



UNITED ARAB EMIRATES
MINISTRY OF CLIMATE CHANGE
& ENVIRONMENT

UAE National Red List Synthesis Report

2021

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This report is the outcome of a three-year UAE National Red List project undertaken by the Red List Unit (Cambridge, UK) of the IUCN (International Union for Conservation of Nature) for the UAE Ministry of Climate Change and the Environment (MOCCA). It brings together data compiled through three National Red List Assessment Workshops held in the UAE, at which draft Red List assessments for the following groups of species were finalised: marine and terrestrial mammals, marine and terrestrial herpetofauna (reptiles and amphibians), birds, vascular plants, corals, cartilaginous fishes, and selected bony fishes.

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State

The United Arab Emirates (UAE) is a federation of seven Emirates (Abu Dhabi, Ajman, Dubai, Fujairah, Ras Al Khaimah, Sharjah, Umm Al Quwain) in the southeast of the Arabian Peninsula and on the southern side of the Arabian Gulf. The country shares land borders with Oman, Saudi Arabia, and Qatar, and has coastlines bordering the Arabian Gulf and the Sea of Oman.

Commercial, industrial, and residential development has expanded greatly in the UAE over the past 30 years, with consequential changes in land use and land cover (Hussein et al. 2020), and together with invasive species, legal and illegal harvest and trade, and agricultural change and expansion, they represent the current primary threats to biodiversity within the UAE and its territorial waters.

Terrestrial habitats

Terrestrial habitats in the UAE fall under two broad types – desert and mountain (Figure 1). The Al Hajar Mountains run north–south along the east, extending south into Oman, with the highest areas rising to almost 2,000 m above sea level, close to the border between the countries. The part of the mountain chain within the UAE is termed the Western Hajar (Al–Hajar al–Gharbi; Feulner 2011). It is composed of steep rocky peaks, slopes, and deeply incised wadis. Towards the north of this range (and extending into Oman) is the Ru’us al–Jibal mountain range that is arid and geologically distinct, with basic igneous rocks, known as ophiolites, and a unique soil composition (ultrabasic bedrock and unusual soil chemistry), which allows unusual, characteristic flora to grow here (Feulner 2011). Jebel Hafeet, an outlier of the Al Hajar mountain range, is found near the city of Al Ain, extending across the border with Oman, where the majority of the mountain is located. Jebel Hafeet presents a unique, elevated rocky habitat within an area that is otherwise characterised by lowland plains (EAD 2018). Further lower, isolated rock outcrops, such as Qarn Nazwā, are found in the gravel plains to the west of the Al Hajar Mountains. Mountain wadis occur throughout the northern section of the UAE; they consist of steep rocky canyons that were formed by historical river erosion but are now predominantly dry, except during sporadic periods of rain. Intensive rainfall can result in significant erosion and deposition of silt.

The rest of the country consists of low-lying desert habitats, including extensive sand sheets and dunes, alluvial and interdunal gravel plains, and coastal and inland sabkhas (salt flats) (Feulner 2005). In the southeast, an extensive area of sand dunes forms the northern edge of the Rub al Khali (Empty Quarter). There are large oasis complexes at Liwa in the south and at Buraimi–Al Ain on the UAE–Oman border. Anthropogenic habitats include, for example, irrigated farms, plantations, road network, dams, quarries, solar installations, and urban areas.

Marine habitats

The Arabian Gulf coastline extends for about 650 km, and is mainly low-lying with some rocky headlands and numerous small offshore islands. There is a range of sandy, sabkha, and beach rock habitats, with areas of mangrove forest dominated by the grey mangrove (*Avicennia marina*), with the introduced true mangrove (*Rhizophora*

mucronata) present in some areas. There are extensive seagrass beds in the subtidal zone and some coral reefs offshore.

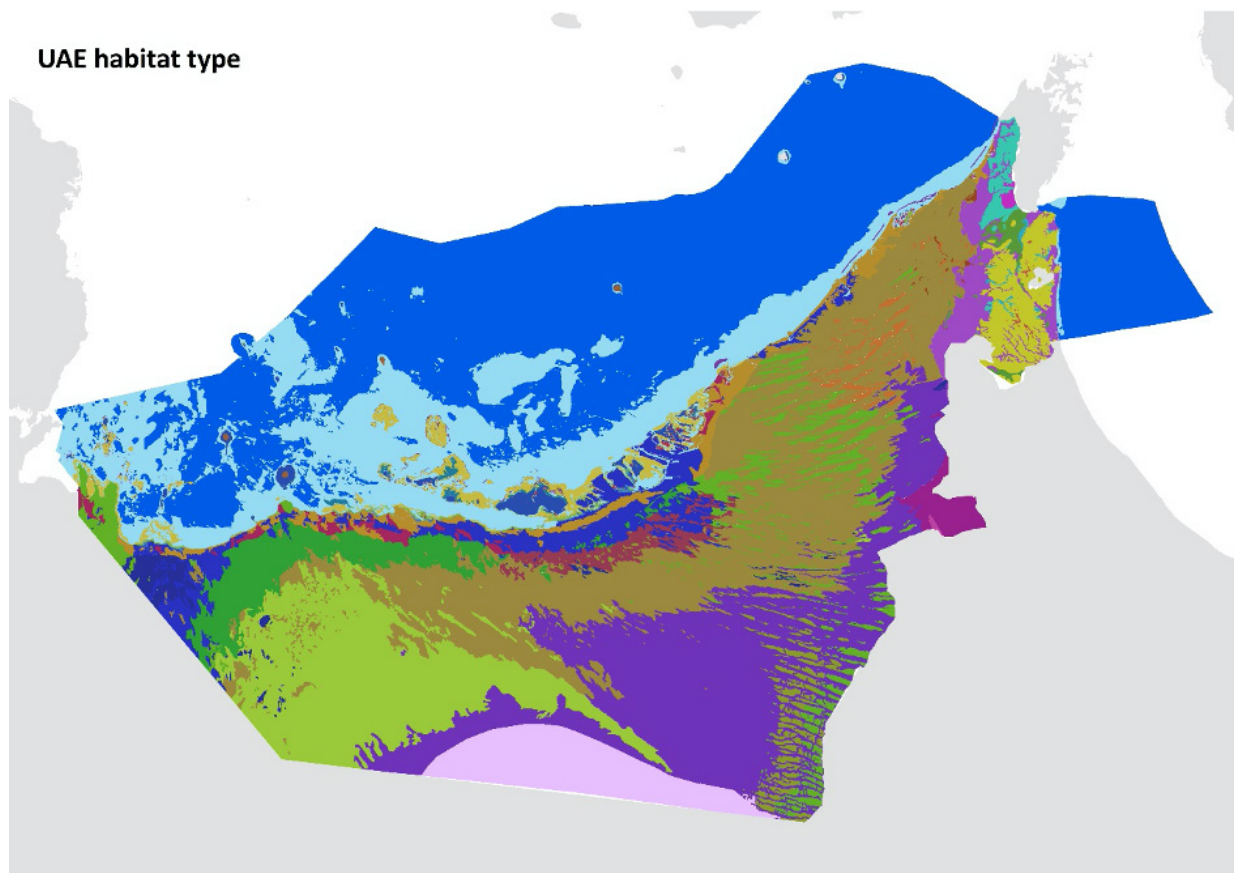
Substantial differences exist between the UAE’s marine waters in the Arabian Gulf and the Sea of Oman. The UAE waters in the Arabian Gulf make up 92% of the entire exclusive economic zone (EEZ) area of the country (Flanders Marine Institute 2014). The Gulf overall is shallow with a mean depth <30 m (Paparella et al. 2019), however, within the UAE EEZ, the coastal waters of the Gulf have a mean depth of 20 m and are metahaline at 37–45 ppt, which, however, can reach as high as 50 ppt (Wang et al. 2013), and exceed 70 ppt in coastal lagoons and 100 ppt in the intertidal zone (Burt 2014). Sea surface temperatures (SST) in the Gulf regularly exceed 33°C in the summer months (Paparella et al. 2019), and can reach 50°C (Burt 2014). The eastern coastline of the UAE, on the Sea of Oman, is about 70 km in length and is more rugged, with the deep waters of the Indian Ocean lying close to the shore.



Jebel Hafet is an iconic outlier of the Al Hajar mountain range, and home to numerous threatened and range-restricted species. Concerted conservation action is required to address threats to the mountain. © Oscar Campbell.

Coastal habitats, including those around the Arabian Gulf islands, have been heavily anthropised (Burt 2014) through the development of marinas and other tourism infrastructure, oil and gas infrastructure, harbours, land reclamation from the sea, the creation of artificial islands, the planting of mangrove forests, etc.

The southern part of the Arabian Gulf in the UAE EEZ hosts numerous inshore and offshore islands. Nearshore areas are swampy with a rich diversity of seagrasses; while most offshore waters are too muddy to sustain corals, there are limited patch reefs and island-associated fringe reefs, historically *Acropora*-dominated (Shinn 1976).



UAE habitat map legend

Habitat		
Algal Mats	Interdunal plains with sabkha	Rocky Platforms
Alluvial or Interdunal plains with dwarf shrub cover	Island	Saltmarsh
Brackish marsh	Island - salt dome	Sand sheets and dunes mainly with perennial herbs or graminoids
Carbonate mountain habitat above 800m	Jebel Hafeet	Sand sheets and dunes with <i>Haloxylon persicum</i>
Carbonate mountain habitat below 800m	Liwa crescent dune and sabkha mosaic	Sand sheets and dunes with distinct dwarf shrub cover
Coastal plains and sand sheets	Mangroves	Sand sheets and dunes with distinct shrub cover or dwarf shrub cover
Coastal sabkha	Mega-dunes	Sand sheets and dunes with distinct tree cover
Coastal sand sheets and low dunes	Northern alluvial or interdunal plains	Sand sheets and dunes with dwarf shrub cover and barqas
Coral Reef	Ophiolite mountain Habitat below 800m	Seagrass / macro-algal beds
Deeper than 15m	Ophiolite mountain habitat above 800m	Tidal flats (no algal mats)
Freshwater wadis	Other Shallow Water	Wadis and floodplains
	Other geology	Wadis and floodplains with distinct tree cover

Figure 1. Terrestrial and marine habitat map of the UAE. Source: S. Holness pers. comm. 2020, AGEDI 2013a.

Anthropogenic habitats

Whilst some essential natural ecosystems are imperilled in the UAE, there is anecdotal evidence that populations of some species have been sustained by the creation of anthropogenic habitats, especially moist and wetland habitats, such as irrigated landscapes (urban and agricultural area), water-harvesting infrastructure and treatment works, and water features within urban areas. *Tephrosia nubica* is thought to have benefitted from dams and rainwater-harvesting infrastructures in the Al Hajar Mountains, whilst a number of bird species might have undergone a greater decline in status since 1996 if not sustained by the creation of alternative habitats.

Ecosystem change

The Abu Dhabi Global Environmental Data Initiative (AGEDI) (2013a,b) undertook a threat status assessment of UAE ecosystems, assigning 39 ecosystems to three broad states (Natural/Good, Degraded/Fair, and Transformed/Poor), and finding nearly 57% (by area) of the UAE marine and terrestrial ecosystems to fall into the first two states (Figure 2).

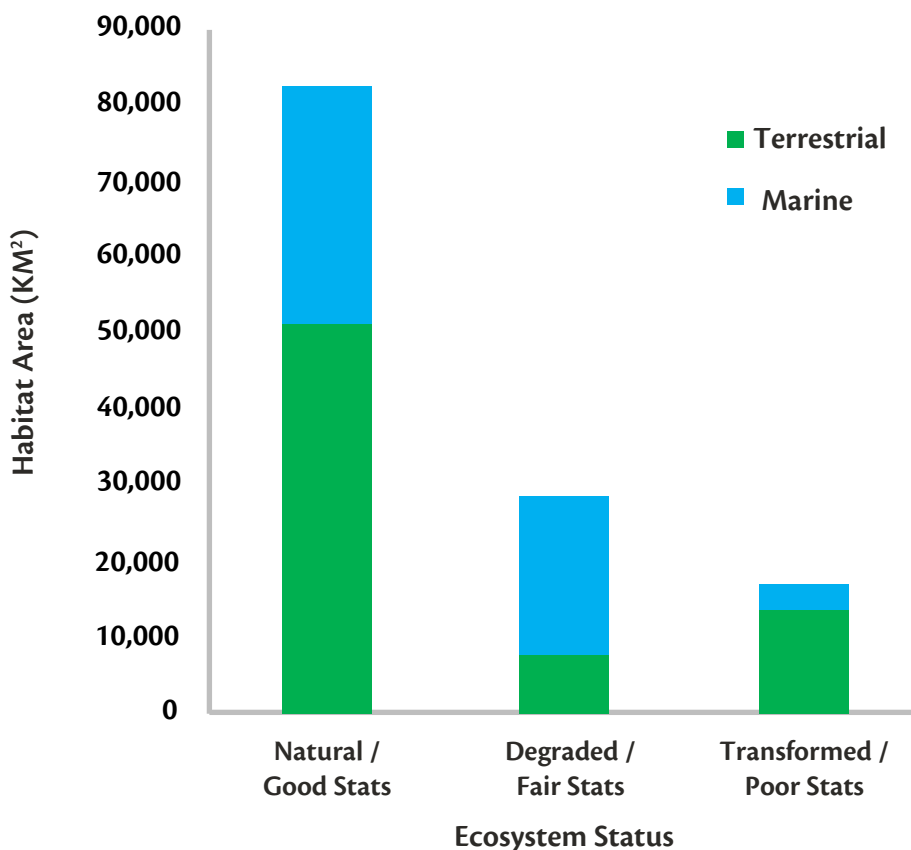


Figure 2. The state of UAE marine and terrestrial habitats. Source: S. Holness pers. comm. 2020, AGEDI 2013b.

Based primarily on the extent of original-condition habitat remaining (see Figure 16 below), habitats were assigned to one of four threat classes (AGEDI 2013a,b). One terrestrial (mountain wadis and floodplains in the Al

Ain area) and two marine habitats (coral reefs and other shallow water habitats in the Sea of Oman) were found to be Critically Endangered (Table 1).

