

# THE TERRESTRIAL MAMMALS, REPTILES AND AMPHIBIANS OF THE UAE – SPECIES LIST AND STATUS REPORT

January 2005



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## **Part 1 The Terrestrial Mammals of The UAE**

The following list includes all UAE terrestrial mammals classified according to the IUCN Red List 2004 (IUCN 2004) and UAE mammals Red List 1996 (Hornby, 1996).

There are 45 species of terrestrial mammals known to occur either naturally, as introduced species, or to have become extinct within the last 75 years in The UAE. These mammals exist within 18 Families of 8 Orders (Carnivora, Perissodactyla, Artiodactyla, Rodentia, Hyracoidea, Lagomorpha, Insectivora and Chiroptera).

Of these 45 species, 2 species (*Oryx leucoryx* and *Capra aegagrus*) are known to be extinct in the wild. Two further species (*Canis lupus arabs* and *Hyaena hyaena*) are probably extinct in UAE with species from Oman or Saudi Arabia that cross the border being seen occasionally. From the remaining 41 species, 6 species have been introduced (*Felis cattus*, *Herpestes edwardsi*, *Equus africanus*, *Capra aegagrus hircus*, *Procavia capensis*, and *Suncus murinus*).

Most of the species either fall within the Data Deficiency category or are Not Listed on the IUCN Red List. The classifications according to the UAE mammals Red List of 1996 (Hornby 1996a), are shown in Table 1. It should be pointed out that the classification (by Hornby) was based on a consensus of opinions of members of the UAE Biodiversity Conservation Committee rather than on systematic survey data. For an explanation of terms used in the IUCN classification, please see part 4.

During 2005, TERC plans to formally produce a UAE Red List based on data that has been collected by the Wildlife Survey and Monitoring (WSM) team, the Emirates Natural History Group (ENHG) and by other sources.

Species shown in bold type font are known to occur in Abu Dhabi Emirate.

**Table 1.** Numbers of UAE mammals falling within categories according to the IUCN Red List and according to the UAE Red List

Category	Abbr.	IUCN Red Data List (2004)	UAE Red Data List
Extinct	EX	0	0
Extinct in the Wild	EW	0	4
Critically Endangered	CR	1	4
Endangered	EN	3	3
Vulnerable	VU	4	6
Near Threatened	NT	3	3
Least Concern	LC	2	9
Data Deficient	DD	1	9
Not Listed		31	7

## 1. Carnivores (Order Carnivora)

### a. Cats (Family Felidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
Arabian Leopard	<i>Panthera pardus nimr</i>	Critically Endangered	CR C2a
<b>Caracal Lynx</b>	<b><i>Felis caracal schmitzi</i></b>	<b>Vulnerable</b>	<b>Not Listed</b>
<b>Gordon's Wildcat</b>	<b><i>Felis silvestris gordonii</i></b>	<b>Endangered</b>	<b>Not Listed</b>
<b>Sand Cat</b>	<b><i>Felis margarita</i></b>	<b>Endangered</b>	<b>NT</b>
<b>Feral Cat (1)</b>	<b><i>Felis catus</i></b>	<b>Not Listed</b>	<b>Not Listed</b>

### b. Dogs (Family Canidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Wolf (2)</b>	<b><i>Canis lupus arabs</i></b>	<b>Extinct in the Wild</b>	<b>LC</b>
<b>Red Fox</b>	<b><i>Vulpes vulpes</i></b>	<b>Least Concern</b>	<b>LC</b>
<b>Blanford's Fox</b>	<b><i>Vulpes cana</i></b>	<b>Vulnerable</b>	<b>VU C1</b>
<b>Rüppell's Fox</b>	<b><i>Vulpes rueppelli</i></b>	<b>Vulnerable</b>	<b>DD</b>

### c. Hyaenas (Family Hyaenidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Striped Hyaena (2)</b>	<b><i>Hyaena hyaena</i></b>	<b>Extinct in the Wild</b>	<b>NT</b>

### d. Weasels (Family Mustelidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Ratel (3)</b>	<b><i>Mellivora capensis</i></b>	<b>Critically Endangered</b>	<b>Not Listed</b>

