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**IN-DEPTH REVIEW OF ONGOING WORK ON ALIEN SPECIES THAT THREATEN
ECOSYSTEMS, HABITATS OR SPECIES***Note by the Executive Secretary***I. INTRODUCTION**

1. In accordance with paragraph 6 and annex II of decision VIII/10 on the operations of the Convention, the work on alien species that threaten ecosystems, habitats or species (referred to as invasive alien species) will be reviewed in depth at the ninth meeting of the Conference of the Parties. In paragraph 71 of decision VIII/27, the Conference of the Parties requested the Executive Secretary, in preparation for that in-depth review, to review implementation of all decisions related to invasive alien species, on the basis of, *inter alia* the third national reports submitted by Parties and the views and experiences submitted by Parties, other Governments and relevant international organizations, not later than six months prior to the ninth meeting of the Conference of the Parties, and to report on that review.

* UNEP/CBD/COP/9/1

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2. The section on invasive alien species in the third national reports (submitted in 2005) and the views submitted by Parties, other Governments and relevant international organizations in response to notification 2006-116 (SCBD/STTM/RH/56333) sent out by the Executive Secretary on 20 October 2006, with a reminder sent out on 31 October 2007, have been the main sources of information for the review. Out of the 165 third national reports considered, 136 contained answers to the questions on invasive alien species. The following countries, regional groups and organizations submitted views ^{1/} in response to the notification: Australia, Belgium, Canada, Chile, Colombia, Denmark, Ethiopia, the European Community, Fiji, Germany, Italy, Japan, Mozambique, New Zealand, Palau, the Philippines, Poland, Portugal, the Republic of Korea, Slovenia, Spain, Sweden, Switzerland, Thailand, Uganda, the United Kingdom of Great Britain and Northern Ireland, the United States of America, Zambia and the South Pacific Regional Environment Programme (SPREP), the Secretariat of the Pacific Community (SPC), the Pacific Invasives Initiative (PII), the Pacific Invasives Learning Network (PILN) and their partners working cooperatively on the Pacific Regional Invasive Species Strategy. The other information sources were the Millennium Ecosystem Assessment reports; publications of the Global Invasive Species Programme, international and regional scientific bodies dealing with invasive alien species; the Global Environment Facility; and experiences shared through the clearing-house mechanism and other information-sharing mechanisms.

3. The present note summarizes the findings of the in-depth review of the work on invasive alien species prepared by the Executive Secretary in consultation with the Global Invasive Species Programme and many other relevant organizations, in response to paragraph 71 of decision VIII/27 and contained in document UNEP/CBD/COP/9/INF/32. A list of the requests or invitations to Parties, other Governments and relevant organizations by the Conference of the Parties that were considered in the in-depth review is accessible at <http://www.cbd.int/invasive/cop-decisions.shtml>. Section II contains an overview of the status and trend of invasive alien species, including an overview of the ongoing work to protect biodiversity from alien species invasions. Section III reviews the implementation of the decisions of the Conference of the Parties related to invasive alien species. A draft decision for the consideration of the Conference of the Parties at its ninth meeting is contained in section IV.

II. OVERALL ASSESSMENT OF THE STATUS AND TREND OF INVASIVE ALIEN SPECIES

4. Many cases of successful prevention of the introduction and spread of alien species that threaten ecosystems, habitats and species (referred to hereafter as invasive alien species), and eradication or mitigation of their impacts, particularly in agro-ecosystems and on some small islands, have been reported in recent literature. However, the problem of invasive alien species continues to grow, essentially due to global trade, transport and travel, including tourism, and the expanding impact of climate change, with enormous socio-economic, health and ecological cost around the world.. Their consequences for peoples' livelihoods are greater in economies that depend heavily on these sectors. Invasive alien species exacerbate poverty and threaten sustainable development, through their impact on agriculture, forestry and fisheries as well as on wild biodiversity which is often a mainstay of livelihood support in developing countries.

5. In 2005, the Millennium Ecosystem Assessment (MA) noted that over the past century, the impact of invasive alien species has been particularly high on islands, high and moderate in deserts and temperate and Mediterranean drylands, and relatively low in forest, marine, mountain and polar ecosystems. The predictive models used by the MA strongly suggested that, in the first half of this century, the impact of invasive alien species will grow in intensity in inland waters, coastal areas, boreal, tropical and temperate forests, and Mediterranean, grassland and savannah drylands. The impact will remain constant in the other ecosystems studied. In general, invasive alien species are becoming one of the major direct causes of

^{1/} <http://www.cbd.int/invasive/assessments.shtml>

biodiversity loss (including species extinctions) and changes in ecosystem services. Their occurrence and impact can be localized, transboundary or have a global impact.

6. As noted by the Millennium Ecosystem Assessment and the fourth assessment report of the Intergovernmental Panel on Climate Change, threats from climate change are increasing and are likely to lead to changes that will make some ecosystems more vulnerable to invasions of alien species.

7. The MA also noted that while measures to control some of the pathways of invasive species - for example, through quarantine measures and new rules on the disposal of ballast water in shipping - are increasingly being adopted, several pathways are not adequately regulated, particularly with regard to introductions into freshwater/inland water systems. National laws and a number of international instruments exist for the prevention, control and mitigation of invasive alien species and their impacts. There are however many gaps in these existing instruments, which are compounded by our limited knowledge of which alien species will become invasive when introduced into a new habitat, and the time-scale between introduction and impacts. Increasingly advice on how to manage or limit the impacts of invasive alien species is becoming available but it is not binding in nature.

III. REVIEW OF THE IMPLEMENTATION OF THE DECISIONS OF THE CONFERENCE OF THE PARTIES RELATED TO INVASIVE ALIEN SPECIES

A. National needs, priorities, policies and legislative measures

8. Out of the 136 countries that responded to the questions on invasive alien species in the third national reports, 39% consider invasive alien species a high priority issue, 36% a medium priority, and the others a low priority. In response to paragraph 10 (a) of decision VI/23 ^{2/} on identification of national needs and priorities regarding the prevention, control and eradication of invasive alien species, only 14 Parties reported they had identified their needs and priorities for the implementation of the Guiding Principles. About half of the responding Parties reported that they were in the process of identifying them, while the others had not started. The most common avenue of assessing needs and priorities was through development of national strategies and action plans. Needs and priorities identified included strengthening policies, institutions and capacities for the operationalization of the Guiding Principles adopted in decision VI/23 ^{2/} at the national level; disseminating information on risk, impacts and management of invasive alien species; and implementing strategies for the prevention of introduction and management of invasive alien species.

