

Endangered Species

These notes are intended as an introduction to the subject of endangered species, what is meant by the term and why so many species are currently listed as endangered.

What is meant by the term 'endangered species'?

The word 'endangered' is a generic term used to describe species that are in danger of disappearing if there is not a dramatic improvement in their present circumstances. The World Conservation Union (IUCN) is a non-governmental organisation that is responsible for collecting data on the world's species, collating that data and producing a list of the world's 'endangered' species. IUCN uses several categories to denote the level of threat from extinct in the wild to least concern (see appendix I for more information on IUCN categories of threat).

What causes extinction?

Extinction is a natural process, it is part of evolution and it is estimated that 99% of all the species that have ever lived on Earth are now extinct. Ammonites, dinosaurs, giant sloths and many, many more are extinct due to natural processes such as the inability to adapt or evolution itself. When a species cannot adapt to environmental changes such as climate change, it is likely to become extinct. Similarly most species do not remain exactly the same forever. Over several million years, as the evolutionary process acts upon them they change, eventually after several million years evolving into a new form. This process gives us the normal or background extinction rate. David Raup has calculated the background extinction rate using the fossil record, which works out at an average of one species every four years.

Mass extinction events

However, throughout the history of life on Earth there have been instances when over a short period of time, geologically speaking, a great many species have suddenly disappeared. This is known as a mass extinction event. For instance ammonites (marine molluscs) were found on Earth as early as 250 million years ago. Over millions of years, new species of ammonites evolved but 65 million years ago they all disappeared, wiped out along with the dinosaurs. Evidence suggests that there have been five of these mass extinction events. The first occurred approximately 450 million years ago shortly after the evolution of the first land-based plants. The second occurred 350 million years

ago. Then there were two during the Triassic period 250 - 200 million years ago with the final one 65 million years ago ending the reptilian dominance of the Earth and making way for their successors - the mammals. But was that the last mass extinction event?

The sixth mass extinction event

Many experts have suggested that we are currently in the grip of a sixth mass extinction event. In order to prove this, it is necessary to compare current extinction rates with the background rate. With so few of the Earth's species currently identified it can be hard to estimate the current extinction rate. Calculations have been made using bird species as the model because scientific interest in birds is global and bird species have long been studied and recorded. From this work it has been estimated that the current extinction rate is anything from 100 - 1000 times the normal background rate. Jared Diamond a physiologist at the University of California has estimated that if the present trends continue, at least 50% of all currently existing species will be either extinct or endangered by 2050.

It is easy to assume that because we know much more now about the plight of wildlife that extinctions no longer happen, but unfortunately that is not true. The Conondale gastric brooding frog was discovered in Queensland, Australia in 1973. By 1981 scientists could no longer find any frogs in the wild and it was declared extinct in 1983.

What are the causes of this sixth mass extinction event?

Unfortunately there is not one single cause that can be identified and therefore stopped. Most endangered species have a number of factors acting upon them. Therefore all of these factors must be looked at and considered. The one unifying factor however is the action of humans - since the 1600s humans have caused many species to come under threat. The major threats to the world's species include habitat loss, exploitation and the introduction of alien species.

Habitat loss

Habitats are defined as 'the natural home of an animal or plant' or 'the area or environment where an organism or ecological community normally lives or occurs'. The word habitat derives from the Latin habitare meaning to dwell. As different species have evolved they have been shaped by the specific habitat in which they live, so their habitat best meets their survival needs. A habitat provides everything that a species needs in order to survive - food, water,

shelter and sex! Without that specific habitat or even with elements of it missing, the species may not survive.

The subject of habitat destruction usually conjures up images of the felling of the tropical rainforest. Although rainforests are a globally important habitat and contain a great deal of the world's biodiversity, habitat destruction and loss is taking place all around the world and across habitat types. Habitat destruction can also occur if there is enough damage done so that the organisms that live there can no longer get everything that they need in order to survive.

Facts and figures regarding rainforest destruction abound. In the 1990s the World Resources Institute examined satellite images in order to work out the true extent of forest loss. They gave a figure of 80,000 square miles lost per year, which is one acre per second. There is no reason to think that this figure has declined, in fact it may well have increased.