### e. Mongooses (Family Herpestidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
White-tailed Mongoose	<i>Ichneumia albicauda</i>	Endangered	Not Listed
Indian Grey Mongoose (4)	<i>Herpestes edwardsi</i>	Not Listed	Not Listed

## 2. Odd-toed Ungulates (Order Perrisodactyla)

### a. Horses, Zebras and Asses (Family Equidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Feral Donkey (5)</b>	<b><i>Equus africanus</i></b>	<b>Not Listed</b>	<b>Not Listed</b>

## 3. Even-Toed Ungulates (Order Artiodactyla)

### a. Bovids (Family Bovidae)

#### i. Grazing antelopes (Sub-family Hippotraginae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Arabian Oryx</b>	<b><i>Oryx leucoryx</i></b>	<b>Extinct in the Wild</b>	<b>EN C1</b>

#### ii. Gazelles and dwarf antelopes (Sub-family Antilopinae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Sand Gazelle</b>	<b><i>Gazella subgutturosa marica</i></b>	<b>Critically Endangered</b>	<b>NT</b>
<b>Mountain Gazelle</b>	<b><i>Gazella gazella cora</i></b>	<b>Vulnerable</b>	<b>VU A2ad</b>

#### iii. Goat antelopes (Sub-family Caprinae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Arabian Tahr</b>	<b><i>Hemitragus jayakari</i></b>	<b>Critically Endangered</b>	<b>EN C2a</b>
Wild Goat (6)	<i>Capra aegagrus aegagrus</i>	Extinct in the Wild	VU A2cde
Feral domestic Goat (7)	<i>Capra aegagrus hircus</i>	Not Listed	Not Listed

#### 4. Rodents (Order Rodentia)

##### a. Rats and mice (Family Muridae)

##### i. Old world rats and mice (Sub-family Murinae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>House Mouse</b>	<b><i>Mus musculus</i></b>	<b>Least Concern</b>	<b>Not Listed</b>
<b>Brown Rat</b>	<b><i>Rattus norvegicus</i></b>	<b>Least Concern</b>	<b>Not Listed</b>
<b>Black Rat</b>	<b><i>Rattus rattus</i></b>	<b>Least Concern</b>	<b>Not Listed</b>
<b>Egyptian Spiny Mouse</b>	<b><i>Acomys cahirinus</i></b>	<b>Near Threatened</b>	<b>Not Listed</b>

##### ii. Gerbils (Sub-family Gerbillinae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Wagner's Gerbil</b>	<b><i>Gerbillus dasyurus</i></b>	<b>Data Deficient</b>	<b>Not Listed</b>
<b>Baluchistan Gerbil</b>	<b><i>Gerbillus nanus</i></b>	<b>Data Deficient</b>	<b>Not Listed</b>
<b>Sundevall's Jird</b>	<b><i>Meriones crassus</i></b>	<b>Least Concern</b>	<b>Not Listed</b>
<b>Arabian Jird</b>	<b><i>Meriones arimalius</i></b>	<b>Least Concern</b>	<b>EN B1 + 2C</b>
<b>Cheesman's gerbil</b>	<b><i>Gerbillus cheesmani</i></b>	<b>Least Concern</b>	<b>Not Listed</b>

##### iii. Pocket mice, kangaroo rats and kangaroo mice (Sub-family Heteromyinae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Lesser Jerboa</b>	<b><i>Jaculus jaculus</i></b>	<b>Near Threatened</b>	<b>Not Listed</b>

#### 5. Hyraxes (Order Hyracoidea)

##### a. Hyraxes (Family Procaviidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Cape Hyrax (8)</b>	<b><i>Procavia capensis</i></b>	<b>Not Listed</b>	<b>Not Listed</b>

## 6. Lagomorphs (Order Lagomorpha)

### a. Rabbits and hares (Family Leporidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Cape Hare</b>	<b><i>Lepus capensis</i></b>	<b>Least Concern</b>	<b>Not Listed</b>

## 7. Insectivores (Order Insectivora)

### a. Hedgehogs (Family Erinaceidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Brandt's Hedgehog</b>	<b><i>Hemiechinus hypomelas</i></b>	<b>Least Concern</b>	<b>Not Listed</b>
<b>Ethiopian Hedgehog</b>	<b><i>Hemiechinus aethiopicus</i></b>	<b>Near Threatened</b>	<b>Not Listed</b>
<b>Long-eared Hedgehog (9)</b>	<b><i>Hemiechinus auritus</i></b>	<b>Vulnerable</b>	<b>Not Listed</b>

