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Environment Agency - ABU DHABI

Policy Brief
2018

Taking action on **Terrestrial and Freshwater Alien Species** in Abu Dhabi:

From Prevention to Control

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Policy briefs are published by the Environment Agency-Abu Dhabi (EAD) with the purpose of exchanging information and ideas about current and future public policies to pursue the Abu Dhabi Environment Policy Agenda and, in particular, to secure the preservation and enhancement of the natural heritage of the Emirate of Abu Dhabi, encourage a more efficient use of natural resources and provide a better quality of life for all. Policy briefs are available for download in pdf format from the Publications section of EAD's website at www.ead.ae.

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Cover Photo: Alien Invasive species in Abu Dhabi include the Ring-Necked Parakeet *(Psittacula krameri)*, the Asian Common Toad *(Duttaphrynus melanostictus)*, the Indian Palm Squirrel *(Funambulus palmarum)*, and the Brown Widow Spider *(Latrodecutus geometricus)*.

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What are alien invasive species?

Alien species are species that have been introduced and/ or have spread outside of their natural past or present distribution, whether intentionally or unintentionally[1].

An alien species is considered invasive if it becomes established in a non-native environment in a way that threatens native habitats, ecosystems or species.

Intentional or unintentional introduction of species to a new environment is leading to the homogenization of our natural environment, particularly in and around populated urban centers. The key drivers of this homogenization are:

1. Increasing human travel, by road, air or sea
2. Globalization of markets, expansion of trade and shipping industries
3. Transformation of natural habitats and increasing urbanization

IAS represent a growing risk to biodiversity locally and globally, exacerbating other threats to native species including climate change, pollution, habitat loss and human-induced disturbance. They can occur in all taxonomic groups, including animals, plants, fungi and microorganisms, affecting all types of ecosystems, particularly on not in islands or isolated environments. Nearly 40% of all animal extinctions since the 17th century have been attributed to IAS[2]. Studies and recent analyses have also demonstrated that IAS may cause significant environmental and economic damage, with the global cost of this damage having been estimated at US$1.4 trillion per year – close to 5% of the global GDP[3].

Figure 1: The Red Palm Weevil *(Rhynchophorus ferrugineus)* is considered one of the most damaging insect pests in the world. It has had significant impacts on the agriculture of date palms in the UAE, as their larvae excavate holes in the trunk of the trees, eventually killing them.

[1] Article 6 of the Convention on Biodiversity & CBD Decision VI/23

[2] CBD Global Biodiversity Outlook – 2, 2006

[3] Pimentel, D., McNair, S., Janecka, J., Wightman, J., Simmonds, C., O›Connell, C., Wong, E., Russel, L., Zern, J., Aquino, T. and Tsomondo, T. 2001. Economic and environmental threats of alien plant, animal, and microbe invasions. Agriculture, Ecosystems and Environment 84: 1-20

Current State:
Terrestrial and Freshwater Alien Species in Abu Dhabi:

The United Arab Emirates' hyper-arid climate helps limit the number and type of introduced species that are able to spread and become established, with most IAS having been successful in spreading mainly in transformed and degraded environments[4].

In the UAE, the Ministry of Climate Change and Environment (MoCCE) has identified 24 invasive plants, animals and other organisms that are considered invasive, following a survey that was carried out as part of the National Program for the Sustainability of Wildlife. The MoCCE is aiming to develop an integrated federal plan to combat invasive species, based on their risk level, with the goal of eradicating and controlling them, as well as recovering and restoring local ecosystems

In Abu Dhabi, the Environment Agency- Abu Dhabi (EAD) has been implementing a program for identifying, controlling and managing certain alien invasive species that are affecting the Emirate's native environment.

A terrestrial invasive species assessment conducted in 2015-2016 identified 149 alien species in the country as a whole, which comprised 50 invertebrates, 5 freshwater fish, 2 amphibian, 6 reptile species, 71 birds, 7 mammals and 8 plants[5] (Figure 2).