Threat status of UAE ecosystems (AGEDI 2013b)		
Critically Endangered	Terrestrial Marine	1
		2
Endangered	Terrestrial Marine	5
		4
Vulnerable	Terrestrial Marine	6
		2
Least Threatened	Terrestrial Marine	13
		6

Table 1. Threat status of UAE ecosystems

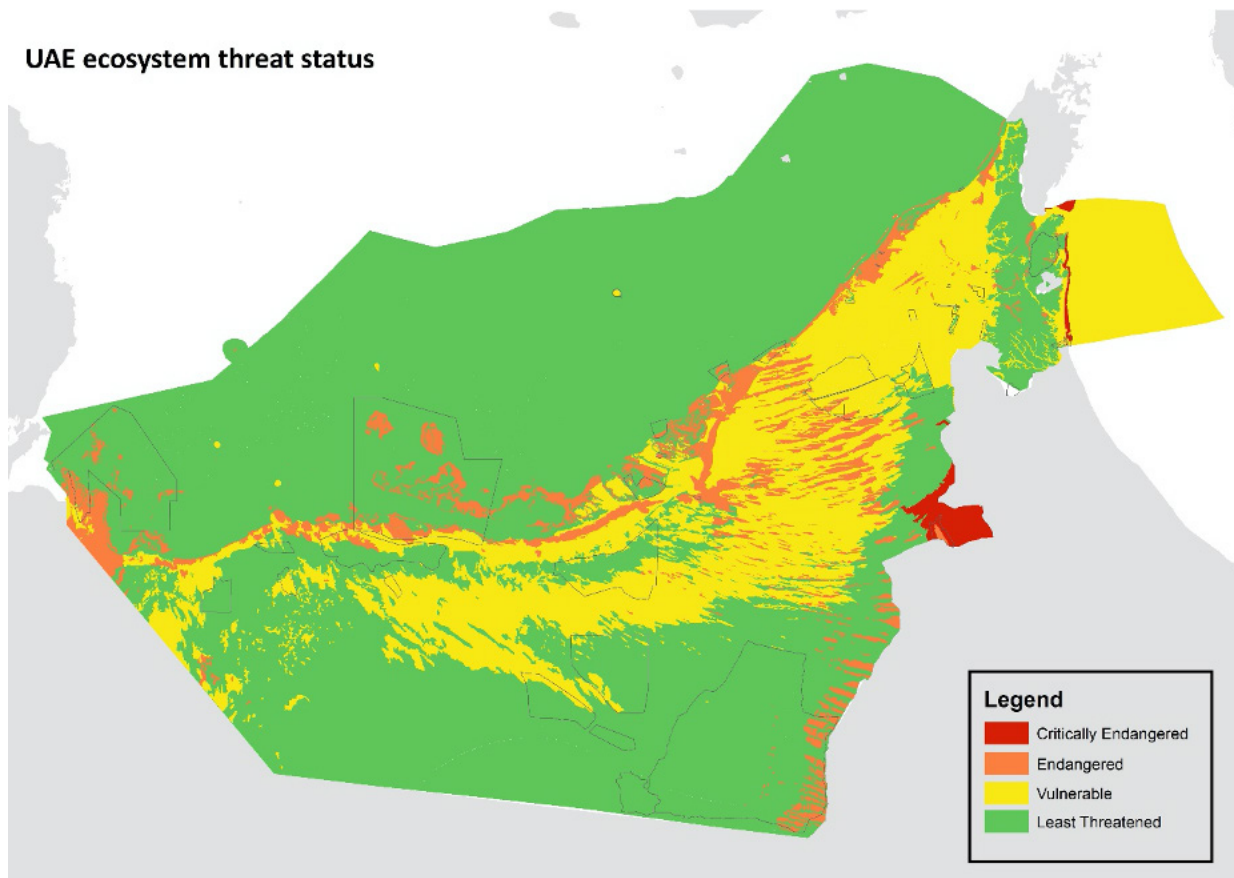


Figure 3. UAE ecosystem threat assessment, with 39 habitats assigned to one of four threat classes based primarily on the proportion of original habitat remaining. Source: S. Holness pers. comm. 2020, AGEDI 2013b.

Red List status

The extinction risk of all included species was determined through the application of the [IUCN Red List Categories and Criteria](#) (IUCN 2012a), which are designed to determine the relative risk of extinction of a taxon, with the main purpose of cataloguing and highlighting those taxa that are facing an elevated risk of extinction. The IUCN Red List Categories are based on a set of quantitative criteria that are linked to population trends, size and structure, and

the geographic extent and distribution of species, as well as the threats they or their habitats face. When conducting regional or national assessments, as in the UAE National Red Lists, the [IUCN Red List Regional Guidelines](#) (IUCN 2012b) are then applied. At the regional or national scale, there are eleven 11 Red List Categories (see Figure 4), with those species classified as Vulnerable (VU), Endangered (EN), or Critically Endangered (CR) collectively considered as “threatened”.

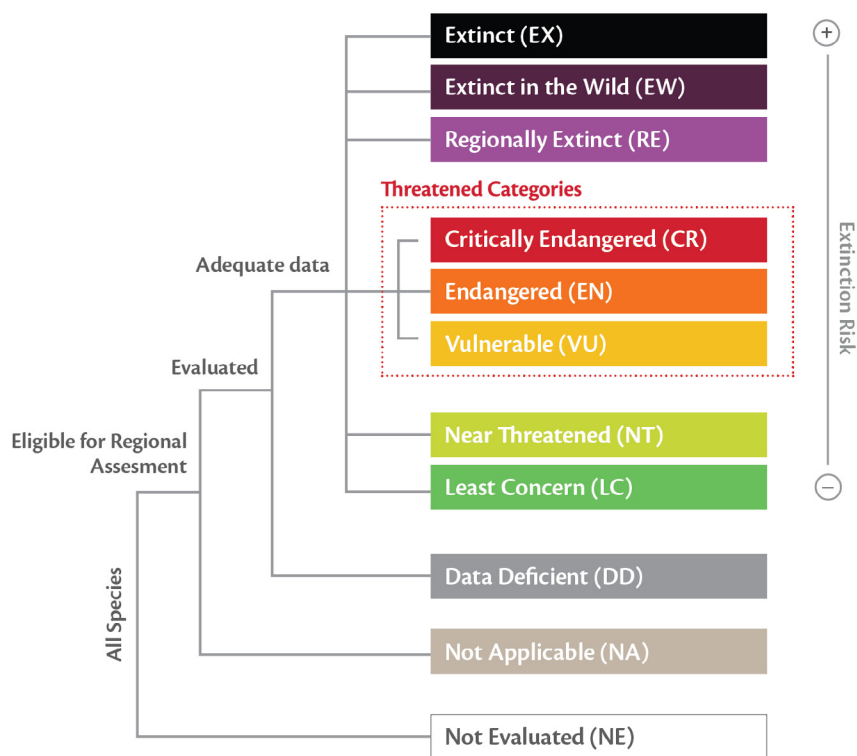


Figure 4. The structure of the IUCN Red List Categories used at the regional and national level. The technical reports and full datasets for each of the assessed groups, including maps, are available on the MOCCA website: <https://gis.moccae.gov.ae>.

The UAE National Red List Project assessed the Red List status of 1,167 species (433 marine and 734 terrestrial) at the national scale, of which 819 species (vascular plants, mammals, and birds) also underwent a back-casted retrospective assessment for 1996. Back-casted assessments assume that the current Red List category for a species will also apply to the earlier period, unless there is information that a genuine change in status (driven, for example, by changes in land use and land cover) occurred. These three groups were selected for back-casting since it

was considered that sufficient information existed. The number of species in each Red List category is summarised in Table 2 and the proportion in each group in Figure 5, whilst the proportion of species in each individual National Red List is shown in Figure 6. Species were assigned to marine or terrestrial (including freshwater) groups based on the primary system that they occur in, although note for birds that any species that regularly occurs in the marine system (pelagic or coastal) within the UAE at whatever the time of year is coded as, ‘marine’.

Red List Category	Number of species in each Red List category		
	All species	Terrestrial species	Marine species
Extinct (EX)	–	–	–
Extinct in the Wild (EW)	–	–	–
Regionally Extinct (RE)	3	3	–
Critically Endangered (CR)	54*	34	20
Endangered (EN)	93	36	57
Vulnerable (VU)	95	28	67
Near Threatened (NT)	70	28	42
Least Concern (LC)	556	430	126
Data Deficient (DD)	296	175	121
Total number of species assessed	1,167	734	433

*Includes 5 CR(PE) species and one CR(PEW) species

Table 2. The number of species in each category included in the UAE National Red Lists.

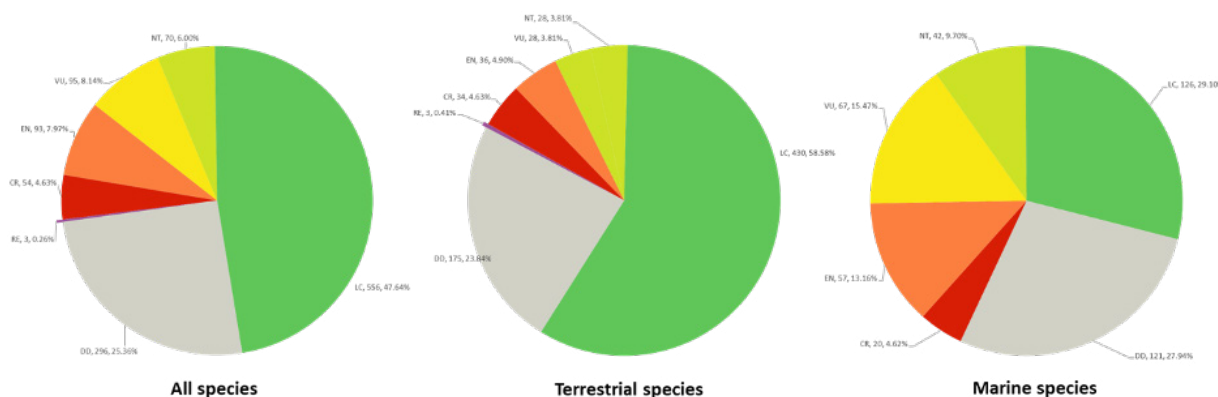


Figure 5. The IUCN Red List status of all species, terrestrial species, and marine species in the UAE, showing the number and proportion of species in each Red List category.

The proportion of threatened (CR, EN, VU) species is uncertain, given the relatively high number of Data Deficient (DD) species, and could lie between 20.8% (if no DD species are threatened) and 46.2% (if all DD species are threatened) (Table 3; IUCN 2016). The mid–point figure provides the best estimation of the proportion of threatened species (IUCN 2016), and for the species

assessed for the UAE in these National Red Lists, 27.9% is the proportion of species that are considered to be threatened. This range in the level of threat emphasises the significant need for further research in the country in order to gather adequate information on the DD species so that their risk of extinction can be properly assessed.

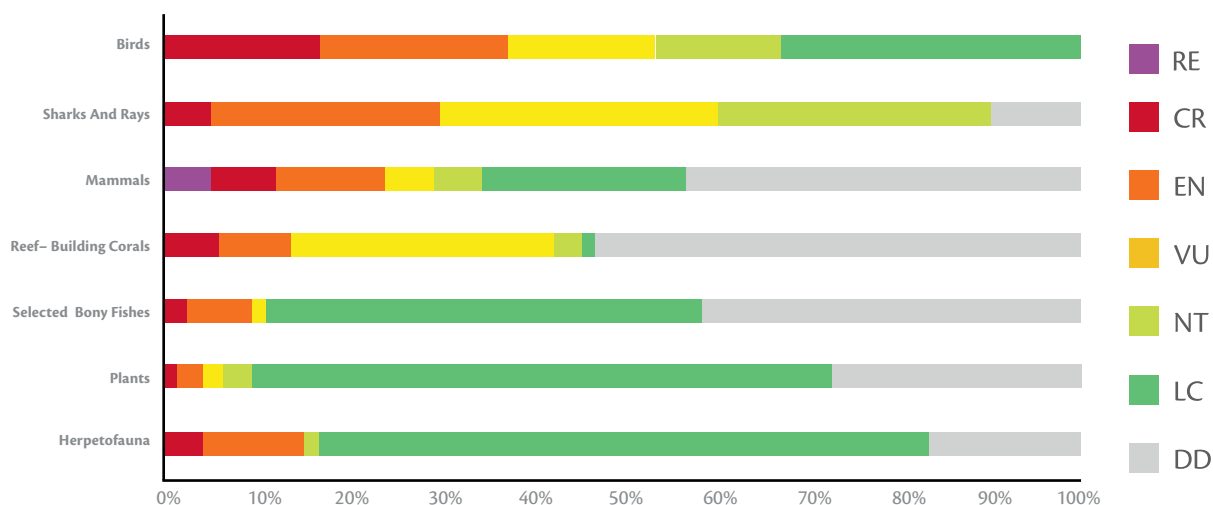


Figure 6. The proportion of species in each category in the individual National Red Lists.

Proportion of threatened species (all, marine, and terrestrial) in the UAE			
	All Species	Terrestrial and Freshwater	Marine
Lower bound (CR+EN+VU) / (assessed – EX)	20.8%	7.19%	30.9%
Mid-point (CR+EN+VU) / (assessed – EX – DD)	27.9%	9.7%	49.3%
Upper bound (CR+EN+VU+DD) / (assessed – EX)	46.2%	32.9%	68.2%

Table 3. Threat status of UAE ecosystems

Nearly half (49.3%, mid-point) of all marine species are considered to be threatened with extinction within the UAE, rising to 68.2% if all DD species were found to be threatened. For terrestrial species, 9.7% (mid-point) of extant species are considered to be threatened with extinction within the country. In addition, three species <0.5% – Grey Wolf (*Canis lupus*), Striped Hyaena (*Hyaena*

hyaena), and Leopard (*Panthera pardus*; as the Arabian Leopard *P. pardus subspecies nimr*) – are considered Regionally Extinct, and six species (Table 4) are considered Regionally Possibly Extinct or Regionally Possibly Extinct in the Wild, including Golden Eagle (*Aquila chrysaetos*), which still reproduces in captivity in the UAE.

Terrestrial species that are assessed as Critically Endangered (Regionally Possibly Extinct) or Critically Endangered (Regionally Possibly Extinct in the Wild), i.e., CR (RPE) or CR (RPEW).			
Group	Species	National Red List Category	Comment
Vascular plant	<i>Gymnarrhena micrantha</i>	CR (RPE)	Not recorded since first obs. (1988)
Bird	<i>Golden Eagle Aquila chrysaetos</i>	CR (RPEW)	Potentially extinct as a breeding species
Bird	<i>European Roller Coracias garrulus</i>	CR (RPE)	Not confirmed breeding in the last decade
Bird	<i>Corn Bunting Emberiza calandra</i>	CR (RPE)	No reported breeding attempts in recent years
Bird	<i>European Bee-eater Merops apiaster</i>	CR (RPE)	Last breeding records from early 2000s
Bird	<i>Spanish Sparrow Passer hispaniolensis</i>	CR (RPE)	No confirmed breeding for c. 5 years

Table 4. Terrestrial species that are assessed as Critically Endangered (Regionally Possibly Extinct) or Critically Endangered (Regionally Possibly Extinct in the Wild), i.e., CR (RPE) or CR (RPEW).

Spatial distribution of species in the UAE National Red Lists

More than 1,000 species had their distributions mapped for the UAE National Red Lists, with only the distributions of 123 Data Deficient species not mapped (Table 5). The reasons for the absence of these maps include uncertainty about the taxonomic identity of species and whether the record occurred definitively within the territory of the UAE, with species sometimes recorded from a geographical area shared with a neighbouring country (such as the Ru’us al-Jibal, shared with Oman), or simply recorded for the UAE without locality details. The distribution maps of some mapped species are also considered incomplete because of the limited data available.