### b. Shrews (Family Soricidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
House Shrew (10)	<i>Suncus murinus</i>	Data Deficient	Not Listed
Savi's Pygmy Shrew	<i>Suncus etruscus</i>	Not Listed	Not Listed



## 8. Bats (Order Chiroptera)

### a. Flying foxes (Sub-order Megachiroptera)

#### i. Fruit bats and flying foxes (Family Pteropodidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Egyptian Fruit Bat</b>	<b><i>Rousettus aegyptiacus</i></b>	<b>Vulnerable</b>	<b>Not Listed</b>

### b. All other bats (Sub-order Microchiroptera)

#### i. Mouse tailed bats (Family Rhinopomatidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Muscat Mouse-tailed Bat</b>	<b><i>Rhinopoma muscatellum</i></b>	<b>Data Deficient</b>	<b>Not Listed</b>

#### ii. Horseshoe and old world leaf-nosed bats (Family Rhinolophidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Persian Leaf-nosed Bat</b>	<b><i>Trienops persicus</i></b>	<b>Data Deficient</b>	<b>Not Listed</b>
<b>Trident Leaf-nosed Bat</b>	<b><i>Asellia tridens</i></b>	<b>Data Deficient</b>	<b>Not Listed</b>

#### iii. Vespertilionid bats (Family Vespertilionidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
Hemprich's Long-eared Bat	<i>Otonycteris hemprichii</i>	Data Deficient	Not Listed
<b>Sind Serotine Bat</b>	<b><i>Eptesicus nasutus</i></b>	<b>Data Deficient</b>	<b>VU A2c</b>
<b>Kuhl's Pipistrelle</b>	<b><i>Pipistrellus kuhlii</i></b>	<b>Not Listed</b>	<b>Not Listed</b>

#### iv. Sheath-tailed bats (Family Emballonuridae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>UAE Category</u>	<u>IUCN Red List</u>
<b>Naked Bellied Tomb Bat</b>	<b><i>Taphozous nudiventris</i></b>	<b>Data Deficient</b>	<b>Not Listed</b>

## **Notes**

- (1) Feral domestic cats are established in many parts of the UAE; the impact on native fauna is not known, but elsewhere, hybridisation with Wild Cats (*Felis silvestris ssp*) is known to be an issue.
- (2) There have been several reported sightings of wolves and Hyaenas over the past 10 years, however these are unlikely to be resident in UAE. The EW classification by Hornby, 1996 is therefore likely to remain unchanged when the taxa are re-evaluated.
- (3) There have been no confirmed sightings of Ratel in UAE, the species has only ever been identified by tracks.
- (4) Indian Grey Mongoose is thought to have established itself in the Northern Emirates as a result of specimens escaping from captivity.
- (5) African Donkey (*Equus africanus* syn. *E. asinus*) is critically endangered throughout its original range, however it has been introduced and become feral in many parts of the world. The status and taxonomy of the species in the UAE is unclear. Bones belonging to an Equid species (identified as *E. africanus*) have been found dating back 7,000 years.
- (6) The presence of wild goats in UAE was documented in 1968 (Harrison 1968). However, no sightings of the species have been recorded since this date.
- (7) Feral domestic goats (*capra aegagrus hircus*) have been introduced to several parts of UAE.
- (8) Cape hyraxes were apparently introduced to Jebel Hafeet in Al Ain during the mid 1990's; however, it is unlikely that they occur naturally in The UAE.
- (9) Long-eared hedgehog is listed based on a single record from Abu Dhabi Emirate.
- (10) The house shrew, a commensal species, was considered by Duckworth, as likely to occur although there are no formal records of its occurrence.

## **Part 2 The Terrestrial Reptiles of The UAE**

The following list includes all UAE terrestrial reptiles classified according to the IUCN Red List 2004 (IUCN 2004).

There are 54 species of terrestrial reptiles that are known to occur in UAE. These exist in 11 Families within 1 Order (Squamata).