9. One hundred Parties reported that they assess the risk of some or most alien species of concern prior to their introduction, while most others do not (decisions VI/23, ^{2/} paragraph 12 (a), and VIII/27 paragraphs 16, 19, 46 and 57).

10. Information submitted in 2007 in response to notification 2006-116 (#56333) (accessible at <http://www.cbd.int/invasive/assessments.shtml>), indicates that most of the responding countries had completed their needs assessments regarding work on invasive alien species, and that they can carry out risk assessment/analysis and developed national and international programmes on invasive alien species. Countries that were implementing programmes on invasive alien species had usually (i) established national inter-agency committees/groups, national databases on invasive alien species, monitoring, early detection and rapid response systems, and communication, information sharing and public awareness mechanisms; (ii) developed management plans for specific species and pathways, national biodiversity

^{2/} One representative entered a formal objection during the process leading to the adoption of this decision and underlined that he did not believe that the Conference of the Parties could legitimately adopt a motion or a text with a formal objection in place. A few representatives expressed reservations regarding the procedure leading to the adoption of this decision (see UNEP/CBD/COP/6/20, paras. 294-324).

strategies and actions plans integrating invasive alien species, and legislation integrating international commitments and risk assessment procedures; (iii) identified management priorities and key threats; (iv) carried out baseline surveys; (v) established inspection and quarantine services, and regional coordination mechanisms; and (vi) mobilized financial resources.

11. The views and information on experiences submitted in response to the notification, showed that:

(a) Development of national invasive species systems requires a significant degree of inter-agency and cross-sectoral coordination. In some cases the relevant authority lies outside of the Ministry of the Environment. The establishment of inter-agency coordinating mechanisms (such as national invasive species committees) appears as a critical step in the early stages of planning national efforts to address invasive alien species; and

(b) National implementation, particularly in developing countries, has largely relied on regional support networks, institutions and projects to acquire information, models and methodologies, and to catalyze internal work:

- (i) In Africa and the Caribbean, planning around two GEF projects (African Barriers and Invasive Species in the Insular Caribbean) has been instrumental in helping countries define their internal priorities and coordinating mechanisms and providing them with the technical expertise and resources for implementation. The New Partnership for Africa's Development Environmental Action Plan (NEPAD-EAP) is also promoting collaborative actions to address invasive alien species in Africa.
- (ii) In the Americas, work through the Inter-American Biodiversity Information Network's Invasives Information Network (IABIN-I3N) has provided countries with initial tools and information to consider invasive alien species, starting with a general orientation on invasive species and training on developing national databases and progressing to model national strategies and assistance with risk assessment methodologies;
- (iii) In the Pacific, four regional organizations have been particularly helpful in supporting national implementation in developing island countries and territories. The Pacific Invasives Learning Network provides an opportunity for the exchange of information and expertise, peer learning and building the capacity of individuals from participating inter-agency teams. The Pacific Invasives Initiative (a regional node of the Cooperative Islands Initiative) assists with the development of project concepts and implementation, and thereby helps with developing new methods, training, and promotion of best case demonstration projects. Finally, the South Pacific Regional Environment Programme (SPREP) and the Secretariat of the Pacific Community (SPC) provide support from the environmental and agriculture/quarantine perspectives, and have also been instrumental in promoting regional coordination (SPREP) and the development of national legislation (SPC); and
- (iv) In the case of Europe and North America, regional institutions have also played an important role although they have largely helped coordinate ongoing national efforts (and to a lesser extent catalysed the initiation of work). In Europe, the Bern Convention, the European and Mediterranean Plant Protection Organization (EPPO), the Delivering Alien Invasive Species Inventories for Europe (DAISIE) and the North European and Baltic Network on Invasive Alien Species (NOBANIS) have helped with regional coordination. In North America, the North American Plant Protection Organization (NAPPO), the North American Free Trade Agreement (NAFTA) and the Inter-American Biodiversity Information Network (IABIN) among others have played a facilitating role.

12. Information in the third national reports and other documents ^{3/} shows that implementation of prevention, control and mitigation measures is limited, essentially but in varying degrees depending on countries, by:

- (a) Insufficient human, technical, institutional and logistical capacity for the prevention, eradication and control of invasive alien species, including *inter alia* phytosanitary and quarantine control, early detection and rapid response systems, field equipment, intersectoral planning, economic valuation, and integrated policy and legal frameworks;
- (b) Limited institutional coordination at national, regional and international levels;
- (c) Lack of political will and, consequently, lack of appropriate policies;
- (d) Limited public awareness of the seriousness of threats posed by invasive alien species, their impacts on the environment, economy and human health, and the drivers of bio-invasion at public, political, planning and technical levels;
- (e) Inadequate policy and legal frameworks, and lack of enforcement, bearing in mind that invasive alien species are a national, regional and global development problem, of which management should be mainstreamed into national biological strategies and action plans and national development planning; and
- (f) Lack or limited financial resources for both short and long-term programmes.

B. *Implementation of the Guiding Principles for the prevention, introduction and mitigation of impacts of alien species that threaten ecosystems, habitats or species*

13. With regard to the promotion and implementation of the Guiding Principles called for in paragraph 5 of decision VI/23, ^{2/} only ten Parties reported, in their third national reports, that they had mechanisms in place to coordinate national programmes for applying the Guiding Principles. Thirty nine Parties had not created but found the needs for such mechanisms. Among these Parties, Ethiopia, Uganda, Zambia and Ghana received support from GEF and CABI (Ghana) and successfully identified the needs for using the Guiding Principles. Two Parties reported that they had completed adjustment or development of their policies, legislation and institutions in light of the Guiding Principles and 38 Parties reported that they were using the ecosystem approach and the precautionary and biogeographical approaches in their work on invasive alien species. Bearing in mind that the Guiding Principles address prevention and mitigation of impacts of invasive alien species, Parties were asked for the third national reports whether measures had been undertaken to prevent the introduction of, control or eradicate, invasive alien species. Most Parties (81%) have some preventive measures in place and only a few have established comprehensive measures.

