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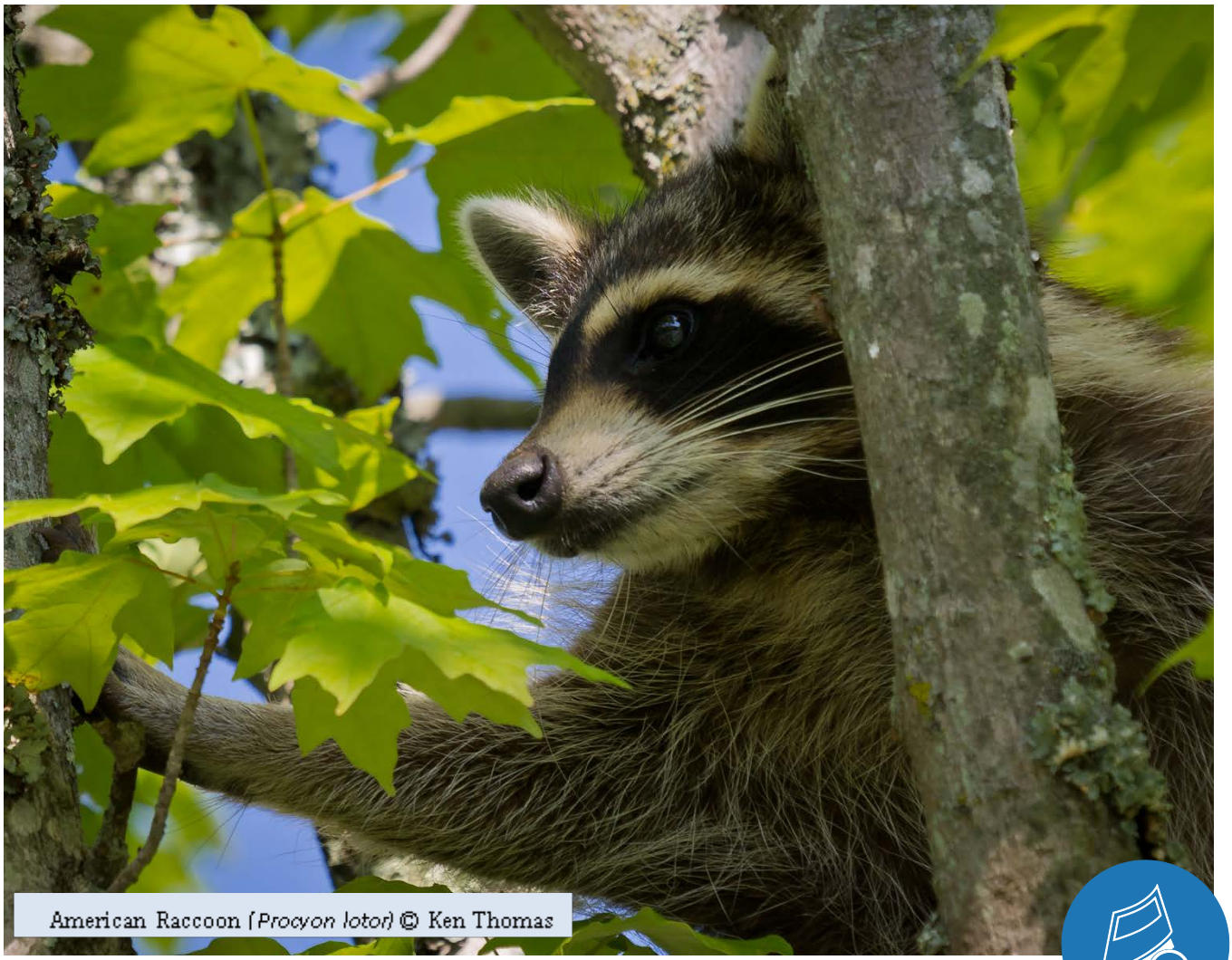
Of global concern: Invasive Alien Species

NeFo CBD Fact Sheet in preparation of CBD-SBSTTA-20, 4/2016



American Raccoon (*Procyon lotor*) © Ken Thomas

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Of global concern: Invasive Alien Species

Invasive alien species (IAS), i.e. non-native species that have negative impacts on native ecosystems and biodiversity, have been recognized as one of the currently most serious and expanding threats to biodiversity and ecosystem service and, thus, also to human health and well-being. In decision XII/16, the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) adopted the voluntary "Guidance on devising and implementing measures to address the risks associated with the introduction of alien species as pets, aquarium and terrarium species, and as live bait and live food". During its 20th meeting, the Subsidiary Body of Technical, Technological and Scientific Advice to the CBD (SBSTTA-20) will revive this subject, drawing upon the results of an expert workshop held in October 2015 in Montreal, Canada.

BACKGROUND

Under the Convention on Biological Diversity (CBD), invasive alien species are defined as "species whose introduction and/or spread outside their natural past or present distribution threatens biological diversity"[1], encompassing a vast, and rapidly increasing range of non-native terrestrial, freshwater and marine vertebrates, invertebrates, plants and disease organims.