Tropical rainforest trees are cut down for a variety of reasons. The leading cause is the search for valuable timber trees such as mahogany and teak. The required trees do not grow in rows or clumps as they would on a plantation but are scattered throughout the forest, therefore all of the other trees and plants that grow around them have to be cut down and cleared. Rainforest trees are used to manufacture a variety of timber products including furniture, which is mostly sold in developed countries, the wood is not used in paper production so the use of recycled paper does not protect tropical forests.

As the human population grows so does the need for more land for growing food crops, farming livestock and the expansion of cities and towns. Unfortunately rainforest soil is particularly poor as it relies on the death and decay of the plants and animals that live there for its nutrients. If the plants and trees, and therefore the animals, are removed in order to grow crops, the soil becomes barren very quickly, necessitating the clearing of new areas of forest to continue farming crops.

However, it is not just tropical forests that are under threat, temperate forests are also being cut down. Oregon in the USA still has vast areas of wilderness and large areas of virgin, temperate forests. This forest is home to the Northern spotted owl and each owl requires 8 square kilometres of virgin, old growth forest as its personal habitat. However, this is a major logging area and 60% of the forest has already been cleared. It takes 60 - 100 years regrowth before the forest is capable of supporting owls again. This bird is listed as threatened by the US Fish and Wildlife Service.

As well as the obvious effects of forest clearance, there are some unexpected consequences including soil erosion, land and mudslides, flooding and climate change. Rainforest soil is very thin and if the trees and plants are removed there is nothing to hold the soil together. When it rains the soil is washed away, forming channels that eventually reach bedrock. Soil denuded of trees is more likely to cause land and mudslides. The soil is washed into rivers, which eventually carry it towards the sea. As the rivers flow more slowly, they drop the soil that has been in suspension, which chokes the riverbed and increases the likelihood of flooding. The removal of forests has an effect on the climate. Plants are a vital part of the water cycle, sucking up water from rainfall and releasing water vapour into the air as part of photosynthesis and this water eventually falls as rain again. Remove the plants and the water cycle is broken which can result in severe water shortages and a change in the local water table.

It is not just the animals and plants that are affected by habitat loss, there are two examples from human history should be taken as a warning.

A sea faring people first settled Easter Island over 1,500 years ago. These people lived very well on their island home and population grew to an estimated 20,000. Investigations by archaeologists have discovered that initially their diet was very good they ate fish, shellfish and chicken. At that time the island was heavily forested. Just over 500 years later they were no longer enjoying the good life, their diet no longer included fish and there were very few trees left. Experts have concluded that they had cut down most of the trees in order to make boats, build houses, cook food and move their famous statues. With very few trees left there were no boats for fishing, no new houses could be built, fires could not be lit and statues could not be moved. There are signs that a war broke out at this point and in a very short time the entire population had either escaped the island or lay dead. These people had deforested themselves to extinction.

350 years ago European settlers discovered the city Pueblo Bonito in a treeless, dry, infertile canyon in New Mexico. Study of this city showed that Pueblo Bonito was built by Indians over 1,000 years before and had been abandoned after only 300 years of occupation. This city was very impressive with five storey buildings, which were the tallest manmade structures in America until the advent of the skyscraper. It has been discovered that when the Indians arrived in the canyon, the area was full of trees and there was a high water table, which made it easy for them to irrigate their crops. The Indians felled the trees to build their houses and for fuel. Soon they had cut down all the

trees that immediately surrounded their city and so constructed roads to make it easier to collect trees from further afield, anything up to 70 miles away. Unfortunately the removal of the trees and an unexpected period of drought caused the water table to drop drastically. The local people could no longer farm and rather than starve to death, had to abandon their magnificent city, leaving nothing but the buildings and a new desert behind.

Of course forests are not the only habitats that are affected by human activity. Wetlands are drained for farmland. Land reclamation, especially along estuaries, disturbs important feeding and roosting sites for birds. Sea walls or harbours built at the mouth of an estuary can change the actions of the tides and waves, which in turn can alter the estuary itself. Barrages built at a river mouth, by altering the flow of seawater into a river mouth, can allow fresh water to build up altering the ecology of the local area. Damage can be caused by altering the rate of water flow in a river by removing water for human consumption or irrigation or by changing the rate of flow by infilling or dredging. Deepening a river can cause water tables to fall and can dry out local marshy areas. Wetlands, marshes and bogs are all important to wildlife and are all under threat from encroachment by people or from drainage. Grasslands may appear to be stable habitats but are vulnerable to overgrazing especially by domestic livestock or by wild animals, which are confined in a reserve. The list goes on.

