Executive Summary

The Status of Globally Threatened Species

- **The 2004 *IUCN Red List* contains 15,589 species threatened with extinction.** The assessment includes species from a broad range of taxonomic groups including vertebrates, invertebrates, plants, and fungi. However, this figure is an underestimate of the total number of threatened species as it is based on an assessment of less than 3% of the world's 1.9 million described species.
- **Among major species groups, the percentage of threatened species ranges between 12% and 52%.** The *IUCN Red List* identifies 12% of birds as threatened, 23% of mammals, and 32% of amphibians. Although reptiles have not been completely assessed, the turtles and tortoises are relatively well reviewed with 42% threatened. Fishes are also poorly represented, but roughly a third of sharks, rays and chimaeras have been assessed and 18% of this group is threatened. Regional case studies on freshwater fishes indicate that these species might be more threatened than marine species. For example, 27% of the freshwater species assessed in eastern Africa were listed as threatened. Of plants, only conifers and cycads have been completely assessed with 25% and 52% threatened respectively.
- **The first complete assessment of amphibians reveals that they are likely to be the most threatened vertebrates.** Not only are amphibians significantly more threatened than other assessed vertebrate groups, but they also have a higher proportion of species on the verge of extinction. In total, 21% of amphibians are Critically Endangered or Endangered, whereas the proportions for mammals and birds are only 10% and 5% respectively. This high level of threat might be an underestimate, as 23% of amphibians could not be assessed because sufficient data were not available. These poorly known species are often rare and have small distributions.
- **There are major gaps in our knowledge of the status of threatened species.** While the status of vertebrates is relatively well documented (roughly 40% assessed), we know little about non-terrestrial systems (freshwater and marine), or many species-rich habitats (such as tropical forests or the ocean depths), or species-rich groups such as invertebrates, plants and fungi (which together compose the overwhelming majority of species).
- **Threatened species are not randomly distributed across orders and families.** A number of families have significantly more threatened species than would be expected on average, while others have far less. This non-random distribution of threats across the tree of life means that entire evolutionary lineages are liable to go extinct very quickly. For example, of the birds, the albatrosses, cranes, parrots, pheasant, and pigeons are significantly more threatened than other groups. Of the mammals, the ungulates, carnivores, primates, dugongs and manatees are particularly at risk. The salamanders, true toads, Asian tree frogs, Cameroonian stream frogs and typical tropical American frogs among the amphibians are more threatened than would be expected.

Extinction in Recent Times

- **As we learn more about the status of species, the world's list of extinctions continues to increase.** The *IUCN Red List* now contains 784 documented extinctions and 60 extinctions in the wild since 1500 AD. Over the past 20 years, 27 documented extinctions or extinctions in the wild have occurred. These numbers certainly underestimate the true number of extinctions in historic times as the majority of species have not been described, most described species have not been comprehensively assessed, and proving that a species has gone extinct can take years to decades.
- **Recent extinction rates far exceed the rates of extinction in the fossil record.** Extinction rates based on known extinctions of birds, mammals and amphibians over the past 100 years indicates that current extinction rates are 50 to 500 times higher than extinction rates in the fossil record. If Possibly Extinct species are included this increases to 100 to 1,000 times natural (background) extinction rates. This is an extremely conservative estimate, as it does not account for undocumented extinctions. Although the estimates vary greatly, it appears that current extinction rates are at least two to four orders of magnitude above background rates.
- **Extinctions are becoming increasingly common on continents.** While the vast majority of extinctions since 1500 AD have occurred on oceanic islands, continental extinctions are now as common as island extinctions. An

assessment of recent extinctions indicates that roughly 50% of extinctions over the past 20 years occurred on continents. This trend is consistent with the fact that most terrestrial threatened species are continental.

Trends in the Status of Threatened Species

- **The Red List Indices show that the status of birds and amphibians continues to deteriorate.** The Red List Indices (RLIs) are an important new development, which measures trends in extinction risk by comparing the conservation status of specific groups over time. For birds the RLI demonstrates that their status has deteriorated steadily since 1988, which was the year that birds were first completely assessed. A preliminary assessment of amphibians demonstrates similar rates of decline since 1980. However, amphibian species closest to extinction have shown a much steeper rate of decline in status.
- **The limited information available for other taxonomic groups indicates that declines may be widespread.** Population trends are available for 260 Cycads (Cycadopsida, 288 species in total), and of these, 79.6% (207 species) are declining, 20.4% (53 species) are stable and none are considered to be increasing.

