 (e) To adapt current pathway management with a view to reducing changes in risks arising from
326 climate, including predicted associated changes in trade and movement of people;
- 327 (f) To engage all sectors, including agriculture and public health agencies and industries, in invasive
328 alien species planning activities where climate change risks are cross-sectoral;
- 329 (g) To raise public awareness of changing invasive alien species threats arising from climate change
330 and include the participation of the public and all relevant sectors in response planning;

⁸ 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.

331 (h) To collect best practices of indigenous peoples and local communities on the monitoring, controlling
332 and mitigation of the impacts of invasive alien species caused by climate change;

333 (i) To engage with regional and local specialists when considering prevention, planning and mitigation
334 measures.

335 **C. Management**

336 11. It is suggested that States take the following actions:

337 (a) Apply adaptive management approaches to future prioritized management actions in the context of
338 climate change and share the information with other Parties to improve outcomes;

339 (b) Take steps to increase the long-term functional resilience of threatened ecosystems and habitats to
340 climate change, extreme weather events and natural disasters and associated invasive alien species incursions,
341 particularly for islands and coastal systems, taking into account guidance in decision 14/5, paragraphs 3(h), 4(b) and
342 its annex as well as decision X/33, paragraph 8(n);

343 (c) Undertake focused management actions, including containment, eradication when possible or
344 control of invasive alien species in areas that could act as non-native sources for spread into identified vulnerable areas
345 and/or native communities;

346 (d) Collate existing knowledge into international online databases to allow the interoperable collection
347 and dissemination of data and knowledge on the effectiveness of actions to mitigate impacts of invasive alien species
348 arising from climate change. An example of such a database is the Database of Island Invasive Species Eradications
349 (DIISE);⁹

350 (e) Develop and integrate invasive alien species management strategies into “threatened climate
351 vulnerable species movement-assisted translocation actions” to avoid unintended consequences, taking into account
352 decision X/33, paragraph 8(e);

353 (f) Collect best practices of indigenous peoples and local communities on the monitoring, control and
354 mitigation of the impacts of invasive alien species, diseases and shifting species distributions caused by climate
355 change.

356 **D. National and international cooperation**

357 12. States and relevant international organizations are strongly urged to integrate pathway and invasive alien
358 species risk based multi-criteria prioritization approaches into all levels of planning to obtain multiple benefits and
359 shared outcomes, including the following:

360 (a) National and international climate mitigation and adaptation strategies, environmental impact
361 assessments, and response planning activities in accordance with decision X/33, paragraph 8(p);

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

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

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

368 13. It is suggested that relevant international organizations organize training for governmental and non-
369 governmental development assistance agencies and operatives engaged in disaster relief, identify risks of introducing
370 and spread of invasive alien species with their activities and undertake rapid response with appropriate measures, such
371 as quarantine of equipment and goods, emergency response, eradication, containment and control.

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⁹ <http://diise.islandconservation.org>.

374 **DRAFT RISK ANALYSIS ON THE POTENTIAL CONSEQUENCES OF THE INTRODUCTION OF**
375 **INVASIVE ALIEN SPECIES ON SOCIAL, ECONOMIC AND CULTURAL VALUES**

376 **(PROVISIONAL ADVICE PURSUANT TO DECISION 14/11, ANNEX II, PARAGRAPH 1 (D))**

377 1. It is suggested that guidelines be developed in order to more explicitly include social and cultural values
378 when assessing the costs, benefits and prioritization of management. This could build on existing processes (for
379 example, Socioeconomic Impact Classification of Alien Taxa (SEICAT)) and international best practices on
380 engagement of indigenous peoples, local communities and relevant stakeholders in decision-making. New Zealand
381 incorporates cultural knowledge, values and perspectives (mātauranga) in the management of invasive alien species.
382 Māori are involved in the governance of invasive alien species management, especially when culturally and spiritually
383 significant (taonga) species are at risk. This system is worthy of emulation. States should seek formal participation
384 and ensure bidirectional data streams between data holders and generators through the national data portals (where
385 applicable) to the global-level aggregators. Country membership status, capacity, resources and other aspects should
386 be understood by all Parties. Open access to data and seamless integration of this data between data tools used by
387 indigenous peoples, local communities and relevant stakeholders is an imperative for better management and
388 monitoring of this threat. This will (a) increase data flows necessary for analysis at the level of the Convention on
389 Biological Diversity and international decision-making and (b) open opportunities for national capacity-building and
390 resourcing.