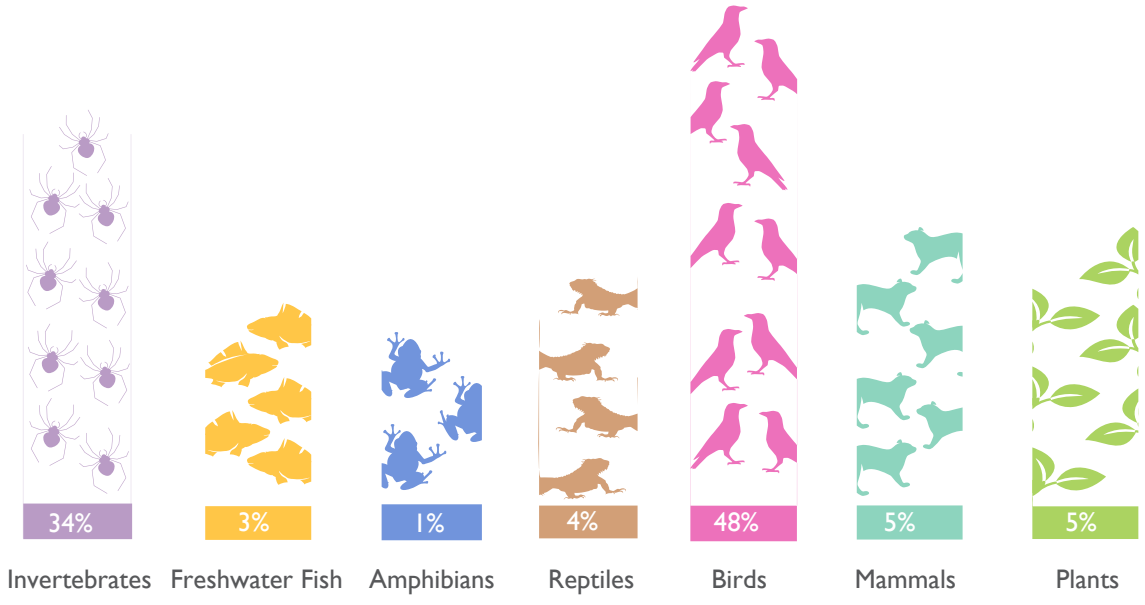

Figure 2: The percentage of alien species recorded in the UAE (EAD, 2017)

[4] Soorae, P. S., Javed S, Al Dhaheri S, Al Qassimi M, Kabshawi M, Saji, A, Khan S, Sakkir S, Al Zaabi R, Shah JN, Ali, A (2015), Alien species recorded in the United Arab Emirates: an initial list of terrestrial and freshwater species Journal of Threatened Taxa | www.threatenedtaxa.org, 7(12): 7910–7921.

[5] Soorae, P.S., Khan, S.B., Ali, A., Sakkir, S., Saji, A., Al Zaabi, R., Kabshawi, M., Alzahlawi, N. Al Mehairbi, M., Al Omari, K., Ahmed, S., Javed, S., Al Dhaheri, S. (2017) A Guide to the Alien Species of the United Arab Emirates (UAE): their pathways, means of introduction and control methods. Environment Agency - Abu Dhabi, UAE (ISBN: 978-9948-10-165-9).48 pp.

Once established, IAS may become extremely difficult to eradicate. They are known to be a leading cause of animal extinctions, representing the fifth most severe threat to amphibians globally, and the third most severe threat to native mammals and birds[6]. In some countries they have led to potential threats to food security, animal and human health, affecting the ability of local ecosystems to deliver goods and services that are provided in a natural balanced environment.

The need to take measures to prevent, control or contain exotic species is dependent on the damage that the introduction of a new species is expected to cause. EAD's approach has been to prioritize the control of a select number of widespread IAS that have had significant impacts on local businesses and industries by fouling up buildings and local infrastructure. Efforts have included humane trap-and-cull operations of invasive bird species to control their populations, with on average 146,000 individual birds of four key invasive bird species trapped annually since 2009[7]. These species have become widely adapted to urban environments due to landscaping and availability of water, their ability to utilize a wide range of habitat and food resources, and due to the absence of any natural predators.

Figure 3: One of the main invasive plant species in the UAE is the mesquite tree, locally known as Ghweif *(Prosopis juliflora)*. Introduced from Central America in the 1970s, it has spread extensively within the UAE, colonizing many wadi and desert habitats and producing toxic chemicals to defend itself from herbivores or competing plants. It is difficult to control, as once the vegetative crown is cut down buds are activated to produce new plants.

[6] IUCN, The Red List of Threatened Species (2012), & Seebens, H. et al. No saturation in the accumulation of alien species worldwide. Nat. Commun. 8, 14435 doi: 10.1038/ncomms14435 (2017)

[7] EAD, 2017

Policy Recommendations for the Prevention, Control and Management of Invasive Alien Species in Abu Dhabi

As eradication becomes very difficult and expensive if IAS becomes established, the emphasis must be on proactively preventing introduction and on early response and intervention once an introduction has been identified. Prevention and early intervention, through establishment of an IAS surveillance system and an Emirate specific IAS intervention taskforce, represents the most cost-effective strategy. Measures can be taken to control the population while it is still small and manageable, although it may require significant investment to ensure effective identification and monitoring of all potential introduction pathways.

Emphasizing prevention comes in line with international agreements made under the Convention on Biological Diversity and the Ramsar Convention on Wetlands, as well as the UAE's National Biodiversity Strategy and Action Plan and the Emirate's Abu Dhabi Plan (Table 1).

Actions to control and manage IAS must be implemented with smart and innovative control methods, in the case where their introduction is not prevented.