Geography of the Red List

- **Most threatened species occur in the tropics, especially on mountains and on islands.** Most threatened birds, mammals, and amphibians are located on the tropical continents: Central and South America; Africa south of the Sahara; and tropical South and Southeast Asia. These realms contain the tropical and subtropical moist broadleaf forests that are believed to harbour the majority of the earth's living terrestrial and freshwater species. Therefore, the patterns evident for mammals, birds and amphibians are likely to be representative of most terrestrial taxonomic groups.
- **The distribution of threatened marine species is poorly known.** Of the limited number of marine species that have been assessed, initial findings indicate that threatened marine mammals are concentrated in the northern Pacific Ocean and threatened seabirds, chondrichthyan fishes (sharks, rays and chimaeras) and seahorses (the latter two not completely assessed) in the eastern Indian Ocean and southwest and west-central Pacific.
- **The uneven distribution of threatened species means that a number of countries have a disproportionate number of species at risk of extinction**. Countries with the most threatened and threatened endemic species tend to lie within the continental tropics and countries with the highest proportion of threatened species are mostly tropical island nations. Countries with both a high number of threatened and threatened endemic species include Australia, Brazil, China, Indonesia, and Mexico. Other countries or territories holding particularly large numbers of threatened species include Colombia, India, New Caledonia, Peru, South Africa, and Viet Nam (all of these are among the top three countries for at least one taxonomic group) while Colombia, India, Malaysia, Myanmar, New Caledonia, Papua New Guinea, the Philippines, South Africa, and the United States are all among the top three countries for numbers of threatened endemics for at least one taxonomic group. Additional countries characterized by particularly high proportionate threat in multiple taxa include Madagascar, São Tomé and Principe, and the Seychelles.
- **Patterns of distribution of threatened species are relatively congruent between the taxonomic groups analysed.** Differences are primarily driven by underlying range-size distributions among taxonomic groups (e.g., birds tend to have much larger range sizes than amphibians) and by ecological limitations of specific taxa (e.g., birds are better able to disperse over saltwater than amphibians). Greater variation in the distribution of threatened species is expected as more diverse groups of species are completely assessed. For example, threatened reptiles or cacti will likely have much greater representation in arid areas.

The Many Causes of Threat

- **Habitat destruction and associated degradation and fragmentation are the greatest threats to assessed terrestrial species.** Habitat loss appears to be by far the most pervasive threat, impacting 86% of threatened birds, 86% of threatened mammals and 88% of threatened amphibians. Habitat loss will remain a dominant threat, as there is no sign that human transformation of the landscape is slowing.
- **Threat processes vary both within and between taxonomic groups.** Although habitat destruction is universally the most dominant threat process, birds, mammals, and amphibians are particularly vulnerable to specific threat processes. Over-exploitation is a major threat to mammals, impacting 33% of threatened species. For birds, over-exploitation and invasive alien species are of similar importance, both impacting about 30% of threatened species (although invasives are impacting 67% of threatened birds on islands). For threatened amphibians, the major threats are different, with 29% of species being

affected by pollution (including climate change) and 17% by disease (particularly chytridiomycosis). The interaction between disease and extreme climatic events (drought) is the leading hypothesis for widespread amphibian declines.

- **Threat processes in the marine and freshwater systems are poorly understood.** However, it appears that over-exploitation is presently the greatest threat to marine species, followed by habitat loss. Incidental mortality as a result of fisheries is an increasing threat, affecting seabirds, marine mammals, and other marine species. Habitat loss is likely the most severe threat to freshwater species followed by pollution and invasive species.
- **Threat processes are dynamic and change over time.** Invasive alien species were historically the greatest threat to birds, followed by over-exploitation and habitat loss. Today, habitat loss has emerged as the dominant threat to birds, followed by invasive species and finally over-exploitation. This order may change again if predictions of global warming are correct.

The Social and Economic Context of the Red List

- **People and threatened species are often concentrated in the same areas.** This is especially true in much of Asia (in particular southeast China, the Western Ghats of India, the Himalayas, Sri Lanka, Java (Indonesia), the Philippines and parts of Japan), and in parts of Africa (especially the Albertine Rift in Central Africa and the Ethiopian Highlands).
- **The number of threatened species is likely to rapidly increase in regions where human population growth rates are high.** Future conflicts between the needs of threatened species and rapidly increasing human populations are predicted to occur in Cameroon, Colombia, Ecuador, India, Madagascar, Malaysia, Peru, Philippines, Tanzania, and Venezuela.
- **Countries that currently have a low human population density but a high rate of population growth could be opportunistic places for pre-emptive conservation initiatives.** For example, Bolivia, Papua New Guinea, Namibia, Angola, and the countries of North Africa.
- **Countries that have the most threatened species tend to be those that are least able to invest significant resources into conservation.** Examples of countries with high numbers of threatened species and relatively low Gross National Incomes (GNI) are Brazil, Cameroon, China, Colombia, Ecuador, India, Indonesia, Madagascar, Peru, and the Philippines. Countries with relatively strong economies but a large number of threatened species include Argentina, Australia, Malaysia, Mexico, United States, and Venezuela. Other countries, particularly those of Europe, have significant financial resources but generally very few globally threatened species.

Conservation Responses

- **Globally threatened species frequently require a combination of conservation responses to ensure their continued survival.** These responses encompass research, species-specific actions, site and habitat based actions, policy responses and communication and education.
- **The majority of threatened species require substantially greater action to improve their status.** While many species already receive some conservation attention, many others do not.
- **Species can be, and many already have been, saved from extinction.** However, this requires a combination of sound research, careful co-ordination of efforts, and, in some cases, intensive management.
- **Improving the effectiveness of conservation action** requires a better understanding of the needs for such action across species, the extent to which it is being applied, and the effects it has had in preventing species extinctions.
- **The *IUCN Red List* information can be used in many different ways as a conservation tool.** The Red List can be used to: provide information on the conservation status of individual species; guide the listing of individual species in national or international legislation; aid in conservation planning and priority setting; help to identify priority species for conservation action and recovery planning; and support educational programmes.