14. Initiatives and organizations, such as the Global Invasive Species Programme (GISP), which are supporting Governments in the use of the Guiding Principles for designing plans and programmes for invasive alien species, noted from their experiences that, while there are many individual actions that countries can take on invasive alien species, the development of effective national systems for the prevention, management and control requires the integration and sequencing of a number of tasks involving a range of agencies and stakeholders. Countries can pick and choose activities as they see fit, including from the Guiding Principles. However, if these activities are not mainstreamed in larger processes, such as the development of national biodiversity action plans or sustainable development plans,

^{3/} Such as document "Towards the Development of a Joint Work Plan for the Management of Marine Invasive Alien Species" (UNEP/CBD/SBSTTA/11/INF/10).

then their overall effectiveness could be marginal. There is a need to provide explicit examples and practical guidance on how to apply the Guiding Principles effectively.

C. *International instruments and standards*

15. Many international instruments referencing the various subsets of invasive alien species, and ranging from legally binding treaties to non-binding technical guidance, have been reviewed in the context of the Convention (see e.g., CBD Technical Series No. 2) in order to assess their efficiency and efficacy for prevention, early detection, eradication and control of invasive alien species and their impacts, and to define options for consideration for the full and effective implementation of Article 8(h) of the Convention.

16. The review showed gaps, overlaps and inconsistencies in existing instruments at all levels. In 2005, an Ad Hoc Technical Expert Group (AHTEG) was established to further clarify gaps and inconsistencies in the international regulatory framework for invasive alien species and develop practical options on how to address them. The Group identified many specific gaps, which were considered by the eighth meeting of the Conference of the Parties. These included in particular various conveyances as pathways for invasive alien animals, and gaps relating to hull fouling, civil air transport, aquaculture / mariculture, ballast water, military activities, emergency relief, aid and response, international development assistance, scientific research, tourists, pets, aquarium species, live bait and live food, biocontrol agents, *ex situ* animal breeding programmes, incentive schemes (including carbon credits), inter-basin water transfer and canals, unintended protection of invasive alien species, and inconsistency in terminology.

17. The AHTEG found that a significant general gap in the international regulatory framework relates to lack of international standards to address animals that are invasive alien species but are not pests of plants under the International Plant Protection Convention. The latter gap was considered by the thirteenth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA). The note on alien species that threaten ecosystems, habitats or species (Article 8 (h)): Report on consultations regarding international standards) (UNEP/CBD/SBSTTA/13/6) contains the result of the consultations carried out by the Executive Secretary with the International Plant Protection Convention (IPPC), the World Organization for Animal Health (OIE), the Food and Agriculture Organization of the United Nations (FAO), and the World Trade Organization (WTO). The advice of the Subsidiary Body (recommendation XIII/5) is annexed to the report of that meeting (UNEP/CBD/COP/9/3).

D. *Assessment and research*

18. Regarding the various requests of the Conference of the Parties relating to research and assessment, development of risk assessment/analysis, and environmental impact assessment and strategic environmental assessment, most Parties (72%) reportedly assess risks only for a few species of concern. Some Parties (11%) assess the risks for most alien species, and the other Parties have not developed capacity for risk assessment to address the threats of invasive alien species.

19. Research is conducted in many areas, for example, in the case of Canada to: identify and assess risks; generate taxonomic and ecological knowledge; develop detection and sampling tools and surveillance systems; develop predictive models; and prevention and mitigation tools as well as strategies for early warning and rapid response and; to assess the biological and socio-economic impacts of invasive alien species.

E. *Cooperation and coordination*

1. *National Governments*

20. Some Governments, such as Australia, Canada, Palau, Uganda, Zambia and the United States of America, have established national coordination mechanisms to ensure close inter-agency collaboration at

the national level among the various sectors and interest-holders relevant to the introduction, control and management of invasive alien species.

21. Many regional agreements exist related to invasive alien species. They are different in scope and content. Most are treaties or conventions on conservation of natural resources and wildlife that contain provisions on invasive alien species ^{4/} Regional conventions related to protection of aquatic and marine ecosystems are reviewed under section H below “Invasive alien species in thematic programmes of work”.

22. Guiding Principle 9 encourages Parties to cooperate with other Governments in order to address invasive alien species. Half of the responding Parties reported regional and/or subregional cooperation to address invasive alien species issues. Some Parties have established mechanisms for bilateral cooperation, about one quarter of Parties have multilateral cooperation, and slightly over one quarter of Parties indicated that they were not involved in any mechanisms for international cooperation. The role of GISP in providing opportunities for countries to work together to address invasive alien species was also mentioned in a number of national reports. In addition, some Parties (21%) reported having programmes in place in collaboration with trading partners and neighbouring countries to address transboundary threats of invasive alien species.

23. In addition, many networks were created for information as well as expertise sharing and access. Some of them are specific for invasive alien species while others have invasive alien species as an area of focus. Many of these cooperative networks also allow data sharing and dissemination between countries and regions and/or across data portals.

24. In support of the Parties, the Executive Secretary is collaborating with many bodies and organizations on invasive alien species issues including, in particular, the joint liaison group of the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change and the United Nations Convention to Combat Desertification, the International Plant Protection Convention (through the development of a joint work plan), the Collaborative Partnership on Forests, the International Maritime Organization, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the OIE, the International Civil Aviation Organization (ICAO) (development of a preventive strategy for invasive alien species through civil-aviation pathways), and the GISP and its partners. The Executive Secretary carried out some joint activities with the GISP (e.g. the workshops on marine and coastal invasive alien species (UNEP/CBD/SBSTTA/11/INF/10) and on terrestrial and freshwater invasive alien species) and will develop a joint programme.

2 *International bodies, instruments and organizations*

25. The international bodies, legal instruments, guidelines and/or codes of conduct that deal with aspects of invasive alien species prevention or management are summarized on the CBD invasive alien species web portal ^{5/} and in an information note on the in-depth review of invasive alien species (UNEP/CBD/COP/9/INF/32). The contributions of these bodies, instruments and organizations to implementation of the Guiding Principles have been significant.

