Threatened species concentrated in fraction of Earth's surface

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Wednesday February 2, 2005

The Guardian <http://www.guardian.co.uk>

Seventy-five per cent of the most threatened mammals, birds and amphibians live in an area covering just 2.3% of the Earth's surface, and roughly half of all flowering plant species and 42% of land-based vertebrates exist in 34 "hotspots", a four-year study by 400 scientists has found.

"The biodiversity hotspots are the environmental emergency rooms of our planet," said Russell Mittermeier, president of Conservation International, one of the world's largest conservation groups, and a co-editor of the study.

"This new assessment underscores the value of the hotspots concept for defining urgent conservation priorities."

He added: "We must now act decisively to avoid losing these irreplaceable storehouses of Earth's life forms."

The new study builds on a 17-year-old theory by the British scientist Norman Myers, who argued that with limited financial resources governments and conservationists should prioritise by protecting the small total land areas which account for a very high percentage of global biodiversity.

In 1999, he and others identified 25 areas, mostly in the tropics, which were centres of global biodiversity.

The new study adds nine areas to the original 25. They include the mountains of central Asia, the whole of Japan, the Horn of Africa including the Ethiopian highlands and the Himalayas region.

The hotspots once covered 15.7% of the Earth's surface, an area roughly the size of Russia and Australia combined. Now, they cover only 2.3% of the Earth's surface, an area which is slightly larger than India.

"This means that 72% of all mammals, 86% of all birds and 92% of all amphibians are crammed into just 2.3% of the landmass," said Mr Mittermeier.

The Madagascar and the Indian Ocean Islands hotspot was found to have very high concentrations of plant and vertebrate families that are found nowhere else on Earth. "We now know that by concentrating on the hotspots, we are not only protecting species, but deep lineages of evolutionary history.

"These areas capture the uniqueness of life on Earth," said Mr Mittermeier.

The study also found that nearly one third of the world's human population lives within the borders of the hotspots, and that many, as in West Africa, are in areas of violent conflict.

Two factors determine which areas qualify as hotspots: the number of endemic species (those found nowhere else), and the degree of threat.

Each of the hotspots holds at least half a percent of the total diversity of vascular plants as endemics; this translates to 1,500 species of vascular plants found exclusively within its boundaries.

Degree of threat is determined by the percentage of remaining habitat, with each hotspot having lost at least 70% of its original natural habitat.

Some of the hotspots have less than 10% of their original natural habitat.