Data Deficient species without distribution maps	
Group	Number of species without map
Vascular plants	107
Corals	8
Marine mammals	3
Terrestrial mammals	2
Terrestrial herpetofauna	1
Sea turtles	1
Sharks and rays	1

Table 5. Data Deficient species without distribution maps.

Overall species richness

As expected from the geography and geology of the UAE, vegetation cover and land use, and the rainfall patterns across the country, the greatest terrestrial species richness occurs in the higher-altitude areas – the Al Hajar Mountains, the Ru’us al-Jibal, and Jebel Hafeet (Figure 7). It is also not surprising that hexagons with multiple habitat types contain a greater number of species, particularly in coastal areas, where species are found that inhabit both the terrestrial and marine realms, in addition to coastal habitat specialists. Many of the DD species

without a distribution map (Table 5) and species with incomplete maps occur within the Ru’us al-Jibal. The mountain areas, especially the Ru’us al-Jibal and the higher parts of the Al Hajar Mountains, are often hard to access, and survey effort in these locations is likely to be lower. For these reasons, it is likely that the mountain species richness shown in (Figure 7) under-represents the actual richness in these areas. The desert areas in the south of the UAE have lower species richness than the remainder of the country, due to the increased aridity and lack of habitat diversity.

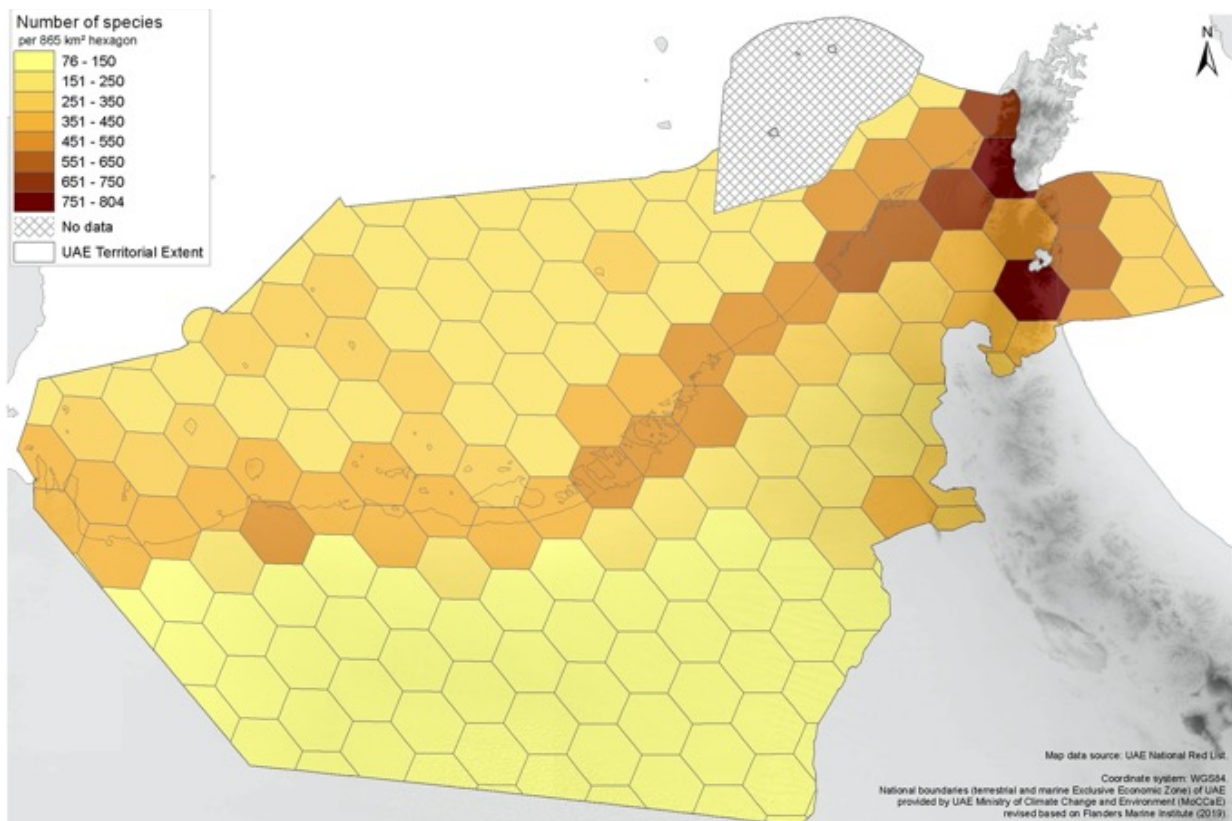


Figure 7. Overall species richness based on species assessed for the UAE National Red Lists.

The occurrence and distributions of species on the islands of the Arabian Gulf are not well-known, at least in the published literature, and again, the distribution maps

compiled here are likely to under-represent species richness on the islands.

Certain areas of species richness may to some degree be the result of data availability and the more extensive survey effort that has been undertaken in some geographical locations and for some taxonomic groups. For example, G.R. Feulner has published on the flora of the Ru'us al-Jibal (Feulner 2011), the Wadi Wurayah National Park, and the Olive Highlands region of the southern part of the Al Hajar Mountains in the UAE. For marine taxa, particularly sea snakes, extensive data were available due to surveys undertaken by the Al Mayya Sanctuary, Fujairah (Géczy et al. 2017, Buzás et al. 2018). There are further examples for individual emirates, but data for all taxonomic groups across the country are far from complete.

Threatened species richness

Threatened (CR, EN, VU) species show richness in two main areas (Figure 8): i) coastal marine and terrestrial species along the Arabian Gulf and eastern coast, and ii) the mountainous areas of the Ru'us al-Jibal and the southern Hajar. This approximately matches the overall species richness distribution (Figure 7).

The highest numbers of threatened species in the UAE are found in the southern Al Hajar Mountains (including the Olive Highlands) and adjacent coastal areas, with 185 threatened species (51 terrestrial species and 134 marine species). Only a very small part of the Alqurm Wa Lehfhaiiah protected area falls within this location. To the north, the southern Ru'us al Jibal area holds 183 threatened species.

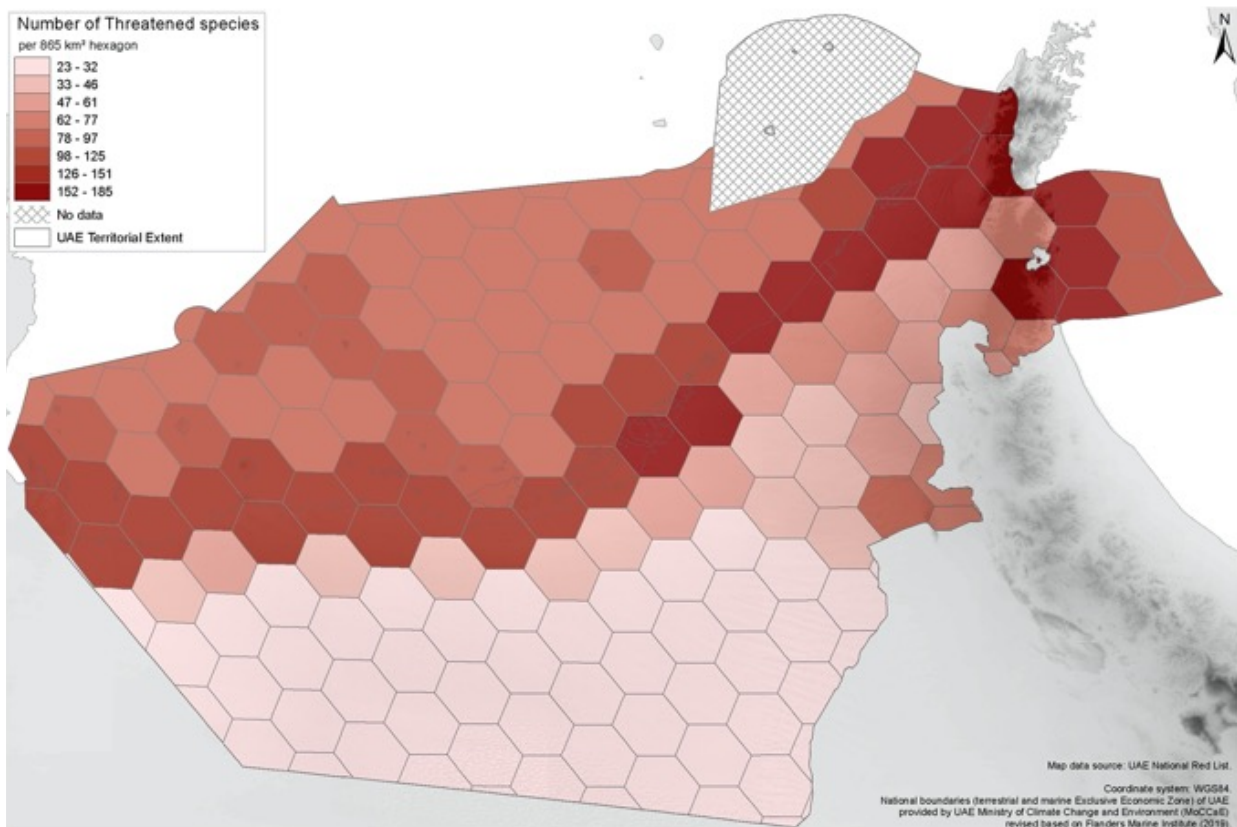


Figure 8. Threatened species richness based on species assessed for the UAE National Red Lists.

Data Deficient (DD) species richness

The highest numbers of Data Deficient species are found in Ru'us al-Jibal, the Al Hajar Mountains, and in adjacent

marine areas off the east coast and the Arabian Gulf (Figure 9), with marine species showing the highest levels of Data Deficiency.

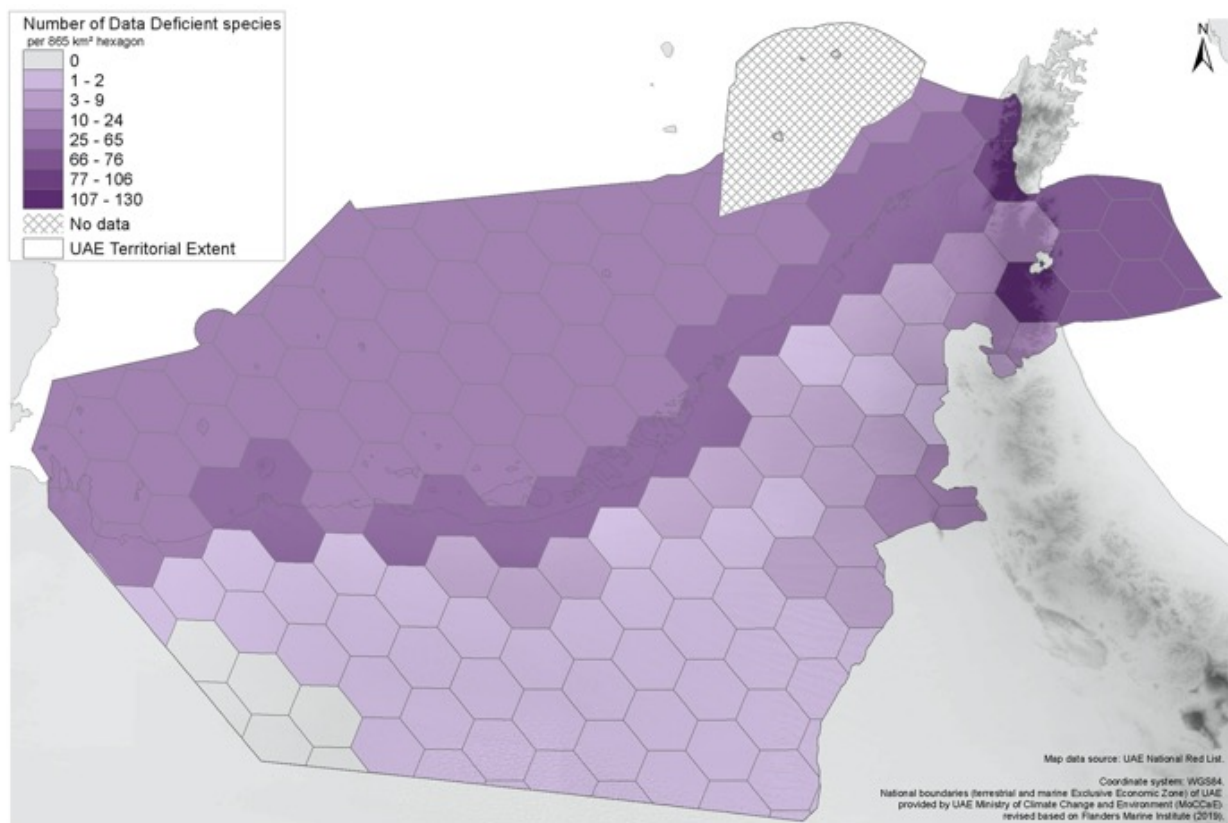


Figure 9. Data Deficient species richness based on species assessed for the UAE National Red Lists.

Population trend

There is a significant absence of information on the population size and trend of species within the UAE, with the population trend of 60.1% of all assessed species unknown (Figure 10). The populations of just 18% of species are stable, 16.8% have declining populations, and just 5.2% have an increasing population trend. Only two mammals are known to have an increasing population trend. For the Arabian Sand Gazelle (*Gazella marica*), this is the result of intensive conservation efforts within the UAE, including captive breeding and release. The population of the Egyptian Fruit Bat (*Rousettus aegyptiacus*) increased in the country due to the rising availability of fruit trees in plantations and gardens.

Amongst the herpetofauna, four terrestrial species have an increasing population trend. Two of them – Red Sea Leaf-toed Gecko (*Hemidactylus robustus*) and Sindh Saw-scaled Viper (*Echis carinatus sochureki*) – are able to utilise a wide range of habitats, including gardens, trees in sand deserts and wadis, and are increasing in urban areas. Blandford's Fringe-toed Lizard (*Acanthodactylus blanfordii*) has benefited from the establishment of the Alqurm Protected Area in 2012; which contains the entire known distribution of this species within the UAE. A population increase has been observed since 2012 as a result of the improvement in vegetation cover, and the restriction and zoning of

recreational activities within the protected area. Last, the Rock Semaphore Gecko (*Pristurus rupestris*) is abundant, and locally increasing through inadvertent introductions.

Just one plant species, *Tephrosia nubica*, is recorded to be increasing, as a result of its range expanding northwards in the Al Hajar Mountains, perhaps partly due to its apparent ability to colonise silt behind dams.

Two marine fish, both LC, have increasing populations. The Dusky Spinefoot (*Siganus luridus*) is not well-known, but it is not targeted in fisheries and thought to be increasing. The Yellowtail Barracuda (*Sphyræna flavicauda*) is rare but has widespread records.

