



UNITED ARAB EMIRATES
MINISTRY OF CLIMATE CHANGE
& ENVIRONMENT

POLICY BRIEF

UAE National Red List of Vascular Plants

2021

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This UAE National Red List of Vascular Plants, undertaken for the Ministry of Climate Change and Environment (MoCCaE) of the UAE, provides the most up-to-date information on the conservation status and distribution of terrestrial, marine and freshwater plants in the UAE. It serves as an information cornerstone for policy and priority-setting, for example, through refinement and expansion of the protected areas network, the protection of marine and terrestrial habitats and in meeting the UAEs commitments to international environmental agreements.

Key Messages

- **Nearly 1,000 species have been recorded for the vascular plant flora of the UAE. Here, we consider 598 species to be valid taxonomically and native to the UAE.**
- **Fewer than 9% of native vascular plant species (38 species), for which sufficient data are available in UAE terrestrial and marine territorial areas, are threatened with extinction** (species assessed as Critically Endangered, Endangered or Vulnerable).
- **However, the level of threatened species would rise to 34% if all Data Deficient species are found to be threatened**, highlighting the urgent need to implement further research and monitoring to understand the distribution and population trend of the native flora of the UAE, and the threats that it faces.
- **The Red List Index (RLI) score for the 2019 assessment of the vascular plants of the UAE is 0.94 and that for 1996 was 0.96, indicating that there was an increase in regional extinction risk of the plants of the UAE.**
- **The RLI score indicates that the plants of the UAE are overall much less threatened than the mammals of the UAE, which had a score of 0.63 and slightly less threatened than the herpetofauna, which had a score of 0.92 in the 2019 assessment.**
- **The global Sampled Red List Index (SRLI) based on the assessment of more than 4,697 randomly selected plant species globally found the SRLI for plants to be 0.86, showing that the UAE plants are less threatened than the SRLI species.**

Overview

There is an urgent need to understand the status of biodiversity within the United Arab Emirates, to inform conservation policy and decision-making within the UAE. Biodiversity data assists with national level reporting for multilateral environmental agreements (MEAs).

Until now, there has been a lack of information on the status of vascular plants in the UAE. Where that information does exist, it is often scattered, sometimes hard to access, and there has been no published comprehensive checklist since the works of Jongbloed et al. (2003) and Karim and Fawzi (2007). This UAE Red List for vascular plants was undertaken to bring together in one place the combined knowledge of experts from the UAE and internationally to assess the risk of extinction of the flora of the UAE (the UAE Red List), and to produce a baseline to understand the long-term trends in the extinction risk of plants (the Red List Index data point) that occur in the marine and terrestrial territory of the country.

At the request of MoCCaE, IUCN compiled the available data on each species of native vascular plant species recorded from the territory of the UAE and produced draft maps of the distribution of these species in the country. Following preliminary review by experts in the UAE, an assessment workshop was held in Dubai between the 15th–19th September 2019. The draft assessments then went through a final stage of peer review prior to finalisation by IUCN.

Background

The United Arab Emirates contains a diversity of desert, mountain and marine habitats, with 598 species of native plants recorded to date. No plant species are endemic to the UAE, although some are restricted to the Hajar Mountain range (shared with Oman) and the Arabian Peninsula. At least one-third of the species recorded for the UAE considered to be introduced or taxonomically invalid (e.g., synonyms, or junior names, of other taxa). However, given the long history of trade, introduction and cultivation of plants in the UAE, there is a degree of uncertainty over the origin of some archeophyte (historically introduced) species.

Many of these native plant species provide indirect benefits to people, such as food, fibre, medicines, through tourism and sustaining natural ecosystems, and form an important component of the rich natural heritage of the UAE. However, terrestrial and marine habitats, especially coastal areas, are being impacted by a range of threats – especially urban, industrial and tourism development. Fortunately, the UAE has a well-developed network of protected areas and these protect key sites for some species. But many species are not known to occur within protected areas, with significant gaps in the protected area network, especially in the species-rich mountain areas.