26. There are dozens of international bodies, legal instruments, guidelines and/or codes of conduct that deal with some aspects of invasive alien species prevention or management. Many international bodies, instruments and organizations have been invited by the Conference of the Parties to address invasive alien species or to take them into account in their work. Many of these are listed on the CBD invasive alien species web portal and summaries of the work of some key organizations are provided in UNEP/CBD/COP/9/INF/32.

^{4/} See CBD invasive alien species web portal for a list of regional agreements
<http://www.cbd.int/invasive/done.shtml>.

^{5/} <http://www.cbd.int/invasive/assessments.shtml>

3. Terminology

27. International bodies, including the Secretariat of the Convention on Biological Diversity, have been collaborating in the clarification of existing invasive alien species terminology. ^{6/} The Executive Secretary compiled a glossary of terms used in various forums in relation to invasive alien species on the CBD invasive alien species web portal, ^{7/} so did CAB International ^{8/} in collaboration with the OIE. The International Plant Protection Convention has a glossary working group that also works towards clarification of terminology.

F. Information-sharing, communication, and awareness-raising

28. The Conference of the Parties put considerable emphasis on information-sharing, communication, and awareness-raising regarding invasive alien species ^{9/} to carry out relevant activities and to engage stakeholders and indigenous and local communities, including through Guiding Principle 8. ^{10/} One result has been the development of the CBD invasive alien species web portal, ^{11/} The Invasive Information Network of the Inter-American Biodiversity Information Network (I3N), ^{12/} the North European and Baltic Network on Invasive Alien Species (NOBANIS) ^{13/}, and the Delivering Alien Invasive Species in Europe (DAISIE) cover the regional level information. The Global Invasive Species Information Network (GISIN), ^{14/} Global Invasive Species Database (GISD), ^{15/} and CABI's Invasive Species Compendium (ISC) ^{16/} have an important role with respect to information-sharing at the global level. With regard to forestry, a global review of the impacts on forest and forestry by alien invasive species was undertaken by FAO in 2005, and a wide range of information made available online (<http://www.fao.org/forestry/site/aliens/>). Parties may be particularly interested in accessing a database on invasive tree species; www.fao.org/forestry/site/24107/en that summarizes information from forest tree species that have been reported to be invasive outside their native habitat. Databases on insects and diseases that are harmful to forests as well as forest pest profiles are also available on FAO's forest health website www.fao.org/forestry/site/pests/en

29. There is a pressing need to provide information to government staff that are often not aware of the magnitude of the invasion, or the steps required to deal with invasive alien species. Quite often, the issue is regarded as an agricultural problem and not a priority for the environment, local livelihoods or human health. Trade, transportation, travel, tourism and infrastructure sectors, including the private sector, need to be informed for their significant role in the movement and even promotion of invasive alien species. Public awareness is also important because, without a good understanding of the impacts of invasive alien species, there is often little pressure placed on decision and policy-makers.

30. The sources of information listed above are accessible through web browsers and have contributed to raising awareness among a wide range of communities. However, the different interfaces used and the inconsistencies in the formats hamper full information-sharing. Coordination amongst the providers of information is needed.

^{6/} Decision VIII/27, paragraphs 67-70 deal with terminology related to invasive alien species.
^{7/} <http://www.cbd.int/invasive/terms.shtml>
^{8/} http://www.cabi.org/ias_ctc.asp?Heading=Terms
^{9/} Decision VIII/27, paragraphs 3, 4, 6, 11, 12, 13, 16, 17, 61; decision VII/13, paragraph 6c; decision VI/23, paragraphs 10e, 10f, 19, 25, 27, Guiding Principle 8 in the annex; decision V/8, paragraphs 3, 9, 12.
^{10/} Decision VIII/27, paragraphs 11, 69; decision VII/13, paragraph 12; decision VI/23, paragraphs 13, 25, 26, 28, 32; decision V/8, paragraphs 4, 14
^{11/} www.cbd.int/invasive/
^{12/} <http://i3n.iabin.net/>
^{13/} <http://www.nobanis.org/>
^{14/} <http://www.gisnetwork.org/>
^{15/} <http://www.issg.org/database/welcome/>
^{16/} <http://www.cabi.org/datapage.asp?iDocID=180>

G. Addressing particular pathways

1. Conveyances as pathways for invasive alien species

31. Information on implementation of the decisions related to this pathway was not available.

2. Aquaculture/mariculture

32. Aquaculture and mariculture are rapidly growing industries that provide pathways for intentional and unintentional introductions of alien species including escaped fish, their parasites and diseases. In decision VIII/27, paragraph 23, the Conference of the Parties invited Parties “to develop and implement national and regional programmes of work, such as those under the Asia-Pacific Economic Cooperation, for the sustainable management of aquaculture as well as for the control of aquatic invasive species.” Countries under the APEC account for over 90% of the world’s aquaculture production. The objectives of the Fisheries Working Group (FWG) cover the management of aquaculture, but there is no specific work on invasive alien species. Canada, for example, adopted the Canadian action plan to address the threat of aquatic invasive species, and Palau is carrying out a project for the eradication of tilapia in a number of ponds. However, very few countries reported to have developed and to be implementing national and regional programmes of work for the sustainable management of aquaculture. In recommendation XIII/5, SBSTTA recommends that the Conference of the Parties should invite the FAO Committee on Fisheries and Aquaculture to consider the formalization of relevant technical guidance on the introduction, for fisheries and aquaculture, of alien species.

3. Ballast water

33. As of March 2008, 13 States representing 3.62% of the world’s merchant shipping tonnage have ratified the Convention for the Control and Management of Ship’s Ballast Water and Sediments (BWM Convention-2004) which is yet to enter into force ^{17/} (www.imo.org). The GEF/UNDP/IMO Global Ballast Water Management Programme (GloBallast) ^{18/} is helping to raise the capacity of developing countries to manage ballast water through communication and awareness raising activities, training and technical assistance, and cooperative regional arrangements between neighbouring countries.

