



UNITED ARAB EMIRATES
MINISTRY OF CLIMATE CHANGE
& ENVIRONMENT

UAE National Red List of Herpetofauna:

Amphibians & Terrestrial Reptiles, Sea Snakes &
Marine Turtles

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UAE National Red List of Herpetofauna:

**Amphibians & Terrestrial Reptiles, Sea
Snakes & Marine Turtles**

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A report to the Ministry of Climate Change and
Environment, United Arab Emirates

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Executive Summary

The United Arab Emirates comprises diverse desert, mountain and marine habitats. Seventy-six species of herpetofauna have been recorded for the UEA, including three terrestrial reptiles (*Indotyphlops braminus*, *Hemidactylus flaviviridis*, *Chalcides ocellatus* ssp. *ocellatus*) that have been introduced and one sea snake (*Hydrophis viperinus*) whose presence in UAE waters requires confirmation. Among the 72 confirmed species and subspecies present within the UAE, one terrestrial species is endemic to the UAE (*Asaccus caudivolvulus*), 13 species are endemic to the Hajar Mountain range (shared with Oman), and there are 20 species that are endemic to the Arabian Peninsula. The conservation status of these species was assessed at the National Red List of Endangered Species Workshop, held in Dubai, 23rd - 27th September 2018, through the application of The IUCN Red List Categories and Criteria at the national scale. Distribution maps were compiled for all of the species. The full dataset, including maps, are available on MoCCaE website

Of the 72 species of herpetofauna considered native to the UAE, three species (4.2%) were assessed as Critically Endangered, nine species (12.5%) as Vulnerable, one species (1.4%) as Near Threatened, 50 species (69.4%) as Least Concern, and nine species (12.5%) as Data Deficient. Four species were considered Not Applicable (three terrestrial reptiles and one sea snake). Habitat loss and degradation remains the overriding threat to terrestrial herpetofauna within the UAE, particularly the conversion of land to urban areas. Oil spills in the Arabian Gulf and the Gulf of Oman are one of the major threats to both sea snakes and marine turtles. Notably, 54 of the 72 species assessed are represented in protected areas. Of concern are the three threatened species (*Asaccus caudivolvulus*, *Platycephalus ventromaculatus* and *Pristurus carteri*) that are not known to occur within any protected areas. This dataset provides a valuable baseline to aid the conservation and development planning process within the

UAE. The two species of amphibians (*Duttaphrynus dhufarensis* and *Sclerophrys arabica*) present in the UAE are mainly restricted to the Hajar Mountains with no major threats and are assessed Least Concern. Overall, terrestrial reptile species richness is highest along the Hajar Mountains, Jebel Hafeet, and in the adjacent hilly gravel plains. Marine turtle species are evenly distributed throughout the UAE Exclusive Economic Zone (EEZ), but there is a lack of fine-scale movement and habitat use data for all the marine turtles found in the UAE to conclude accurate findings. The sea snake diversity appears to be the highest along the east coast of the UAE in the Gulf of Oman, although this might be due to sampling effort.

The Red List Index (RLI) score for the 2018 assessment of the herpetofauna of the UAE is 0.9172, where a score of 1 indicates that all species are Least Concern, and the lower the value the faster the set of species is heading toward extinction. This score indicates that the herpetofauna are much less threatened than the mammals of the UAE, which had a score of 0.6303 in a 2018 assessment (Mallon et al. 2019). However, the threatened species require continued conservation action to avoid a lower RLI score when the assessments are next repeated. Further research on the Data Deficient species is also required so that their risk of extinction can be better estimated.



The Critically Endangered Emirati Leaf-toed Gecko *Asaccus caudivolvulus* is the only species of herpetofauna that is endemic to the UAE
Credit: Johannes Els

1. Introduction

1.1 The United Arab Emirates context

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. It lies between 22°30' and 26°10'N and 51° and 56°25'E. It shares land borders with Oman and Saudi Arabia; and has coastlines bordering the Arabian Gulf and the Gulf of Oman. The land area is approximately 71,024 km² including some islands in the Arabian Gulf (UAE 2019). The UEA has a marine Exclusive Economic Zone area of 52,580 km². The UAE's total population (nationals and expatriate residents) was 9,304,277 in 2017, as compared to 9,121,167 in 2016, with the population showing significant growth in recent years (Figure 1).

The Hajar Mountains run north-south along the east of the UAE, rising to

almost 2,000 m above sea level. They are composed of steep rocky peaks, slopes and deeply incised wadis. The rest of the country consists of low-lying desert habitats, including extensive sand sheets and dunes, alluvial and inter-dunal gravel plains, and coastal and inland sabkha (salt flats). 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 consist of irrigated farms, forest plantations and urban areas. Commercial, industrial, touristic and residential development has expanded greatly in the UAE during the past 30 years.

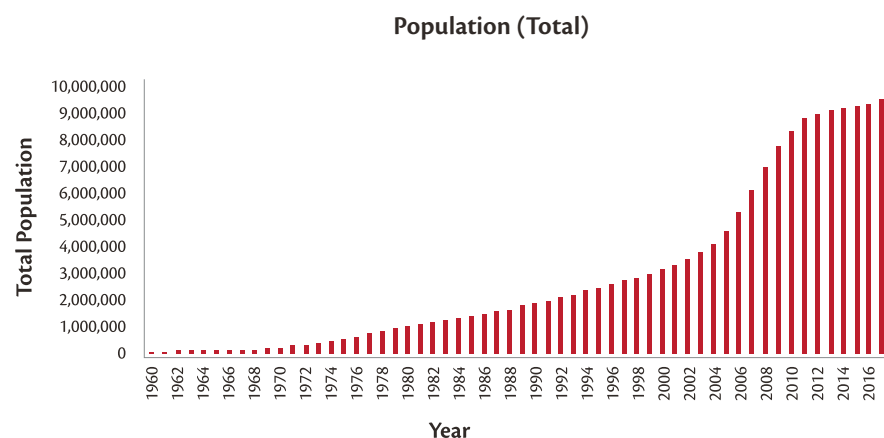
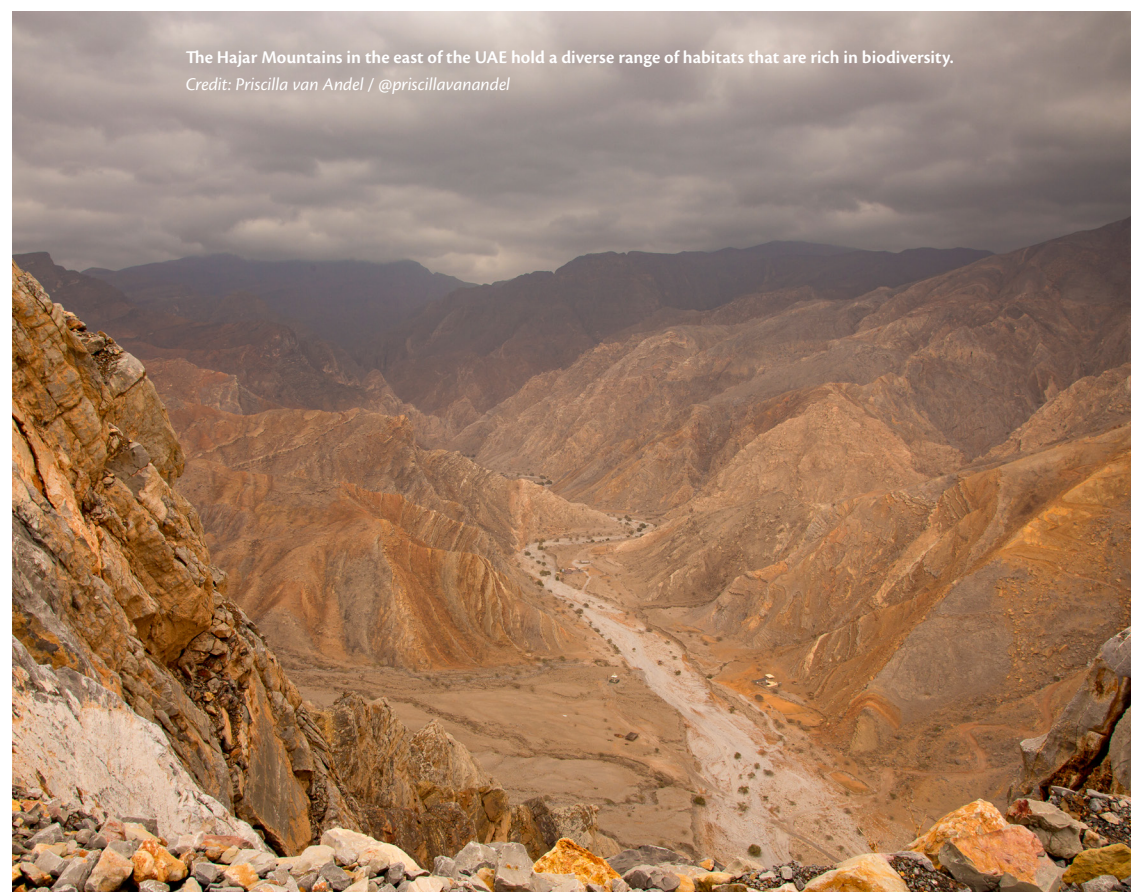


Figure 1: Total population of the UAE, 1960 to 2017.
(Source: World Bank. 2018. World Development Indicators, UAE)



The Arabian Gulf coastline extends for about 650 km and is mainly low-lying with some rocky headlands and numerous small offshore Islands. There are a range of sandy, sabkha and beach rock habitats, with areas of *Avicennia marina* mangrove. There are extensive seagrass beds in the subtidal zone and some coral reefs offshore. The coastal waters of the Arabian Gulf are relatively shallow. The east coast of the UAE, on the Gulf of Oman, is about 70 km in length and is rugged, with deep water lying much closer to the shore.



Mangroves and Siniya Island at Umm Al Quwain. Satellite tracking has found the waters around Siniya Island to be an important foraging ground for Hawksbill turtles.

Credit: Priscilla van Andel

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 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 Hajar Mountains. There is wide monthly and annual variation in rainfall (Figure 2).

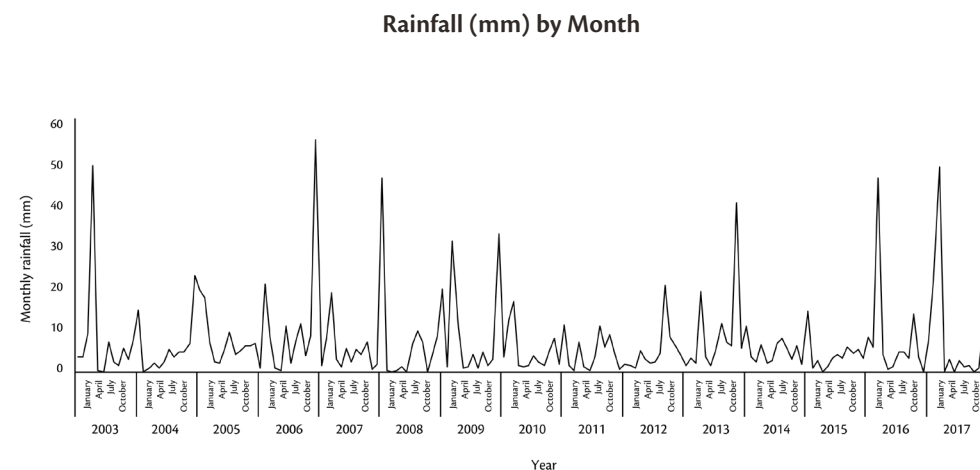


Figure 2: Monthly rainfall (mm), 2003 to 2017.
Source: UAE 2019. Open Data Portal of the UAE Government.