Another problem is that of habitat degradation. Many forest areas are now broken up into small fragments or 'islands'. This 'islandisation' brings its own problems. A major study carried out on the remnants of forest in Brazil has revealed some unforeseen problems of islandisation. In one 250 acre study plot of fragmented forest, three species of frog disappeared because the area was too small to support peccaries (South American wild pigs) whose mud wallows created the ponds the frogs needed. Another problem is that habitat fragmentation isolates and divides major habitats into much smaller areas, confining species and preventing them from leaving their family groups or home area. This can cause problems such as the reduction of genetic diversity and inbreeding, making the species less able to adapt to any changes to their environment and leaves them much more likely to become extinct.

Even in large forest patches there is a problem known as the 'edge effect'. The boundaries between forest and grassland are exposed to wind, dramatically varying microclimates and incursion by non-forest animals and humans. Due to these influences, the habitats can remain unsuitable for as much as half a mile in from the edge of the forest patch.

Exploitation

During human history animals have been used for food, clothing, tools, currency, companionship, sport, entertainment and commercial gain. They have been domesticated, hunted, worshipped, trained and traded. Humans have always killed animals for food. In some parts of the world this is still a part of everyday life. Many of us no longer have to hunt for our food since the advent of agriculture negated that need. However, hunting has caused the extinction of many species. In the early 19th century there were estimated to be in excess of 5,000 million passenger pigeons in America. However the last existing passenger pigeon died in Cincinnati Zoo in 1914. The birds had been hunted to extinction for food, feathers and sport. The Steller's sea cow was discovered in 1741 but was extinct a mere 27 years later, hunted for meat and leather.

Natural growth processes cannot keep pace with the technology, which enables us as a species to get what we want, as quickly and efficiently as we can. We fell trees at a rate that is ten times faster than they can reproduce, each year 25 - 50% of all new plant growth is harvested for human use, that leaves only 50% for every other living thing on the planet. We harvest seventy major sea species at or above their natural reproduction rates, pushing them towards extinction. For instance between 1966 and 1970 the global herring catch decreased from 1.7 million tons to only 20,000 tons.

Primary productivity on land is the total amount of energy created by photosynthesis minus whatever the plants need to survive. Humans consume 40% of that primary productivity. Therefore humans take almost half of the energy that is available to sustain the rest of life on earth. For every extra 1% of NPP we take, there is 1% less for all other species. Eventually, if this continues, primary productivity will begin to fall as space for the producers falls and then biodiversity plummets, including the producers on which we depend.

Animal and their constituent parts have always been traded. Before international regulation, spotted cats were hunted for their fur. There is still a market and a demand for ivory, rhino horn and other animal parts. Tiger parts are used in Chinese medicine, 20,000 Chinese medical items containing illegal endangered species parts are sold in London alone. In 1998 129 rhino horns were seized in Kensington London.

The trade in live animals has increased due to the demand for exotic pets. Especially at risk are birds, reptiles and spiders. In 1970 almost 84 million live fish were imported into the USA, by 1979 this trade had increased to 250 million. Between 1989 and 1994 33,000 individual Asian box turtles were imported into the USA to be sold as pets.

The killing of wildlife for food could see the extinction of gorillas, chimpanzees and bonobos in the next 50 years.

Introduction of non-native species

Introducing non-native flora and fauna disrupts the delicate existing balance of nature. Species evolve to the specific requirements of their habitat including any predators it may contain. They develop the necessary skills to protect them. The introduction of predators such as dogs, cats, pigs and rats as well as herbivores such as goats and rabbits can spell disaster for native animals and plant populations. Predators can eat both adults and young and herbivores compete for food and overgraze.

Grey squirrels were introduced to Britain on several occasions between 1875 and 1930. They bred extremely well and, as a more aggressive species, forced the native red squirrel into smaller, more isolated areas. Greys cause damage to trees, rob bird's nests and kill nesting birds. In the early 20th century foresters were known to kill up to 50,000 grey squirrels a year, but still the numbers increased.