Within the UAE, there are 51 bird species that have increasing population sizes. Many of these are making use of anthropogenic habitats; whether inhabiting gardens and urban areas, e.g., Purple Sunbird (*Cinnyris asiaticus*) or Eurasian Collared-dove (*Streptopelia decaocto*), or benefitting from artificial water sources, e.g., Common Reed-warbler (*Acrocephalus scirpaceus*) or Common Moorhen (*Gallinula chloropus*). Some also represent species that have colonised the UAE since 1996, e.g., Purple Swamphen (*Porphyrio porphyrio*), and a small number has increased owing to dedicated conservation efforts, most notably the Asian Houbara (*Chlamydotis macqueenii*).

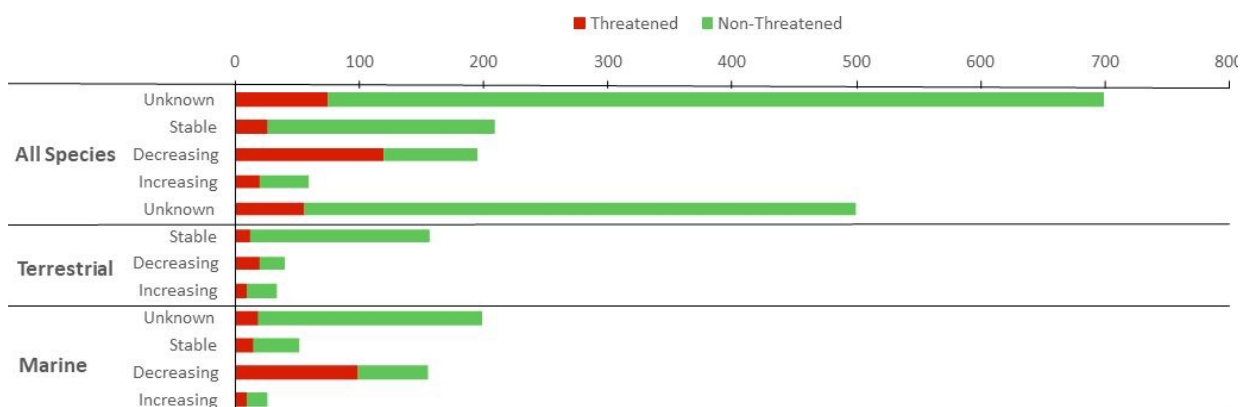


Figure 10. The population trend of all species assessed for the UAE National Red Lists.

Species use and trade

Fewer than half (481 species) of the extant species included in the UAE National Red Lists have some use recorded for them, however, this is likely to be a significant underestimate, as use is often under-recorded as a result of limited research or because trade and utilisation is illegal. A further issue is that use and trade may have happened in the past for a species in the country, but this may no longer occur for a range of reasons, including societal change (e.g., decline in the use of traditional medicinal products), or effective legislation at the

national or international scale. Finally, species utilisation may have been recorded within the Arabian Peninsula region or internationally, but utilisation for that purpose within the UAE may require confirmation.

Utilisation of species for human food is the primary use recorded (Figure 11), followed by medicinal use, animal food (mainly grazing and fodder for livestock), and ‘Pets/display animals, horticulture’ – a broad classification that includes collection of corals for aquaria, plants for botanical gardens or personal cultivation, and herpetofauna for the domestic and international pet trade.

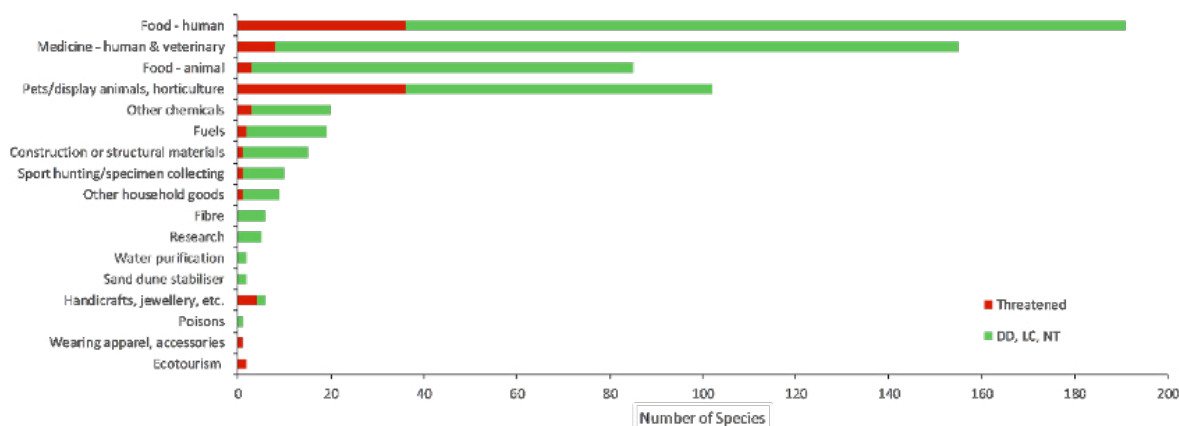


Figure 11. End uses of species assessed for the UAE National Red Lists.

Of the threatened species that have been utilised for human food, 30 are marine (16 sharks and rays, 14 bony fishes), three are terrestrial plants, and one terrestrial reptile species (both subspecies of Spiny-tailed Lizard *Uromastyx aegyptia*) (Table 6). However, in some cases,

this refers to historical use, and several of these species are no longer utilised for food as a result of economic development, societal change, and conservation legislation.

Species utilised for human food in the UAE.			
		All species	Threatened species
Marine	Bony fishes	155	30
	Marine mammals	120	14
	Vascular plants	1	–
	Sharks and rays	5	–
		28	16
Terrestrial	Reptiles*	35	5
	Vascular plants	2	2
		33	3

*Includes the two subspecies *Uromastyx aegyptia ssp. leptieni* and *U. a. microlepis*

Table 6. Species utilised for human food in the UAE.

Protected areas

Based on expert opinion and available literature, nearly 65% of all assessed extant species (72% of threatened

species) are thought to occur within a protected area, however, 68 threatened species (28.1%) have either not yet been recorded within a protected area, or occurrence there is not known (Figure 12).

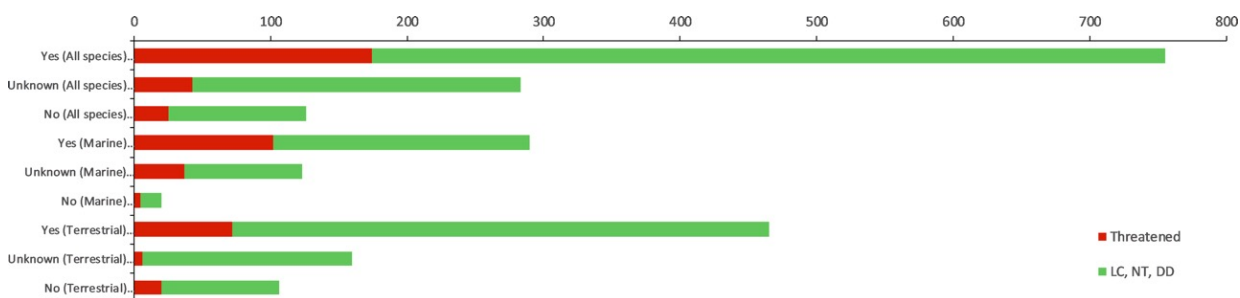


Figure 12. Occurrence of all, marine, and terrestrial species within protected areas in the UAE by threatened status (categories CR, EN, VU) and other categories (LC, NT, and DD).

Analysis of distribution data compiled through the National Red List project refines the above figure; this shows that 17 threatened species (1.4% of all extant species) do not occur within a protected area (Table 7,

Figure 13a,b). A further 58 DD species (5% of extant species), almost all of them plant species, whose status may range from Least Concern to Critically Endangered, are not known to occur within a protected area.

Threatened species that are not yet recorded within a protected area in the UAE		
Group	Species	Red List Category
Herpetofauna	<i>Pristurus carteri</i> (Carter’s Semaphore Gecko)	CR
	<i>Asaccus margaritae</i> (Margarita’s Leaf-toed Gecko)	VU
	<i>Platyceps ventromaculatus</i> (Hardwicke’s Rat Snake)	VU
Vascular plants	<i>Cordia quercifolia</i>	CR
	<i>Cutandia dichotoma</i>	CR
	<i>Ehretia obtusifolia</i>	CR
	<i>Grewia tenax</i>	CR
	<i>Maerua crassifolia</i>	CR
	<i>Pavonia arabica</i>	CR
	<i>Abutilon fruticosum</i>	EN
	<i>Adonis dentata</i>	EN
	<i>Desmidorchis flava</i>	EN
	<i>Limonium carnosum</i>	EN
	<i>Melhanian muricata</i>	EN
	<i>Polygala irregularis</i>	EN
	<i>Pupalia lappacea</i>	EN
	<i>Volutaria sinaica</i>	EN
	<i>Indigofera cordifolia</i>	VU
<i>Olea europaea</i> (Olive)	VU	

Table 7. Threatened species that are not yet recorded within a protected area in the UAE.

Protected areas, both marine and terrestrial, hold the highest numbers of threatened species. Alqurm Wa Lehhfaiiah (171 threatened species) is an Important Bird and Biodiversity Area on the east coast, followed by Birds

Island (Jazeraat Al Tuyur; 160 species), Jebel Ali (155 species), Ras Al Khor (154 species), and Al Zorah (151 species).

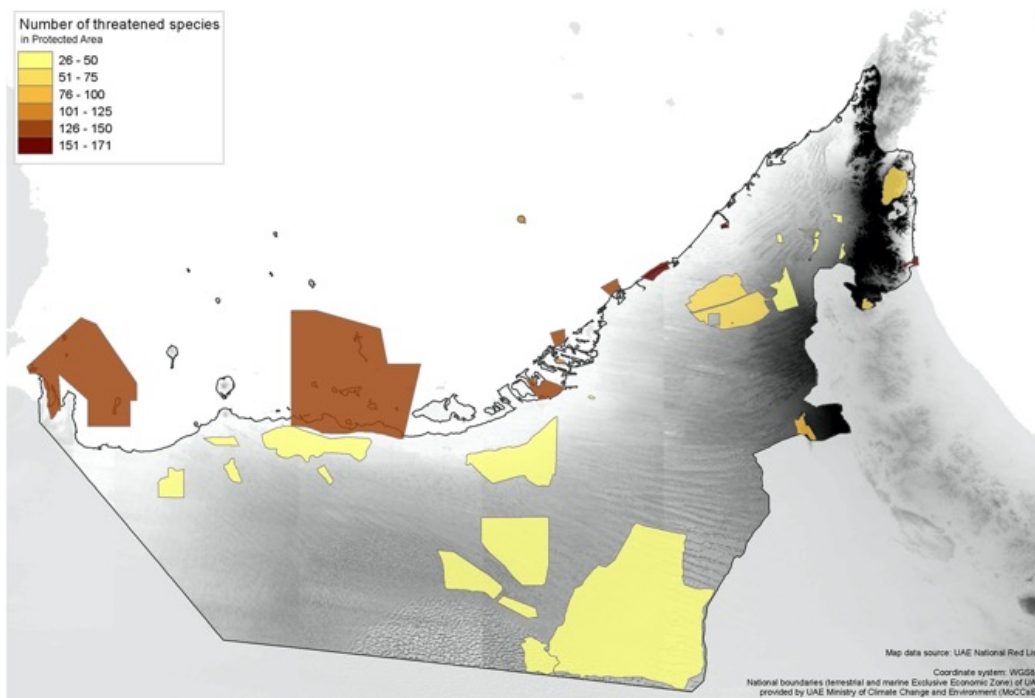


Figure 13a. Protected areas within the UAE, showing numbers of threatened (CR, EN, VU) species within each one.



Figure 13b. Protected areas within the UAE, showing numbers of Data Deficient species within each one.

Four threatened species (three plants – *Acridocarpus orientalis*, *Cladium mariscus*, *Gymnarrhena micrantha*) and one mammal (Arabian Oryx – *Oryx leucoryx*) as well

as one DD bat species (Botta’s Serotine – *Eptesicus bottae*) are only known to occur in the wild within protected areas in the UAE.

UAE National Red List Index

Following the procedures set out in Butchart et al. (2004, 2005, 2007), an overall Red List Index (RLI) score of 0.82 was calculated for all non-Data Deficient species assessed in the UAE National Red List project (2018–20). This includes birds, mammals, plants, herpetofauna, marine corals, cartilaginous fishes, and bony fishes. To provide context, a score of 1 means that all species are Least Concern, whereas a score of 0 would mean that all species are Extinct. The group with the overall lowest extinction risk was the plants (0.94), followed by herpetofauna

(0.90), select marine species (corals, cartilaginous fishes, and bony fishes combined; 0.71), birds (0.65), and then mammals (0.63) with the highest overall extinction risk. If the selected marine species were split, bony fishes (0.88) would remain as the group with the third-lowest overall extinction risk, but cartilaginous fishes (0.60) and corals (0.54) would be the two groups with the highest overall extinction risk in the UAE. When species are divided into two generic groups of terrestrial and marine, terrestrial species have an overall lower risk of extinction (RLI score of 0.87) compared to marine species (0.73).



Carangid species off Sir Bu Nair. Forty species of Carangidae, a family of ray-finned fish, are recorded in the UAE. © K.D.P. Wilson

Bird, mammal, and plant species also underwent a back-casted assessment to decide what their Red List status would have been in 1996. Thus, for these groups, two separate Red List Index datapoints have been calculated – one for 1996, and one at the time of assessment as part of this project (2018–20); and from these, trends were inferred. Amongst the birds, there were several species that colonised the country between these two time points, therefore, a procedure was developed to take this into account. This was the first time this has been done

for a regional/national Red List project (for details of the approach, see Burfield et al. 2021).

Combining the data for birds, mammals, and plants indicates an overall decline in the Red List Index for these three groups (from 0.86 to 0.85). However, the Red List Index for both birds and mammals has increased slightly since 1996 (see Figure 14; plants declined from 0.96 to 0.94, birds increased from 0.64 to 0.65, mammals increased from 0.61 to 0.63).

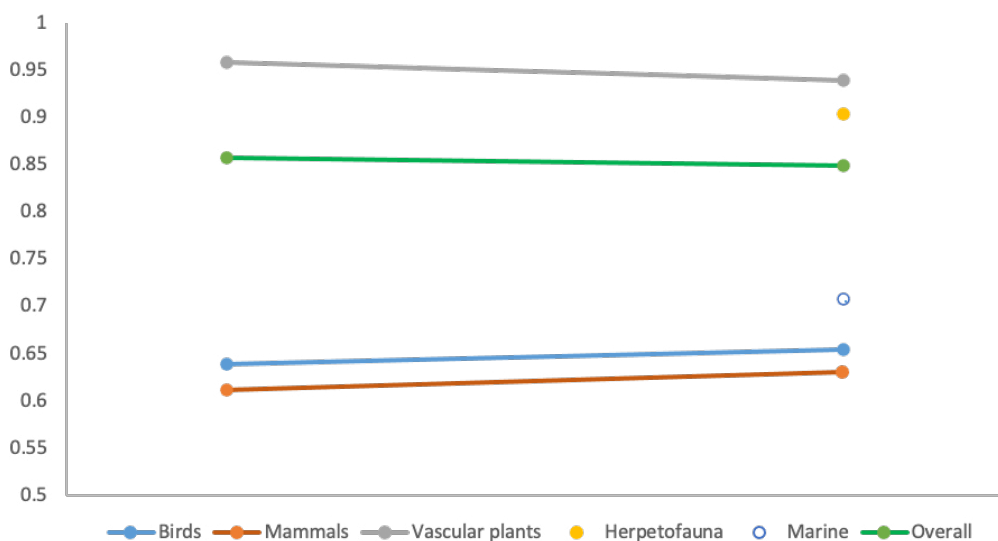


Figure 14. The Red List Index values and datapoints for species groups assessed during the UAE National Red List project (birds, terrestrial and marine mammals, vascular plants, terrestrial and marine herpetofauna, other marine groups). The green line shows the combined Red List Index trend for the three groups for which back-casted assessments were produced (birds, mammals, and plants).