The UAE has a well-developed network of protected areas, with 43 protected areas recognised by local and Federal governments (Figure 3), as well as numerous private reserves.

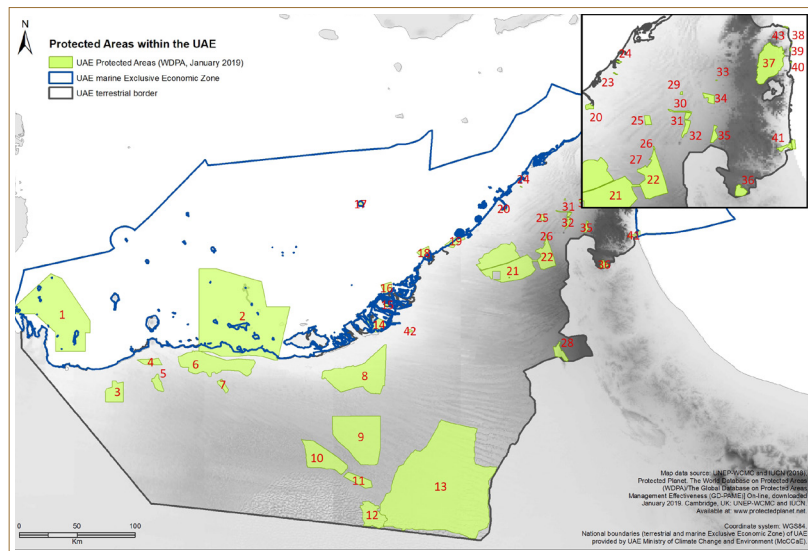


Figure 3: Protected areas within the UAE.

Source: IUCN and UNEP-WCMC. 2019. The World Database on Protected Areas.

No. Protected Area name

- 1 Al Yasat Protected Area (Marine)
- 2 Marawah UNESCO-MAB Biosphere Reserve (Marine)
- 3 Yaw Al Dibsa Protected Area (Terrestrial)
- 4 Barqat Al Soqour Protected Area (Terrestrial)
- 5 Bida'a Hazza' Protected Area (Terrestrial)
- 6 Al Houbara Protected Area (Terrestrial)
- 7 Al Tawi Protected Area (Terrestrial)
- 8 Al Marzoum (Al Ghadha) Protected Area (Terrestrial)
- 9 Bidaa Protected Area (Terrestrial)
- 10 Ramlah Protected Area (Terrestrial)
- 11 Dilmawya Protected Area (Terrestrial)
- 12 Qaser Al Sarab Protected Area (Terrestrial)
- 13 Arabian Oryx Protected Area (Terrestrial)
- 14 Bul Syayeeef Ramsar Site (Marine)
- 15 Eastern Mangrove Protected Area (Marine)
- 16 Al Saadyat Protected Area (Marine)
- 17 Jazirat Sir Bu Naair Ramsar Site (Marine)
- 18 Ras Ghanada Protected Area (Marine)
- 19 Jabal Ali Protected Area (Marine)
- 20 Ras Al Khor Ramsar Site (Marine)
- 21 Al Marmoun Desert Protected Area (Terrestrial)
- 22 Dubai Desert Conservation Reserve (Al Maha) Protected Area (Terrestrial)

No. Protected Area name

- 23 Wasit Protected Area (Terrestrial)
- 24 Al Zorah Protected Area (Marine)
- 25 Al Wohoosh Desert Protected Area (Terrestrial)
- 26 Nazwa Mountain Protected Area (Terrestrial)
- 27 Al Ghaf of Nazwa Protected Area (Terrestrial)
- 28 Jebel Hafeet Protected Area (Terrestrial)
- 29 Ed-dhelaimah Protected Area (Terrestrial)
- 30 Hezaam Ghabat Elmentether Protected Area (Terrestrial)
- 31 Meleihah Protected Area (Terrestrial)
- 32 Elfaya Protected Area (Terrestrial)
- 33 Al Naseem Protected Area (Terrestrial)
- 34 Elebriddi Protected Area (Terrestrial)
- 35 Lemdynah Protected Area Protected Area (Terrestrial)
- 36 Hatta Protected Area (Terrestrial)
- 37 Wadi Wurayah Ramsar Site (Terrestrial)
- 38 Dhadna Protected Area (Marine)
- 39 Al Aqqa Protected Area (Marine)
- 40 Al Bidiya Protected Area (Marine)
- 41 Alqurm Wa Lehfeiyah (Marine and Terrestrial)
- 42 Al Wathba Ramsar Site (Terrestrial)
- 43 Birds Island (Jazaraat Al Tuyur) Protected Area (Marine)



The Al Qurm Protected Area at Khor Kalba on the east coast of the UAE.

Credit: John Pereira

1.2 Amphibians

The amphibian diversity within the UAE is restricted to two native species of the family Bufonidae, which include the genera *Sclerophrys* and *Duttaphrynus* (Soorae et al. 2013). The two species, the *Sclerophrys arabica* and *Duttaphrynus dhufarensis*, depend on seasonal rainfall and surface water for reproduction, thus making the species vulnerable to overutilisation of freshwater resources and, potentially, climate change.

1.3 Terrestrial reptiles

The UAE has 60 species of terrestrial reptiles recorded to date within its territory, including the offshore islands (Burriel-Carranza et al. submitted). The 60 species of terrestrial reptiles in the UAE consist of one species that is endemic to the UAE (*Asaccus caudivolvulus*), 13 species that are endemic to the Hajar Mountain range (shared with Oman) of the southeastern Arabian Peninsula, 20 species that are endemic to the Arabian Peninsula and three species introduced to the UAE.

The highest species diversity is within the geckos, which comprises 21 species from three families. The family Gekkonidae include the genera *Bunopus* (one species), *Cyrtopodion* (one species), *Hemidactylus* (three species), *Pseudoceramodactylus* (one species), *Stenodactylus* (three species), and *Trachydactylus* (one species). The family Phyllodactylidae are significant in view of

its higher levels of endemism to the Hajar Mountains of the Arabian Peninsula, which includes the genera *Asaccus* (four species) and *Ptyodactylus* (two species). The family Sphaerodactylidae includes the genera *Pristurus* (four species) and *Teratoscincus* (one species, *Teratoscincus keyserlingii*), with the Arabian Peninsula distribution of the latter genera is restricted to the UAE.



The Eastern Sand Gecko *Stenodactylus leptocosymbotes* (LC) is widespread in eastern parts of the UAE.

Credit: Johannes Els

The lacertids, or true lizards, are from a single family (Lacertidae) that includes ten species from three genera; *Acanthodactylus* (six species), *Mesalina* (two species) and *Omanosaura* (two species). The family Agamidae includes four genera with six species; *Phrynocephalus* (two species), *Pseudotrapelus* (one species), *Trapelus* (one species) and *Uromastix* (two subspecies). The skinks, family Scincidae, include five genera with six species: *Ablepharus* (one species), *Chalcides* (one species), *Heremites* (one species), *Scincus* (two species) and *Trachylepis* (one species). The least diverse families in the UAE are the Varanidae and Trogonophidae, with one species each.

The terrestrial snakes in the UAE are represented by 13 species from six families. The most diverse family is the Colubridae which include the genera *Lytrochilus* (one species), *Platycephalus* (two species), *Spalerosophis* (one species) and *Telescopus* (one species). The Viperidae consist of the genera *Cerastes* and *Pseudocerastes* that have one species each; and with *Echis* (two species). The Psammophidae include one species from each of the genera *Psammophis* and *Rhagerhis*. The families Boidae, Leptotyphlopidae and Typhlopidae consist of one species each from the genera *Eryx*, *Myriopholis* and *Indotyphlops*.

1.4 Marine reptiles

The marine herpetofauna encompasses the sea snakes and the marine turtles.

Sea snakes represent one of two elapid (Family: Elapidae) lineages that have evolved to survive in marine environments. The UAE has eight confirmed species of 'true' sea snakes from the family Elapidae in the monophyletic genus *Hydrophis*, with one further species, *Hydrophis viperinus*, requiring further investigation to confirm its presence within the UAE EEZ. Three of the sea snake species are abundant and five are rarely encountered – limited data is therefore available on these species within the UAE EEZ.

The Green Turtle (VU) is one of two turtle species known to breed within the UAE.

Credit: Warren Baverstock



Globally, seven species of sea turtle are known, of which five have been recorded within the UAE EEZ and consist of two families Cheloniidae (four species) and Dermochelyidae (one species). Only two species are known to nest within the UAE, and these are *Eretmochelys imbricata* and *Chelonia mydas*. One pelagic species, *Dermochelys coriacea* is a rare and an infrequent visitor to the Arabian Gulf and Gulf of Oman, with no specimens recorded alive within the UAE EEZ.

1.5 Assessment of species extinction risk

The conservation status of plants, animals and fungi is one of the most widely used indicators for assessing the condition of ecosystems and their biodiversity. Conservation status assessments are intended to be policy-relevant and can be used to inform conservation planning and priority setting processes. However, they are not intended to be policy-prescriptive and are not in themselves a system for setting biodiversity conservation priorities.



A workshop on herpetofauna

The IUCN Red List Categories and Criteria (IUCN 2012a) 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 provides information on taxonomy, distribution, ecology, threats and conservation status of taxa that have been evaluated using the IUCN Categories and Criteria.

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. There are nine categories, with species classified as Vulnerable (VU), Endangered (EN) or Critically Endangered (CR) considered as “threatened”. When conducting regional or national assessments, as in this UAE National Red List, the IUCN Red List Regional Guidelines (IUCN 2012b) are applied and two additional categories are used: Regionally Extinct (RE), and Not Applicable (NA) (Figure 4). The Regionally Extinct category is used in the context of the scope of the assessment project, and so throughout this report RE refers to a species that is extinct within the UAE but persists elsewhere in the wild across its global distribution. As the extinction risk of a species can be assessed at global, regional (for example, the Arabian Peninsula) or national levels, a taxon may have a different Red List category in the global Red List than in the sub-global Red List. For example, a species that is common worldwide and classed as Least Concern (LC) in the global Red List could face a high level of threat in the UAE and therefore be listed as threatened in the UAE National Red List. Logically, if any species were endemic to the UAE, it should have the same category at the national and global levels, as it is not present anywhere else in the world.