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

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

403 4. There is a lack of well-documented semi-quantitative criteria for socioeconomic, cultural and community
404 well-being on which not only to evaluate impacts, but also to evaluate the effectiveness of the applied risk management
405 option.

406 5. Social impact assessment offers a structured process for identifying, evaluating and addressing social costs
407 and benefits. It has potential value for enabling public participation in planning and as a key component of integrated
408 assessments of management options.

409

410

Annex V

411 **DRAFT USE OF EXISTING DATABASES ON INVASIVE ALIEN SPECIES AND THEIR IMPACTS, TO**
412 **SUPPORT RISK COMMUNICATION**

413 **(PROVISIONAL ADVICE PURSUANT TO DECISION 14/11, ANNEX II, PARAGRAPH 1 (E))**

414 1. This advice is aimed at assisting Parties, other Governments and organizations in developing and maintaining
415 efficient, timely and up-to-date data and information for management of invasive alien species.

416 2. Enhanced risk communication is essential to facilitate dialogue and understanding between and among
417 indigenous peoples, local communities and relevant stakeholders. Risk communication seeks to reconcile the views
418 of all interested Parties in order to achieve a common understanding of the risks posed by invasive alien species,
419 develop credible risk management options and consistent regulations, and promote awareness of issues concerning
420 invasive alien species.

421 3. It is essential that regularly updated and curated data is maintained on invasive alien species distribution,
422 impact and management action and relevant knowledge. Relevant publicly available data should be shared with the
423 key global data aggregators to support processes under the Convention on Biological Diversity and other international
424 and regional agreements.

- 425 4. It is essential that Parties, other Governments and organizations engage with key global aggregators and data
426 providers (e.g. Global Biodiversity Information Facility (GBIF), Global Registry of Introduced and Invasive Species
427 (GRIIS)) and ensure bidirectional data streams between data holders and generators through the national data portals
428 (where applicable) to the global-level aggregators. Open access to data, seamless integration of this data between data
429 tools and availability of the data to indigenous peoples, local communities and relevant stakeholders are imperative
430 for better management and monitoring of invasive alien species. National or central coordination of data streams is
431 essential for timely, comprehensive and fair availability of the occurrence data on invasive alien species from multiple
432 sources. This will (a) increase data flows necessary for global and regional analysis and decision-making and (b) open
433 opportunities for national capacity-building and resourcing.
- 434 5. It is important to facilitate data sharing and, where appropriate, use common international data standards,
435 standard terminology in national, regional, local and thematic databases, even if languages differ between data portals.
- 436 6. It is also important to obtain free, prior and informed consent from indigenous peoples and local communities
437 when using their traditional knowledge.
- 438 7. Real-time data sharing is recommended to allow access to up-to-date information to enable early detection
439 and rapid response.
- 440 8. There is a great need for States, organizations and the scientific community to identify gaps in knowledge
441 and information on alien species in existing databases and strive to improve knowledge and data, especially for
442 organism groups on which knowledge is especially poor, such as alien marine species, invertebrates, microorganisms
443 and fungi. Increased interaction between data generators, data providers and experts may provide improvements in
444 the quality of data. Collaboration between experts in collating existing databases using existing standards could also
445 contribute to filling these information gaps. Errors in current databases should be identified and corrected in existing
446 databases.
- 447 9. Existing global invasive alien species data providers, such as the IUCN-Invasive Species Specialist Group
448 (IUCN-ISSG), the Global Biodiversity Information Facility (GBIF) and CABI, could be invited to provide a global
449 platform for sharing information, experiences and analysis of the results of management activities for invasive alien
450 species, best practices in policy and regulatory mechanisms and codes of conduct to address activities that lead to the
451 introduction and spread of alien and invasive species, aquariums and local productive activities.
- 452 10. IUCN-ISSG and partners could be invited to index, collate and archive the development of policy response
453 indicators within the Biodiversity Indicators Framework (BIP) and Sustainable Development Goal indicator 15.8.1.
- 454 11. States, organizations and experts are invited to continue supporting the ongoing development of the Global
455 Registry of Introduced and Invasive Species (GRIIS) and other expert networks focused on collation and curation of
456 new and existing data.
- 457 12. GBIF could be invited to include distribution data on invasive alien species in their global biodiversity
458 databases.
- 459 13. States, sectoral authorities, international, regional and local organizations and relevant stakeholders could be
460 invited to contribute to and use the CABI Invasive Species Compendium, which is an encyclopedic resource of
461 scientific information on invasive alien species to help inform decision-making.
- 462 14. States, sectoral authorities, international, regional and local organizations, experts and relevant stakeholders
463 are invited to use and further develop, as needed, impact assessment frameworks (e.g. EICAT and SEICAT) to develop
464 science-based policies and prioritization of invasive alien species management actions.¹⁰