Pressure

The individual assessments compiled through the UAE National Red List project identified the known threats to each species and its habitat(s) that were coded using the IUCN Threats Classification Scheme (Salafsky et al. 2008). A summary of the relative importance of the different threatening processes is shown in Figure 15.

Development, mainly housing, tourism, and other urban infrastructure, is considered to be the most important threat in the UAE, having been recorded as a threat to 412 species. Biological resource use, primarily (i) fishing and harvesting of marine aquatic resources, and (ii) hunting and trapping of terrestrial animals, is the second most significant threat, followed by agriculture and climate change.

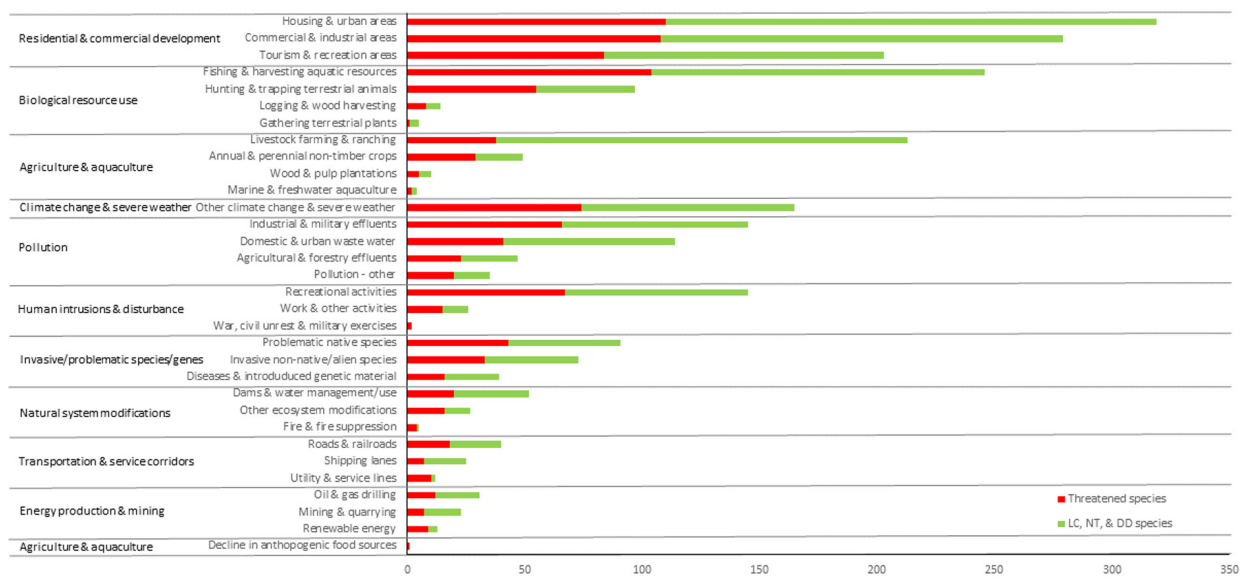


Figure 15. Primary drivers of threats identified to species assessed for the UAE National Red List.

Habitat condition

As indicated above, habitat change and loss, driven by development, has been identified as the primary driver of extinction risk to the biodiversity of the UAE. The extent of the impact of habitat change and degradation can be seen on the habitat condition map below (Figure 16 (S. Holness pers. comm. 2020, AGEDI 2013a); also see Figure 3. UAE ecosystem threat assessment). Coastal and near-coastal habitats have been extensively degraded, with impacts extending through the central belt to the Al Ain area. In 2012—2013, when the AGEDI condition-mapping exercise was undertaken, habitats in the Al Hajar Mountains and to the west and south were considered to be in ‘natural’ condition. However, fragmentation through

ribbon development along roads had extended through most areas, with pressure from livestock grazing growing as a result of the expanding national livestock sector (Figure 17; FAO 2020), and human population size continuing to rise since 2013 (World Bank 2018).

This picture of ongoing degradation is mirrored in the marine realm; however, there are fewer available data for marine species and habitats. AGEDI (2013a) found nearshore marine habitats on the east coast and in the Arabian Gulf (including around islands) to be in poor condition, but little information was obtained through this National Red List process on the impact of some threats, such as marine plastic/debris pollution.

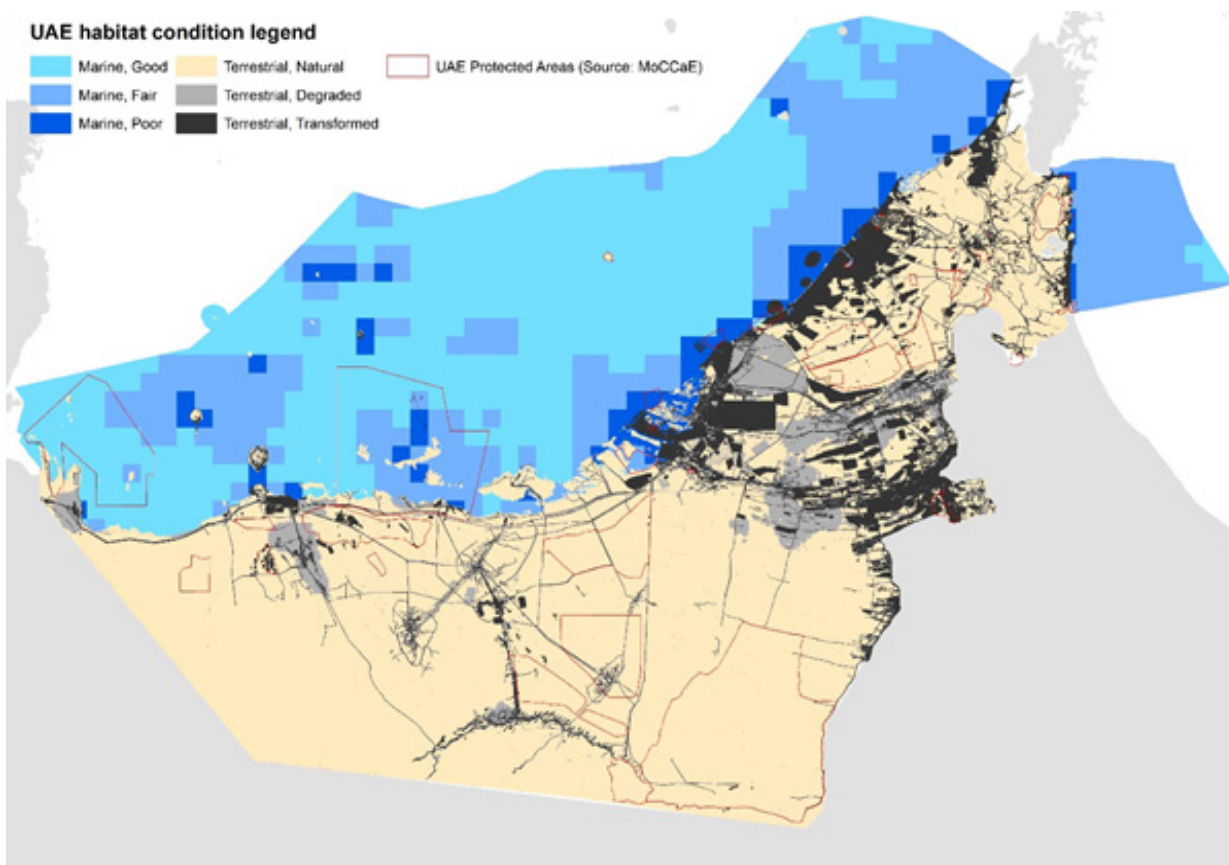


Figure 16. Habitat condition map of the UAE (Source: S. Holness pers. comm. 2020, AGEDI 2013a).

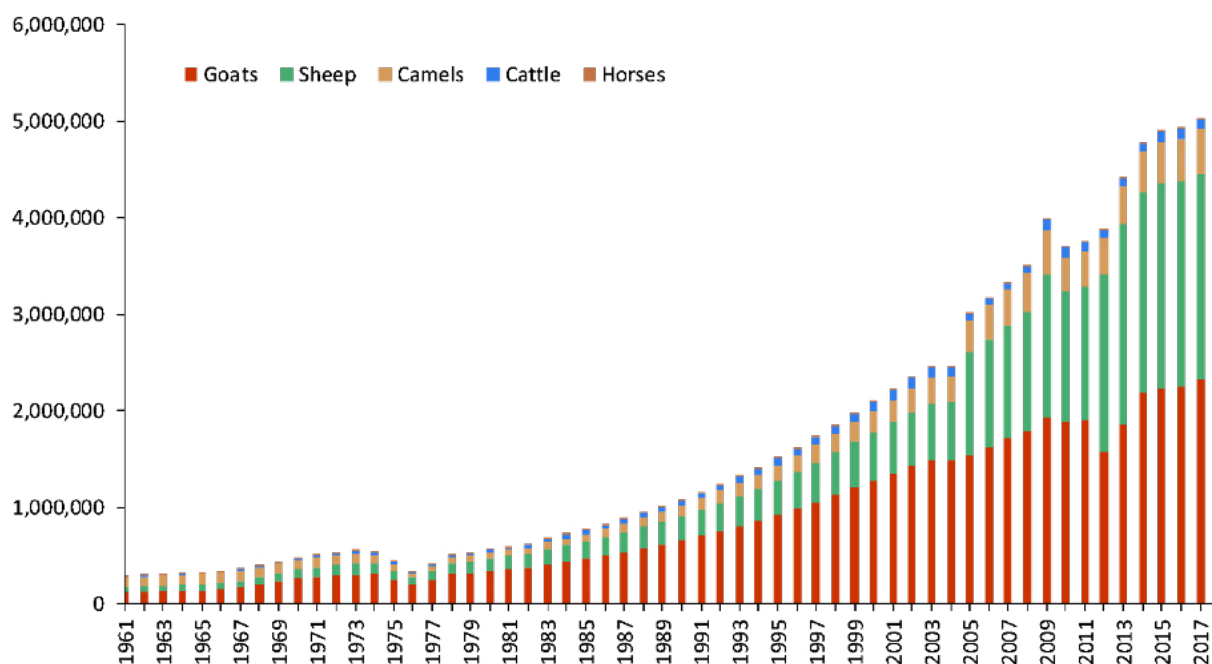


Figure 17. Livestock head growth over the period 1961 to 2018 (Source: FAO 2020).

Climate change

The climate of the UAE is characterised by hot summers and warm winters. Maximum temperatures in July and August may exceed 45°C on the coastal plain, while mean minimum temperatures are 10–14°C in January and February. Temperatures in the Al Hajar Mountains are lower and decrease with elevation. Annual precipitation averages less than 120 mm in the lowlands but may reach 350 mm in the Al Hajar Mountains.

There is increasing information on the potential scale and nature of climate change in the UAE, based on modelling work undertaken by AGEDI. AGEDI (2015c) modelled winter rainfall to increase over much of the country’s territory (but especially parts of Dubai, Sharjah, and the northern emirates) by the second half of the 21st century (2060–2079) compared with the recent past (1986–2005). Summer rainfall is predicted to increase over the same period by an even greater amount (in terms of both actual amounts and the proportion change from the recent past). Increased rainfall is predicted for the eastern UAE,

including the Al Hajar Mountains, and the extreme west, whilst central regions are modelled to become drier. However, rainfall intensity is modelled to increase, with the number of wet days decreasing across the country (AGEDI 2015c). Based on current carbon emission rates, average air temperatures are modelled to increase by 2–3°C over land, with slightly lower increases over coastal areas.

However, due to model uncertainties (AGEDI 2015c), the difficulty of defining local impacts, and the relatively short generation lengths of most species found in the UAE, it has not always been possible to use climate change information while conducting the National Red List assessments.

Fitzpatrick et al. (2015) undertook climate change vulnerability assessments for a set of select species (birds, amphibians, reptiles, mammals, and plants) that occur in the Arabian Peninsula. They found breeding birds, mammals, and amphibians to have the most extensive projected reductions in suitable habitat over the period

2030–2070 across the Peninsula. Within the UAE, plants and reptiles were projected to lose suitable habitat across the country, with the exception of the Al Hajar Mountains, where these two groups were projected to gain suitable habitat (Fitzpatrick et al. 2015).

Marine temperatures, both sea–surface and bottom, are influenced by a range of factors that include wind speed and water depth; however, there has been an increase in sea–surface and seabed temperatures in the Arabian Gulf in recent years (Noori et al. 2019), reaching a peak to date of $35.9 \pm 0.1^\circ\text{C}$ in 2017, with a record daily maximum of 37.7°C (Burt et al. 2019).

Global increases in atmospheric CO₂ can also result in increased acidification of sea water. The Arabian Gulf is a significant regional sink for CO₂. Uddin et al. (2012) reported increasing acidification of the northern Arabian Gulf, although Izumi et al. (2020) report that the Gulf is degassing CO₂ at present, and will not take up atmospheric CO₂ until 2042.

Wabnitz et al. (2018) modelled future habitat suitability for marine biodiversity in the Arabian Gulf, predicting high levels of local extinctions of a select set of priority species in the southern Gulf by 2090, although the magnitude of change in habitat suitability is uncertain over this period.

Further research to understand species distributions and their vulnerabilities to climate change, as well as more detailed local climate models are required in order to understand the likely impacts of climate change.

Species groups

Particular key threats to individual species groups are highlighted below.

Marine

Corals

Reef–building corals in the UAE are in a very fragile state (Burt et al. 2019). The effects of naturally extreme environmental conditions and local human disturbances are compounded by the increasing frequency, duration, and extent of temperature anomalies caused by climate

change (Riegl et al. 2011). The most recent temperature anomaly event (2015–2017) resulted in severe coral bleaching and mass mortality, including of those species generally considered stress–tolerant (Burt et al. 2019). The loss of coral reefs in the UAE has implications for the survival of many marine species that utilise them.