The common names of many of the species have multiple synonyms and should not be used when referring to a species. In some cases over the last 10 years, the scientific names have changed (for example *Agama flavimaculata* has become *Trapelus flavimaculatus*).

During 2004, TERC plans to formally produce a UAE Red List based on data that has been collected by the Wildlife Survey and Monitoring (WSM) team, the Emirates Natural History Group (ENHG) and by other sources.

Species shown in bold type font are known to occur in Abu Dhabi Emirate.

## 1. Snakes and lizards (Order Squamata)

### a. Lizards (Sub-order Sauria)

#### i. Agamid lizards (Family Agamidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>IUCN Red List</u>
<b>Arabian Toad-headed Agama</b>	<i>Phrynocephalus arabicus</i>	<b>Not Listed</b>
<b>Spotted Toad-headed Agama</b>	<i>Phrynocephalus maculatus</i>	<b>Not Listed</b>
<b>Yellow-spotted Agama</b>	<i>Trapelus flavimaculatus</i>	<b>Not Listed</b>
<b>Sinai Agama</b>	<i>Pseudotrapelus sinaitus</i>	<b>Not Listed</b>
<b>Spiny-tailed Lizard</b>	<i>Uromastyx aegyptia microlepis</i>	<b>Not Listed</b>
<b>Spiny-tailed Lizard</b>	<i>Uromastyx leptieni</i>	<b>Not Listed</b>

#### ii. Geckos (Family Gekkonidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>IUCN Red List</u>
Musandam Leaf-toed Gecko	<i>Asaccus caudivulvulus</i>	Not Listed
	<i>Asaccus elisae</i>	Not Listed
Gallagher's Leaf-toed Gecko	<i>Asaccus gallagheri</i>	Not Listed
Spatulate-tailed Rock Gecko	<i>Bunopus spatulurus</i>	Not Listed
<b>Baluch Rock Gecko</b>	<i>Bunopus tuberculatus</i>	<b>Not Listed</b>
<b>Wall Gecko</b>	<i>Cyrtodactylus scaber</i>	<b>Not Listed</b>
<b>Yellow-bellied House Gecko</b>	<i>Hemidactylus flaviviridis</i>	<b>Not Listed</b>
Persian House Gecko	<i>Hemidactylus persicus</i>	Not Listed
<b>Turkish Gecko</b>	<i>Hemidactylus turcicus</i>	<b>Not Listed</b>
<b>Bar-tailed Semaphore Gecko</b>	<i>Pristurus celerrimus</i>	<b>Not Listed</b>
<b>Least Semaphore Gecko</b>	<i>Pristurus minimus</i>	<b>Not Listed</b>
<b>Rock semaphore Gecko</b>	<i>Pristurus rupestris</i>	<b>Not Listed</b>
<b>Fan-footed Gecko</b>	<i>Ptyodactylus hasselquistii</i>	<b>Not Listed</b>
<b>Arabian Sand Gecko</b>	<i>Stenodactylus arabicus</i>	<b>Not Listed</b>
<b>Dune Sand Gecko</b>	<i>Stenodactylus doriae</i>	<b>Not Listed</b>
<b>Gulf Sand Gecko</b>	<i>Stenodactylus khobarensis</i>	<b>Not Listed</b>
<b>East Sand Gecko</b>	<i>Stenodactylus leptocosymbotes</i>	<b>Not Listed</b>
<b>Slevin's Big-headed Gecko</b>	<i>Stenodactylus slevini</i>	<b>Not Listed</b>
<b>Desert Skink Gecko</b>	<i>Teratoscincus scincus</i>	<b>Not Listed</b>

#### iii. Lacertid lizards (Family Lacertidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>IUCN Red List</u>
Striped Sand Lizard	<i>Acanthodactylus boskianus</i>	Not Listed
<b>Fringe-toed Lizard</b>	<i>Acanthodactylus gongrorhynchatus</i>	<b>Not Listed</b>
<b>Haas's Spiny-footed Lizard</b>	<i>Acanthodactylus haasi</i>	<b>Not Listed</b>
<b>Spiny-footed Lizard</b>	<i>Acanthodactylus opheodurus</i>	<b>Not Listed</b>
<b>White spotted Lizard</b>	<i>Acanthodactylus schmidti</i>	<b>Not Listed</b>
Blue-tailed Lizard	<i>Lacerta cyanura</i>	Not Listed
Jayakar's Lacertid	<i>Lacerta jayakari</i>	Not Listed
<b>Desert Race-runner</b>	<i>Mesalina adramitana</i>	<b>Not Listed</b>
<b>Short-nosed Desert Lizard</b>	<i>Mesalina brevirostris</i>	<b>Not Listed</b>