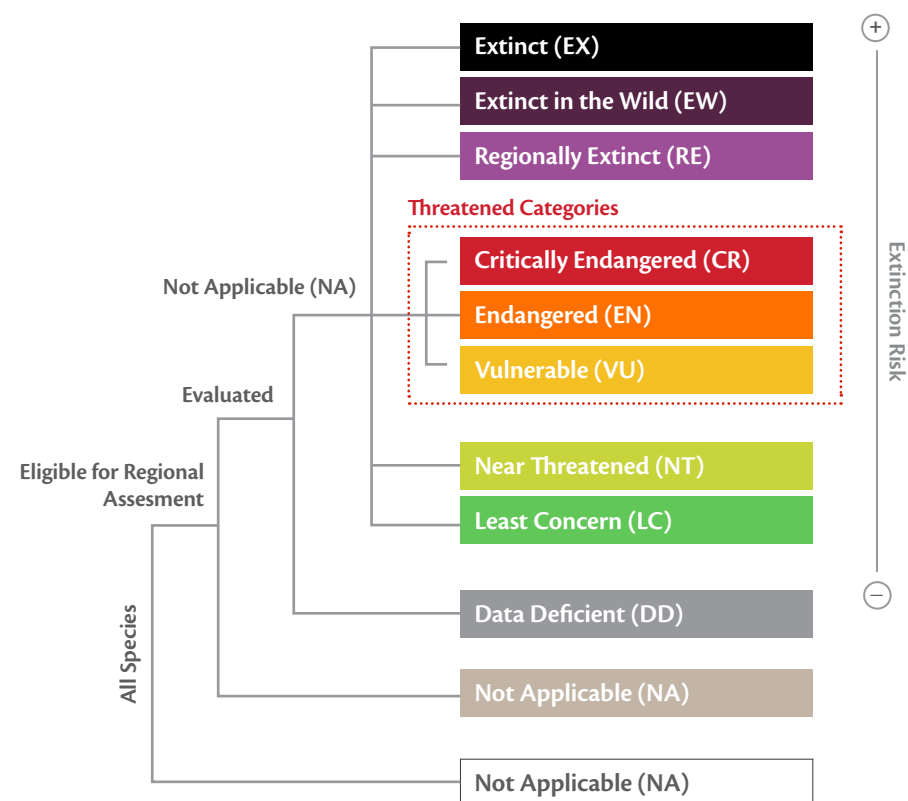


Figure 4: The IUCN Red List Categories at the regional scale which includes two additional categories to the global Categories; Regionally Extinct (the species no longer occurs in the wild in the UAE), and Not Applicable (the species is not considered to be native to the UAE).

1.6 Objectives of the UAE National Red List of Herpetofauna

The UAE National Red List of Herpetofauna has four main objectives:

- to contribute to national conservation planning through the provision of a baseline dataset reporting the conservation status of native herpetofauna species;
- to identify those priority geographic areas and habitats needing to be conserved to prevent extinctions and to ensure that UAE herpetofauna species reach and maintain a favourable conservation status;
- to identify the major current and future threats and to propose potential mitigating measures and conservation actions to address them;
- to bring together and strengthen the network of experts focused on herpetofauna conservation in the UAE, so that research can be undertaken to address the lack of information that results in Data Deficient species, and expertise can be targeted to address the highest conservation priorities.
- To produce a Red List Index datapoint for the UAE herpetofauna.

The data presented in this report provide a snapshot based on the knowledge available of the UAE national assessments at the time of production.

2. Assessment Methodology

2.1 Geographic scope

The geographical scope of the UAE National Red List are the terrestrial and marine (as defined by the EEZ) extents of the UAE (Figure 5). The EEZ excludes areas of disputed ownership. GIS spatial layers provided by MoCCaE were used to restrict the individual species distribution maps to the UAE and to undertake spatial analyses.

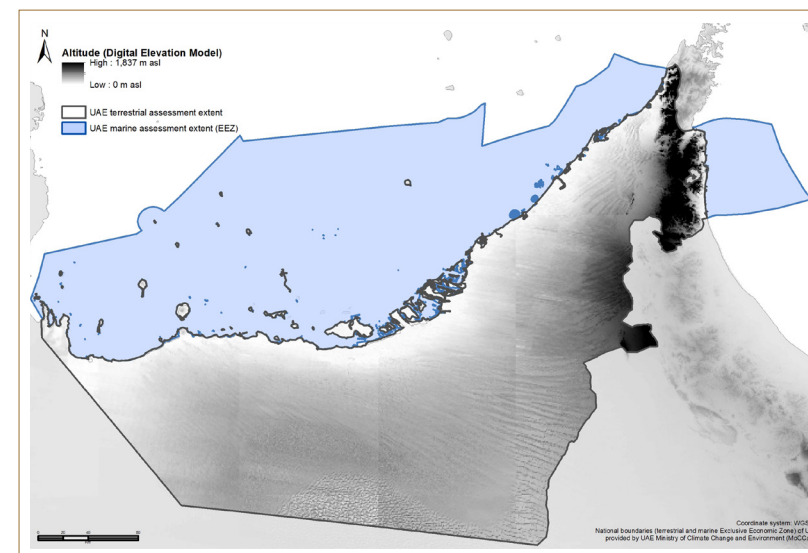


Figure 5: The geographical scope of the UAE national Red List assessment, showing the national terrestrial and marine (Exclusive Economic Zone, excluding disputed areas) extents. Source: MoCCaE

2.2 Taxonomic scope

The UAE National Red List of Herpetofauna has assessed the status of all marine and terrestrial herpetofauna species (or in a few cases, subspecies, where only one subspecies is present in the country) native to the UAE. For the terrestrial herpetofauna, the original list of taxa was compiled by J. Els based on personal knowledge and a range of sources, including Gardner (2013), Burriel-Carranza et al. (submitted), Soorae (2013) and Egan (2007). Amendments were made and the inclusion of newly described or modified taxa was undertaken following consultation with relevant experts either during the assessment workshop (see below) or through email correspondence. The list of species for the marine reptiles was produced through a search for occurrence in the UAE territory of the IUCN Red List website and revised following consultation with experts. All non-native species are excluded from the assessment.

2.3 Assessment protocol

For all assessments, the following data were compiled using IUCN's online database, the Species Information Service (SIS);

- Taxonomic classification and UAE-specific Taxonomic Notes.
- Geographic range within the UAE and, briefly, the global distribution of the species.
- Population information and overall population trend.
- Habitat preferences and primary ecological requirements, including pertinent biological information (e.g., generation length, maximum size and age, etc.), where available.
- Species use and trade.
- Major threats.
- Conservation measures (in place and needed).
- Other general information.
- National Red List Category and Criteria and Rationale.
- Key literature references.

The draft assessments for the terrestrial reptiles were compiled by J. Els using personal knowledge and a range of resources (cited as sources within individual assessments). Draft assessments of the marine taxa (sea snakes and marine turtles) were compiled by D. Allen based on existing draft and published global assessments, review of available literature, and in consultation with experts both within and outside the UAE.

Finalisation of assessments and distribution maps (see section 2.4 Species mapping, below) followed a three-stage process. First, the draft assessments and maps were submitted to MoCCaE in June-July 2018, who circulated them to national experts and returned edits and comments to IUCN. The main review occurred through a National Red List of Endangered Species Workshop, held in Dubai, 23rd - 27th September 2018. The workshop was hosted by MoCCaE and facilitated by IUCN staff. A large number of experts contributed their time and expertise during the workshop to review both the assessment maps and the draft

assessments, and to assign a final Red List category. Post-workshop editing was undertaken by IUCN staff, and a final stage of review and commenting was undertaken, with the drafts again circulated by MoCCaE to national experts, and resulting comments and data incorporated by IUCN. Consistency in the use of IUCN Criteria was checked by IUCN staff. The resulting finalised IUCN Red List assessments are a product of scientific consensus concerning species status and are supported by relevant literature and data sources.

2.4 Species distribution mapping

For the terrestrial herpetofauna, draft digital distribution maps were created in QGIS plugin "JoinSplit" by J. Els based on data presented in Burriel-Carranza et al. (submitted). The draft maps were then brought into ESRI ArcMap GIS and clipped to the terrestrial national boundary provided by the Ministry of Climate Change and Environment (MoCCaE). Draft maps first underwent review and editing during the Dubai assessment workshop in September 2018, and then a final stage of review after the workshop, before finalisation (clipping to the altitude range for each species were cited in the Red List assessment, and polygon smoothing) by D. Allen.

For the draft maps for the marine turtles and sea snakes, the global distribution map for each species was downloaded (in GIS shapefile format) from the IUCN Red List of Threatened Species website and clipped to the UAE marine boundary provided by MoCCaE.

Metadata coding was used to distinguish presence, origin, and seasonality across the spatial extent of a species' distribution in the UAE. These codes differentiate the species presence (species are recorded as extant, possibly extant or extinct); seasonal presence of the species in the location (the default setting of 'resident' was assigned); and the origin of the species (native, introduced, reintroduced or uncertain). The coding information can be found in the Red List digital distribution metadata guidance (IUCN 2018). Review and finalisation then followed the approach taken for the terrestrial herpetofauna maps.

In the analysis of the spatial data to produce the species richness maps, only distributions with the following Presence, Seasonal and Origin codes were used:

- Presence: Extant and Possibly Extant
- Origin: Native and Reintroduced
- Seasonality: Resident, Breeding Season, Non-Breeding Season, Passage, Seasonal Occurrence Uncertain.

Spatial data were analysed using a geodesic discrete global grid system, defined on an icosahedron and projected to the sphere using the inverse Icosahedral Snyder Equal Area (ISEA) Projection, cell resolution 10. This corresponds to a hexagonal grid composed of individual units (cells) that retain their shape and area (865 km²) throughout the globe. These are more suitable for a range of ecological applications than the most commonly used rectangular grids. The range of each species was converted to a hexagonal grid for analysis purposes and coastal cells clipped to the coastline (using the relevant UAE country boundary or EEZ later provide by MoCCaE). The pattern of overall species richness was mapped by counting the number of species in each cell (or cell section, for species with a coastal distribution). Patterns of threatened species richness were mapped by counting the number of threatened species (categories CR, EN, VU at the UAE national level) in each cell or cell section.

2.5 Red List Index datapoint

Due to a lack of historical data on the occurrence, distribution and status of herpetofauna in the UAE, we calculated a single Red List Index (RLI) data point rather than a full index of two or more datapoints.

For the RLI datapoint calculation, we used assessments for the 72 native herpetofauna species which are resident to, or occur regularly in, the UAE and its territorial waters. Species which just occur in the UAE or have only been reported very occasionally were also included, these are sometimes termed marginal species (IUCN 2012b). Introduced (NA) species were excluded.

The categories used in the assessments were Least Concern (LC), Near Threatened (NT), Vulnerable (VU), Critically Endangered (CR), Data Deficient (DD), and Not Applicable (NA) (IUCN 2012a,b). The DD, NA and NE categories were not used in the calculation of the RLI.

For the calculation of RLIs we followed the methods of Butchart et al. (2007). We also adopted recent practice (e.g. Butchart 2008, Butchart et al. 2010, Hoffmann et al. 2010, 2011) in using 'equal steps' weights for each Red List Category (0 for LC, 1 for NT, 2 for VU, 3 for EN, 4 for CR and 5 for EW [RE]). CR species were tagged as Possibly Extinct in the Wild – sensu IUCN Standards and Petitions Subcommittee (2017) – rather than weighted based on relative extinction risk. The latter approach makes the index much less sensitive to changes in status of less threatened taxa (see Butchart et al. 2004, 2005 for further discussion). The number of taxa in each IUCN Red List Category was multiplied by these weights and the sum expressed as a fraction of the maximum possible sum (equating to all taxa having gone extinct i.e. the number of species multiplied by the maximum weight of 5), and subtracted from one. Calculations were made using the RLI calculator tool, which has been developed in Microsoft Excel.

The calculation produces an index value that ranges from 0 to 1. The lower the value the faster the set of species is heading toward extinction. If the value is 1, all species in the set are Least Concern and if the value is 0, all species are Extinct in the UAE. We calculated the RLIs following Bubb et al. (2009).