A small snail is the perfect example of how devastating the introduction of an alien species can be. In many island groups around the world, non-marine snails have evolved into different forms. With few natural predators they have been safe to carry on their lives without much interference. The partula snail group contains 79 species recognised by science. On the Hawaiian Islands humans introduced Giant African land snails as a food source. Unfortunately these large snails found crop plants and orange groves very tasty and as their population expanded, people's livelihoods were being compromised. The solution seemed to be simple, import a carnivorous snail, the Rosy wolf snail, which would eat the land snails and save people's crops. Unfortunately the wolf snail found the much smaller, native snails more to its liking and the rest is history. The wolf snail was introduced to the Hawaiian Islands in 1955 and since then 50 - 75% of the 800 different snail species have disappeared. Of the 79 partula species, 50 are extinct, 14 are extinct in the wild and the remaining 15 are critically endangered.

Human activities have spread the wolf snail to more than 20 other island groups in the Pacific and Indian oceans and the snail can move across an island at a rate of more than 1km per year, killing every native snail it comes across.

The most famous extinct animal is the dodo, another victim of introduced species. Like most island species with no natural predators the dodo had no need for defences, it could no longer fly and was nesting on the ground. With the arrival of pigs, rats and monkeys on sailing ships there was competition for food and their eggs and nestlings were eaten. Before long the dodo was gone.

However, it isn't just in tropical countries or the dim and distant past that this kind of misguided introduction occurs. In the 1970s 4 hedgehogs were brought to islands off the west coast of Scotland as pets. They bred, escaped and with no natural predators and plenty of food they now number in excess of 5,000 and have spread to other islands by walking across sand bars at low tide. Their ability to make use of different foodstuffs has spelled disaster for ground nesting birds such as dunlin. Dunlin no longer have successful breeding seasons in these areas due to the hedgehogs eating their eggs.

Introduced plants can be equally devastating. When the prickly pear was introduced to Australia from South America it very quickly covered a quarter of a million square kilometres of land, choking the native plant species. By 1925 it was spreading at a rate of 4,000 square kilometres per year. Exhaustive tests were done before a species of South American moth was introduced whose caterpillars feed exclusively on prickly pear. Within three years nearly all of the pears were gone.

Other threats

It is rare for a natural disaster such as drought, flood, volcano, cyclone etc. to cause a species to become threatened, as these events tend to be very localised. However, if such localised events occur on a small island or where the last remnant populations of a species are found, the results can be catastrophic.

Pollution, like natural events, is generally localised but even that can spell disaster for species. The use of various chemicals by humans can cause pollution in the local environment. Nitrate fertilisers used on the soil can be washed off into rivers and lakes. These cause algae to bloom, growing out of control. When the algae die, they are broken down by bacteria, which uses up all of the dissolved oxygen in the water which can cause everything in the lake or river to die.

The most worrying result of pollution is global warming. Carbon dioxide released by burning fossil fuels is collecting in the atmosphere and trapping the heat. The Earth is likely to become 1 - 5° hotter over the next 100 years. As temperatures rise, some species will need to move anything between 100 - 1000 kms to keep within their preferred temperature range. This may prove impossible for some plants as their path will be blocked by urban developments and some species will be isolated on islands. This movement is already occurring. The Edith's checkerspot butterfly is very sensitive to climate change. The caterpillars feed on figwort after hibernation but if spring comes too early, the figwort flowers before the caterpillars can feed. In King's Canyon, California, the caterpillars have moved their range 200kms up the mountain in the last 20 years to stay where the flowers appear at the right time.

Red is for Danger

The IUCN red data list is a book that publicises the KNOWN threatened and extinct species. The number of animal species listed as critically endangered increases with the publication of each new list. From 1996 to 2000 the number of listed mammal species increased from 169 to 180; birds from 168 to 182 and even more worrying the number of bird species listed as extinct in 1996 was 108, the 2000 list shows 131.

For plants the total number of listed threatened species is 5,611. However, only approximately 4% of the described plants have even been evaluated.