iv. Skinks (Family Scincidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>IUCN Red List</u>
<b>Snake-eyed Skink</b>	<b><i>Ablepharus pannonicus</i></b>	<b>Not Listed</b>
<b>Ocellated Skink</b>	<b><i>Chalcides ocellatus</i></b>	<b>Not Listed</b>
Tesselated Mabuya	<i>Mabuya tessallata</i>	Not Listed
<b>Eastern Sand Skink</b>	<b><i>Scincus mitranus</i></b>	<b>Not Listed</b>
<b>Common Skink</b>	<b><i>Scincus scincus conirostris</i></b>	<b>Not Listed</b>

v. Varanid lizards (Family Varanidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>IUCN Red List</u>
<b>Desert Monitor Lizard</b>	<b><i>Varanus griseus</i></b>	<b>Not Listed</b>

b. Amphisbaenids (Sub-order Amphisbaenia)

i. Short-head worm lizards (Family Trogonophidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>IUCN Red List</u>
<b>Zarudny's Worm Lizard</b>	<b><i>Diplometopon zarudnyi</i></b>	<b>Not Listed</b>

c. Snakes (Sub-order Serpentes)

i. Slender blind snakes (Family Leptotyphlopidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>IUCN Red List</u>
<b>Hooked Thread Snake</b>	<b><i>Leptotyphlops macrorhynchus</i></b>	<b>Not Listed</b>

ii. Blind snakes (Family Typhlopidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>IUCN Red List</u>
Flowerpot Snake	<i>Rhamphotyphlops braminus</i>	Not Listed

iii. Boas and pythons (Family Boidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>IUCN Red List</u>
<b>Sand Boa</b>	<b><i>Eryx jayakari</i></b>	Not Listed

iv. Colubrid snakes (Family Colubridae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>IUCN Red List</u>
<b>Rat Snake</b>	<b><i>Coluber ventromaculatus</i></b>	<b>Not Listed</b>
Wadi Racer	<i>Coluber rhodorhacis</i>	Not Listed
<b>Leaf-nosed Snake</b>	<b><i>Lytorhynchus diadema</i></b>	<b>Not Listed</b>
<b>Hooded Malpolon</b>	<b><i>Malpolon moilensis</i></b>	<b>Not Listed</b>
<b>Hissing sand snake</b>	<b><i>Psammophis schokari</i></b>	<b>Not Listed</b>
Arabian Cat Snake	<i>Telescopus dhara</i>	Not Listed
Diadem Snake	<i>Spalerosophis diadema</i>	Not Listed

v. Vipers (Family Viperidae)

<u>Common Name</u>	<u>Scientific Name</u>	<u>IUCN Red List</u>
<b>Arabian Horned Viper</b>	<b><i>Cerastes gasperettii</i></b>	<b>Not Listed</b>
<b>False Horned Viper</b>	<b><i>Pseudocerastes persicus</i></b>	<b>Not Listed</b>
<b>Saw-scaled Viper</b>	<b><i>Echis carinatus</i></b>	<b>Not Listed</b>
<b>Oman saw-scaled Viper</b>	<b><i>Echis omanensis</i></b>	<b>Not Listed</b>

### **Part 3 The Amphibians of The UAE**

The following list includes all UAE terrestrial amphibians classified according to the IUCN Red List 2004 (IUCN 2004).

There are only 2 species of amphibians recorded in The UAE. The Dhofar toad, *Bufo dhufarensis* has been recorded around plantations in the Al Ain area, although it is possible that they may occur within some of the permanent, inaccessible water pools on Jebel Hafeet.

During 2004, TERC plans to formally produce a UAE Red List based on data that has been collected by the Wildlife Survey and Monitoring (WSM) team, the Emirates Natural History Group (ENHG) and by other sources.