IAS has been established a cross-cutting issue within the work programme of the CBD, and is contained within its Strategic Plan for Biodiversity 2011-2020 under Aichi Target 9: "By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment", as contained in the Strategic Plan for Biodiversity 2011–2020[2].

IAS have invaded and affected native biota in almost every ecosystem type on Earth, and have affected all major taxonomic groups[3]. They can lead to the extinction of native species, degradation of ecosystems, declining agricultural productivity and loss of genetic diversity, and damage to property, infrastructure, native fisheries, tourism and outdoor recreation[4].

Invasive alien species (IAS) have been recognized as one of the currently most serious and expanding threats to biodiversity and ecosystem services and, thus, also to human health and well-being[5]. In the perspective of some countries, the negative consequences of invasive alien species on their natural ecosystems even paramount the threat of climate change[6].

They also have a significant impact on economies worldwide. Many if the introduced species, such as corn, weat, rice or domestic chicken and catttle, had positive impacts on local and national economies. However, in case of IAS there are also huge costs associated with their mostly unintentionally and unpredictable spread. The cost of damage from IAS in 2001 has been estimated $ 1.4 trillion globally[7], including losses to crops, pastures and forests, as well as environmental damages and control costs, not including loss of speci es and ecosystem services.

Invading Germany: the American Raccoon

Originally from Northern America, the American Raccoon (*Procyon lotor*) has been increasingly populating the low mountain ranges in central Germany. As generalist he combs through the plenty, easy accessible food in the waste containers. However, he also enjoys eating the eggs of the European Freshwater Turtle (*Emys orbicularis*), a strictly protected species in Germany. This certainly is a problem.

[1] https://www.cbd.int/invasive/WhatAreIAS.shtml
[2] http://www.cbd.int/sp/targets
[3] IUCN (The World Conservation Union). 2000. IUCN Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species. Prepared by the Species Survival Commission Invasive Species Specialist Group, and approved by the 51st Meeting of the IUCN Council. Gland, Switzerland; quoted after https://www.cbd.int/invasive/matter.shtml
[4] IPBES/4/10
[5] Millenium Ecosystem Assessment. 2005. Ecosystems and human well-being: biodiversity synthesis. World Resources Institute, Washington, DC
[6] IPBES/4/10
[7] Pimentel, D., et al., 2001. "Economic and environmental threats of alien plant, animal, and microbe invasions". *Agriculture, Ecosystems and Environment* 84: 1–20

WAYS AND MEANS TO ADDRESS THE RISKS ASSOCIATED WITH TRADE IN WILDLIFE

In preparation of the 20th meeting of the CBD Subsidiary Body of Technical, Technological and Scientific Advice (SBSTTA-20), the CBD Secretariat prepared a document reviewing (i) approaches to addressing the risks associated with trade in wildlife, (ii) experiences in the use of biological control agents against IAS, and (iii) existing decision-support tools with regard to IAS[8].

Global approaches and processes related to addressing the risks associated with trade in wildlife

- Convention on International Trade in Endangered Species in Wild Fauna and Flora (CITES): While the regulatory framework of CITES explicitely aims to ensure that international trade in specimens of wild animals and plants does not threaten the survival of species in the wild, it does not contain concrete measures to reduce the risk of biological invasion as a consequence of wildlife trade. However, the CITES Trade Database, listing over 15 million records of wildlife trade and over 34,000 taxa listed in CITES Appendices, could help monitoring also trade in IAS.
- World Trade Organization Agreement on Application of Sanitary and Phytosanitary Measures: Member states of the World Trade Organisation (WTO) Agreement on Application of Sanitary and Phytosanitary Measures are required to report to the WTO about alien organims and their national import regulations. Cross-border traders are required to obtain permits for the import of regulated live species from the authority of the country where the relevant national legislation is in place. The WTO Trade Statistics also could help to monitor IAS trade.
- United Nations Centre for Trade Facilitation and Electronic Business: The United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) has established a Single Window to enhance the efficient exchange of information between trade and government (Recommendation No. 33, 2004). The Single Window could be an effective and appropriate approach to improve monitoring of cross-boundary movements of regulated species beyond species listed in the CITES Appendices I-III, and to prevent the import of problem species if the national legislation sets import requirements.
- IMO/ILO/UNECE Code of Practice for Packing of Cargo Transport Units: At its 93th meeting, in 2014, the Maritime Safety Committee of the International Maritime Organization (IMO) approved the revised IMO/International Labour Organization/United Nations Economic Commission for Europe Code of Practice for Packing of Cargo Transport Units (CTU Code)[9]. The CTU Code is a voluntary guidance on the safe packing of cargo transport units. Among other things, it contains provisions to ensure that containers are free from plants, plant products, visible pests, animals and other invasive alien species.
- Animal health codes of the World Organisation for Animal Health: The World Organisation for Animal Health (OIE) is the WTO reference organization for standards relating to animal health and zoonoses. OIE has published two codes: the Terrestrial Animal Health Code[10], which aims to assure the sanitary safety of international trade in terrestrial animals; and the Aquatic Animal Health Code[11], which sets out standards for the improvement of aquatic animal health and welfare of farmed fish worldwide, and for safe international trade in aquatic animals and their products.