Figure 4: The White-Cheeked Bulbul *(Pycnonotus leucotis)* has become naturalised in the UAE and competes with other native birds for food resources and nesting space. Its spread was facilitated by the pet trade.

Table 1: Invasive Alien Species within the local, national, and international policy framework

Abu Dhabi Plan	Sustainable environment and optimal use of resources to preserve natural heritage Program: Conservation of Biodiversity
Abu Dhabi Environment Policy Agenda	Abu Dhabi will preserve its natural heritage by protecting biodiversity, restricting habitat loss, and pursuing sustainable fisheries and resource use. Abu Dhabi's policy is to ensure stable or increasing populations for key threatened species of flora and fauna.
UAE National Biodiversity Strategy and Action Plan (NBSAP)	TARGET 4.4: By 2021, all introduced invasive species and pathways are identified, and management plans to control the prioritised ones are developed and implemented.
Convention on Biological Diversity , ratified by UAE in 2000, Aichi Target 9	Convention on Biological Diversity Article 8. In-situ Conservation (h) Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species; Aichi Biodiversity Target 9 states: 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 (http://www.cbd.int/sp/targets/)
Ramsar Convention on Wetlands , ratified by UAE in 2008	Resolution VIII.18 Invasive species and wetlands encourages countries to assess IAS within their wetlands and Ramsar sites and work on the "development and implementation of national policies, strategies and management responses to threats from invasive alien species, and to ensure that prevention, eradication and control of such species are fully incorporated in national legislation and national wetland and biodiversity policies, strategies and action plans"
Agenda for Sustainable Development: Sustainable Development Goals (SDGs)	SDG #15 Life on land, has a target focusing specifically on IAS. "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"

Way Forward: key policy recommendations for addressing the threat of invasive alien species

They key policy recommendations are:

1. Awareness and mainstreaming at all stages: This is necessary for enabling both prevention and management of IAS. The public, government and private sectors must be informed as well as engaged in actions that help limit the spread of IAS. Education and awareness should focus on the effects of invasions and possible solutions, to build an increased understanding and support from society, which in turn will facilitate the implementation of regulations and policies aiming to prevent the introduction of spread of IAS.

2. Investing in Prevention and Early Intervention: Setting up an IAS surveillance and response system, with official controls, early detection and rapid eradication systems, would help identify and address the priority pathways through which IAS are unintentionally introduced and spread. This may include developing new or updating existing regulations on the trade or movement of certain species, as well as creating an Emirate specific taskforce in charge of early intervention if and when a new IAS is identified.

3. Prioritizing control and management: Smart management of IAS can be achieved through prioritizing containment and control programs. A cost benefit analysis would enable informed decision making and efficient resource allocation for eradication and control programs utilizing international guidance for prioritization such as the IUCN's Environmental Impact Classification of Alien Taxa (EICAT). These control programs must strive to be ethical, environmentally sound and minimally invasive to the natural environment (employing proven physical or natural controls rather than chemical).

4. Restoring habitats: Along with eradication, the restoration of habitats can help control and prevent future invasions. Transformed habitats can be rehabilitated to a natural or semi-natural state through replanting of native flora and reintroduction of fauna, with the aim to fully or partially restore a damaged area. Once an area is restored, prevention is also required to keep an invasive species from returning.

Figure 5: The Tropical Leatherleaf Slug *(Laevicaulis alte)* is native of East and West Africa. It has been introduced to the UAE through imported plants, soil and fertilisers used in landscaping and agriculture. It feeds on native plants and may transmit pathogens to humans, plants and livestock.

Key needs are:

- Information campaigns and tools that help the public differentiate between native species and introduced species, that highlight the introduction pathways and impacts of IAS in Abu Dhabi, and discourage the public from feeding or supporting IAS, such as the recently published EAD Guide to Alien Species
- Public and municipal guidelines on landscaping with native species and humane trapping programs for invasive fauna
- Relevant guidelines and consistent engagement for key sectors (agriculture, transport, shipping), including examples of best practices, effective solutions, and innovative technical options to address IAS
- Local, federal and regional cooperation for border controls and capacity building of customs authorities for effective customs checks, shipment inspections and implementation of quarantine regulations
- Development of an Abu Dhabi Emirate IAS early warning and rapid response system, implemented through a cross-sectoral taskforce
- Focused research on introduction pathways of the highest impact IAS, as well as the assessment of the risk of possible future invasions under likely climate change scenarios for the region

Figure 6: The Common Myna *(Acridotheres tristis)* is an extremely adaptable invasive bird that originates from Southeast Asia. It is considered to be one of the world's most invasive species impacting biodiversity and agriculture. It competes with native bird species for food resources and nesting sites.

Figure 7: The Brown Widow Spider *(Latrodecutus geometricus)* originates from Southern Africa but has spread worldwide. It was likely introduced to the UAE through shipping containers. Its venom is neurotoxic, with bites usually resulting in localised pain and swelling.

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