34. At the regional level, various activities are being carried out, e.g.:

(a) the Great Lakes-St Lawrence Seaway System in Canada/United States ^{19/} has some of the most stringent standards in the world for management of ballast water;

(b) China and South Africa developed strategic plans of ballast water management through the demonstration projects of GloBallast; and

(c) Malaysia conducted a regional workshop, through the initiative of The Network of Aquaculture Centres in Asia (NACA), on alien-species carrying pathogens.

4. Marine bio-fouling, particularly hull-fouling

35. No specific instruments exist concerning invasive alien species transferred by hull-fouling and few countries have national controls. The Marine Environmental Protection Committee of IMO instructed the Bulk Liquids and Gases (BLG) Sub-Committee to commission the development of international measures for minimizing the translocation of invasive aquatic species through bio-fouling of ships.

^{17/} www.imo.org

^{18/} GloBallast - <http://globallast.imo.org/>

^{19/} www.greatlakes-seaway.com/en/navigation/ballast_water.html

5. *Civil air transport*

36. There are no binding agreements addressing civil air transport as a pathway for invasive alien species. In 2004, the International Civil Aviation Organization (ICAO) adopted the Assembly resolution A35-19 committing member States to reducing threats of potential invasive alien species and for ICAO to produce guidance material and standards and recommended practices (SARPs) to reduce risks. ICAO conducted a worldwide survey of member States on various aspects of the invasive alien species problem *vis-à-vis* international air transportation. The ICAO also requested member States and their national organizations for air transport to provide “best practices” in combating the spread of invasive alien species via civil aviation, which supports decision VIII/27, paragraph 37. ICAO has not had adequate resources to analyse the results or carry the issue forward. The GISP obtained funds to analyse these results and is in the process of finalizing the draft guidelines for invasive species prevention in air transport.

6. *Military activities*

37. There is little information available regarding invasive alien species and military operations, In Australia, for example, the Department of Defence signed a memorandum of understanding with the Australian Quarantine and Inspection Service (AQIS) concerning quarantine procedures, fees and requirements for defence-force personnel and equipment returning to Australia. Also, to mitigate the threats associated with invasive species, the Department of Defence has in place Defence Instruction (General) 46-1: Quarantine and Defence Instruction (Navy) OPS 19-1: Policy for the disposal of ship borne waste. Useful general references include Ruiz and Carlton 20/ and a report by the National Wildlife Federation. 21/

7. *Emergency relief, aid and response*

38. Humanitarian or other emergency relief or development assistance efforts may introduce or spread invasive alien species, particularly due to the short-time period for urgent preparation of humanitarian responses, which makes incorporation of invasive alien species considerations difficult. Apart from the work by GISP on the development assistance pathway, 22/ very little information is available. Regarding the need to develop codes of practice, little guidance exists in this regard but relevant examples are listed on the CBD IAS web portal. 23/

8. *Scientific research*

39. Scientific research has been identified as a significant pathway for the spread of pests and diseases via contaminated equipment, through deliberate release or the release of unwanted research organisms and biological specimens, and the reintroduction of species as part of biodiversity management programmes (decision VIII/27, paragraphs 45 to 48). Little has been reported in response to the requests of the Conference of the Parties on this issue. Information on the existing research guidelines have been made available and updated on the CBD invasive alien species web portal. 24/ The most comprehensive guidance is a code of conduct for field work developed by the Scientific Committee on Antarctic Research.

20/ Ruiz, G. and J. Carlton (eds.). 2004. *Invasive Species: Vectors and Management Strategies*, Island Press, Washington, D.C

21/ <http://www.cbd.int/invasive/tools.shtml?sec=military>

22/ For example, Gutierrez, A. T. and J.K. Reaser. 2005. Linkages between development assistance and invasive alien species in freshwater systems in Southeast Asia. USAID Asia and Near East Bureau, Washington, D.C. Pp. 87.

23/ <https://www.cbd.int/invasive/tools.shtml?sec=aid>

24/ <http://www.cbd.int/invasive/tools.shtml>

9. *Tourism*

40. The IUCN Guidelines for the Prevention of Biodiversity Loss Caused by Invasive Alien Species 25/ include a guiding principle that encourages operators in eco-tourism businesses to raise awareness on the issue of invasive alien species.

10. *Pets, aquarium species, live bait, live food and plant seeds*

41. The GISP and the Pet Industry Joint Advisory Council (PIJAC) 26/ began to collate case-studies on best management practices for preventing the introduction of invasive alien species via the pathway related to pet trades, with a view to creating a toolkit on relevant regulatory and non-regulatory measures. The internet-based sale of live plants and animals is of particular concern because it is rapidly expanding and is largely lacking standard international national controls and regulation, 27/ as well as enforcement capacity. The United States Department of Agriculture (USDA) has an Internet Surveillance Project, which includes an Agricultural Internet Monitoring System (AIMS). GISP invited Parties and others to present their views on how to address this issue. 28/ SBSTTA addressed this issue in recommendation XIII/5.

11. *Biocontrol agents*

42. Alien species that are used to control pests can become invasive alien species. The Code of Conduct for the Import and Release of Exotic Biological Control Agents 29/ is a major instrument. The International Plant Protection Convention has developed a standard (revised International Standard for Phytosanitary Measures #3) on Guidelines for the Export, Shipment, Import and Release of Biological Control Agents and Other Beneficial Organisms. 30/ However, animals for biological control of other animals are not specifically addressed. Marine organisms used in biocontrol are included in the Code of Practice of International Council for the Exploration of the Sea on the Introductions and Transfers of Marine Organisms, 31/ which is voluntary.