3. Results

3.1 Threat status

Of the 72 herpetofauna considered native to the UAE, three species (4.2%) were assessed as Critically Endangered, nine species (12.5%) as Vulnerable, one species (1.4%) as Near Threatened, 50 species (69.4%) as Least Concern, and nine species (12.5%) as Data Deficient. Four taxa were considered Not Applicable (three terrestrial reptiles and one sea snake). The proportion of threatened (CR, EN, VU) species is uncertain given the number of Data Deficient (DD) species and could lie between 16.7% (if no DD species are threatened) and 29.2% (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 UAE, 19.0% of species are considered to be threatened. The threat status of the amphibians, terrestrial and marine reptiles are summarised in Table 2 and Figure 6 and discussed in detail below.

Red List Category	Amphibians	Terrestrial Reptiles	Sea Snakes	Marine Turtles
Extinct (EX)	-	-	-	-
Extinct in the Wild (EW)	-	-	-	-
Regionally Extinct (RE)	-	-	-	-
Critically Endangered (CR)	-	3	-	-
Endangered (EN)	-	-	-	-
Vulnerable (VU)	-	6	-	3
Near Threatened (NT)	-	1	-	-
Least Concern (LC)	2	43	3	2
Data Deficient (DD)	-	4	5	-
	2	57	8	5
Total number of species assessed	72			

The highlighted rows (CR, EN, and VU) are the threatened Red List categories. The above table excludes three species of terrestrial reptiles and one species of sea snake that are considered Not Applicable for this UAE National Red List.

Table 2: The threat status of the amphibians, terrestrial and marine reptiles assessed for the UAE National Red List

Lower bound (CR+EN+VU) / (assessed - EX)	%16.7
Mid-point (CR+EN+VU) / (assessed - EX - DD)	%19.0
Upper bound (CR+EN+VU+DD) / (assessed - EX)	%29.2

Table 3 : Proportion of threatened herpetofauna (amphibians, terrestrial and marine reptiles) in the UAE

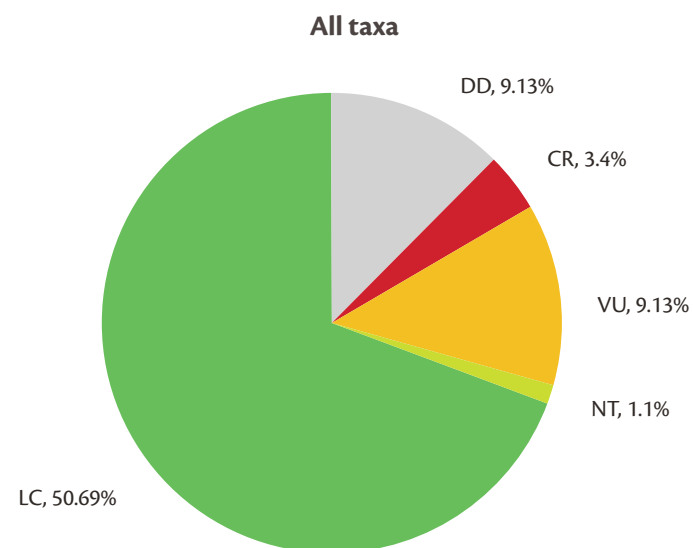


Figure 6 : The IUCN Red List status of herpetofauna (amphibians, terrestrial reptiles, sea snakes and marine turtles) in the UAE, showing the number and proportion of species in each category.

3.2 Status and distribution of amphibians

The extinction risk of species of herpetofauna considered native to the UAE was assessed at the national level. Both amphibian species within the UAE were assessed as Least Concern with no major threats throughout their distribution range.



The Arabian Toad *Sclerophrys arabica* (LC) is found in association with surface water throughout the Hajar Mountains in the UAE.

Credit: Priscilla van Andel



The Dhofar Toad *Duttaphrynus dhufarensis* (LC) is found in the UAE throughout the Hajar Mountains south to Al Ain.

Credit: Johannes Els

The two species of amphibians in the UAE, *Duttaphrynus dhufarensis* and *Sclerophrys arabica* are widespread throughout much of their range on gravel plains and rocky habitats in the Hajar Mountains. Both species depend on surface water for reproduction and in particular, *Sclerophrys arabica* depends more on available surface water which limits its distribution range within the Hajar Mountains, although its range may expand within its natural habitat during wetter seasons.

3.3 Status and distribution of terrestrial reptiles

Of the 57 terrestrial reptile taxa considered native to the UAE, three species (5.3%) were assessed as Critically Endangered, six species (10.5%) as Vulnerable, one species (1.8%) as Near Threatened, 43 species (75.4%) as Least Concern, and four species (7.0%) as Data Deficient. Three taxa (*Chalcides ocellatus* ssp *ocellatus*, *Hemidactylus flaviviridis*, *Indotyphlops braminus*) were considered Not Applicable as present in the UAE as a result of introduction. The proportion of threatened (CR, EN, VU) species is uncertain given the number of Data Deficient (DD) species and could lie between 15.8% (if no DD species are threatened) and 22.8% (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 UAE, 17.0% of species are considered to be threatened. Taking into account Near Threatened taxa, 18.9% of terrestrial reptiles can be considered to be of elevated conservation concern. The number and proportion of species in each category are shown in Figure 7.

Lower bound (CR+EN+VU) / (assessed - EX)	%15.8
Mid-point (CR+EN+VU) / (assessed - EX - DD)	%17.0
Upper bound (CR+EN+VU+DD) / (assessed - EX)	%22.8

Table 3 : Proportion of threatened terrestrial reptiles in the UAE

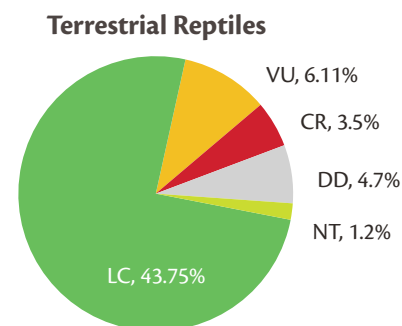


Figure 7 : The IUCN Red List status of terrestrial reptiles in the UAE, showing the number and proportion of species in each category.

On a generic level, the gecko genera *Bunopus*, *Hemidactylus*, *Pseudoceramodactylus* and *Stenodactylus* prefer arid desert areas and are widespread around the country, except for the mountainous areas. The genera *Trachydactylus*, *Asaccus*, *Ptyodactylus* and *Pristurus* (with the exception of *Pristurus minimus*) are found at higher elevations with a wider spectrum of habitats, from vegetated to bare areas with gravel rock. The lizard genera *Acanthodactylus* and *Mesalina* species are limited to elevations below 400 m asl, in hot and dry deserts. The endemic genera to the Hajar Mountains, *Omanosaura* species are restricted to vegetated and bare areas with gravel rocks ranging between 300 m and 1,200 m asl, in colder and wetter areas than the other genera of lizards (Burriel-Carranza et al. submitted).

As might be expected, the highest levels of species richness (Figure 8) are found in the Hajar Mountains (40 species per hexagon cell), Jebel Hafeet (31 species per hexagon cell), and in the adjacent hilly plains (25-30 species per hexagon cell). Coast richness ranges from 16-28 species per hexagon cell, decreasing to 11 species per hexagon cell in the south and southwest.

Within the agamids, the genera *Phrynocephalus* inhabits the most arid areas of the UAE and are widely distributed in both inland and coastal deserts. The two subspecies of *Uromastix aegyptia* have an allopatric distribution and have different ecological preferences. Both subspecies can be found in bare areas with sand, but *U. a. lepteni* is restricted to the northeast of the country, in areas where annual precipitation is higher, while *U. a. microlepis* lives in the southwest of the country, tolerates higher temperatures, and lives in more arid areas than *U. a. lepteni* (Burriel-Carranza et al. submitted).

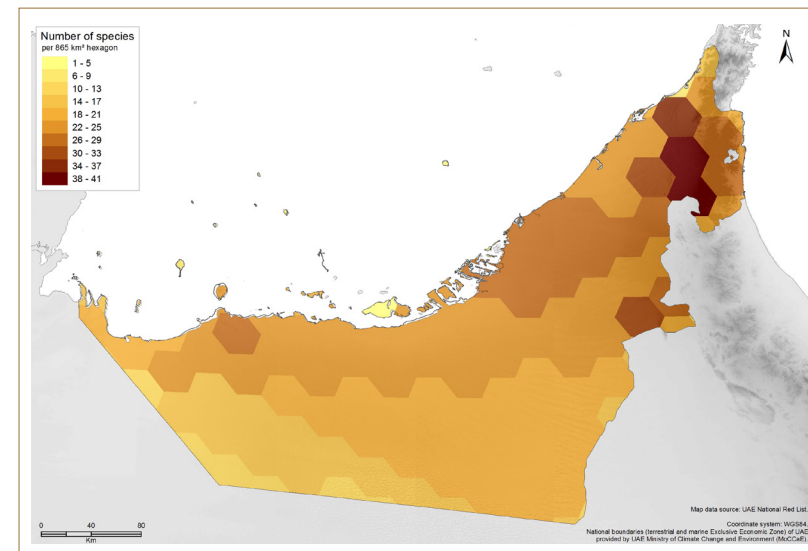
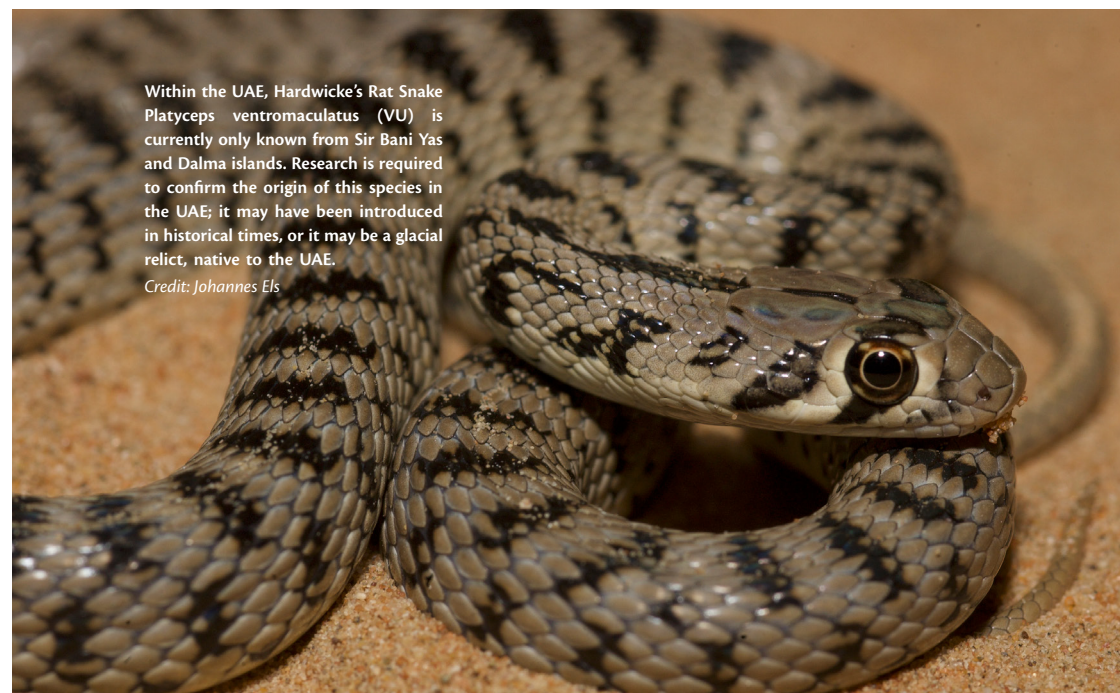


Figure 8: Overall species richness of terrestrial reptiles in the UAE.