Cartilaginous fishes

The direct and indirect (bycatch) impacts of fisheries overexploitation were identified as the primary threat to all threatened cartilaginous fishes in the UAE. In the past, the country was considered a significant regional and international hub for the export and re–export of shark products, including shark fins (Shea and To 2017, Lau and To 2019, Okes and Sant 2019). For example, all 10 species of *Rhinopristiformes* (sawfishes and guitarfishes) known to occur in UAE waters were also landed in the country (Jabado 2018). The Green Sawfish *Pristis zijsron* (CR) is an iconic sawfish that was historically abundant in UAE waters. It has drastically declined in the country, regionally, and throughout its global range, though sightings of these animals still occur in the UAE (Jabado et al. 2017).

Many cartilaginous fishes are taken as bycatch in fisheries. For example, the Scaly Whipray (*Brevitrygon walga*) and Arabian Carpetshark (*Chiloscyllium arabicum*) are regularly caught in gill nets, longlines, trawls, and stake nets; they are not targeted or highly valued in markets of the UAE, and are discarded at sea in large numbers.

Bony fishes

All threatened bony fishes are experiencing regional population declines that are at least partially attributable to fishing pressure, but not all threatened fishes have undergone stock assessment. Many highly valued and heavily fished species, such as *Lutjanus malabaricus* (Malabar Blood Snapper, hamra), assessed as CR, have yet to undergo formal stock assessment in the UAE. Formal stock assessments that have occurred concluded that many species (nine of the 10 threatened species with formal stock assessments) are overexploited, including *Cephalopholis hemistiktos* (Yellowfin Hind, eshnenuh).

Mammals

The main threats identified for terrestrial mammal species are loss of habitat (extent and/or quality) due to overgrazing by livestock, hunting, and persecution, although the introduction of new laws and more stringent enforcement have managed to reverse trends for species particularly badly impacted by hunting (Mallon et al. 2019). Such threats have led to the national extinction of four mammal species within the UAE – Grey Wolf (*Canis lupus*), Common Leopard (*Panthera pardus*; as subspecies *nimr*, the Arabian Leopard), Striped Hyena (*Hyaena hyaena*), and Arabian Oryx (*Oryx leucoryx*). The Arabian Oryx has since been successfully reintroduced into the country. The UAE has been instrumental in establishing and running conservation breeding programmes for some of the region’s most threatened species, including the Arabian Leopard and Arabian Cobra, and participates in several international breeding programmes for Cheetah, Sand Cat, Striped Hyena, and Nubian Ibex.

The key threats identified for marine mammal species were bycatch in fishing gear, pollution (from both

abandoned fishing gear and oil), and boat strikes (Mallon et al. 2019).

Vascular plants

Agriculture represents the primary threat for most vascular plant species where information exists; primarily grazing and habitat degradation from livestock farming and ranching, with, to a much lesser extent, clearance of habitat for crop agriculture and plantations. Residential and commercial development is the next most significant threat to plants in the UAE. Climate change and severe weather is the third most cited threat to plants, with temperature extremes, storms and flooding, habitat shifting and alteration, and increasing frequency of droughts all cited as threats to species.

Other threats include quarrying and road construction, recreational activities, water abstraction and management, fire, and grazing by problematic native and introduced species, e.g., Feral Goat (*Capra hircus*) and Donkey (*Equus asinus*).



Quarrying has been identified as a current or potential threat to a number of species in the UAE. © Priscilla van Andel

Birds

The threats to the birds of the UAE are particularly difficult to interpret because of the migratory nature of many of the species found in the country. This means that many of the most serious threats an individual bird that visits the UAE faces are actually outside of the country, and the drivers of population trends could therefore be a result of external factors. This highlights the importance of international agreement and coordination of

conservation efforts to protect many of these species.

Focussing on threats that occur within the UAE, the two main threats that were noted for bird species were loss of habitat due to residential and commercial development, and pollution (particularly from oil spills). These were recorded as impacting 104 and 94 bird species assessed as part of this project respectively (62% and 56% of assessed UAE birds) (Burfield et al. 2021).



*Direct disturbance of species and habitat degradation caused by recreational activities is an increasing threat in the UAE, as shown here with crab plover (*Dromas ardeola*; Endangered). © Oscar Campbell.*

Herpetofauna

The threat impacting the most herpetofauna species within the UAE is loss of habitat due to residential and commercial development (47 species), followed by disturbance from recreational activities (16 species), and

oil and gas drilling (14 species) (Els et al. 2019). Marine species are particularly impacted by pollution, either by oil pollution or by becoming entangled in solid debris (e.g., abandoned fishing gear), as well as by becoming caught as bycatch by both large-scale and small-scale fisheries (Els et al. 2019).

Response

The UAE has implemented an extensive range of responses to address biodiversity loss and conservation, and to meet its international obligations.

The UAE Government has ratified the following biodiversity-related conventions at international and regional levels, with direct implementation through national legislation where required :

- UN Convention on Biological Diversity (CBD)
 - Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity
 - Cartagena Protocol on Biosafety to the Convention on Biological Diversity
- Convention on Migratory Species (CMS, the Bonn Convention)
 - CMS Memorandum of Understanding on Conservation and Management of Dugongs and their Habitats throughout their Range (Dugong MOU)
 - *Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia* (IOSEA Marine Turtle MOU)
 - Memorandum of Understanding on the Conservation of Migratory Birds of Prey in Africa and Eurasia (Raptors MOU)
 - Memorandum of Understanding on the Conservation of Migratory Sharks (Sharks MOU)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
 - Federal Law No. 11 of 2002 on Regulating and Controlling the International Trade in Endangered Species of Wild Fauna and Flora
- Ramsar Convention on Wetlands of International Importance (Ramsar Convention)
- International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)
 - Federal Law No. 9 of 2013 on Plant Genetic Resources for Food and Agriculture
- World Heritage Convention (WHC)
- UN Convention to Combat Desertification (UNCCD)
- UN 2030 Agenda for Sustainable Development
- Convention on the Preservation of Wildlife and its Natural Habitat in the Countries of the Gulf Cooperation Council
- United Nations Framework Convention on Climate Change (UNFCCC)



*The Egyptian vulture (Neophron percnopterus; Critically Endangered) is an example of a species protected under the Convention on Migratory Species.
© Ahmed Al Ali.*

In addition, a range of federal laws and ministerial decrees has been issued, for example:

- Federal Decree Law No. 9 of 1983 Regulating the Hunting of Birds and Animals
- Federal Law No. 23 of 1999 Concerning the Exploitation, Protection and Development of Living Water Resources in the United Arab Emirates
- Ministerial Decree No. 224 of 2015 on the Protection of Wild Plants Species
- Federal Law No. 17 of 2009 on the Protection of New Botanical Species
- Federal Law No 24 of 1999 on the Protection and Development of the Environment
- Cabinet Decree No. 18 of 2018 on the Cultivation of Local Plants and Conservation of Nature
- Ministerial Resolution No. 43 of 2019 Regulating Shark Fishing and Trade

A wide range of biodiversity-related legislation is also in force at the level of individual emirates.

Under the CBD, the UAE is committed to developing national strategies, plans, and programmes for the conservation and sustainable use of biological diversity. In response, a range of policy and action frameworks has been developed, for example, the National Climate Change Plan of the United Arab Emirates 2017–2050, the [UAE National Plan of Action for the Conservation and Management of Sharks](#), the National Plan of Action for the Conservation of Marine Turtles in the UAE, and the National Strategy and Action Plan for Environmental Health. [The UAE National Biodiversity Strategy and Action Plan](#) (NBSAP) is the primary reporting function on progress towards meeting CBD commitments.

Species Groups

Marine

Corals

The protection of habitat-forming species, such as reef-building corals, is a high priority for the UAE through reducing local stressors, and establishing and managing protected areas, as there is the potential to mitigate climate change impacts (AGEDI 2015a, Abelson 2019).

Given the high level of Data Deficient species, and the serious knock-on effects of the decline of reef-building corals on other taxa (e.g., Buchanan et al. 2016), research and conservation initiatives aimed at improving the information on and the status of the country's corals are urgently needed. Of particular concern are species in the genus *Acropora*, which have been locally lost from much of the UAE's waters.

Cartilaginous fishes

Recent legislation has reduced the UAE's role in the international trade in shark products. For example, Ministerial Resolution No. 43 of 2019 regulates shark fishing and trade, including permanent bans on protected species (e.g., those listed in CITES, CMS, and earlier national legislation), spatial and seasonal fishing bans, and bans on import and re-export of shark fins (excluding those intended for scientific purposes with appropriate permits). Monitoring of the long-term effects of these regulations on the stabilisation and future recovery of shark and ray populations is needed. However, immediate urgent conservation actions are required to secure the long-term survival of Green Sawfish and other Rhinopristiformes in the country.

As most of the UAE's cartilaginous fish species are widely distributed in the Arabian Sea region, cooperation among neighbouring countries will be essential to ensure the persistence of these species.

Bony fishes

Highly valued and heavily fished species, such as *Lutjanus malabaricus* (Malabar Blood Snapper), are high priorities for future stock assessment and management efforts. In addition to this, efforts to reduce exploitation are urgently

required to ensure the continued sustainability of these fisheries. The Twobar Seabream (*Acanthopagrus bifasciatus*) is the only threatened species with a formal stock assessment of underexploited based on the 2014 Abu Dhabi stock assessment. Catch has declined by more than 91% over the past 16 years, and although there have been some management measures to limit the use of gargoor fishing cages, the declines in effort are unlikely to be sufficient to have caused such extensive declines in catch, particularly as the regulations aimed at reducing fishing effort are inconsistent across the emirates.

Mammals

Many UAE mammal species are undergoing slow declines as a result of a combination of factors, involving extraction of groundwater, increasing aridity due to climate change, and overgrazing by livestock, all of which impact vegetation cover.

If the information on mammal species in the country is to be effectively integrated within the development and environmental planning processes, then a scheme for coordinated monitoring of species should be enacted and maintained so that population changes can be identified early. Such monitoring programmes can be used to collect data on species currently assessed as Data Deficient. Data obtained from such work can then be utilised in future National Red List projects, and can be shared with national and international bodies to help inform coordinated and collaborative conservation actions.

Vascular plants

With nearly one-third of vascular plant species in the UAE considered Data Deficient, the primary conservation needs for this group are (i) a comprehensive and repeated survey of the flora of the country to understand distributions and trends, and (ii) a commitment to data sharing and publication, ensuring that information held at the level of individual emirates is made available to

inform conservation whilst acknowledging the work of contributors.

Ongoing taxonomic and nomenclatural studies are needed to resolve remaining issues about the identity and naming of native plant species found in the UAE.

Birds

The majority of conservation actions recommended for bird species in the UAE focussed on formal land management and protection (Burfield et al. 2021), although further research to gain a greater insight into population dynamics within the country (for a range of species) would also be of huge benefit. Given that residential and commercial development is the major threat to bird species in the UAE, Burfield et al. (2021) recommended that a system of integrated coastal zone planning be established so that developers can avoid important and sensitive bird areas (see MOCCA 2018). This would not only be important for birds but would also be beneficial for a wide range of species that occur in the same areas.

Another important conservation action particularly

highlighted for birds is the need for international cooperation, as was also the case for cartilaginous fish. Many of the birds that occur within UAE are migratory and face a range of threats outside the national boundaries. Ensuring the persistence of the species in the UAE would therefore require coordinated efforts to conserve these species in all countries along migratory pathways (BirdLife 2018).

Herpetofauna

Amphibians

Both species of amphibians within the UAE occur within protected areas with stable populations, which at present require no direct conservation actions. Further research into their life history is required. The amphibian disease chytridiomycosis, caused by the chytrid fungus *Batrachochytrium dendrobatidis*, was not detected in surveys of wild populations in the UAE in 2012 (Soorae et al. 2012, Chaber et al. 2016).

Despite both species of amphibians being assessed as Least Concern, they must remain part of conservation efforts due to their dependence on freshwater habitats



Emirati leaf-toed gecko (*Asaccus caudivolvulus*) is the only species assessed for the UAE National Red Lists that is considered endemic to the country.
© Johannes Els.

for reproduction; these habitats are limited within their natural range and under threat from overutilisation.

Terrestrial reptiles

The majority of the UAE's terrestrial reptiles do not require direct conservation actions, as most of the widespread species occur within one or more protected areas across their distribution ranges in the country. Although most species are widespread with no major threats, further research into their life history and monitoring of their threats is required. It is recommended that the existing legislation for environmental impact assessments prior to urban development should be fully implemented to limit or avoid the degradation of ecologically sensitive areas.

Deserving particular focus, the Emirati Leaf-toed Gecko (*Asaccus caudivolvulus*) is the only species assessed for the UAE National Red List that is endemic to the country. Its habitat is under severe transformation, and its preservation is essential to ensure the future survival of this species.

Marine reptiles

There are no species-specific conservation actions in place for sea snakes, with only two confirmed records from within any of the marine protected areas in the UAE. None of the sea snakes are currently protected under any laws nationally or internationally. A research priority in the country is a better understanding of the distribution of the species in the UAE EEZ, as well as their habitat requirements, population size and trend, and threats.

The marine turtle species are all protected under Appendix I of CITES, under CMS, and under UAE Federal Laws No. 23 and 24 (1999) and No. 11 (2002).

Priorities include the full implementation of the National Plan of Action for the Conservation of Marine Turtles in the UAE (2019–2021), and continued research and monitoring efforts for all species of marine turtles in the country's waters.



The Kalba subspecies of the collared kingfisher *Todiramphus chloris kalbaensis* is effectively endemic to the UAE, and is Endangered. © Ahmed Al Ali.

Summary

The UAE National Red List assessments provide a current baseline and an indicator of recent biodiversity trends in the country, and identify and recommend essential measures that need to be taken. At the national and international policy level, these will align with the implementation of the UAE's National Biodiversity Strategy and Action Plan 2014–2021 (NBSAP), inform future reporting to the CBD, and national commitments to other multilateral environmental agreements (MEAs), as well as regional collaboration. The wide taxonomic scope of the assessments has highlighted pressures existing across the entire terrestrial and marine realms. Actions to address these pressures can be developed at a systems level. Protected area gap analysis, identification of Key Biodiversity Areas (KBAs), and designation of new protected areas are needed to conserve both critical sites for endemic and highly threatened species, and representative examples of the country's main ecosystem.

Specific actions recommended for the most highly threatened species should be implemented to stabilise

and then reverse their declines, supported by development of strategies and action plans. Surveys of DD species are a priority to establish their status in the UAE. The successful restoration of Arabian oryx and two species of gazelle, all of which are endemic to the Arabian Peninsula, highlights what can be achieved. More releases of these three species and improved connectivity between existing sites would further enhance these efforts, as would replicating them for other species.

The [UAE's Sixth National Report to the CBD](#) includes the UAE National Red Lists and the Red List Index as measures of progress towards two key targets, both included in the NBSAP for 2014–2021;

- By 2021, the state and direction of the country's major biodiversity components have been assessed, monitored, and linked to decision making.
- By 2021, programmes are being developed and implemented to improve the conservation status of the most threatened species.

With the completion of the UAE National Red List project in 2021, both targets are on track to be met.



Conservation recommendations

Based on the UAE National Red Lists, a range of conservation and policy recommendations has been made.