There are 25 biodiversity hotspots in the world and these areas have already lost 88% of their original extent. The small area that remains equals 1.4% of the land surface of the planet and contains 44% of all plants and 35% of all non-fish vertebrates. More than two thirds of the world's most endangered mammals and 80% of the most endangered birds come from these hotspots.

The 2000 Red Data List includes:

- 11,046 species threatened with extinction
- 816 species that are extinct or extinct in the wild

The 11,046 species threatened with extinction includes 24% of all mammals, and 12% of all bird species so one in four mammals and one in eight birds is facing a high risk of extinction in the near future. Approximately 25% of reptiles, 20% of amphibians and 30% of fish are threatened.

If the three major biomes defined in the Red Data book (terrestrial, marine and freshwater) are examined, terrestrial animals are the most highly studied. The numbers of threatened species are:

- 1,111 mammals
- 1,144 birds
- 283 reptiles
- 143 amphibians
- 438 insects
- 508 molluscs
- 11 spiders and centipedes
- 5,607 plants

For the first time the 2000 Red Data list graded the major threats to species:

1. Habitat loss and degradation: this affects 89% of threatened birds, 83% of mammals sampled and 91% of plants sampled.

The three main causes are:

Agricultural activities including crop and livestock farming; farming and timber plantations

Extraction activities: mining, fisheries, logging and harvesting

Development: human settlements; industry and associated infrastructure such as roads, dams, power lines etc.

2. Direct loss and exploitation: hunting, collecting and the impact of trade.

3. Intrinsic factors: poor dispersal; poor recruitment; high juvenile mortality rates and inbreeding and other threats such as natural disasters; land and water pollution.

Although the Red Data list documents the loss of 816 species in the last 500 years due to the impact of human activities we must conclude that many more have been lost that had not been described to science.

11,046 threatened species are considered to be facing a high risk of extinction in at least the near future as a result of direct and indirect human activities. A further 4,595 species are on the brink of moving into one of the threatened categories unless something is done to reverse their continued population decline which once again is the result of human activities.

Some ARKive examples of 'endangered' species

Habitat Destruction

Imperial woodpecker

Likely to be extinct as the last individual was seen 1956.

Threats - hunting for food, habitat loss particularly the destruction of tall trees in which species nested.

Black footed ferret

Extinct in the wild

During the first half of the 20th century the population plummeted due to habitat loss as the prairies were modified for intensive agriculture. Now less than 2% of the original habitat is left. Prairie dogs, the ferrets main prey, were systematically poisoned under a government eradication programme in the mid 1900s. The main threat today is disease particularly canine distemper. The final surviving animals (23) brought into captivity between 1985 and 1987 as they were the last remnants of a population discovered in 1981 having been thought to be extinct.

Spix's macaw

Critically endangered - only one male left in the wild



Threats are habitat destruction and more recently trapping for the illegal bird trade.

Javan rhino

Critically endangered

Habitat loss due to logging and hunting for body parts for oriental medicine

Yellow-tailed woolly monkey

Critically endangered

Main threat is habitat destruction for cattle ranching and cultivation as well as hunting for food and capture for pet trade.

Silvery gibbon

Critically endangered

There was a drastic population decline from 20,000 in 1977 to 2,000 - 400 by 1994. Caused by habitat destruction (only 4% of original habitat remaining) due to logging and clearance for agriculture and development

Philippine eagle

Critically endangered (world's largest eagle, one of the rarest)

It is primarily a forest eagle feeding on monkeys and other forest animals. The population was never abundant and suffered a precipitous decline primarily due to habitat destruction. Vast areas of forest cleared for commercial development and shifting cultivation.

Western swamp turtle

Critically endangered

This turtle has always had a restricted range and swamps are filled in and drained for agricultural purposes. They also suffer predation from the red fox especially as aestivating (the summer equivalent of hibernating) individuals are protected only by leaf litter.

River pipefish

Critically endangered

Was declared extinct in 1994 but another population was discovered in 1996. Under pressure due to altered river systems caused by construction of upstream dams. These restrict flow of water and therefore the supply of nutrients the food chain depend on. Developments along the river have led to silting problems, the creation of artificial beaches and removal of reed beds.