Within the UAE, Hardwicke's Rat Snake *Platyceps ventromaculatus* (VU) is currently only known from Sir Bani Yas and Dalma islands. Research is required to confirm the origin of this species in the UAE; it may have been introduced in historical times, or it may be a glacial relict, native to the UAE.

Credit: Johannes Els

Higher levels of threatened species are found on two of UAE's islands, and in two areas on the mainland (Figure 9). Dalma and Sir Bani Yas islands contain two threatened species. *Platyceps ventromaculatus* (VU) is a globally widespread snake, but is only known from the two islands in the UAE. It is threatened by urbanisation and other development, as well as persecution. *Hemidactylus persicus* (VU) also has a moderately wide global distribution, but in the UAE is only known from the two islands, from Qarn Nazwa, and from the Dubai city area (where it is considered to be introduced). Confirmation of the origin of the species in the UAE is required; especially research to confirm its distribution and the status of the subpopulations on the islands. The lizard *Uromastix aegyptia*, ssp. *microlepis* (south and west of the Abu Dhabi Emirate) and ssp. *lepteni* (from north of Abu Dhabi city to Al Ain and Sharjah, including the Hajar foothills), both VU, are dependent on undisturbed sandy or gravel plains. *Teratoscincus keyserlingii* (CR) is an emblematic gecko found in sandy deserts from Ras Al Khaimah to Abu Dhabi, and threats include habitat loss and severe fragmentation due to roads, development and urbanisation.



Keyserling's Wonder Gecko *Teratoscincus keyserlingii* (CR) is found in severely fragmented populations from Ras Al Khaimah to Abu Dhabi in the sandy deserts.

Credit: Johannes Els

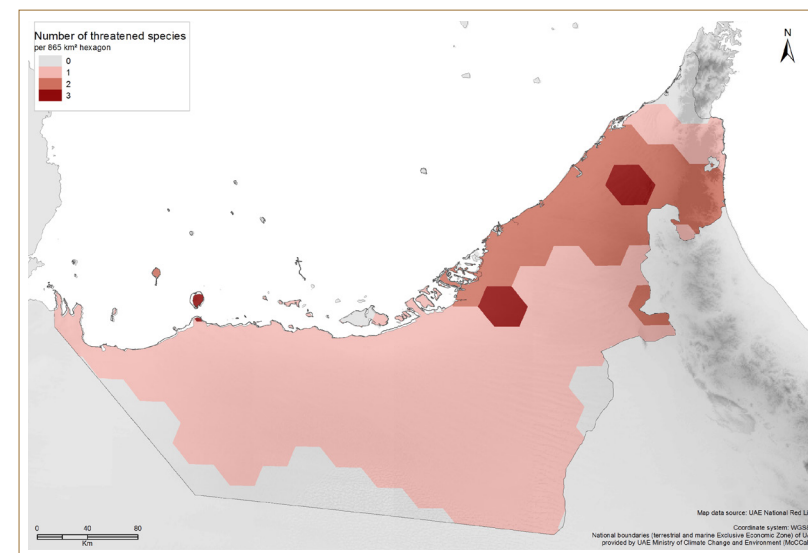


Figure 9: Threatened species richness of terrestrial reptiles in the UAE.

Only four terrestrial reptiles were considered Data Deficient (Figure 10; *Heremites septemtaeniatus*, *Scincus scincus* ssp. *conirostris*, *Acanthodactylus opheodurus* and *Acanthodactylus haasi*). The distribution of *Acanthodactylus opheodurus* is poorly known in the UAE, with four widely spaced localities, including one in the Sila Peninsula in western Abu Dhabi and other three along the gravel plains bordering the Hajar Mountains to the west, and in the vicinity of Jebel Hafeet. It may be more widespread, but further survey work is required to understand its distribution in the country. *Scincus scincus* ssp. *conirostris* is distributed along the Gulf coast, on the Fujairah coast, and along a narrow band at the interface between the gravel plains bordering the mountain and active sand dunes to the west. It was considered Data Deficient due to insufficient available information about its distribution, population and natural history. The origin of *Heremites septemtaeniatus* in the UAE requires confirmation, and its restricted distribution (two offshore islands and at Al Qua'a, south of Al Ain) is currently only associated with ornamental gardens and cultivated land, which suggests the possibility that it was introduced, and its origin in the UAE remains uncertain. *Acanthodactylus*

haasi is localised and apparently uncommon, known from a small number of records in widely scattered localities in Abu Dhabi Emirate – more research is required.



Snake-tailed Fringe-toed Lizard *Acanthodactylus opheodurus* (DD) is known from just four widely separated records from the Sila Peninsula in western Abu Dhabi, the gravel plains bordering the Hajar Mountains in the west, and from the vicinity of Jebel Hafeet.

Credit: Daniel Fernandez

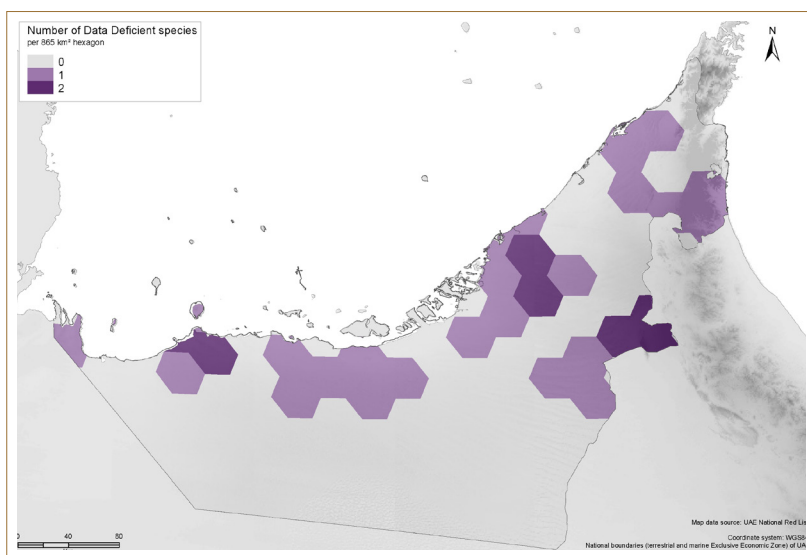


Figure 10: Data Deficient species richness of terrestrial reptiles in the UAE.

Within the skinks, the genera *Trachylepis* and *Ablepharus* have similar ecological preferences, inhabiting near bare areas with gravel rocks in the Hajar Mountains. *Chalcides* (introduced species) and *Heremites* both have preferences for low elevations in dry areas with sparse vegetation. The two taxa of *Scincus* (*S. mitranus* and *S. scincus conirostris*) have different ecological preferences, with *S. mitranus* being much more abundant and mainly restricted to hot and dry deserts, at elevations below 400 m asl. *S. s. conirostris* is less abundant but is found in a wider range of land covers, such as sparse vegetation, bare areas with gravel rocks or deserts. *Varanus griseus* and *Diplometopon zarudnyi* inhabit most parts of the country in sandy deserts below 300 m in elevation.



The distribution of the Common Sand Skink *Scincus scincus* ssp. *conirostris* (DD) is not well known in the UAE, and is a good example of a Data Deficient reptile that requires more research to be able to assess it.

Credit: Johannes Els

Of the 13 species of snakes, two are generalist, while others are adapted to live in sandy deserts. *Eryx jakakari*. *Platyceph ventromaculatus* and *Indotyphlops braminus* (introduced) are only found in coastal areas, while *Pseudocerastes persicus*, *Echis omanensis*, *Telescopus dhara dhara* and *Platyceph rhodorachis rhodorachis* are restricted to the rocky environments of the Hajar Mountains from sea level to 1,200 m asl.

3.4 Status and distribution of marine reptiles

The sea snakes were assessed as follows; three species (33%) Least Concern, five species (56%) Data Deficient and one species (11%) as Not Applicable (*Hydrophis viperinus*). The marine turtles were assessed with two species Vulnerable (40%) and three species (60%) Data Deficient. The number and proportion of species in each category are shown in Figure 11 and their species richness in Figure 12.

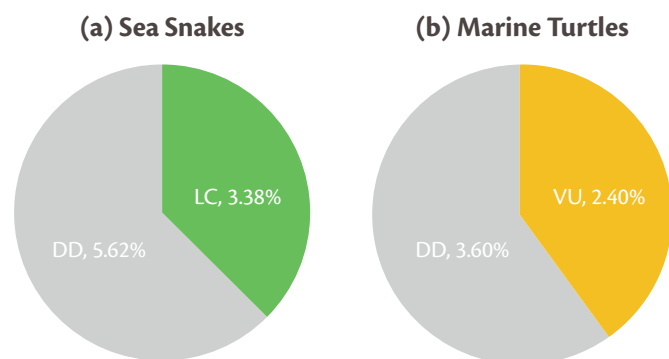


Figure 11: The IUCN Red List status of (a) Sea snakes and (b) Marine turtles in the UAE, showing the number and proportion of species in each category.

Among the eight species of sea snakes, some are generalists that occur in many different marine habitats, while others have more specialised habitat preferences, such as *Hydrophis gracilis*, a bottom-dwelling species (Gardner 2013) that appears to prefer clear waters with a sandy or coral substrate. Of all the reptiles within the UAE, the sea snakes are among the most specialised yet least studied, despite their wide distribution ranges. Seven species are regularly confirmed in both the Arabian Gulf and the Gulf of Oman, while two species are less known. *Hydrophis schistosus* are known from only a handful of specimens, all of which are strandings within the UAE. *Hydrophis viperinus* has been reported as present within the Arabian Gulf with a single known museum specimen collected in UAE waters, from near Sir Abu Nu'ayr, by the crew of the HMS Dalrymple (British Royal Navy) around 1963 (Gasperetti 1988). Due to insufficient data to support the presence of *Hydrophis viperinus* within the UAE EEZ after 1963 the species was considered Not Applicable.



Yellow Sea Snake *Hydrophis spiralis* (DD) is recorded from UAE waters in both the Arabian Gulf and the Gulf of Oman, however as with some other sea snakes, little is known of this species.

Credit: Keith Wilson

The distribution of sea snakes in general is very poorly known. Occurrence of species on the east coast are best recorded due to consistent survey work undertaken by the Al Mayya Sanctuary, Fujairah (Géczy et al. 2017, Buzás et al. 2018), as demonstrated by the species richness shown in Figures 12 and 13.