National Red Lists and National Red List Indices

- The UAE National Red Lists should be updated on a regular basis, ideally every ten years. Regularly reassessing species can provide an accurate assessment of long-term trends through the further development of Red List Indices for the UAE. Such national-level information can help to ensure the survival of threatened species in the UAE.
- Effective conservation efforts have resulted in a positive RLI for mammals, and it is essential that these efforts continue and are expanded to more species in order to maintain this achievement.
- The information from the UAE National Red Lists 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:
 - Progress of national implementation of Aichi Biodiversity Target 12 (*Species extinction and recovery*).
 - In the 7th National Report for the UAE to the CBD.
 - Reporting on relevant targets of the UAE National Biodiversity Strategy and Action Plan (2014–2021).
 - Targets for the Sustainable Development Goals (SDGs), notably:
 1. Target 14.2 to sustainably managing and protecting marine and coastal ecosystems
 2. Target 14.4 to regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices
 3. Target 15.1 for the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services
 4. 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
- Consideration should be given to expanding the taxonomic coverage of the UAE National Red Lists, taking advantage of available knowledge and expertise within the UAE, to encompass vertebrates (e.g., freshwater fish) and invertebrates e.g., Lepidoptera (butterflies and moths), Odonata (damselflies and dragonflies), and marine and terrestrial molluscs groups.
- Civil society can play a key role in research, monitoring, conservation planning and action, and in educating fishers, farmers and local communities.

Species & ecosystem conservation

- Species conservation successes within the UAE should be documented and celebrated through application of the IUCN Green Status of Species methodology (Akçakaya et al. 2018), once that is adopted as a new IUCN standard.
- Lessons learned through the recovery and conservation of emblematic species, such as the Dugong, Houbara, and Arabian Oryx, should be applied to other priority species and their habitats.
- Anthropogenic habitats are likely to have been vital in sustaining species populations as natural habitats are lost. Research into and monitoring of the importance of anthropogenic habitats is required given their vulnerability to future potential events, such as economic depressions and declines in water availability.



The dugong (NT) is an example of a species that has benefited from applied conservation action in the UAE. © Kris Mikael Krister, Unsplash

Capacity building

- Capacity should be increased to ensure government bodies (national to local) are able to capitalise on this new information on biodiversity through training in the application of biodiversity data sets to species- and site-based management and enforcement activities.
- Relevant agencies in each of the seven emirates comprising the UAE have a wealth of data and expertise, and have the potential to play a vital role in the conservation, management, and monitoring of biodiversity. Processes for the exchange and publication of biodiversity information curated by federal and local governments and by civil society organisations should be developed, such as a centralised national biodiversity database, transparent and accessible to all stakeholders.
- Local expertise in taxonomy, species identification, and monitoring should be supported and developed in order to establish a long-term and sustainable skills base for biodiversity conservation in the UAE.

- Although there is some monitoring of species populations in parts of the UAE (e.g., for birds), an expansion of these schemes across the country and all taxonomic groups is needed.
- Detailed distribution data are required for all the groups assessed for the UAE National Red Lists, and funding for long-term initiatives (such as a UAE flora atlas) to obtain, curate, and update distribution data is essential to address the high level of Data Deficient assessments for some taxonomic groups.
- Further research into the population size, trends, life history, and ecology of all species in the UAE is needed in order to identify potential threats, diagnose causes of decline, and improve habitat management.

Environmental safeguards

- The data made available through the UAE National Red Lists should inform the performance standards and environmental safeguard policies of the country's private sector 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 fishermen and local communities.

Harmonisation of environmental policies

At both federal and emirate levels, environmental policy needs to be better integrated in policies and coordinated across sectors, such as the extractive industries, urban planning, energy, and agriculture, in order to avoid contradictory regulatory objectives and inconsistent financial initiatives. Without such coordination, species and ecosystems will continue to decline. Improved monitoring of the implementation and effectiveness of relevant environmental policies would identify gaps and deficiencies to be addressed.

Protected areas

- A full review of protected area coverage in the marine and terrestrial realms should be undertaken in order to ensure that the network encompasses the distributions of threatened species, areas of high species diversity, and key (threatened) habitats. This work could be informed by undertaking a KBA analysis of the data from the UAE National Red Lists, and ideally by additional assessments of, for example, invertebrate groups.
- Federal, emirate, and private protected areas should be better integrated in order to ensure connectivity and coverage of the protected area network within the UAE.
- Well-managed and well-governed protected and conserved areas in the country should be recognised through the application of the IUCN Green List of Protected and Conserved Areas standard.

Acknowledgements

Workshop participants

A very large number of experts have made their time and expertise available through the three assessment review workshops that were held under the UAE National Red List project.



Mammals and herpetofauna species (Dubai: 23 to 27 September 2018)

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Mammal assessments

The marine mammal assessments benefited greatly from comments and data from Robert Baldwin and Andrew Wilson ([Five Oceans Environmental Services LLC](#) and the [Fujairah Whale and Dolphin Research Project](#)).

Herpetofauna assessments

The terrestrial herpetofauna assessments benefited greatly from comments and data from Salvador Carranza (Institute of Evolutionary Biology, Spain), Andrew Gardner (University of Western Australia), and Pritpal Soorae (Environment Agency – Abu Dhabi), who also participated in the Assessment Workshop, and from Bernat Burriel–Carranza and Junid Nazeer. Philip Bowles ([IUCN SSC Amphibian Specialist Group](#), IUCN SSC Snake and Lizard Red List Authority, IUCN Global Species Programme) and Peter Uetz ([The Reptile Database](#)) contributed to discussions of taxonomic concepts and distributions.

Nicholas Pilcher and Alan Rees ([IUCN SSC Marine Turtle Specialist Group](#)) provided extensive comments and additional data on marine turtle assessments. The sea snake taxonomy, species selection, and assessments were informed by draft global IUCN Red List assessments in preparation by members of the IUCN [SSC Sea Snake Specialist Group](#).

Bird assessments

The assessments were undertaken in close collaboration with the Emirates Bird Records Committee (EBRC), whose willingness to share records from their extensive database was essential, and thanks are due to all the birdwatchers, both UAE residents and visitors, who have submitted records to the EBRC down the years, and supplied the data that underpinned this National Red List. We are particularly grateful to Colin Richardson and Tommy Pedersen (past and present UAE Bird Recorders), and to Oscar Campbell and Maxim Koshkin (for help with the initial data collation). Oscar Campbell, Colin Richardson, and Richard Porter also served as expert reviewers of the collated data. Salim Javed (Environment Agency – Abu Dhabi) and Wetlands International assisted with the provision of various unpublished data, including counts from the [International Waterbird Census](#).

Vascular plant assessments

Dr. David Aplin, former Senior Executive of the Sharjah Botanic Garden, contributed significantly throughout the assessment project. Dr. Aplin made available a list of UAE flora compiled by colleagues at the Sharjah Seed Bank and Herbarium (SSBH) that formed the basis of the species list used in this project, and coordinated and hosted a native plant working group that reviewed the origin of plant species in the UAE. Dr. Aplin also made his own data available that informed many assessments, and many of his photographs are used in the report. Gary Feulner (independent consultant and Chairman, Dubai Natural History Group) contributed his extensive and unique knowledge and long experience to this Red List, greatly informing the assessments of the many mountain species especially, and undertook extensive post-workshop review and revision of the Data Deficient mountain species assessment. A large number of experts have contributed, bringing to this Red List irreplaceable field data and knowledge: Dr. Gary Brown (independent consultant), Dr. Marina Tsaliki (Plant Conservation and Research Specialist, Landscape Agency, Government of Ras Al Khaimah), Dr. Shahina A. Ghazanfar (Honorary Research Associate, Royal Botanic Gardens Kew), Sabitha Sakkir (Assistant Scientist – Flora, Terrestrial and Marine Biodiversity, Environment Agency – Abu Dhabi), Dr. Benno Böer, and others.

The following botanists participated in the native plant working group held at the Sharjah Research Academy in May 2019: Gary Feulner (Independent Consultant); Sabitha Sakkir (Environment Agency – Abu Dhabi); Ali El–Keblawy (Department of Applied Biology, University of Sharjah); Mohamed Shahid (International Centre for Biosaline Agriculture); Marina Tsaliki (Landscape Agency, Government of Ras Al Khaimah); Hassina Ali, Maitha Al Mheiri, and Muna Al Shamsi (MOCCA); Tamer Mahmoud, Hatem Shabana, and Sanjay Gairola (SSBH).

Botanists at SSBH (Dr. Sanjay Gairola, Dr. Hatem Shabana, and Tamer Mahmoud) also contributed to the native plant working group, made plant data records available that significantly improved distribution maps and assessments, and contributed to assessments at all stages.

Dr. Shahina A. Ghazanfar provided inputs at all stages of the Red List preparation, including invaluable comments and data on the taxonomic identity and status of species. Dr. Alan Forrest (Centre for Middle Eastern Plants – CMEP, Royal Botanic Garden Edinburgh) very kindly shared an early draft of the CMEP checklist for the UAE, and commented on nomenclature, taxonomy, and distributions of plant species.

The UAE National Red List of Plants could not have been produced without reference to the 2003 book *The Comprehensive Guide to the Wild Flowers of the United Arab Emirates*, the work of Marijcke Jongbloed and co-authors Gary Feulner, Benno Böer, and Rob Western.

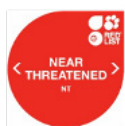


Case Studies

Vascular plants

Grey Mangrove; *Avicennia marina*

UAE Red List status:



1996 status:



Global Red List status:



Where is it found in UAE?: This species occurs in coastal areas, including off-shore islands.

What threats does it face?: Coastal development, and harvesting of individuals.

What are the proposed actions?: Site protection and monitoring. There has been a government programme in place since 1988 to help to restore mangrove vegetation, and the area of mangroves in UAE has increased in recent years.



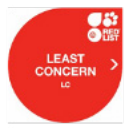
Photo © Dave Aplin

Ghaf; *Prosopis cineraria*

UAE Red List status:



1996 status:



Global Red List status: Not Assessed

Where is it found in UAE?: This species occurs on sand plains and dunes of the northern Emirates, and occasionally in wadis of the Hajar Mountains.

What threats does it face?: Development, overgrazing and a reduction in the amount of available water.

What are the proposed actions?: This is the national tree of UAE. Research into its demographics may be beneficial.



Photo © Dave Aplin

Stipagrostis foexiana

UAE Red List status:



1996 status:



Global Red List status: Not Assessed

Where is it found in UAE?: This species is recorded from Jebel Faya and Qarn Nazwa

What threats does it face?: Potentially grazing by livestock could impact this species.

What are the proposed actions?: Research is needed to better understand the species' status in UAE.

Marine

Acropora arabensis

UAE Red List status:



Global Red List status:



Where is it found in UAE?: This species is known from reefs from both coasts.

What threats does it face?: It faces a large number of threats, particularly from climate change, coastal development, disease and predation by the crown-of-thorns starfish (*Acanthaster planci*).

What are the proposed actions?: Expansion and establishment of new Marine Protected Areas; *ex-situ* conservation; research and monitoring; and *in-situ* species management (e.g. disease/parasite/pathogen control).

Giant Devilray; *Mobula mobular*; شيطان البحر العملاق

UAE Red List status:



Global Red List status:



Photo © Fabrizio Serena

Where is it found in UAE?: It occurs throughout UAE waters.

What threats does it face?: Threats within the UAE itself are unknown, but it may be caught in bycatch and targeted elsewhere.

What are the proposed actions?: There is a ban on fishing for this species in UAE waters. Research and monitoring will be useful, in addition to collaboration between countries to provide effective conservation throughout the region.

Orange-spotted Grouper; *Epinephelus coioides*

UAE Red List status:



Global Red List status:



Where is it found in UAE?: It occurs throughout UAE waters.

What threats does it face?: Overfishing, degradation of estuaries by coastal development and pollution.

What are the proposed actions?: Reducing fishing effort, changing fishing gear and introducing juvenile escape panels in demersal trap fisheries. There has also been a suggestion for *ex-situ* breeding efforts – either to release into the wild, or to go to market and thus reduce pressures on the wild population.

Mammals

Arabian Oryx; *Oryx leucoryx*; Al Maha

UAE Red List status:



1996 status:



Global Red List status:



Where is it found in UAE?: The Oryx has been reintroduced to the Arabian Oryx Sanctuary, Marmoom Reserve and the Dubai Desert Conservation Reserve.

What threats does it face?: Populations are fragmented and many areas of former habitat have been developed.

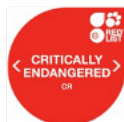
What are the proposed actions?: Monitoring the status, and further reintroductions.



Photo © Pridcilla van Andel

Caracal; *Caracal caracal*

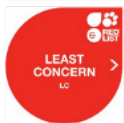
UAE Red List status:



1996 status:



Global Red List status:



Where is it found in UAE?: It was formerly widespread in the northern mountains, but sightings are becoming scarcer.

What threats does it face?: Development and generalised persecution of carnivores.

What are the proposed actions?: All mammals are protected by Law. Monitoring and research is needed.



Photo © Jean-Christophe Vié

Indo-Pacific Bottlenose Dolphin; *Tursiops aduncus*

UAE Red List status:



1996 status:



Global Red List status:



Photo © Gill Braulik

Where is it found in UAE?: It occurs across UAE waters in the Arabian Gulf and the Gulf of Oman.

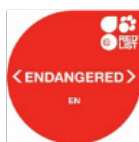
What threats does it face?: Fisheries (bycatch and depletion of prey), boat strikes, disturbance, pollution and development.

What are the proposed actions?: It is protected by Law. Research is underway, but for all cetaceans in UAE waters actions should include further research and monitoring, identification and protection of important areas, and interaction with fisheries and other sea traffic to minimise the impacts on species.

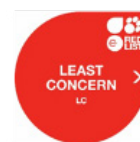
Birds

Chestnut-shouldered Bush-sparrow; *Gymnoris xanthocollis*; العصفور أصفر الحلق

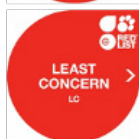
UAE Red List status:



1996 status:



Global Red List status:



Where is it found in UAE?: It is locally common in northern and eastern UAE as a breeding species, but will occur elsewhere during migration.

What threats does it face?: Key threats are land development and loss of woodland. This species is particularly associated with *Prosopis cineraria*, the national tree of UAE.

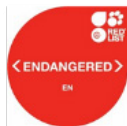
What are the proposed actions?: Protection of woodland and beneficial land management.

Red-billed Tropicbird; *Phaethon aethereus*; رئيس البحر

UAE Red List status:



1996 status:



Global Red List status:



Photo © Oscar Campbell

Where is it found in UAE?: It occurs across the Arabian Gulf and Gulf of Oman, and breeds on offshore islands in the Arabian Gulf.

What threats does it face?: Invasive species such as rats and cats, and disturbance and habitat degradation from oil production.

What are the proposed actions?: The introduction of pest control, and monitoring of islands to make sure invasive species do not reach further sites.