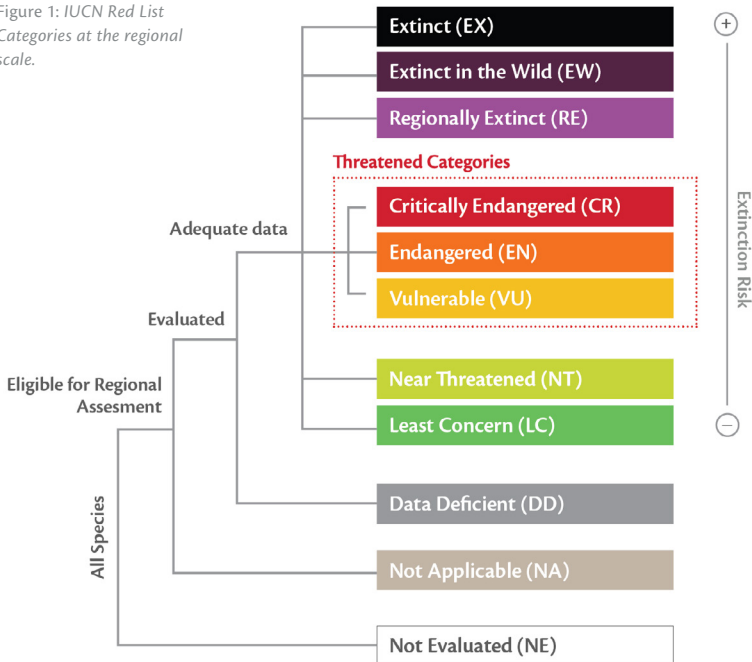
This UAE National Red List of Vascular Plants, undertaken for the Ministry of Climate Change and Environment (MoCCaE) of the UAE, provides the most up-to-date information on the conservation status and distribution of native terrestrial, marine and freshwater plants in the UAE. Information on the status and distribution of plants in the UAE can be applied to:

- Improving their representation within protected area networks through the expansion of existing protected areas and the designation of new ones.
- Guiding the management of existing protected areas for plants.
- Informing Environmental Impact Assessments.

Methodology

To support the UAE National Red List process, IUCN produced the list of species for inclusion in the UAE Red List and compiled draft distribution maps for each species, as well as data on their distribution, population size and trend, habitat needs and ecology in the UAE, and the threats that the species and their habitats face. This information underwent initial review by experts in the UAE, followed by a National Red List Assessment workshop (Dubai, September 2019) where experts from across the UAE came together to assign each species to one of nine IUCN Regional Red List categories (Figures 1 and 2). A retrospective assessment for 1996 was produced and a Red List Index developed covering the period 1996–2019.

Figure 1: IUCN Red List Categories at the regional scale.



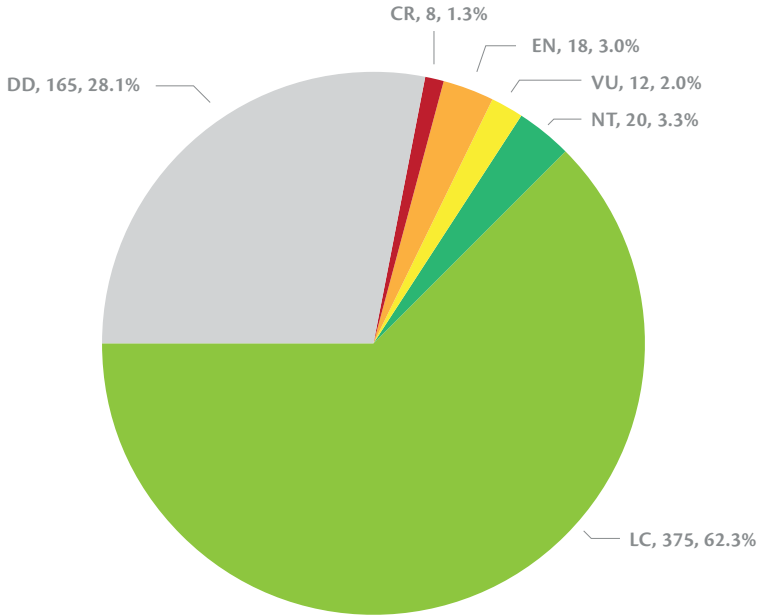


Figure 2: Extinction risk of native vascular plants assessed for the UAE National Red List: percentage of species within each IUCN Red List Category



Outcomes

Threatened species – priorities for conservation action

All terrestrial, marine and freshwater plants considered native to the UAE were assessed for their risk of extinction using The IUCN Red List of Threatened Species™ Regional Categories and Criteria (Fig. 1). Their distributions within the UAE was also mapped. This represents the **first comprehensive assessment of native vascular plants for the UAE** (Fig. 2).

Plants – overview

A total of 598 species of plants were considered native to the UAE. This figure is very likely to change with the availability of new data, and to some degree is based on opinion, especially where introduction is thought to have occurred in historical times.