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Annex VI

DRAFT ADDITIONAL ADVICE AND TECHNICAL GUIDANCE ON INVASIVE ALIEN SPECIES MANAGEMENT

467

A. Advice on the use of sanitary and phytosanitary measures

- 470 1. The application of sanitary and phytosanitary (SPS) measures to regulate import/export of alien organisms
471 at the national level requires close collaboration between national authorities and other relevant ministries and
472 departments. Some countries closely coordinate their activities on import requirements for alien organisms among

¹⁰ For more information on using these tools, see CBD/AHTEG/IAS/2019/1/2, pp 31-35.

473 relevant ministries and agencies, including national plant protection organizations and the veterinary authorities (e.g.,
474 coordination in Australia between the Department of Agriculture and the Department of Environment and Energy).

475 2. Environmental authorities, national plant protection organizations and veterinary authorities should be
476 advised to establish strong partnerships with national, regional and local governments in connection with mandates
477 for alien species management. This will help prevent the introduction of invasive alien species and support early
478 detection, rapid response and effective management. Such partnerships could include collaboration in setting national
479 and regional priorities, completing risk assessments, carrying out surveillance, developing response plans, sharing
480 information and exchanging expertise.

481 3. A large number of the international standards that are recognized by the World Trade Organization (WTO)
482 Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) are relevant for protecting
483 biodiversity. These SPS measures should be applied more widely, not only in the context of agriculture, but also to
484 protect the health of wild fauna and flora.

485 4. A number of guides, manuals and training materials have been developed under the International Plant
486 Protection Convention (IPPC) to build capacity and support the implementation of international standards. These
487 materials should be used to raise awareness and build capacity among partner organizations to address the issue of
488 invasive alien species.

489 5. There is a need for capacity-building among developing countries, for implementing existing IPPC and the
490 World Organisation for Animal Health (OIE) international guidelines and standards and for developing national
491 regulatory frameworks to address the risks associated with invasive alien species.

492 6. Regional cooperation and partnerships should be further developed to support the achievement of Aichi
493 Biodiversity Target 9 and beyond, through regular coordination and communication, identification of common
494 priorities and alignment of efforts on a regional basis. This could be supported through IPPC by using the model of
495 regional plant protection organizations to foster cooperation on invasive alien species.

496 7. A key gap that needs additional attention and guidance is pathogens affecting wildlife and invasive alien
497 species that may be a vector or host of pathogens or parasites and other organisms that do not meet the IPPC definition
498 of quarantine pests, the pathogens causing diseases listed under OIE and other organisms (e.g. invasive ants) that are
499 not covered by IPPC or OIE.

500 8. As countries adopt different approaches in regulating invasive alien species (e.g., lists of restricted, prohibited
501 and permitted species or hybrids), guidelines could be developed on how such approaches can be implemented in
502 compliance with the SPS Agreement, with a view to facilitating the development of better regulation and ensure
503 transparency.

504 *B. Advice on management-specific pathways*

505 *1. Inter-basin water transfer and navigational canals*

506 9. The ratification and application of relevant international maritime agreements (e.g. the International
507 Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention), mentioned
508 in paragraph 25 of decision VIII/27, and the Guidelines for the control and management of biofouling mentioned in
509 paragraphs 29 and 30 of decision VIII/27) should be promoted in order to diminish the spread of invasive alien species
510 through new shipping routes opening up as a result of climate change.

511 10. Regional cooperation among States should be enhanced on planning, monitoring and data exchange on
512 invasive alien species specifically related to inter-basin water channels to establish early warning and rapid response
513 systems as well as researching and employing methodologies to reduce new invasions through these channels.