Herpetofauna

Emirati Leaf-toed Gecko; *Asaccus caudivolvulus*; وزغة ورقية الأصابع من الامارات

UAE Red List status:



Global Red List status: New taxonomic concept under assessment



Photo © Johannes Els

Where is it found in UAE?: It has been reported only at two localities (one in Sharjah and the other in Fujairah) along a narrow strip of the east coast, but it has not been recorded at the Sharjah site since 1973.

What threats does it face?: Coastal development and oil pollution.

What are the proposed actions?: Site preservation and searches for the species, particularly in the area of the Sharjah locality to confirm whether it persists there or not.

Annulated Sea Snake; *Hydrophis cyanocinctus*; الأفعى البحرية المحلقة

UAE Red List status:



Global Red List status:

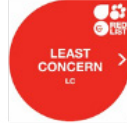


Photo © Harold K. Voris

Where is it found in UAE?: This species occurs in UAE waters in the Arabian Gulf and the Gulf of Oman.

What threats does it face?: Development, pollution and entanglement in marine litter.

What are the proposed actions?: Research is needed, and is underway, to give a clearer view on its distribution, population size and ecology; and thus give a clearer national Red List status.

References

- Abelson, A. 2019. Are we sacrificing the future of coral reefs on the altar of the “climate change” narrative? *ICES Journal of Marine Science* 77(1):40–45. <https://doi.org/10.1093/icesjms/fsz226>
- Akçakaya, H.R., Bennett, E.L., Brooks, T.M., Grace, M.K., Heath, A., Hedges, S., Hilton–Taylor, C., Hoffmann, M., Keith, D.A., Long, B., Mallon, D.P., Meijaard, E., Milner–Gulland, E.J., Rodrigues, A.S.L., Rodriguez, J.P., Stephenson, P.J., Stuart, S.N. and Young, R.P. 2018. Quantifying species recovery and conservation success to develop an IUCN Green List of Species. *Conservation Biology* 32(5): 1128–1138. <https://doi.org/10.1111/cobi.13112>
- AGEDI. 2013a. *Systematic Conservation Planning Assessments and Spatial Prioritizations for the Emirate of Abu Dhabi, the United Arab Emirates and the Arabian Peninsula*. Local, National and Regional Climate Change Programme. Abu Dhabi, UAE: Abu Dhabi Global Environmental Data Initiative (AGEDI).
- AGEDI. 2013b. *Systematic Conservation Planning Assessments and Spatial Prioritizations for the Emirate of Abu Dhabi, the United Arab Emirates and the Arabian Peninsula*. Supporting Technical Information for the United Arab Emirates. Local, National and Regional Climate Change Programme. Abu Dhabi, UAE: Abu Dhabi Global Environmental Data Initiative (AGEDI).
- AGEDI. 2015a. *Technical Report: Regional Marine Biodiversity Vulnerability and Climate Change*. LNRCCP. CCRG/UBC/ Changing Ocean Research Unit/Sea Around Us. Abu Dhabi, UAE: Abu Dhabi Global Environmental Data Initiative (AGEDI).
- AGEDI. 2015b. *Executive Summary: Regional Terrestrial Biodiversity and Climate Change*. Local, National and Regional Climate Change Programme. Abu Dhabi, UAE: Abu Dhabi Global Environmental Data Initiative (AGEDI).
- AGEDI. 2015c. *Regional Climate Change: Atmospheric Modelling*. Abu Dhabi, UAE: Climate Change Programme, Abu Dhabi Global Environmental Data Initiative (AGEDI).
- BirdLife. 2018. *Declaration of the Global Flyways Summit. A Summit for the Flyways*. April 23rd – 26th 2018, Abu Dhabi, United Arab Emirates. Cambridge UK: BirdLife International, and Abu Dhabi, UAE: Ministry of Climate Change and the Environment.
- Buchanan, J.R., Krupp, F., Burt, J.A., Feary, D.A., Ralph, G.M. and Carpenter, K.E. 2016. Living on the edge: Vulnerability of coral–dependent fishes in the Gulf. *Marine Pollution Bulletin* 105(2):480–488. <https://doi.org/10.1016/j.marpolbul.2015.11.033>
- Burfield, I.J., Westrip, J., Sheldon, R.D., Hermes, C., Wheatley, H., Smith, D., Harding, K.A. and Allen, D.J. 2021. *UAE National Red List of Birds*. Ministry of Climate Change and Environment, Dubai, United Arab Emirates.
- Burt, J.A. 2014. The environmental costs of coastal urbanization in the Arabian Gulf. *City* 18(6):760–770. <https://doi.org/10.1080/13604813.2014.962889>
- Burt, J.A., Paparella, F., Al–Mansoori, N., Al–Mansoori, A. and Al–Jailani, H. 2019. Causes and consequences of the 2017 coral bleaching event in the southern Persian/Arabian Gulf. *Coral Reefs* 38:567–589. <https://doi.org/10.1007/s00338-019-01767-y>
- Butchart, S.H.M., Akçakaya, H.R., Chanson, J., Baillie, J.E.M., Collen, B., Quader, S., Turner, W.R., Amin, R., Stuart, S.N. and Hilton–Taylor, C. 2007. Improvements to the Red List Index. *PLoS ONE* 2:e140. <https://doi.org/10.1371/journal.pone.0000140>
- Butchart, S.H.M., Stattersfield, A.J., Baillie, J., Bennun, L.A., Stuart, S.N., Akçakaya, H.R., Hilton–Taylor, C. and Mace, G.M. 2005. Using Red List Indices to measure progress towards the 2010 target and beyond. *Philosophical Transactions of the Royal Society B* 360:255–268. <https://doi.org/10.1098/rstb.2004.1583>

- Butchart, S.H.M., Stattersfield, A.J., Bennun, L.A., Shutes, S.M., Akçakaya, H.R., Baillie, J.E.M., Stuart, S.N., Hilton-Taylor, C. and Mace, G.M. 2004. Measuring global trends in the status of biodiversity: Red List indices for birds. *PLoS Biology* 2:e383. <https://doi.org/10.1371/journal.pbio.0020383>
- Buzás, B., Farkas, B., Gulyás, E. and Géczy, Cs. 2018. The sea snakes (Elapidae: Hydrophiinae) of Fujairah. *Tribulus* 26:4–34.
- Chaber, A.–L., Combreu, O., Perkins, M. and Cunningham, A. 2016. Preliminary surveys fail to detect *Batrachochytrium dendrobatidis* infection in the United Arab Emirates and Oman. *Herpetological Review* 47(3):403–404.
- EAD. 2018. *Annual Report: Status of Rare and Threatened Plants of Jebel Hafit*. Abu Dhabi, UAE: Environment Agency Abu Dhabi.
- Els, J., Allen, D.J., Hilton-Taylor, C. and Harding, K.A. 2019. *UAE National Red List of Herpetofauna: amphibians and terrestrial reptiles, sea snakes and marine turtles*. Ministry of Climate Change and Environment, Dubai, United Arab Emirates.
- FAO. 2020. *FAOSTAT* Food and agriculture data. Rome, Italy: Statistics Division, Food and Agriculture Organization of the United Nations.
- Feulner, G.R. 2005. Geological overview. In: P. Hellyer and S. Aspinall (eds), *The Emirates – a natural history*, pp. 41–64. Abu Dhabi, UAE: Environment Agency – Abu Dhabi.
- Feulner, G.R. 2011. The Flora of the Ru'us al-Jibal – the Mountains of the Musandam Peninsula: An Annotated Checklist and Selected Observations. *Tribulus* 19:4–153.
- Feulner, G.R. 2014. The Olive Highlands: a unique “island” of biodiversity within the Hajar Mountains of the United Arab Emirates. *Tribulus* 22:9–34.
- Feulner, G.R. 2016. The Flora of Wadi Wurayah National Park, Fujairah, United Arab Emirates: An annotated checklist and selected observations on the flora of an extensive ultrabasic bedrock environment in the northern Hajar Mountains. *Tribulus* 24:4–84.
- Fitzpatrick, M., Pradhan, K. and Lisk, M. 2015. *Technical Report: Regional Terrestrial Biodiversity and Climate Change*. LNRCCP. CCRG/University of Maryland – Centre for Environmental Science. Report for AGEDI. Abu Dhabi, UAE: Abu Dhabi Global Environmental Data Initiative (AGEDI).
- Flanders Marine Institute. 2014. *Union of the ESRI Country shapefile and the Exclusive Economic Zones* (version 2). Available online at <http://www.marineregions.org/>. Consulted on 2018–10–18.
- Géczy, Cs., Buzás, B., Gulyás, E., De Vargas, A. and Gál, J. 2017. *Preliminary results of the surveillance of physiologic values of sea snakes in the Gulf of Oman*. AEMV and ARAV Conference. 2017.IX.28. Dallas, TX, USA.
- Hussein, K., Alkaabi, K., Ghebreyesus, D., Liaqat, M.U. and Sharif, H.O. 2020. Land use/land cover change along the Eastern Coast of the UAE and its impact on flooding risk. *Geomatics, Natural Hazards and Risk* 11(1):112–130. <https://doi.org/10.1080/19475705.2019.1707718>
- IUCN. 2012a. *IUCN Red List categories and criteria: Version 3.1*. Second edition. Gland, Switzerland and Cambridge, UK: IUCN.
- IUCN 2012b. *Guidelines for application of IUCN Red List criteria at regional and national levels*. Version 4.0. Gland, Switzerland and Cambridge, UK: IUCN.
- IUCN. 2016. ‘Guidelines for reporting on proportion Threatened. Version 1.1 (October 2016)’. In (Annex I): *Guidelines for appropriate uses of IUCN Red List data. Version 3.0 (October 2016)*. Gland, Switzerland and Cambridge, UK: IUCN.
- Izumi, C., Al-Thani, J., Yigiterhan, O., Al-Ansari, I.S., Vethamony, P., Sorino, C.F., Anderson, D.A. and Murray, J.W. 2020. Ocean Acidification and Carbonate System Geochemistry in the Arabian Gulf. ePoster. Fall Meeting 2020, San Francisco 7 – 11 December 2020, *Advancing Earth and Space Sciences*.

- Jabado, R.W., Al Baharna, R.A., Al Ali, S.R., Al Suwaidi, K.O., Al Blooshi, A.Y. and Al Dhaheri, S.S. 2017. Is this the last stand of the Critically Endangered green sawfish *Pristis zijsron* in the Arabian Gulf? *Endangered Species Research* 32:265–275. <https://doi.org/10.3354/esr00805>
- Jongbloed, M.V.D., Feulner, G.R., Böer, B. and Western, A.R. 2003. *The Comprehensive Guide to the Wild Flowers of the United Arab Emirates*. Abu Dhabi, UAE: Environmental Research and Wildlife Development Agency.
- Lau, W. and To, R. 2019. *State of Wildlife Trade in Macau*. Cambridge, UK: TRAFFIC.
- Mallon, D.J., Hilton–Taylor, C., Allen, D.J. and Harding, K.A. 2019. *UAE National Red List of Mammals: marine and terrestrial*. Ministry of Climate Change and Environment, Dubai, United Arab Emirates.
- MoCCaE. 2018. *Status of Important Bird Areas (IBAs) in the UAE*. Ministry of Climate Change and the Environment, Dubai, United Arab Emirates.
- Noori, R., Tian, F., Berndtsson, R., Abbasi, M.R., Naseh, M.V., Modabberi, A., Soltani, A. and Kløve, B. 2019. Recent and future trends in sea surface temperature across the Persian Gulf and Gulf of Oman. *PLoS One* 14(2):e0212790. <https://doi.org/10.1371/journal.pone.0212790>
- Okes, N. and Sant, G. 2019. *An Overview of Major Shark Traders, Catchers and Species*. Cambridge, UK: TRAFFIC.
- Paparella, F., Xu, C., Vaughan, G.O. and Burt, J.A. 2019. Coral bleaching in the Persian/Arabian Gulf is modulated by summer winds. *Frontiers in Marine Science* 6:205. <https://doi.org/10.3389/fmars.2019.00205>
- Riegl, B.M., Purkis, S.J., Al–Cibahy, A.S., Abdel–Moati, M.A. and Hoegh–Guldberg, O. 2011. Present limits to heat–adaptability in corals and population–level responses to climate extremes. *PLoS One* 6:e24802. <https://doi.org/10.1371/journal.pone.0024802>
- Salafsky, N., Salzer, D.W., Stattersfield, A.J., Hilton–Taylor, C., Neugarten, R.A., Butchart, S.H., Collen, B., Cox, N.R., Master, L.L., O'Connor, S.M. and Wilkie, D.S. 2008. A standard lexicon for biodiversity conservation: unified classifications of threats and actions. *Conservation Biology* 22(4): 897–911. <https://doi.org/10.1111/j.1523-1739.2008.00937.x>
- Shea, K.H. and To, A.W.L. 2017. From boat to bowl: Patterns and dynamics of shark fin trade in Hong Kong — implications for monitoring and management. *Marine Policy* 81:330–339. <https://doi.org/10.1016/j.marpol.2017.04.016>
- Soorae, P., Mohamed, A.A., Els, J., O'Donovan, D., Pedro, V. Jr., Alzahlawi, N., Jones, B.W. and Molur, S. 2018. *Wonder Gecko Conservation Action Plan*. December 2017 Workshop Report. Environment Agency Abu Dhabi and Conservation Planning Specialist Group.
- Soorae, P.S., Abdessalaam, T.A., Tourenq, C., Shuriqi, M.K. and Mehairbi, M.A. 2012. Preliminary analyses suggest absence of the amphibian chytrid fungus in native and exotic amphibians of the United Arab Emirates. *Salamandra* 48(3):173–176.
- UAE. 2019. Government.ae. [The Official Portal of the UAE Government](https://www.gov.ae). Open Data Portal of the UAE Government, Federal Competitiveness and Statistics Authority (FCSA). Accessed: 15 January 2019.
- Uddin, S., Gevao, B., Al–Ghadban, A.N., Manickam, N. and Al–Shamroukh, D. 2012. Acidification in Arabian Gulf – Insights from pH and temperature measurements. *Journal of Environmental Monitoring* 14:1479–1482. 10.1039/c2em10867d. <https://doi.org/10.1039/C2EM10867D>
- Wabnitz, C.C.C., Lam, V.W.Y., Reygondeau, G., Teh, L.C.L., Al–Abdulrazzak, D., Khalfallah, M., et al. 2018. Climate change impacts on marine biodiversity, fisheries and society in the Arabian Gulf. *PLoS One* 13(5):e0194537. <https://doi.org/10.1371/journal.pone.0194537>
- Wang, Z., Dimarco, S., Jochens, A. and Ingle, S. 2013. High salinity events in the northern Arabian Sea and Sea of Oman. *Deep Sea Research Part I: Oceanographic Research Papers* 74:14–24. <https://doi.org/10.1016/j.dsr.2012.12.004>
- World Bank. 2018. *World Development Indicators*. UAE country indicators. Downloaded: 15 January 2019. <https://data.worldbank.org/country/united-arab-emirates>

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