The best estimate of extinction risk is that 8.8% of all native plant species are threatened with extinction – see the full report for more details on this statistic. Species richness is highest in the Hajar Mountains and Ru'us al-Jibal, which is also where the greatest concentration of threatened species and Data Deficient species occur. However, the proportion of threatened species may range between **6.4%** (if no species currently assessed as Data Deficient were found to be threatened) and **34%** (if all species currently assessed as Data Deficient were found to be threatened).

Information remains very limited for many vascular plant species in the UAE, **with more than one-quarter (165 species) assessed as Data Deficient (DD)**, meaning there was insufficient knowledge to assess their extinction risk. Given the range of threats observed across the country, and that many of these DD species have small ranges restricted to the mountains, it is reasonable to expect that some of these DD species are also threatened. **There is therefore an urgent need for new field research** to better understand these species distributions, taxonomy and population trends. Without this knowledge it will be difficult to ensure the future survival of these species.

Threats to plants in the UAE

Human activities were identified as major threats to plants in the UAE and include: i) **Agriculture** (primarily grazing and habitat degradation from livestock farming & ranching) is considered to be the greatest threat to plants in the UAE; ii) **Development, both residential and commercial**; iii) **Introduced species** (e.g., feral donkeys and goats); and iv) **Climate change and severe weather** is the fourth most cited threat to plants, with temperature extremes, storms & flooding, habitat shifting & alteration, and droughts all cited as threats to species.



Management and conservation recommendations

Just over half (337 species) of all plant species are recorded from protected areas (PAs), perhaps the result of the relatively high level of survey work within PAs. However, fewer than half (16 out of 38) threatened species are confirmed from protected areas, and opportunities for protecting key areas for other threatened species need urgent attention. This is especially the case for the Ru'us al-Jibal mountains in the northeast of the country, which currently has no federally-recognised protected areas, and where a number of range-restricted species occur.

Coastal species

Plants growing in coastal areas within the UAE are particularly at risk due to ongoing coastal development. This is due to the rapid influx of people in line with the expanding economy and the growing tourism and hospitality industry in the UAE. As a result, artificial islands have been created offshore and coastal towns (along both the east coast and the Arabian Gulf coast) are being developed to accommodate the increased population. This has caused coastline-specialised species to decline and, in some places, become locally extinct.

Pavonia arabica

- Preservation of the single known locality where this species occurs in the UAE is recommended. This locality has recently become more accessible to tourist activities and human disturbance, which may destroy the last known occurrence of this species within the UAE.

Terrestrial and freshwater species

The mountain areas of the UAE, the Ru'us al-Jibal, the Hajar Mountains, and Jebel Hafeet, hold the highest number of species overall – as well as the highest numbers of threatened species. The primary threat in these areas is currently grazing/browsing by livestock and feral animals, however the impact of development (road building and development) is rapidly increasing in these areas:

- *Gymnarrhena micrantha*, probably restricted to Jebel Hafeet and last recorded in 1988, is considered Critically Endangered (Regionally Possibly Extinct, CR(PE)).
- Wild populations of Olive (*Olea europaea*) are restricted to the Olive Highlands in the southern parts of the Hajar Mountains in the UAE. The Olive is assessed as Vulnerable as a result of impacts and potential threats from development and grazing. The introduction of cultivated olive trees or European origin presents the risk of hybridisation by pollinators and wind pollination. Conservation action, including the identification of protected areas, is needed for this and other threatened range-restricted species in the mountains.

Marine species

- The Grey Mangrove (*Avicennia marina*) is currently subject to conservation actions in terms of planting trees. There is also an ongoing government programme focussed on this species, which has been in place since 1988. Although stands of this species are encompassed by protected areas in Umm Tais and Al Dhakira, it is suggested that more could be done to protect this species (Moore et al. 2013).
- The Seagrass (*Halophila ovalis*) is subject to ongoing monitoring in Abu Dhabi Emirate (EAD 2017); monitoring and protection of the three UAE seagrass species should continue in order to benefit both the plant species themselves, in addition to threatened fauna such as dugongs and marine turtles.

Data Deficient species

More than one-quarter (169 species) of all native plant species within the UAE are considered Data Deficient, highlighting important knowledge gaps for the flora of this country. Many of these species also appear to occur in rocky and mountainous habitats: including Jebel Hafeet, the Hajar Mountains and the Ru'us al-Jibal. As a result, further research into these habitats, and the plants that occur here, would be highly beneficial to better understand the native flora of the UAE in addition to the measures needed to protect it.