12. *Ex-situ animal breeding programmes*

43. Prior to the request by the Conference of the Parties in 2006, IUCN issued Technical Guidelines on the Management of *ex-situ* Populations for Conservation 32/ (2002). The Centre for Plant Conservation has issued Voluntary Codes of Conduct for Botanic Gardens and Arboreta. These professional codes of conduct are designed to control the use and distribution of invasive plant species. They are being considered by the major professional societies and organizations for endorsement. 33/

H. *Invasive alien species in thematic programmes of work*

1. *Islands*

44. The Island Biodiversity Portal on the CBD website contains invasive alien species-related information, including a list of partner organizations that are working to control threats to island biodiversity from invasive alien species. 34/ Key initiatives addressing islands and invasive alien species

25/ <http://www.iucn.org/themes/ssc/publications/policy/invasivesEng.htm>

26/ <http://www.pijac.org>

27/ Source: UNEP/CBD/SBSTTA/11/INF/4

28/ <http://www.gisp.org/publications/brochures/index.asp>

29/ FAO 1995 - <http://www.fao.org/docrep/x5585E/x5585e0i.htm>

30/ www.acfs.go.th/sps/downloads/76047_ISPM_3_E.pdf

31/ www.ices.dk/reports/general/2004/ICESCOP2004.pdf

32/ www.eaza.net/download/doc_EEP_IUCNGuidelines.pdf

33/ List of endorsements: <http://www.centerforplantconservation.org/invasives/endorsementN.html>

34/ <http://www.cbd.int/island/partners.shtml>

have been undertaken *inter alia* by the Cooperative Islands Initiative, ^{35/} the Pacific Island Ecosystems at Risk, ^{36/} and the South Pacific Regional Environment Programme, ^{37/} the Pacific Island Invasives Learning Network, the Pacific Invasives Initiative, and the CABI-GEF project “Mitigating the threats of invasive alien species in the insular Caribbean.” The Executive Secretary is collaborating with the Global Island Partnership to promote the implementation of the programme of work on island biodiversity, including the provisions on invasive alien species.

2. *Dry and sub-humid lands*

45. The in-depth review of implementation of the programme of work on dry and sub-humid lands during the eleventh meeting of SBSTTA concluded that management of invasive alien species was marginal with fewer than fifteen Parties reporting on relevant activities. Since then, some initiatives have been reported for increased information exchange, the establishment of mechanisms for best management of invasive alien species in dry and sub-humid lands (decision VII/2, annex, activity 7 (c)), and for putting in place and implementing management plans, in accordance with target 6.1 of the programme of work, for major alien species that threaten dry and sub-humid lands ecosystems, habitats or species. There are activities proposed on the management of invasive alien species in the CBD joint work programme with the United Nations Convention to Combat Desertification (UNCCD), which is yet to be considered by the Conference of Parties to the UNCCD.

3. *Marine and coastal ecosystems*

46. Regarding the implementation of the requests of the Conference of the Parties on invasive alien species in marine and coastal ecosystems, it can be noted that: (i) several national and international organisations are working on marine invasive alien species issues and examples are available in UNEP/CBD/COP/9/INF/14; (ii) the Executive Secretary made available on the Marine and Coastal Biodiversity portal ^{38/} information on relevant collaboration, experiences and expertise; (iii) some countries put in place mechanisms to control potential invasions from ballast water (30% of responding Parties), aquaculture (30%), and accidental releases (16%); (iv) only a few Parties established mechanisms to control potential invasions from hull-fouling (7%); and (v) a draft work plan for the management of marine invasive species was developed by the Workshop on the Joint Programme of Work on Marine and Coastal Invasive Species organized by the Executive Secretary, GISP and the UNEP Regional Seas Programme. ^{39/}

47. The Convention on the Protection of the Marine Environment of the Baltic (HELCOM), the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention) and the United Nations Convention on the Law of the Sea (UNCLOS) are the major binding agreements having provisions related to the protection of the marine environment from invasive alien species. The Executive Secretary is collaborating with the secretariats of these conventions. More information on agreements is available in the submission from the GEF Secretariat on a Strategy for resource mobilization (UNEP/CBD/COP/9/INF/14) and on the CBD invasive alien species web portal. ^{40/}

4. *Inland waters*

48. Many national, regional and international initiatives address invasive alien species in inland waters (see CBD invasive alien species web portal and document UNEP/CBD/SBSTTA/10/INF/4).

^{35/} <http://www.issg.org/cii/>
^{36/} <http://www.hear.org/pier/>
^{37/} www.sprep.org
^{38/} <http://www.cbd.int/marine/IAS.shtml>
^{39/} UNEP/CBD/SBSTTA/11/INF/10
^{40/} <https://www.cbd.int/invasive/done.shtml>

5. *Mountains*

49. Little information was found on the implementation of decisions of the Conference of the Parties on invasive alien species in mountain ecosystems.

6. *Forests*

50. The programme of work on forest biodiversity calls for strategies at regional and national level to address invasive alien species, and also calls for improvement of knowledge regarding impacts of invasive alien species on forest ecosystems and adjacent ecosystems (decision VI/22 annex, goal 2, objective 1). There are some initiatives related to IAS in forests, including networks technically supported by FAO and endorsed by the Regional Forestry Commissions such as the Forest Invasive Species Network for Africa (FISNA), the Asia-Pacific Forestry Invasive Species Network (APFISN), Near East Network for Forest Health and Invasive Species (NENPHIS) and a forest invasive species network for the South Cone Countries of South America (in formulation stage) and The North American Forest Commission Exotic Forest Pest Information System (NAFC-ExFor).

7. *Agriculture – Pollinators Initiative*

51. Regarding decisions of the Conference of the Parties on threats to pollinator diversity and invasion of exotic pollinators, some case studies have been developed and are accessible on the CBD invasive alien species web portal. ^{41/} The North American Pollinator Protection Campaign (NAPPC) ^{42/} is addressing the issue of invasive species through its task forces and committees. It works with the International Pollinator Initiative. The European Pollinator Initiative (EPI) ^{43/} also addresses competition with non-native pollinators and effects of invasive plants in their work to conserve Europe's pollinators.

I. Invasive alien species in the work of the Convention on cross-cutting issues

1. Protected areas

52. Little information was found on the implementation of decisions of the Conference of the Parties on invasive alien species in protected areas.

2. Impact assessment

53. The voluntary guidelines on biodiversity-inclusive impact assessment (decision VIII/28, annex), which call for a description of possible impacts of main drivers of change, including invasive alien species, as a requirement in the screening phase of impact assessments, have been applied and tested in a number of regions through the project on capacity-building in biodiversity and impact assessment (CBBIA), implemented by the International Association for Impact Assessment (IAIA). These applications led to additional sector-specific procedures (see also UNEP/CBD/COP/9/20).

