

We don't even know what we don't know

The Club of Earth warned in 1986 that the destruction of biodiversity was a threat to civilization 'second only to thermonuclear war' in its severity.

But what exactly is biodiversity?

Biological diversity is the variety and relationships between all living things in the world: from microbes to insects to plants to animals and people. It refers to the range of genetic, species and ecosystem diversity of the Earth's biosphere, which includes its atmosphere, water systems and crust.

Most scientists agree that there are about 13 million species in the world, but some guesstimate that there could be as many as 100 million. However, researchers have identified only about 1.75 million species so far. Only a fraction of 1 per cent of the world's species has been properly studied for its potential value to humanity – and that doesn't include its value to the world's ecosystem.

But the diversity of life is being lost at an unprecedented speed. Species are now becoming extinct at 1,000 times the natural rate – or much faster, according to some. And the pace is likely to quicken if we don't take measures to reverse the trend. Some scientists think that by 2050, half of all the species alive in 1992 could be lost forever.

We humans are the greatest threat to this diversity. We are destroying natural habitats so rapidly that we cannot even assess the extent of the damage. For example, foresters in the temperate rainforest in the northwestern United States had been burning a tree that they considered a weed. After years of clinical trials, it was determined in 1991

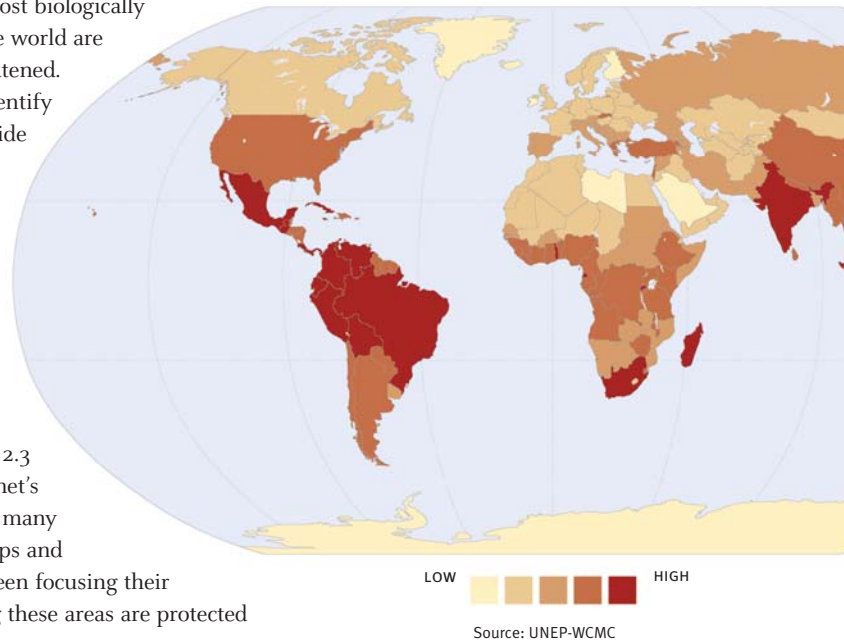
that the Pacific yew contained the most important anti-cancer drug in 15 years. But the harm to its habitat nearly destroyed all hope of using it to treat patients. This is only one example of the value nature possesses. Because we're degrading so many ecosystems so rapidly, we may never know what could have been.

Some of the most biologically diverse areas in the world are also the most threatened. Recent analyses identify 34 regions worldwide where 75 per cent of the most threatened mammals, birds and amphibians live. These 'hot spots', which also have numerous plant and insect species, cover only 2.3 per cent of the planet's surface. Therefore, many governments, groups and individuals have been focusing their energy on assuring these areas are protected from damage.

Does this mean we should focus our energy on just these areas? Many biologists say that this is the wrong approach. The bottom line is that we simply don't know how much the world holds, so converting or destroying lands haphazardly might have repercussions beyond our comprehension.

CONTINENT	TOTAL FOREST 1990 MILLION HECTARES
AFRICA	702
ASIA	551
OCEANIA	201
EUROPE	1 030
NORTH, CENTRAL AMERICA	555
SOUTH AMERICA	923
TOTAL WORLD	3 962

BIODIVERSITY BY COUNTRY



PANGAEA



If you look at a world atlas, some of the continents seem to fit together like a jigsaw puzzle. Some scientists believe that the Earth's continents were once joined to form one supercontinent called Pangaea, which means 'all lands' in Greek. More than 200 million years ago, the tectonic plates began to shift, causing the land mass to split. This drift caused plants and animals on each continent to evolve according to their own environments.

In the early 20th century, scientists found identical fossil species along the once-interlocking eastern coastline of South America and the western coastline of Africa. But the species had adapted differently on each continent.

Australia's wombat is a marsupial, which means its young complete their development in a pouch. The wombat shares a common ancestor with the North American groundhog. However, the groundhog is a placental mammal, which means it is fully developed upon leaving the female's womb. The two animals developed differently based on adaptations to their individual environments.

Land masses that broke into islands have a unique biological diversity. One example is Madagascar, a hot spot of biodiversity. This island off the southeastern coast of Africa and its smaller, neighbouring islands have eight plant, four bird and five primate families that are endemic, which means they aren't found anywhere else in the world. For instance, 142 of the 144 amphibians in Madagascar are endemic.

How

many

species

are

there?