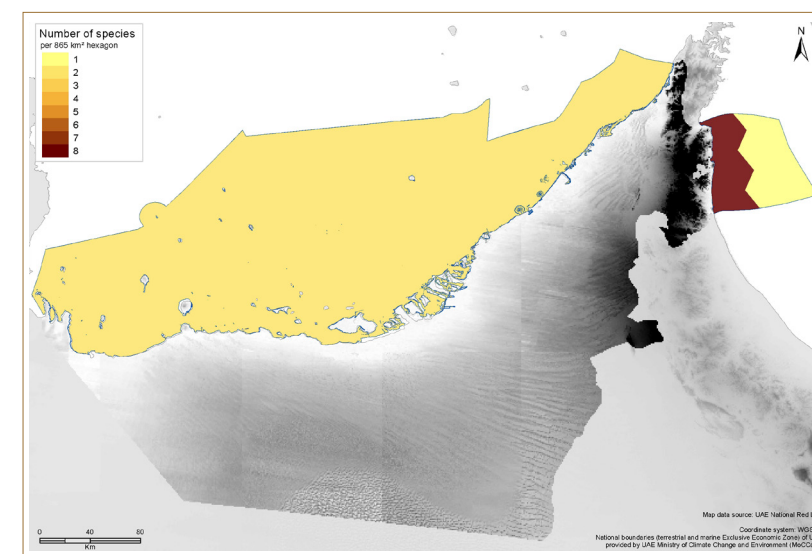


Figure 12: Overall species richness of sea snakes in the UAE EEZ.

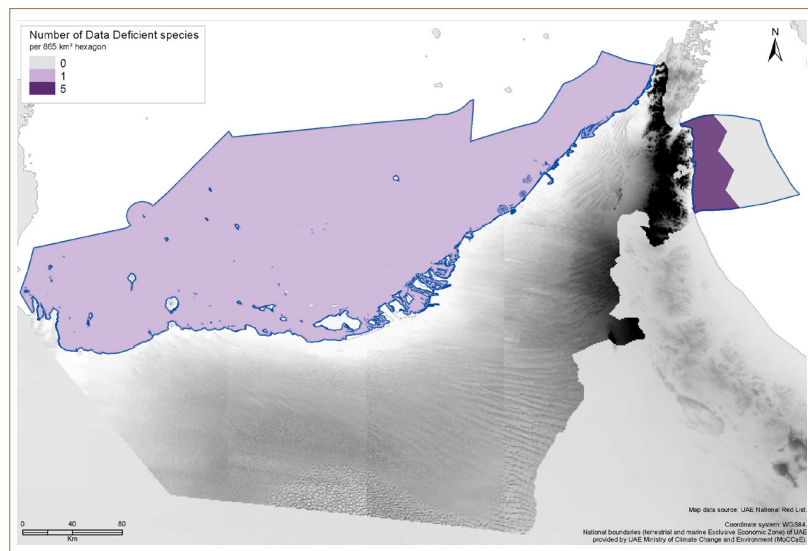


Figure 13: Data Deficient species richness of sea snakes in the UAE.



Figure 14: Overall species richness of marine turtles in the UAE EEZ.

The overall (Figure 14), threatened (Figure 15) and Data Deficient (Figure 16) species richness maps for the marine turtles found in the UAE EEZ show both that turtles probably utilise all parts of the UAE EEZ during seasonal movements. There is a lack of fine-scale movement and habitat use data for all the marine turtles found in the UAE. Only for *Eretmochelys imbricata* and *Chelonia mydas*, the two species that nest within the UAE, is detailed distribution information available, however more research is needed to understand non-breeding season movements and population dynamics.



Figure 15: Threatened species richness of marine turtles in the UAE EEZ.

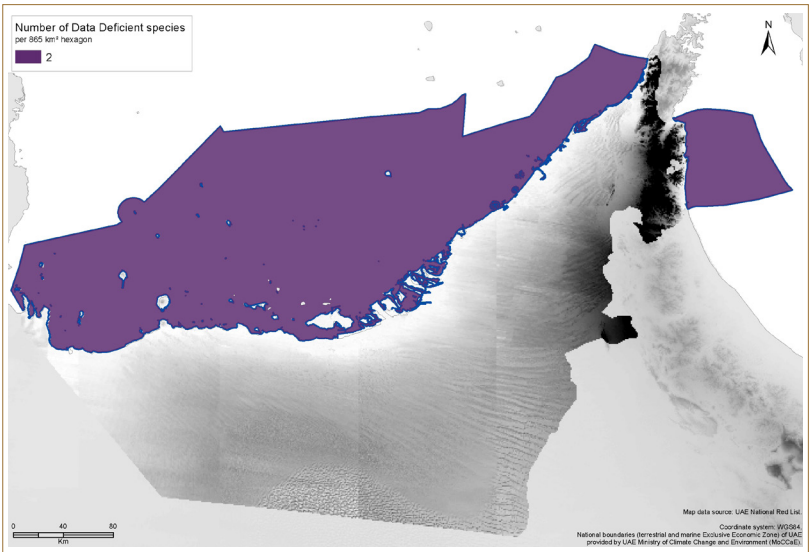


Figure 16: Data Deficient species richness of marine turtles in the UAE.

All of the marine turtle species are present in both of the Arabian Gulf and the Gulf of Oman. *Caretta caretta*, *Lepidochelys olivacea* and *Dermochelys coriacea* are occasional visitors to the UAE EEZ with no recorded nesting sites. *Chelonia mydas* and *Eretmochelys imbricata* are the only two species occurring throughout UAE waters in both the Arabian Gulf and Gulf of Oman, with recorded nesting sites on the mainland beaches and surrounding islands. *Chelonia mydas* are known to occur in larger population numbers on feeding grounds to the west of Abu Dhabi in the Arabian Gulf.

3.5 Major threats to amphibians, terrestrial and marine reptiles in the UAE

The threats for each species were coded in the SIS database using the IUCN Threats Classification Scheme. A summary of the relative importance of the different threatening processes is shown in Figure 17 (terrestrial reptiles and amphibians), Figure 18 (marine turtles) and Figure 19 (sea snakes). Development, mainly housing and other urban infrastructure, is considered to be the greatest threat in the UAE, affecting 47 species. The second significant threat is human

disturbance through recreational activities such as dune driving and boats in marine environments, which are affecting 16 species, and activities such as oil and gas drilling are affecting 14 species. Thirteen species are threatened by persecution and this relates mostly to terrestrial snakes, most of which are harmless to man and may even be considered beneficial in controlling pest species. The construction of transport infrastructure such as roads is a threat to 12 species.

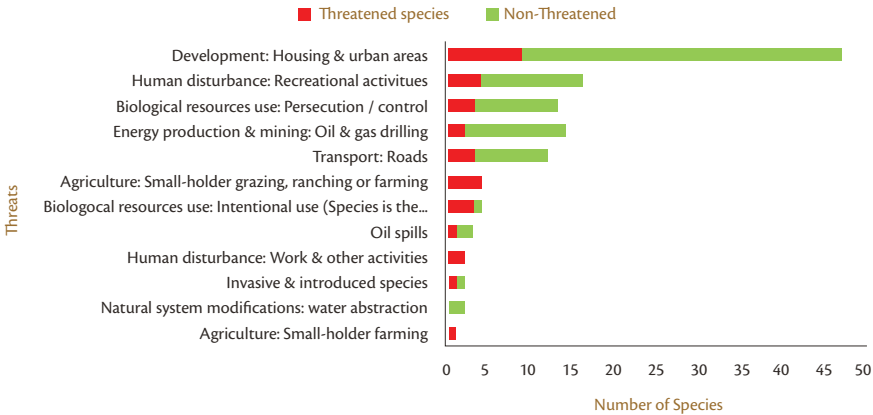


Figure 17: Terrestrial reptiles and amphibians.

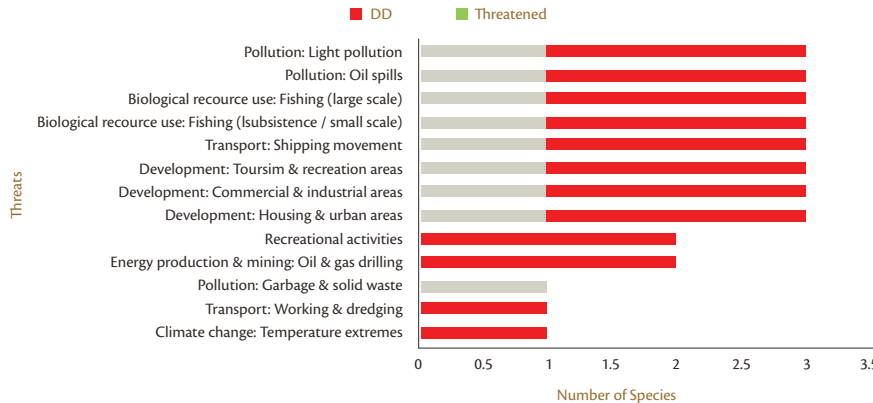


Figure 18: Marine turtle threats.



One of the primary threats to terrestrial herpetofauna in the UAE are recreational activities, such as off-road driving, and mining and quarrying activities.
Credit: Priscilla van Anel



Credit: Priscilla van Anel

The most significant threat to the sea snakes is marine pollution (oil pollution, and entanglement in marine debris, including abandoned fishing nets and traps). Bycatch in large- and small-scale fisheries is also a significant threat.

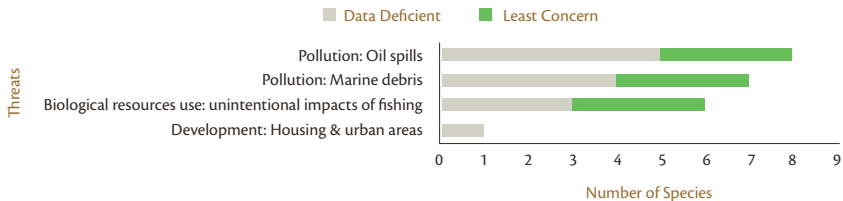
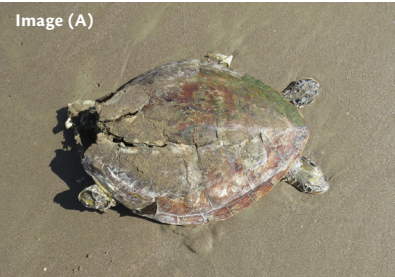


Figure 19. Sea snake threats.



Marine turtles and sea snakes face a range of threats in the UAE, including (a) boat strike, entanglement in abandoned fishing gear (b), and (c) fishery bycatch, as is the case with this Green Turtle caught in a gargoor fish trap.
Credit: Fadi Yaghmour

3.6 Population trends

The majority of the terrestrial herpetofauna are considered to have stable populations with only small numbers of species experiencing decreasing populations (Figure 20).

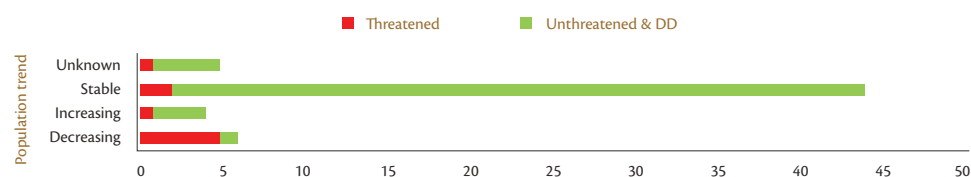


Figure 20. Population trend of terrestrial herpetofauna.

There is less information available for the marine turtles (one species with a decreasing population, one with stable population and three with unknown population trends) and sea snakes (three species with stable populations, five with unknown trends).