[8] UNEP/CBD/SBSTTA/20/7

[9] https://www.unece.org/fileadmin/DAM/trans/doc/2014/wp24/CTU_Code_January_2014.pdf

[10] http://www.oie.int/international-standard-setting/terrestrial-manual/access-online/

[11] http://www.oie.int/international-standard-setting/aquatic-code/

- Convention on Biological Diversity (CBD): In decision XII/16, the Conference of the Parties adopted voluntary guidance on devising and implementing measures to address the risks associated with the introduction of alien species as pets, aquarium and terrarium species, and as live bait and live food. The guidance seeks to address the risks associated with trade in wildlife at various levels, including the risk of escape of live species, noting that escape of live species from confined conditions was identified as the most frequent pathway to spread invasive alien species[12]. The voluntary guidance contains useful risk reduction measures for safe trade of live species per se. However, risks posed by the associated materials (packaging, media, food etc.) and so called "hitchhikers" (live organisms unintentionally attached to or contaminating the imported live species or its container) may not be sufficiently covered by this guidance. As a result from an expert meeting in October 2015 in Montreal, Canada[13], the following suggestions were collected:
  - Establishing commodity-specific international standards for live organism under the standard-setting process of IPPC;
  - Establishing national regulatory frameworks to control the import and spread of wildlife species and associated materials, and national sanitary and phytosanitary measures in compliance with the WTO-SPS Agreement;
  - Enhancing cooperation among national authorities responsible for the control of wildlife trade and IAS, including CITES representatives;
  - Ensuring application of the guidance by actors in trade and industry;
  - Exploring ways and means to individual behavioral change so as to reduce the risks to biodiversity associated with both legal and illegal trade in wildlife.

STRENGTHENING THE KNOWLEDGE BASE ON IAS IMPACTS

In order to strengthen the knowledge base on threats posed by IAS on the enviroment and human health, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) decided to include an assessment on IAS and their control into its first work programme.

The according scoping document[14] was recently discussed at the fourth plenary of IPBES in February 2016 in Kuala Lumpur, Malaysia (IPBES-4). It contains the following chapter outline:

- *Chapter 1* will introduce the concept of invasive alien species (terminology and definitions; risks posed by such species to ecosystems; brief overview of the importance of understanding perceptions of invasive alien species under different value systems).
- *Chapter 2* will provide a detailed review of the various types of invasive alien species, including means and history of the spread of such species, and their impacts, broken down by region, on biodiversity, the world's ecosystems, ecosystem services and human well-being. Invasive alien species in all major taxonomic groups will be covered.
- Chapter 3 will consist of a global assessment of the direct and indirect drivers responsible for invasive alien species.
- Chapter 4 will be a global assessment of the environmental, economic and social impacts of invasive alien species.
- Chapter 5 will review the effectiveness of past and current programmes and tools for the global, national and local management of invasive alien species.
- Chapter 6 will explore future options for the management of invasive alien species.

[12] UNEP/CBD/SBSTTA/18/9/Add.1

[13] Expert meeting on alien species in wildlife trade, experiences in the use of biological control agents and development of decision support tools for management of invasive alien species Montreal, Canada, 28-30 October 2015

[14] IPBES/4/10

The assessment directly relates to CBD Aichi Target 9 as well as Targets 5, 11, 12 and 17. Furthermore, it will contribute to achieving the Sustainable Development Goal 15, target 15.8, of the 2030 Agenda for Sustainable Development which reads “By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species”.

Due to its current financial shortfall, IPBES needed to postpone the decision about the start of the IAS assessment to IPBES-5 in early 2017. However, IPBES-4 already discussed and endorsed its rapid implementation.

Use of biological control agents to manage IAS

Classical biological control is based on the idea on identifying host-specific natural enemies from the country of origin of the invasive alien species and to release them into the area where the IAS is harmful to naturally control it[1].

Classical biological control is recognized as an effective measure to address the problems of already established invasive alien species in the environment. Experiences with this approach to pest control exist for more than 100 years.

One of the most successful methods is to suppress the harmful species. It is assumed that the control agent would also effectively control the same species in similar ecosystems. Thus, biological control has great potential to also benefit a multitude of regions affected by harmful IAS.

Among the technical considerations for the use of biological control agents to manage IAS the CBD document lists are:

- Comprehensive risks analysis on the basis of the precautionary principle
- Classical biological control as part of and integrated ecosystem management package
- Cost-effectiveness and cost-benefit analysis
- Public consultation and collaboration (risk communicaiton)
- International collaboration
- Systematic monitoring and evaluation in post-release phase
- Capacity development

IMPRESSUM

The Network-Forum for Biodiversity Research Germany (NeFo) is a project funded by the German Federal Ministry of Education and Research (BMBF) and is mainly carried out by the Hemholtz Centre for Environmental Research – UFZ and the Museum für Naturkunde Berlin.

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For more information about the NeFo-Project and the NeFo-Team visit www.biodiversity.de.