Viruses

Bacteria

Protozoa and algae

Vertebrates

Insects and myriapods

Arachnids

Molluscs

Crustaceans

Nematodes

Fungi

Plants

VP: Very poor

P: Poor

- 1) WHICH ARE RAISED ON FARMS AND HARVESTED FOR THEIR MEAT AND SKIN?
- 2) WHICH OF THE FOLLOWING DOES NOT CAUSE DESERTIFICATION?
- 3) WHAT PERCENTAGE OF PLANTS THAT WE EAT RELY ON INSECTS FOR POLLINATION?
- 4) WHAT'S THE MINIMUM NUMBER OF EDIBLE PLANTS ON EARTH?
- 5) WHICH HAVE BEEN USED TO MAKE MEDICINES?
- 6) WHICH OF THESE PRODUCTS TYPICALLY COME FROM PLANTS THAT GROW ON LAND THAT WAS ONCE TROPICAL RAINFOREST?

TOTAL FOREST 2000 MILLION HECTARES	% CHANGE 1990-2000	PLANTATION AS % OF FOREST AREA
650	-7.8	1
548	-0.7	21
198	-1.8	2
1 039	0.8	3
549	-1.0	3
886	-4.1	1
3 870	-2.2	5

Source: FAO

CONTAINING AN ESTIMATED HALF OF PLANT AND ANIMAL SPECIES WORLDWIDE, FORESTS ARE THE LARGEST RESERVOIR OF LAND-BASED BIODIVERSITY. PEOPLE HAVE ALREADY CLEARED ROUGHLY HALF THE PLANET'S NATURAL FORESTS, IN PART FOR TIMBER BUT ALSO TO USE THE LAND FOR AGRICULTURE OR PLANTATIONS. THE WORLD RESOURCES INSTITUTE ESTIMATES THAT ABOUT 40 PER CENT OF OUR REMAINING NATURAL FORESTS COULD BE DESTROYED WITHIN 10-20 YEARS – IF NOT SOONER.

Estimated number of species in selected biodiverse countries



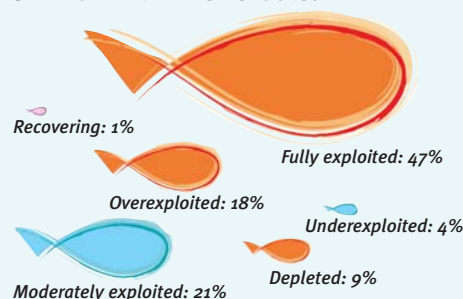
Country	Plants	Mammals	Birds
Brazil	55 000	394	1 573
Costa Rica	11 000	205	848
Ecuador	18 250	271	1 435
United States	19 000	346	650
China	30 000	394	1 100
India	15 000	317	969
Indonesia	22 500	515	1 519
Dem. Rep. Congo	11 000	415	1 086
South Africa	23 000	247	774
Australia	15 500	282	57

Source: UNEP-WCMC

Fishing to the limit

Fish provide 16 per cent of all the protein we eat. The world's wild fish catch has increased from less than 20 million tonnes in 1950 to more than 93 million tonnes in 2002. We may have reached the limit: 75 per cent of the Earth's marine fish stocks are now fully exploited or overexploited. And to meet increasing demand, we are fishing further and further down the food chain, making it more difficult for individual species to recover.

STATE OF MARINE FISH STOCKS:



Source: FAO/UNEP/MEA

Estimated number of described species

Percentage of known species threatened

Estimated number of species

Level of accuracy

4 000	id	400 000	VP
4 000	id	1 000 000	VP
80 000	id	600 000	VP
52 000	7	55 000	G
963 000	0	8 000 000	M
75 000	id	750 000	M
70 000	1	200 000	M
40 000	1	50 000	M
25 000	id	400 000	P
72 000	id	1 500 000	M
270 000	2	320 000	G

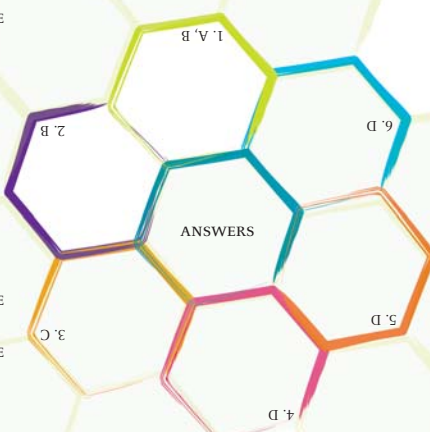
M: Moderate G: Good

id: insufficient data

Estimates of described species are incomplete as new ones are being added all the time. The generally accepted working totals used by scientists are 1.75 million for all described species and 13.62 million for all species.

Source: UNEP/AAAS

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|--------------------|--------------------------------|----------------|---------------------|
| A. ALLIGATORS | B. OSTRICHES | C. KOALA BEARS | D. ALL OF THE ABOVE |
| A. OVERCULTIVATION | B. CREATION OF PROTECTED AREAS | C. OVERGRAZING | D. DEFORESTATION |
| A. 10% | B. 24% | C. 33% | D. 52% |
| A. 5 000 | B. 25 000 | C. 50 000 | D. 75 000 |
| A. CORAL | B. VAMPIRE BAT SALIVA | C. SHARKS | D. ALL OF THE ABOVE |
| A. BANANAS | B. COFFEE | C. CHOCOLATE | D. ALL OF THE ABOVE |



How
MUCH
DO
YOU
KNOW?

Adapted from 'Buy-O-Diversity', an activity in *Smart Consumers: An Educator's Guide to Exploring Consumer Issues and the Environment*. World Wildlife Fund, 2004. Website: www.worldwildlife.org