54. Natureserve has developed an Invasive Species Assessment Protocol, ^{44/} which ranks hundreds of alien plant species found in the United States of America by impact or "I-ranks" (high, medium, low, or insignificant) and provides reports for each individual species. Some countries routinely carry out risk assessments for potentially invasive species, both before and after their introduction.

^{41/} <http://www.cbd.int/programmes/areas/agro/cs.aspx>

^{42/} <http://www.nappc.org/>

^{43/} <http://europeanpollinatorinitiative.org/>

^{44/} <http://www.natureserve.org/getData/plantData.jsp>; see also <http://www.natureserve.org/library/invasiveSpeciesAssessmentProtocol.pdf>

3. *Global Taxonomy Initiative (GTI)*

55. Prevention and mitigation of the impacts of invasive alien species often relies on timely access to taxonomic expertise and resources. As part of the implementation of the decisions of the Conference of the Parties on the integration of invasive alien species in the GTI, the development and/or expansion of invasive alien species databases, and the development of working identification keys and lists of organisms which are susceptible to key invasion pathways: (i) the Executive Secretary has included the Global Taxonomy Initiative in the joint work plan between the secretariats of the Convention and the International Plant Protection Convention; and (ii) BioNET International has developed a series of case-studies on “taxonomy targeting invasives”, which can be accessed through the CBD invasive alien species web portal. BioNET and the United Kingdom National History Museum (NHM) have assessed taxonomic needs in relation to invasive alien species management. They recommend “supra-institutional activities to promote prioritization and application of taxonomy to tackle invasive alien species”. Further information about links between the GTI and invasive alien species can be found in the GTI Guide. ^{45/}

4. *Global Strategy for Plant Conservation*

56. Target 10 of the Global Strategy for Plant Conservation (GSPC) is “Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems” (decision VI/9, annex). The following are examples of implementation of target 10 in the context of the Global Strategy for Plant Conservation:

(a) Working closely with the Global Invasive Species Programme and the IUCN species survival commission, Australia has identified and developed rigorous management strategies for twenty invasive species of national significance and most of the data are available online. Belgium has developed four management plans, Chile put in place control mechanisms for 10 exotic species while Ireland has management plans for 10 species and Ghana a national programme for two species; and

(b) Missouri Botanical Garden held a workshop on guidelines for the sectoral control of invasive species about six years ago, a direct contribution toward Target 10. The voluntary codes of conduct developed are available for various sectors. To date, acceptance of the codes of conduct has been limited, but current efforts to update them and to get industry buy-in are under way.

5. *Financial measures and incentives*

57. Examples of financial measures and incentives to help prevent, control and manage invasive alien species are included in the note by the Executive Secretary on incentive measures (UNEP/CBD/COP/9/12).

6. *Financial support*

58. The GEF reported to the eighth meeting of the Conference of the Parties that there were 51 GEF-funded projects dealing with invasive alien species. ^{46/} Many other donors, including the World Bank and other bodies, non-government organizations and bilateral donors, are supporting the Global Invasive Species Programme, projects related to invasive alien species, and developing countries in building capacity and implementing measures to address invasive alien species.

^{45/} <http://www.cbd.int/doc/programmes/cro-cut/gti/gti-guide-en.pdf>
^{46/} UNEP/CBD/COP/8/10 and UNEP/CBD/COP/9/INF/15

7. *Financial mechanisms for incursion response*

59. In response to the request of the Conference of the Parties, the Executive Secretary contacted the GISP, the GEF, the FAO the Organisation for Economic Co-operation and Development and through the Aliens-L ListServe (a network of over 700 experts) and others to identify a mechanism(s) for providing Parties with access to financial support for rapidly responding to new incursions by alien species. Several responses were received and are summarized in document UNEP/CBD/COP/9/INF/14.

8. *Targets and indicators for the 2010 framework*

60. In 2006, the Secretariat commissioned the Species Survival Commission of IUCN-The World Conservation Union to carry out a study on options for a global indicator on “Trends in invasive alien species”. The report served as background document for an expert meeting of invasive alien species data holders and users in England in 2007. The conclusions of this meeting form the basis for the work of the 2010 Biodiversity Indicators Partnership on this indicator. GISP, through a working group, will refine the list of indicators and liaise with data providers to deliver some of these indicators.

9. *Implications of the Millennium Ecosystem Assessment*

61. The Millennium Ecosystem Assessment (MA) confirmed the role of invasive alien species as a major driver of biodiversity loss, local or global extinction, and homogenization of species in specific ecosystems. The MA illustrated these phenomena in its assessments of inland waters, island and polar ecosystems. The MA described three broad negative impacts of invasive alien species on ecosystems and human well-being: loss of biodiversity, change in ecosystem functioning and economic costs. The economic costs of addressing invasive alien species and their impact are significant. However, introductions of alien species, like in the case of biocontrol, can also be beneficial. In the MA reports, it is predicted that the impacts of invasive alien species will continue to increase. Addressing invasive alien species will require unprecedented efforts focusing on (i) prevention measures; (ii) a combination of global cooperation and local management; (iii) measures to address trade as an important vector of introduction; and (iv) overcoming insufficient commitment, financial and human resources to implement existing policy and regulation.

62. The MA's survey of trends in species introductions and modeling predictions strongly suggested that invasive alien species will interact strongly with other drivers of biodiversity loss such as climate change, land use and land use change. The MA identified trade as a major cause of introductions, reaffirmed that preventing species invasion is the safest and most cost-effective approach to the problem of invasive species, and noted that eradication and control measures have had mixed results.

IV. CONCLUSIONS AND DRAFT DECISION ON THE IN-DEPTH REVIEW OF ONGOING WORK ON INVASIVE ALIEN SPECIES

63. The Conference of the Parties has adopted many decisions to implement Article 8(h) of the Convention which calls for the prevention of the introduction of, control or eradication of those alien species which threaten ecosystems, habitats or species. These decisions and in particular the “Guiding Principles for the prevention, introduction and mitigation of impacts of alien species that threaten ecosystems, habitats or species” adopted in decision VI/23, ^{47/} provide useful guidance for work on invasive alien species, and for raising awareness among national and regional authorities and organizations about the ways and means for addressing invasive alien species at the national, regional

^{47/} One representative entered a formal objection during the process leading to the adoption of this decision and underlined that he did not believe that the Conference of the Parties could legitimately adopt a motion or a text with a formal objection in place. A few representatives expressed reservations regarding the procedure leading to the adoption of this decision (see UNEP/CBD/COP/6/20, paragraphs 294-324).

and international levels including through collaboration. Substantial work has been carried out to develop norms and to address gaps in the international regulatory framework. SBSTTA addressed the latter issue most recently in recommendation XIII/5. However, much greater additional efforts are needed to implement the guidance developed under the Convention, especially at the national level. In turn, this requires enhanced efforts to strengthen capacity and to facilitate the exchange of experiences in implementation..