#### **1. Amphibia (Order Anura)**

##### **a. True toads (Family Bufonidae)**

<u>Common Name</u>	<u>Scientific Name</u>	<u>IUCN Red List</u>
Arabian Toad	<i>Bufo arabicus</i>	Not Listed
<b>Dhofar Toad</b>	<b><i>Bufo dhufarensis</i></b>	<b>Not Listed</b>

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## **Part 4 Explanation of terms used in the IUCN Red Data List**

### **EXTINCT (EX)**

A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

### **EXTINCT IN THE WILD (EW)**

A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

### **CRITICALLY ENDANGERED (CR)**

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.

### **ENDANGERED (EN)**

A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.

### **VULNERABLE (VU)**

A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild.

### **NEAR THREATENED (NT)**

A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

### **LEAST CONCERN (LC)**

A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

### **DATA DEFICIENT (DD)**

A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that

future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

### **NOT EVALUATED (NE)**

A taxon is Not Evaluated when it has not yet been evaluated against the criteria.

## **THE CRITERIA FOR CRITICALLY ENDANGERED, ENDANGERED AND VULNERABLE**

### **CRITICALLY ENDANGERED (CR)**

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing an extremely high risk of extinction in the wild:

A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of  $\geq 90\%$  over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:

- (a) direct observation
- (b) an index of abundance appropriate to the taxon
- (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
- (d) actual or potential levels of exploitation
- (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2. An observed, estimated, inferred or suspected population size reduction of  $\geq 80\%$  over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

3. A population size reduction of  $\geq 80\%$ , projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.

4. An observed, estimated, inferred, projected or suspected population size reduction of  $\geq 80\%$  over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy)  
OR both:

1. Extent of occurrence estimated to be less than 100 km<sup>2</sup>, and estimates indicating at least two of a-c:

- a. Severely fragmented or known to exist at only a single location.
- b. Continuing decline, observed, inferred or projected, in any of the following:
  - (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) area, extent and/or quality of habitat
  - (iv) number of locations or subpopulations
  - (v) number of mature individuals.
- c. Extreme fluctuations in any of the following:
  - (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) number of locations or subpopulations
  - (iv) number of mature individuals.

2. Area of occupancy estimated to be less than 10 km<sup>2</sup>, and estimates indicating at least two of a-c:

- a. Severely fragmented or known to exist at only a single location.
- b. Continuing decline, observed, inferred or projected, in any of the following:
  - (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) area, extent and/or quality of habitat
  - (iv) number of locations or subpopulations
  - (v) number of mature individuals.
- c. Extreme fluctuations in any of the following:
  - (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) number of locations or subpopulations
  - (iv) number of mature individuals.

C. Population size estimated to number fewer than 250 mature individuals and either:

1. An estimated continuing decline of at least 25% within three years or one generation, whichever is longer, (up to a maximum of 100 years in the future)

OR

2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):

- (a) Population structure in the form of one of the following:
  - (i) no subpopulation estimated to contain more than 50 mature individuals, OR
  - (ii) at least 90% of mature individuals in one subpopulation.
- (b) Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 50 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 50% within 10 years or three generations, whichever is the longer (up to a maximum of 100 years).

## **ENDANGERED (EN)**

A taxon is Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a very high risk of extinction in the wild:

### A. Reduction in population size based on any of the following:

1. An observed, estimated, inferred or suspected population size reduction of  $\geq 70\%$  over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:

- (a) direct observation
- (b) an index of abundance appropriate to the taxon
- (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
- (d) actual or potential levels of exploitation
- (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

2. An observed, estimated, inferred or suspected population size reduction of  $\geq 50\%$  over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

3. A population size reduction of  $\geq 50\%$ , projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1. 4. An observed, estimated, inferred, projected or suspected population size reduction of  $\geq 50\%$  over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

### B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 5000 km<sup>2</sup>, and estimates indicating at least two of a-c:

- a. Severely fragmented or known to exist at no more than five locations.
- b. Continuing decline, observed, inferred or projected, in any of the following:
  - (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) area, extent and/or quality of habitat
  - (iv) number of locations or subpopulations
  - (v) number of mature individuals.
- c. Extreme fluctuations in any of the following:
  - (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) number of locations or subpopulations
  - (iv) number of mature individuals.