3.7 Protected areas

More than 50 of the terrestrial herpetofauna are recorded from protected areas (Figure 21), perhaps the result of the relatively high level of survey work within PAs. Of clear concern are the three threatened species (*Asaccus caudivolvulus*, *Platycephalus ventromaculatus* and *Pristurus carteri*) that are not known to occur within a protected area, and opportunities for protecting key areas for these three species need urgent attention.

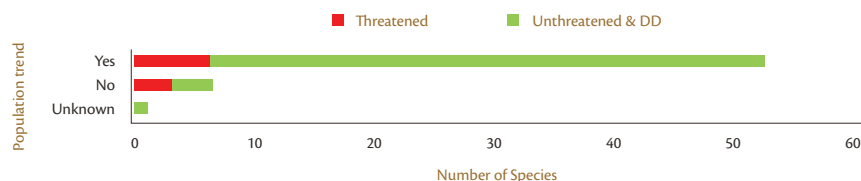


Figure 21. The occurrence of terrestrial herpetofauna within protected areas.

Of the eight sea snake species, only two are known to occur within a marine protected area. For the marine turtles, only two (*Chelonia mydas* and *Eretmochelys imbricata*) are known occur within a marine protected area, with occurrence of the other three species not known.

3.8 Gaps in knowledge

In general, all species, including those that are abundant and widespread, require further research into their life history and ecology, to identify potential threats, and to aid in improving habitat management. Further studies into the distribution and status of *Acanthodactylus haasi*, *Acanthodactylus opheodurus*, *Heremites septemtaeniatus* and *Scincus scincus conirostris* are required. Sea snakes are severely understudied and will benefit from ongoing research projects such as that of Buzás et al. (2018) to obtain an understanding of the species diversity and ecological requirements within the UAE EEZ marine environments. Important feeding grounds within the UAE EEZ marine environments for marine turtle species require further investigation, including identifying the impact of major threats to the feeding environments.

3.9 Red List Index datapoint

The Red List Index (RLI) score for the 2018 assessment of the herpetofauna of the UAE (includes the terrestrial reptiles, the marine reptiles and the frogs) is 0.92, where a score of 1 indicates that all species are Least Concern, and the lower the value the faster the set of species is heading toward extinction. This score indicates that the herpetofauna are much less threatened than the mammals of the UAE, which had a score of 0.63 in a 2018 assessment (Mallon et al. 2019). However, the threatened species require continued conservation action to avoid a lower RLI score when the assessments are next repeated. Further research on the Data Deficient species is also required so that their risk of extinction can be better estimated.

4. Conservation measures

4.1 Conservation of amphibians, terrestrial and marine reptiles in the UAE

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).

Terrestrial reptiles

The majority of the UAE terrestrial reptiles do not require direct conservation measures as most of the widespread species occur within one or more protected areas across their distribution ranges. Although most species are widespread with no major threats, further research is required into the life history of these species and monitoring of their threats. 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. The terrestrial reptile species *Eryx jayakari*, *Uromastyx aegyptia leptieni*, *Uromastyx aegyptia microlepis* and *Varanus griseus* are listed as Appendix II under CITES. In the UAE, the following species are listed as protected under Federal Law Nos. 23 and 24 (1999) and No. 11 (2002): *Uromastyx aegyptia leptieni*, *Uromastyx aegyptia microlepis*, *Varanus griseus*, *Stenodactylus slevini*, *Pristurus rupestris*.

Clifford's Diadem Snake *Spalerosophis diadema* ssp. *cliffordii* (LC) occurs along the western side of the Hajar Mountains and on the gravel plains surrounding the mountains from Al Ain to Ras Al Khaimah from sea level to 500 m asl.

Credit: Johannes Els



The habitat of *Asaccus caudivolvulus*, the only endemic vertebrate for the UAE, is under severe transformation and the preservation of its habitat is recommended to ensure the future survival of this species. *Pristurus carteri* is not recorded within any protected area and the species will require site protection and research into its population trends to prevent biodiversity loss for the UAE. *Teratoscincus keyserlingii* is known from four protected areas across its range in the UAE (Soorae et al. 2018). A nationwide survey and genetic sampling of the species resulted in the drafting of a conservation action plan (Soorae et al. 2017) for the species with the involvement of UAE governmental agencies. The plan is due for implementation. Population genetic studies in collaboration with the University of Barcelona were funded by the Mohamed bin Zayed Species Conservation Fund. These studies will aid in both in situ and ex situ conservation management of the species. Ex situ populations have been maintained at the Breeding Centre for Endangered Arabian Wildlife (Sharjah) since 2001 and at Al Ain Zoo (Al Ain) since 2016. The protection of subpopulations from development, as well as the development or expansion of existing protected areas, is needed to protect this species in the wild.



Quarrying, road construction & infrastructure development impacts a number of species & their habitats in the UAE.

Credit: Priscilla van Andel



One of the primary threats to terrestrial herpetofauna in the UAE are recreational activities, such as off-road driving, and mining and quarrying activities.

Credit: Priscilla van Andel

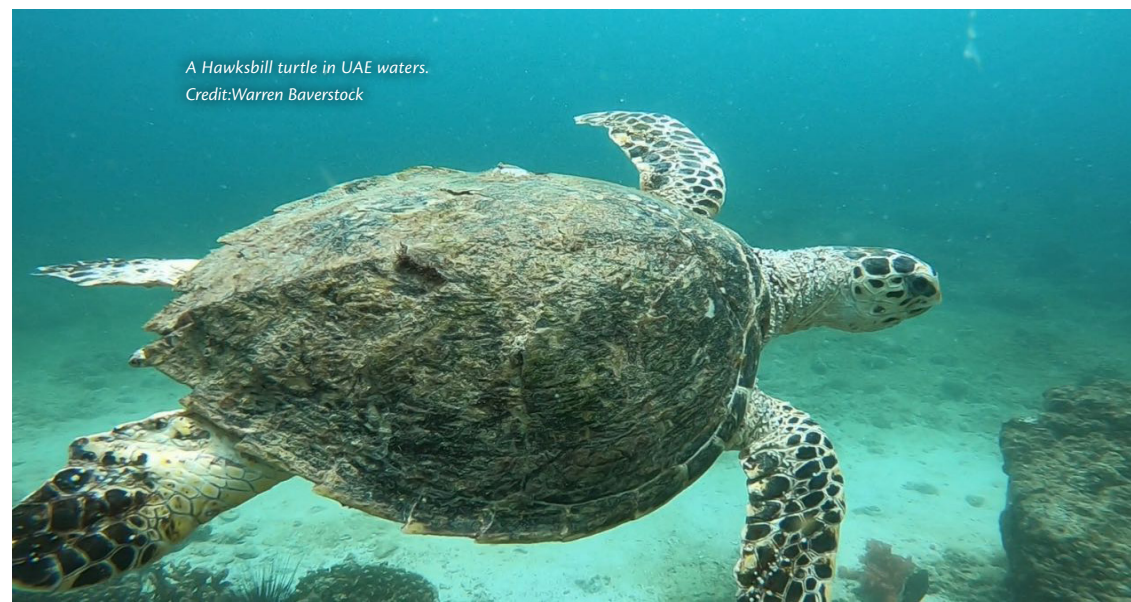
Sabkha habitats within the UAE are a frequent target for development. Sabkha is the primary habitat for *Pseudoceramodactylus khobarensis*, and it requires habitat and population monitoring. *Acanthodactylus blandfordii* populations have improved since the designation of the Alquarm protected area in Sharjah. Previous threats included recreational activities, fisheries activities and recreational driving on the dune. *Mesalina brevirostris* is known from some protected areas but may require additional coastal area protection on the mainland to prevent further declines in its population. *Ptyodactylus ruusaljibalicus* is not known to occur in any protected areas and within the UAE, it is limited to a small geographical area that will require protection in the near future. *Pseudocerates persicus* requires monitoring in trade and collection from the wild, as well as further population size, trend and ecological studies. The population status of *Platycephalus ventromaculatus* requires additional research. This species will benefit from site protection on the islands it occupies.

Sea snakes

There are no species-specific conservation measures in place for any of the species of sea snake. Only two species are confirmed within any of the marine protected areas in the UAE. A research priority in the UAE is for a better understanding of the distribution of the species in the UAE EEZ, as well as their habitat requirements, population size and trend. There is ongoing research into sea snakes on the east coast of the UAE carried out by Al Mayya Sanctuary, Fujairah. None of the sea snakes are currently protected under any laws nationally or internationally.

Marine turtles

The marine turtle species are all protected under Appendix I of CITES and under the Convention on the Conservation of Migratory Species of Wild Animals (CMS). In the UAE, the species is protected under Federal Law Nos. 23 and 24 (1999) and No. 11 (2002), and a National Plan of Action for Marine Turtles has been developed. *Chelonia mydas* is the focus of ongoing studies in the UAE to understand its migration and movements within the UAE marine areas, including satellite flipper tagging projects. This species benefits from education and rehabilitation projects, and it occurs frequently in protected areas. Two species of marine turtles, *Eretmochelys imbricata* and *Chelonia mydas*, are known from marine protected areas.



A Hawksbill turtle in UAE waters.

Credit: Warren Baverstock

Eretmochelys imbricata is benefiting from a research project funded by the Mohamed bin Zayed Species Conservation Fund. The project, the Marine Turtle Conservation Project was launched by Emirates Nature-WWF and is using satellite transmitters to understand turtle movements and habitat requirements. Sir Bu Na'ir Island (Sharjah) is an IOSEA (Memorandum of Understanding on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia) Marine Turtle site and a protected area. Breeding beaches for this species are located within the Marawah marine biosphere reserve, which was designed to protect key sites for marine turtles. There is a need to undertake further research to understand the threats, distribution and population trends for this species in UAE waters. In particular, more data, e.g. through tracking studies, is needed to understand habitat use and movements so that key areas and habitats can be protected. It is recommended that this species should be reassessed when these data become available.

4.2 Red List versus priority for conservation action

The conservation priorities of threatened reptile species within the UAE do not conflict significantly with those assigned in this National Red List, with a few exceptions. Despite both species of amphibians being assessed as Least Concern, they must remain part of conservation efforts. These amphibians are dependent on freshwater habitats for reproduction; freshwater habitats are limited within the amphibians' natural range and are under threat from overutilisation. Regional endemic species with limited distribution ranges within the UAE, such as *Ptyodactylus ruusaljibalicus*, should be taken into consideration for future planning of potential protected areas in the northern Hajar Mountains. Even though *Ptyodactylus ruusaljibalicus* is listed as Least Concern, it is not known within any protected areas increasing the need for early incorporation into conservation measures. Sea snakes, the least studied of all snake species despite their wide distribution ranges require conservation action in the form of identifying important breeding areas for protection within marine environments. The marine turtle *Eretmochelys imbricata*, listed as Vulnerable, is considered nationally to have a higher conservation priority compared to other marine turtle species, as it is one of only two species that are known to nest within UAE territory.

5. Recommendations

5.1 Recommended actions

To ensure biodiversity conservation, it is recommended that current and future protected areas management plans take into consideration the distribution and presence of amphibians, terrestrial and marine reptiles when expanding or designating new protected areas. It is recommended that the existing legislation for environmental impact assessment prior to development should be implemented to minimise or prevent possible habitat loss for species with restricted distribution ranges or with specialised habitat requirements. *Asaccus caudivulvulus*, the only endemic vertebrate for the UAE requires site and habitat protection to ensure its survival. Continued support of conservation initiatives for *Teratoscincus keyserlingii*, in the form of habitat protection and ecological studies, will help to ensure the future survival of this species, which has suffered a severe population decline over the past ten years. A comprehensive long-term study on the distribution and habitat use of sea snakes, in particular within the Arabian Gulf, will aid in a better understanding of the species diversity and potential threats, to which this species is subjected. Existing marine turtle projects should continue and threats such as oil spills, which have a negative impact on all marine turtle species, should be regionally addressed to minimise or prevent such events from occurring.