Population trends

For the majority of native plants in the UAE, the population trend is unknown (77% of all species assessed). In addition to the large proportion of Data Deficient plant species in the UAE, this also highlights the level of research needed to better clarify the extinction risk to the UAE's native flora. None of the 598 plant species were shown to have an increasing population trend.

Red List Index (RLI)

A total of 25 of the plant species that were assessed as part of this national Red List were considered to have undergone a genuine change in status between 1996 and 2019. Only one of these was thought to have genuinely improved its status (*Avicennia marina*), all others were thought to have deteriorated. As a result, the RLI declined between 1996 and 2019. In 2019, the RLI was 0.94, when in 1996 it was 0.96 indicating that there was an increase in extinction risk of the native flora of the UAE.



However the RLI score indicates that the plants of the UAE are overall much less threatened than the mammals of the UAE, which had a score of 0.63 in a 2018 assessment (Mallon et al. 2019), and slightly less threatened than the herpetofauna, which had a score of 0.92 in the 2018 assessment (Els et al. 2019). However, the threatened species require continued conservation action to avoid a lower RLI score when the assessments are next repeated. Further research on the Data Deficient species is also required so that their risk of extinction can be better estimated. At present 169 species are considered DD, with many of these range-restricted species found in the mountains of the UAE.

Only 71 UAE plant species have published assessments at the global scale, hence a comparison is not possible. However, Brummitt et al. (2015) produced a Sampled Red List Index (SRLI) based on the assessment of more than 4,697 randomly selected plant species globally, and found the baseline value of the SRLI for plants to be 0.86, showing that the UAE plants are less threatened than the SRLI species are at a global scale.

The information compiled in the UAE National Red List of Vascular Plants, combined with political will and subsequent action, can help to ensure the long-term survival of these species in the UAE.

Key Recommendations

This report finds that:

- The UAE National Red List of Vascular Plants should be repeated on a regular basis, ideally every ten years.
- The threatened species require continued conservation action to avoid a lower RLI score when the assessments are next repeated and further research on the Data Deficient species is required so that their risk of extinction can be better estimated.
- Regularly reassessing species can provide an accurate assessment of long-term trends through the development of a Red List Index for the UAE. Such national-level information can help to ensure the enduring survival of these species in the UAE.
- The UAE National Red List of Vascular Plants should be repeated so that a Red List Index can be produced and contribute to CBD and SDG reporting. It is important to maintain the high index score through targeted conservation actions and research into Data Deficient species.
- This information can and should be used for national reporting for the UAE's commitments to the MEAs, including CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora), Ramsar (Convention on Wetlands of International Importance), CMS (Convention on the Conservation of Migratory Species of Wild Animals), and notably, the Convention on Biological Diversity (CBD), where several opportunities exist:
 - o Progress of national implementation of Aichi Biodiversity Target 12 (Species extinction and recovery).
 - o In the 6th National Report for the UAE.
 - o Reporting on relevant targets of the UAE National Biodiversity Strategy and Action Plan (2014).
 - TARGET 11. By 2021, at least 50% of degraded habitats are undergoing restoration to help mitigate against the impacts of climate change and combating desertification.

- TARGET 12. By 2021, at least 90% of restoration plans of degraded ecosystems that provide essential services have been implemented.
- TARGET 13. By 2021, important genetic resources are conserved and protected in the UAE.
- o Targets for the Sustainable Development Goals, notably: Target 14.1 to prevent and significantly reduce marine pollution of all kinds;
- o Target 14.2 to sustainably managing and protecting marine and coastal ecosystems;
- o Target 14.4 to regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices;
- o Target 14.5 to conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information;
- o Target 15.1 for the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, and;
- o Target 15.5 for urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.

Capacity building

Capacity must be increased to ensure that government bodies (national to local) are able to capitalise upon this new information on flora biodiversity through training in the application of biodiversity data sets to species and site-based management and enforcement activities.

Environmental safeguards

The data made available through the UAE National Red List of Vascular Plants should inform the performance standards and environmental safeguard policies of the private sector in the UAE to help avoid or minimise impacts of their operations in and around areas containing threatened species. Civil society can play a key role in research, monitoring, conservation planning and action, and in educating developers and local communities

Harmonisation of environmental policies

Environmental policy needs to be better integrated and coordinated across sectorial policies such as the extractive industries, urban planning, energy and agriculture, to avoid contradictory regulatory objectives and inconsistent financial initiatives. Without such coordination, plants species and ecosystems will continue to decline.

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Read the full report

Allen et al. (2021) UAE National Red List of Vascular Plants
(<https://www.moccae.gov.ae/en/home.aspx>)

Visit the UAE National Red List portal
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