Species Extinction – The Facts

A NATURAL - AND UNNATURAL – PROCESS

The world is, and always has been, in a state of flux. Over hundreds of millions of years, continents have broken apart, oceans appeared, mountains formed and worn away. With geological change come changes in living things: species, populations, and whole lineages disappear, and new ones emerge.

Extinction is therefore a natural process. According to the fossil record, no species has yet proved immortal; as few as 2-4% of the species that have ever lived are believed to survive today. The remainder are extinct, the vast majority having disappeared long before the arrival of humans.

But the rapid loss of species we are seeing today is estimated by experts to be between 1000 and 10,000 times higher than the "background" or expected natural extinction rate (a highly conservative estimate). Unlike the mass extinction events of geological history, the current extinction phenomenon is one for which a single species - ours - appears to be almost wholly responsible. This is often referred to as "the sixth extinction crisis", after the five known extinction waves in geological history.

The number of species known to be threatened with extinction has topped 16,928. Their ranks include familiar species like the Polar Bear, Hippopotamus, sharks, freshwater fish and Mediterranean flowers. Marine species are proving to be just as much at risk as their land-based counterparts.

WHY DOES EXTINCTION MATTER?

Biodiversity - the variety of species and their habitats - plays an important role in ecosystem function and in the many services ecosystems provide. These include nutrient and water cycling, soil formation and retention, resistance against invasive species, plant pollination, climate regulation, and pest and pollution control. Escalating biodiversity loss has widespread implications for both human and environmental security.

The monetary value of goods and services provided by ecosystems is estimated to amount to some 33 trillion dollars per year – nearly twice the global production resulting from human activities. An estimated 50,000-70,000 plant species are used in traditional and modern medicine worldwide. About 100 million metric tons of aquatic organisms, including fish, molluscs and crustaceans are taken from the wild every year and represent a vital contribution to world food security. Meat from wild animals forms a critical contribution to food sources and livelihoods in many

WHAT ARE THE THREATS?

Major threats to biodiversity are:

Habitat destruction and degradation
Over-exploitation (extraction, hunting, fishing etc.)
Pollution
Disease
Invasions of alien species (e.g. cats and rats on islands)
Global climate change (changes in migratory species, coral bleaching)

Threats vary both within and between species groups. Although habitat destruction is universally the most dominant threat, over-exploitation (harvesting, trade etc.) is a major threat to mammals, affecting 33% of threatened species. For birds, over-exploitation and invasive alien species both affect about 30% of threatened species. Of the amphibians, 29% of species are affected by pollution (including climate change) and 17% by disease (particularly chytridiomycosis). The interaction between disease and extreme climatic events (drought) is the leading theory behind widespread amphibian declines.

Threats in marine and freshwater systems are poorly understood but it appears that over-exploitation is presently the greatest threat to marine species, followed by habitat loss. Incidental death in fisheries affects seabirds, marine mammals, and others. Habitat loss is likely to be the most severe threat to freshwater species followed by pollution and invasive species.

Threats to species 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 over-exploitation. This order may change again if predictions of global warming are correct.

Invasion by alien species, second only to habitat loss as a threat to biodiversity, severely disrupts freshwater and marine ecosystems, tropical forests, urban areas, islands, grasslands and deserts. Green Crabs, Zebra Mussels, the African Tulip Tree and the Brown Tree Snake are among the ecological offenders that also affect global and local economies. Introductions of alien species can happen deliberately or unintentionally, for example, by organisms "hitchhiking" in containers, ships, cars or soil.

There are many examples of the effects of climate change on species from around the world, which taken together, provide compelling evidence that climate change will be catastrophic for many species.

WHERE ARE THE THREATENED SPECIES?

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.

IUCN'S RESPONSE TO THE EXTINCTION CRISIS

Working closely together, the IUCN Species Programme and the Species Survival Commssion (SSC) - a global network of 7,500 experts - provide the tools and knowledge needed for conservation action, through Action Plans, policy guidelines and checklists, among others.

IUCN helps to identify global conservation priorities by producing assessments like the IUCN Red List of Threatened Species which serves as a gauge of biodiversity loss and helps target conservation action.

The Species Information Service is being developed to provide access to high-quality, up-to-date species information for users across the world.

IUCN is part of the Global Invasive Species Programme (GISP) which brings several IUCN programmes and partners together to counter the invasive species problem. This initiative recognizes that working cooperatively is the only way to respond to this multifaceted problem.

The IUCN Invasive Species Specialist Group (www.issg.org) maintains a global database of invasive species and has produced a booklet "100 of the World's Worst Invasive Species" as an awareness-raising tool. IUCN advises the government Parties to international treaties, such as the Convention on Biological Diversity, and the Convention on Migratory Species to help ensure that decisions are informed by the best available information about biodiversity. It provides scientifically based analyses of proposals to change the way plant and animal species are regulated within the terms of the Convention on International Trade in Endangered Species (CITES).

IUCN promotes conservation action through partnerships with conservation organizations, government agencies and others. Thanks to the IUCN/SSC Action Plans and other conservation measures they have inspired, there have been many notable success stories.

GLOSSARY

Biological diversity - "biodiversity" means the diversity of life on Earth, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Biome: major ecological community, a division of the world's vegetation that corresponds to a particular climate and is characterized by certain types of plants and animals, for example, tropical rain forest or desert.

Ecosystem: a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

Endemic: restricted to a particular area: used to describe a species or organism that is confined to a particular geographical region, for example, an island or river basin.

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