5.2 Application of project outputs

The outputs of this project can be applied at the national scale to assist government and non-governmental organisations to prioritise sites for conservation at both the national and regional scales (including internationally important sites for biodiversity- e.g. Key Biodiversity Areas (Langhammer et al. 2007) and Alliance for Zero Extinction sites (Ricketts et al. 2005).

5.3 Future work

If the information on the species of the United Arab Emirates is to be effectively integrated within the national developmental and environmental planning processes then:

- The data collated need to be maintained and updated regularly through ongoing collaboration with the network of experts who have contributed their valuable time and knowledge to this national Red List;
- Links between IUCN and its partners, policymakers and regionally decision makers must be maintained and strengthened, and data made freely available to these organisations;
- A best practice methodology for the process of integrating biodiversity information within the environmental/ development planning process needs to be developed. It is important that this methodology aims to provide the information in a user-friendly format for all stakeholder and provides guidelines as to when and where the information should appropriately be made available. biodiversity- e.g. Key Biodiversity Areas (Langhammer et al. 2007) and Alliance for Zero Extinction sites (Ricketts et al. 2005).



Zarudnyi's Worm Lizard *Diplometopon zarudnyi* (LC) occurs throughout the sandy deserts of the UAE from Ras al Khaimah to western Abu Dhabi, including the Liwa area.
Credit: Johannes Els

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The Arabian Cat Snake Telescopus dhara ssp. dhara (LC) is found in the Hajar Mountains.
Credit: Johannes Els

Appendix 1

Red List status of amphibians, terrestrial and marine reptiles in the UAE.

Group	Order	Family	Taxon	Endemic to UAE	UAE National Status	Global Red List status
Amphibians	ANURA	BUFONIDAE	<i>Duttaphrynus dhufarensis</i>	No	LC	LC
Amphibians	ANURA	BUFONIDAE	<i>Sclerophrys arabica</i>	No	LC	LC
Marine turtles	TESTUDINES	CHELONIIDAE	<i>Caretta caretta</i>	No	DD	VU
Marine turtles	TESTUDINES	CHELONIIDAE	<i>Chelonia mydas</i>	No	VU	EN
Marine turtles	TESTUDINES	CHELONIIDAE	<i>Eretmochelys imbricata</i>	No	VU	CR
Marine turtles	TESTUDINES	CHELONIIDAE	<i>Lepidochelys olivacea</i>	No	DD	VU
Marine turtles	TESTUDINES	DERMOCHELYIDAE	<i>Dermochelys coriacea</i>	No	DD	VU
Sea snakes	SQUAMATA	ELAPIDAE	<i>Hydrophis curtus</i>	No	DD	LC
Sea snakes	SQUAMATA	ELAPIDAE	<i>Hydrophis cyanocinctus</i>	No	DD	LC
Sea snakes	SQUAMATA	ELAPIDAE	<i>Hydrophis gracilis</i>	No	DD	LC
Sea snakes	SQUAMATA	ELAPIDAE	<i>Hydrophis lapemoides</i>	No	LC	LC
Sea snakes	SQUAMATA	ELAPIDAE	<i>Hydrophis ornatus</i>	No	LC	LC
Sea snakes	SQUAMATA	ELAPIDAE	<i>Hydrophis platurus</i>	No	LC	LC
Sea snakes	SQUAMATA	ELAPIDAE	<i>Hydrophis schistosus</i>	No	DD	LC
Sea snakes	SQUAMATA	ELAPIDAE	<i>Hydrophis spiralis</i>	No	DD	LC
Sea snakes	SQUAMATA	ELAPIDAE	<i>Hydrophis viperinus</i>	No	NA	LC
Terrestrial reptiles	SQUAMATA	AGAMIDAE	<i>Phrynocephalus arabicus</i>	No	LC	LC

Terrestrial reptiles	SQUAMATA	AGAMIDAE	<i>Phrynocephalus maculatus</i>	No	LC	LC*
Terrestrial reptiles	SQUAMATA	AGAMIDAE	<i>Pseudotrapelus jensvindumi</i>	No	LC	NE
Terrestrial reptiles	SQUAMATA	AGAMIDAE	<i>Trapelus flavimaculatus</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	AGAMIDAE	<i>Uromastix aegyptia</i> ssp. <i>leptieni</i>	No	VU	NE
Terrestrial reptiles	SQUAMATA	AGAMIDAE	<i>Uromastix aegyptia</i> ssp. <i>microlepis</i>	No	VU	NE
Terrestrial reptiles	SQUAMATA	BOIDAE	<i>Eryx jayakari</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	COLUBRIDAE	<i>Lytrohynchus diadema</i> ssp. <i>diadema</i>	No	LC	NE
Terrestrial reptiles	SQUAMATA	COLUBRIDAE	<i>Platycephalus rhodorachis</i> ssp. <i>rhodorachis</i>	No	LC	NE
Terrestrial reptiles	SQUAMATA	COLUBRIDAE	<i>Platycephalus ventromaculatus</i>	No	VU	LC*
Terrestrial reptiles	SQUAMATA	COLUBRIDAE	<i>Spalerosophis diadema</i> ssp. <i>cliffordii</i>	No	LC	NE
Terrestrial reptiles	SQUAMATA	COLUBRIDAE	<i>Telescopus dhara</i> ssp. <i>dhara</i>	No	LC	NE
Terrestrial reptiles	SQUAMATA	GEKKONIDAE	<i>Bunopus tuberculatus</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	GEKKONIDAE	<i>Cyrtopodion scabrum</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	GEKKONIDAE	<i>Hemidactylus flaviviridis</i>	No	NA	LC*
Terrestrial reptiles	SQUAMATA	GEKKONIDAE	<i>Hemidactylus persicus</i>	No	VU	LC*
Terrestrial reptiles	SQUAMATA	GEKKONIDAE	<i>Hemidactylus robustus</i>	No	LC	LC*

Terrestrial reptiles	SQUAMATA	GEKKONIDAE	<i>Pseudoceramodactylus khobarensis</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	GEKKONIDAE	<i>Stenodactylus arabicus</i>	No	LC	LC*
Terrestrial reptiles	SQUAMATA	GEKKONIDAE	<i>Stenodactylus doriae</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	GEKKONIDAE	<i>Stenodactylus leptosymbotes</i>	No	LC	LC*
Terrestrial reptiles	SQUAMATA	GEKKONIDAE	<i>Stenodactylus slevini</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	GEKKONIDAE	<i>Trachydactylus hajarensis</i>	No	LC	LC*
Terrestrial reptiles	SQUAMATA	LACERTIDAE	<i>Acanthodactylus blanfordii</i>	No	VU	LC*
Terrestrial reptiles	SQUAMATA	LACERTIDAE	<i>Acanthodactylus boskianus ssp. asper</i>	No	NT	NE
Terrestrial reptiles	SQUAMATA	LACERTIDAE	<i>Acanthodactylus gongrorhynchatus</i>	No	LC	DD
Terrestrial reptiles	SQUAMATA	LACERTIDAE	<i>Acanthodactylus haasi</i>	No	DD	LC
Terrestrial reptiles	SQUAMATA	LACERTIDAE	<i>Acanthodactylus opheodurus</i>	No	DD	LC
LACERTIDAE	SQUAMATA		<i>Acanthodactylus schmidtii</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	LACERTIDAE	<i>Mesalina adramitana</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	LACERTIDAE	<i>Mesalina brevirostris</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	LACERTIDAE	<i>Omanosaura cyanura</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	LACERTIDAE	<i>Omanosaura jayakari</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	LEPTOTYPHLOPIDAE	<i>Myriopholis macrorhyncha</i>	No	LC	LC*
Terrestrial reptiles	SQUAMATA	PHYLLODACTYLIDAE	<i>Asaccus caudivolvulus</i>	Endemic	CR	CR*

Terrestrial reptiles	SQUAMATA	PHYLLODACTYLIDAE	<i>Asaccus gallagheri</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	PHYLLODACTYLIDAE	<i>Asaccus gardneri</i>	No	LC	LC*
Terrestrial reptiles	SQUAMATA	PHYLLODACTYLIDAE	<i>Asaccus margaritae</i>	No	VU	LC*
Terrestrial reptiles	SQUAMATA	PHYLLODACTYLIDAE	<i>Ptyodactylus orlovi</i>	No	LC	LC*
Terrestrial reptiles	SQUAMATA	PHYLLODACTYLIDAE	<i>Ptyodactylus ruusaljibalicus</i>	No	LC	LC*
Terrestrial reptiles	SQUAMATA	PSAMMOPHIIDAE	<i>Psammophis schokari</i>	No	LC	LC*
Terrestrial reptiles	SQUAMATA	PSAMMOPHIIDAE	<i>Rhagerhis moilensis</i>	No	LC	LC*
Terrestrial reptiles	SQUAMATA	SCINCIDAE	<i>Ablepharus pannonicus</i>	No	LC	LC*
Terrestrial reptiles	SQUAMATA	SCINCIDAE	<i>Chalcides ocellatus ssp. ocellatus</i>	No	NA	NE
Terrestrial reptiles	SQUAMATA	SCINCIDAE	<i>Heremites septemtaeniatus</i>	No	DD	LC
Terrestrial reptiles	SQUAMATA	SCINCIDAE	<i>Scincus mitranus</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	SCINCIDAE	<i>Scincus scincus ssp. conirostris</i>	No	DD	NE
Terrestrial reptiles	SQUAMATA	SCINCIDAE	<i>Trachylepis tessellata</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	SPHAERODACTYLIDAE	<i>Pristurus carteri</i>	No	CR	LC
Terrestrial reptiles	SQUAMATA	SPHAERODACTYLIDAE	<i>Pristurus celerrimus</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	SPHAERODACTYLIDAE	<i>Pristurus minimus</i>	No	LC	LC
Terrestrial reptiles	SQUAMATA	SPHAERODACTYLIDAE	<i>Pristurus rupestris</i>	No	LC	LC*
Terrestrial reptiles	SQUAMATA	SPHAERODACTYLIDAE	<i>Teratoscincus keyserlingii</i>	No	CR	LC*

Terrestrial reptiles	SQUAMATA	TROGONOPHIDAE	Diplometopon zarudnyi	No	LC	LC
Terrestrial reptiles	SQUAMATA	TYPHLOPIDAE	Indotyphlops braminus	No	NA	LC*
Terrestrial reptiles	SQUAMATA	VARANIDAE	Varanus griseus	No	LC	LC*
Terrestrial reptiles	SQUAMATA	VIPERIDAE	Cerastes gasperettii	No	LC	LC
Terrestrial reptiles	SQUAMATA	VIPERIDAE	Echis carinatus ssp. sochureki	No	LC	NE
Terrestrial reptiles	SQUAMATA	VIPERIDAE	Echis omanensis	No	LC	LC
Terrestrial reptiles	SQUAMATA	VIPERIDAE	Pseudocerastes persicus	No	LC	LC

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