In light of the above review, the Conference of the Parties may wish to adopt elements of a decision, including SBSTTA recommendation XIII/5, along the following lines:

The Conference of the Parties,

General

Recalling its decisions IV/1C, V/8, VI/23, 47/ VII/13 and VIII/27, and other provisions adopted to implement Article 8(h) of the Convention in the thematic programmes of work and work on cross-cutting issues;

Taking note of the progress made in implementing Article 8(h) of the Convention, as summarized in document UNEP/CBD/COP/9/11 and SBSTTA/CBD/COP/9/INF/32,

1. *Recognizes* that all the decisions adopted to date for the prevention, introduction and mitigation of impacts of alien species that threaten ecosystems, habitats or species, including the “Guiding Principles” adopted in decision VI/23, 47/ provide relevant guidance for work on invasive alien species to achieve the objectives of the Convention, its Strategic Plan and the 2010 biodiversity targets, and other global goals such as the Millennium Development Goals; and *requests* the Executive Secretary to develop, in collaboration with the Global Invasive Species Programme (GISP) and other relevant organizations, a practical guide to facilitate the implementation of the decisions of the Conference of the Parties on invasive alien species and the development and implementation of national invasive alien species systems, taking into account the Guiding Principles and, where appropriate, making use of relevant guidance developed through other relevant organizations;
2. *Further recognizes* that the in-depth review identified as a major constraint to the implementation of the work on invasive alien species lack of technical, institutional and logistical capacity for the prevention, eradication and control of invasive alien species, including *inter alia* phytosanitary and quarantine control; early detection and rapid response systems; incident lists on introductions of alien species, especially in relation to their further spread and impacts on biodiversity and human welfare; adequate field equipment; intersectoral planning; economic valuation; and integrated policy and legal frameworks; and *invites* Parties, other Governments and relevant organizations to address the above-mentioned capacity gaps;
3. *Notes with concern* that the problem of invasive alien species will continue to grow, essentially due to trade, transport and travel, including tourism, and the expanding impact of climate change, with enormous socioeconomic, health and ecological costs around the world;
4. *Emphasizes* the need for additional efforts and resources to address the invasive alien species in particular through the exchange of lessons learned from experience in addressing the threats from invasive alien species, and the strengthening of capacity to address these threats, especially in developing countries, in particular the least developed countries and small island developing States, as well as countries with economies in transition;

International instruments and standards

5. *See draft decision: SBSTTA recommendation XIII/5 in document UNEP/CBD/COP/9/3;*

Management, pathways and assessment

6. *Encourages* Parties, other Governments and relevant organizations to put in place mechanisms to control all pathways, for potential invasive alien species, especially in inland water, marine and coastal ecosystems, including shipping, trade and aquaculture and mariculture;

7. *Requests* the Executive Secretary, in collaboration with other relevant organizations, in particular as part of the joint global work programme with GISP and for possible inclusion in the practical guide referred to in paragraph 1 above, to compile and disseminate through the clearing house and other means, best management practices and tools relating to the management of the pathways of transfer and introduction of invasive alien species, particularly those identified as gaps in decision VIII/27, taking into account further steps for their elaboration, the ecosystem approach and impacts on human well-being and locally and globally important biodiversity;

8. *Requests* the Executive Secretary, in collaboration with the GISP, to compile information on restoration and rehabilitation of ecosystems degraded by the presence of invasive alien species, including the socioeconomic aspects, and to report to the Conference of the Parties, and *invites* Parties, other Governments and relevant organizations to submit to the Executive Secretary any relevant information;

9. Further to paragraph 4 of decision VI/23 ^{47/} *invites* research organisations to improve our understanding of the impact of other drivers, in particular climate change and land-use change, on the establishment and spread of invasive alien species, and the socioeconomic, health and ecological impact of such introductions on biological diversity;

10. *Invites* Parties, other Governments and relevant organisations to build capacity to anticipate and mitigate the impacts of climate change on invasive alien species, in order to conserve biodiversity and ecosystem goods and services.

Cooperation and coordination

11. *Noting* the importance of regional initiatives and institutions for facilitating national implementation and providing coordination among countries, *invites* Parties, other Governments and financial institutions to support them, and *requests* the Executive Secretary and the GISP to analyze the functioning and contribution of regional initiatives and institutions and identify best practices in addressing issues of coordination and shared resources.

Communication, education and public awareness

12. *Invites* Parties, other Governments and relevant organizations to support awareness raising programmes for decision-makers and practitioners in the freshwater, marine and terrestrial environment sectors and in transportation, trade, travel and tourism sectors that are major drivers of biological invasions; and *requests* the Executive Secretary, in collaboration with the GISP and relevant organisations, to develop training materials in support of awareness-raising and catalyze the organisation of practical workshops to strengthen capacity for the implementation of the Guiding Principles and other measures to address the threats from invasive alien species, while recognizing that such activities will require adequate resources;

13. Further to paragraph 11 of decision VIII/27, *invites* Parties, other Governments and relevant organization to submit case studies, lessons learned and best practices for the implementation of the Guiding Principles, and other measures to address the threats from invasive alien species, and, where

relevant, invasive alien genotypes, including successful use of risk assessment procedures and methods for assessing the costs of invasive alien species and the benefits from controlling them;

Provision of resources

14. *Calls upon* relevant organizations and funding agencies to carry out, promote and / or support capacity building activities referred to in this decision.

15. *Reiterates* its invitation to the Global Environment Facility, Parties, other Governments and funding organizations to provide adequate and timely financial support to enable the GISP to fulfill the tasks outlined in many of its decisions.