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

519 *2. International aid programmes*

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

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

524 *Emergency relief, aid and response*

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

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

530 16. The risk of invasive alien species should be incorporated into emergency response strategies.

531 17. The responsibilities of aid-providers and aid-recipients should be identified to avoid any invasive alien
532 species introduction through contaminants in aid transports and transfers.

533 *3. Air transport*

534 18. Relevant organizations should engage indigenous peoples, local communities and relevant stakeholders at all
535 levels to develop standards to prevent hitchhiker or stowaway species arriving by air.

536 19. Relevant organizations, including IPPC, OIE, ICAO, WCO and IATA, should collaborate to develop
537 harmonized operating standards related to air cargo, with input from indigenous peoples, local communities and
538 relevant stakeholders.

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

541 *4. Tourism*

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

545 22. Minimizing the impact of touristic activity to prevent the introduction and spread of invasive alien species
546 should be prioritized, taking into account vulnerable ecosystems, such as in protected areas, and island ecosystems.

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

549 *5. Sea containers and cargos*

550 24. Parties and other Governments should be aware that sea containers may carry invasive alien species with any
551 cargoes, including industrial products, not only cargoes containing living organisms.

552 25. Relevant organizations should engage indigenous peoples, local communities and relevant stakeholders at all
553 levels to develop guidelines to prevent invasions of hitchhiker or stowaway species through sea containers.

554 26. Relevant organizations, including IPPC, OIE, IMO and WCO, should further collaborate to develop
555 harmonized operational standards to address the pathways of biological invasion (contaminants and stowaway) via
556 sea containers, in close cooperation with the relevant business sector and input from indigenous peoples, local
557 communities and relevant stakeholders, taking into account the appropriate treatment of sea containers prior to loading
558 cargos.

559 27. The introduction and spread of invasive alien species through the transport of sea containers should be
560 avoided, in accordance with the guidance annexed to decision XIII/13 and take appropriate actions to prevent the
561 unintentional spread of invasive alien species via sea containers, taking into account paragraphs 10, 34, 35 and 36 of
562 the guidance annexed to decision 14/11 and other relevant international guidance, for example, the IPPC Guidance
563 from the International Plant Protection Convention's Sea Container Task Force.¹¹

564 28. Trade partners involved in operation of sea containers should act proactively to prevent unintentional
565 introduction and spread of invasive alien species.

566 *C. Advice on capacity-building activities*

567 29. The capacity-building programme under the Convention, should include capacity-building in invasive alien
568 species management.

¹¹ Reducing the spread of invasive pests by sea containers (<http://www.fao.org/3/ca7670en/CA7670EN.pdf>)

- 569 30. Training programmes at the international, national, subnational or local level should be established by
570 inviting broad sectors, especially academics and scientific expert organizations and other relevant organizations,
571 including indigenous peoples and local communities and women and youth.
- 572 31. The evaluation of existing capacity and the development of training packages for relevant topics, such as
573 taxonomy, ecology, invasion biology, risk analysis – in particular horizon scanning – biological control, management
574 of priority species and pathways should be considered within the long-term strategic framework for capacity-building.
- 575 32. There is a need to develop technical resources, including technical manuals for broad sectors, as follows:
- 576 (a) Taxonomic identification of organisms, including identification keys based on morphology, and the
577 link to databases with images and to lists of specialists, DNA barcoding, artificial-intelligence-aided identification and
578 citizen science;
- 579 (b) How to apply sanitary and phytosanitary measures to prevent spread of invasive alien species;
- 580 (c) How to publish and use data on invasive alien species using international data standards to ensure
581 cross-linking national, subnational and regional and global thematic databases;
- 582 (d) Best practices published on successful eradications, and other useful information resources on
583 technical advice on websites;
- 584 (e) How to use shared information on invasive alien species for national and subnational policy-setting
585 and implementation;
- 586 (f) How to apply classical biological control agents against invasive alien species and under what
587 circumstances;
- 588 (g) How to apply an ecosystem-based approach to control invasive alien species;
- 589 (h) Multi-criteria decision support manual for policymakers;
- 590 (i) If needed, a model regulatory act on invasive alien species with shared responsibility among broad
591 sectors;
- 592 (j) Management manuals for broad sectors to communicate on invasive alien species among different
593 stakeholders, including indigenous peoples and local communities and women and youth.