Australian ant

Critically endangered

Severely restricted distribution closely associated with eucalyptus tree and extremely vulnerable to their deforestation. One site was all but destroyed by the installation of underground telephone cables and the population was almost wiped out.

Asiatic lion

Critically endangered

Prized as big game trophies hunted out of Eastern Europe and Asia. Destruction of habitat for logging and agriculture has forced population to brink of extinction. As a single population at risk from epidemics, wild fires etc.

Indochinese box turtle

Critically endangered

Forests cleared and watercourses altered in the process of cultivating land for human use. Pet trade There is an increasing demand for food and medicines

European bison

Endangered

Vast tracts of habitat lost to agriculture persecuted by hunting and declared extinct in 1927. Captive populations and breeding have led to successful reintroduction programmes.

Iberian lynx

Endangered - World's most endangered cat

Habitat loss - scrublands converted to agriculture and plantations of pines or eucalypts. Populations of main food source rabbit suffered drastic decline in 1950s due to myxomatosis now viral haemorrhagic pneumonia once again threatening rabbit numbers. Despite legal protection illegal hunting continues.

Mountain pygmy possum

Endangered

Was only known from the fossil record till rediscovered in 1996. Suffered from development of ski industry. Habitat destroyed from management of pistes and general tourist development. Development and building of roads obstruct the dispersal of males. Further threat comes from habitat loss caused by increased temperatures and decreasing snow cover caused by global warming.

Satranala decussilvae - palm first discovered by Kew in 1991

Endangered

Forests cleared, predominantly by slash and burn agriculture, species may also suffer the additional curse of being unable to germinate without the elephant bird which became extinct in the 17th century.

Bullfinch

Red list of birds of conservation concern in the UK

1968 - 1991 75% decline in bullfinch numbers on farmland, and a 47% decline in woodland. General trend for removing trees and hedgerows in agricultural land and over trimming remaining hedges. This removes the nesting sites and food sources. Changes in agricultural practices including the loss of winter stubble fields and increased use of herbicides. Till 1996 it was still legal to trap and kill bullfinches.

Exploitation

Scimitar horned oryx

Extinct in the wild

Original decline due to climatic changes causing Sahara region to become dry. Europeans hunted for meat, hides and horn trophies. Increase in hunting for food.

Californian condor

Critically endangered

Threats - trapping, shooting, egg collecting, lead poisoning following ingestion of carcasses killed with lead shot. Collisions with power lines and anti-freeze poisoning.

Yellow or sulphur crested cockatoo

Critically endangered

Unsustainable trapping for the pet bird trade.

Red wolf

Critically endangered

Persecution (trapping and shooting) livestock, habitat loss.

Delacour's langur

Critically endangered

Hunting for meat and use of body parts, organs, bones and tissues used in oriental medicine.

Slender-billed curlew

Critically endangered

Extensive hunting of waders for food in early 20th century, curlews a prime target due to large size and being tamer than others. Now loss and degradation of wetlands. Population estimated at 50 - 270 individuals

Baltic sturgeon

Critically endangered

Fished to the brink of extinction principally as a source of caviar and for its highly prized flesh. Also the development of river systems including hydroelectric dams means adults are no longer able to return to their natal rivers to breed.

Southern blue fin tuna

Critically endangered

Fished to the brink of extinction. During 1960s annual catch was around 80,000 tonnes worldwide.

Amur leopard

Critically endangered

Systematically hunted for its coat and bones used in oriental medicine. Its prey has been hunted leaving leopard forced to prey on domestic livestock inciting further persecution.

Wild bactrian camel

Critically endangered

Heavily hunted for meat and hide. Still persecuted as they are seen as competition with domestic livestock for water and grazing in desert. Habitat loss threatened with proposed development of gas pipeline and highly toxic illegal mining. Population predicted to decrease by 80% over the next three years.

Dyopsis ambositrae - palm tree

Critically endangered

Only 2 mature individuals persist. First discovered in 1991. Northern population lost as a result of a land slip and collection of edible palm hearts. There is a market for this palm and seeds are collected and sold further depleting the potential population.

Forest coconut

Critically endangered

Relative and possible ancestor of modern coconut. Trees cut down for edible palm heart and seeds harvested for trade. Only 10 mature trees are known.