2. Area of occupancy estimated to be less than 500 km<sup>2</sup>, and estimates indicating at least two of a-c:

- a. Severely fragmented or known to exist at no more than five locations.

- b. Continuing decline, observed, inferred or projected, in any of the following:
  - (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) area, extent and/or quality of habitat
  - (iv) number of locations or subpopulations
  - (v) number of mature individuals.
- C. Extreme fluctuations in any of the following:
  - (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) number of locations or subpopulations
  - (iv) number of mature individuals.

C. Population size estimated to number fewer than 2500 mature individuals and either:

- 1. An estimated continuing decline of at least 20% within five years or two generations, whichever is longer, (up to a maximum of 100 years in the future)
- OR
- 2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):
  - (a) Population structure in the form of one of the following:
    - (i) no subpopulation estimated to contain more than 250 mature individuals,
    - OR
    - (ii) at least 95% of mature individuals in one subpopulation.
  - (b) Extreme fluctuations in number of mature individuals.

D. Population size estimated to number fewer than 250 mature individuals.

E. Quantitative analysis showing the probability of extinction in the wild is at least 20% within 20 years or five generations, whichever is the longer (up to a maximum of 100 years).

### **VULNERABLE (VU)**

A taxon is Vulnerable when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a high risk of extinction in the wild:

A. Reduction in population size based on any of the following:

- 1. An observed, estimated, inferred or suspected population size reduction of  $\geq 50\%$  over the last 10 years or three generations, whichever is the longer, where the causes of the reduction are: clearly reversible AND understood AND ceased, based on (and specifying) any of the following:
  - (a) direct observation
  - (b) an index of abundance appropriate to the taxon
  - (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
  - (d) actual or potential levels of exploitation
  - (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.
- 2. An observed, estimated, inferred or suspected population size reduction of  $\geq 30\%$  over the last 10 years or three generations, whichever is the longer, where the reduction

or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

3. A population size reduction of  $\geq 30\%$ , projected or suspected to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.

4. An observed, estimated, inferred, projected or suspected population size reduction of  $\geq 30\%$  over any 10 year or three generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.

B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both:

1. Extent of occurrence estimated to be less than 20,000 km<sup>2</sup>, and estimates indicating at least two of a-c:

- a. Severely fragmented or known to exist at no more than 10 locations.
- b. Continuing decline, observed, inferred or projected, in any of the following:
  - (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) area, extent and/or quality of habitat
  - (iv) number of locations or subpopulations
  - (v) number of mature individuals.
- c. Extreme fluctuations in any of the following:
  - (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) number of locations or subpopulations
  - (iv) number of mature individuals.

2. Area of occupancy estimated to be less than 2000 km<sup>2</sup>, and estimates indicating at least two of a-c:

- a. Severely fragmented or known to exist at no more than 10 locations.
- b. Continuing decline, observed, inferred or projected, in any of the following:
  - (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) area, extent and/or quality of habitat
  - (iv) number of locations or subpopulations
  - (v) number of mature individuals.
- c. Extreme fluctuations in any of the following:
  - (i) extent of occurrence
  - (ii) area of occupancy
  - (iii) number of locations or subpopulations
  - (iv) number of mature individuals.

C. Population size estimated to number fewer than 10,000 mature individuals and either:

1. An estimated continuing decline of at least 10% within 10 years or three generations, whichever is longer, (up to a maximum of 100 years in the future)

OR

2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals AND at least one of the following (a-b):

- (a) Population structure in the form of one of the following:

- (i) no subpopulation estimated to contain more than 1000 mature individuals,
  - OR
  - (ii) all mature individuals are in one subpopulation.
- (b) Extreme fluctuations in number of mature individuals.

D. Population very small or restricted in the form of either of the following:

1. Population size estimated to number fewer than 1000 mature individuals.
2. Population with a very restricted area of occupancy (typically less than 20 km<sup>2</sup>) or number of locations (typically five or fewer) such that it is prone to the effects of human activities or stochastic events within a very short time period in an uncertain future, and is thus capable of becoming Critically Endangered or even Extinct in a very short time period.

E. Quantitative analysis showing the probability of extinction in the wild is at least 10% within 100 years.