Hawksbill turtle

Critically endangered

Population may have declined by 80% over the last century. Illegal trade in shell, substantial market for eggs, meat and stuffed juveniles as exotic gifts, loss of nesting sites, deterioration of coral reefs which act as feeding sites.

Leatherback turtle

Critically endangered

Capture in fisheries (accidental) over-harvest of eggs, habitat loss, boat strikes, ingestion of discarded plastic bags which they mistake for jellyfish.

Orinoco crocodile

Critically endangered

Hunted to the brink of extinction for skin during the 1930s - 1960s and population has not recovered since. Illegal hunting for meat and teeth (thought to have medicinal properties) along with collection of eggs and juveniles.

Common skate

Endangered

During the mid 20th century made up a considerable amount of the commercial fishery. Population has seen drastic decline and population now too low to fish.

Blue whale

Endangered

Hunting

Long-nosed echidna

Endangered



Hunting with dogs trained for the purpose.

Giant otters

Endangered

No natural predators. Between 1940s and 1970s excessively hunted for their fur, despite legal protection hunting still occurs. Habitat loss and pollution current major threats. Mining in Amazon basin cause rivers to become polluted with heavy metals, concentrating in bodies of top predators.

Green turtle

Endangered

Over-harvested for meat and eggs

Basking shark

Vulnerable

Hunted for huge livers sold as an aphrodisiac in Japan, oil used in manufacture of cosmetics. Today the biggest threat comes from demand for fins for soup in the Far East. Reported decline by as much as 80% since the 1950s.

Greater bilby

Vulnerable

Hunted extensively for skins; accidentally killed in rabbit traps or poisoned baits; predation by introduced foxes and feral cats major cause of mortality today.

Introduction of non-native species

Sardinian brook salamander

Critically endangered Europe's rarest and most threatened salamander.

Habitat drainage, competition and predation from introduced species such trout

Kakapo

Critically endangered.

Threats - Maori hunted it for feathers and meat, introduced Polynesian dog and rat both preyed on species. Europeans settled 1800s; cleared forests, hunted it, introduction of cats, stoats and rats. Particularly vulnerable due to its strong smell, habit of freezing when threatened, ground nesting and flightless.

Takahe

Critically endangered.

Europeans introduced animals which for grass and predated by stoats.

Spotted handfish

Critically endangered

Was common in restricted range till mid 1980s when population suddenly declined. Thought introduction of Northern Pacific sea star may be the key. These are voracious predators and it is thought that they may eat the eggs of handfish.

Antiguan racer

Critically endangered - probably the world's rarest snake

Used to be common in Antigua but had disappeared by 20th century due to introduction of black and brown rats ate eggs and young. Late 19th century Asian mongoose introduced to control rats in sugar cane plantations. Quickly established and drove many species of terrestrial reptiles and ground-nesting birds to extinction. Many Antiguan and visiting tourists believed wrongly that racer was dangerous and many killed on sight.

Chatham Island oystercatcher

Endangered

Small population so vulnerable anyway. Introduced predators; sheep and cattle trample eggs and chicks. Introduced marram grass spread into open areas birds

prefer to nest in so they have been forced closer to the water's edge where eggs are vulnerable to high tides.

Shore plover

Endangered

Threats initially introduced cats and rats; human collecting hundreds of specimens in early 20th century for scientific purposes. Extremely vulnerable today as restricted to one island, accidental introduction or natural disaster could wipe out the species.

Other factors

Golden toad

Critically endangered probably extinct

Population of golden toad along with populations of 20 other species underwent massive population crash in 1987. Few individuals were found up until 1989. The area is free from human influences and decline thought to be result of climatic changes and disease as well as human created pollutants, decrease in ozone and changing weather patterns.

Corncrake

Vulnerable

Decline due to the increased use of farm machinery to cut hay meadows. Meadows cut earlier causing massive loss of adults, juveniles and nests. Loss of habitat due to conversion of grassland to arable and pasture. Disturbance and predation by domestic and feral cats and mink may also cause significant losses.

Appendix I

This information is taken directly from the IUCN Red Data List

The categories

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.

Note: As in previous IUCN categories, the abbreviation of each category (in parenthesis) follows the English denominations when translated into other languages (see Annex 2).

For further information go to www.redlist.org