

Unit 4 Lecture 6

Hotspots of biodiversity

Biodiversity hotspot is a biogeographic region with a significant reservoir of biodiversity that is threatened with destruction.

The concept of biodiversity hotspots was originated by Dr. Norman Myers in two articles in “The Environmentalist” (1988 & 1990), revised after thorough analysis by Myers and others in “Hotspots: Earth’s Biologically Richest and Most Endangered Terrestrial Ecoregions” (1999). The hotspots idea was also promoted by Russell Mittermeier in the popular book “Hotspots revisited” (2004), although this has not been subjected to scientific peer-review like the other hotspots analyses.

To qualify as a biodiversity hotspot on Myers 2000 edition of the hotspot-map, a region must meet two strict criteria: it must contain at least 0.5% or 1,500 species of vascular plants as endemics, and it has to have lost at least 70% of its primary vegetation. Around the world, at least 25 areas qualify under this definition, with nine others possible candidates. These sites support nearly 60% of the world's plant, bird, mammal, reptile, and amphibian species, with a very high share of endemic species.

Around the world 34 areas are identified that each have lost at least 70% of their original habitat that each contain more than 1,500 endemic vascular plant species. These sites support nearly 60% of the world's plant, bird, mammal, reptile, and amphibian species, with a very high share of endemic species. These sites are called “biodiversity hotspots”. The Conservation International Biodiversity Hotspot-approach is not the only approach for assessing global conservation priorities.

Birdlife International has identified all over the world 218 “Endemic Bird Areas” (EBAs) each of which hold two or more bird species found nowhere else. Birdlife International identified also more than 11,000 Important Bird Areas all over the world. Plantlife International coordinates several projects all over the world aiming at the identification of Important Plant Areas.

Concentrating on initiatives that cover all taxonomic groups, two other initiatives are also important to be mentioned: The World Wildlife Fund has derived a system called the “Global 200 Ecoregions”, the aim of which is to select priority Ecoregions for conservation within each of 14 terrestrial, 3 freshwater, and 4 marine habitat types. They are chosen for their species richness, endemism, taxonomic uniqueness, unusual ecological or evolutionary phenomena, and global rarity. All biodiversity hotspots contain at least one Global 200 Ecoregion and all but three contain at least one EBA; 60% of Global 200 terrestrial Ecoregions and 78% of EBA’ s overlap with biodiversity hotspots.

The initiative “Alliance for Zero Extinction”, in which a large number of scientific organisations and conservation groups co-operate, focuses on the most threatened

endemic species of the world and has as yet identified 595 sites, incorporating for example a large number of Birdlife's Important Bird Areas.

These initiatives are all based on scientific criteria and quantitative thresholds. A detailed map prepared by National Geographic of the hotspots and individual endangered fauna details is provided at Conservation International's Website.

Critiques of Hotspots

The high profile of the biodiversity hotspots has resulted in considerable criticism. Critics have argued that the biodiversity hotspots:

- Do not adequately represent other forms of species richness (e.g. total species richness or threatened species richness).
- Do not adequately represent taxa other than vascular plants (e.g. vertebrates, or fungi).
- Do not protect smaller scale richness hotspots.
- Do not make allowances for changing land use patterns. Hotspots represent regions that have experienced considerable habitat loss, but this does not mean they are experiencing ongoing habitat loss. On the other hand, regions that are relatively intact (e.g. the Amazon Basin) have experienced relatively little land loss, but are currently losing habitat at tremendous rates.
- Do not protect ecosystem services
- Do not consider phylogenetic diversity

A recent series of papers has pointed out that biodiversity hotspots (and many other priority region sets) do not address the concept of cost. The purpose of biodiversity hotspots is not simply to identify regions that are of high biodiversity value, but to prioritise conservation spending. The regions identified include regions in the developed world (e.g. the California Floristic Province), alongside regions in the developing world (e.g. Madagascar). The cost of land is likely to vary between these regions by an order of magnitude or more, but the biodiversity hotspots do not consider the conservation importance of this difference.

The 34 biodiversity hotspots by region

North and Central America

California floristic province
Caribbean Islands
Madrean pine-oak woodlands
Mesoamerica

South America

Atlantic Forest
Cerrado
Chilean Winter Rainfall-Valdivian Forests

Tumbes-Chocó-Magdalena
Tropical Andes

Europe and Central Asia

Caucasus
Irano-Anatolian
Mediterranean Basin
Mountains of Central Asia

Africa

Cape Floristic Region
Coastal forests of eastern Africa
Eastern Afromontane
Guinean Forests of West Africa
Horn of Africa
Coastal Forests of Eastern Africa
Madagascar and the Indian Ocean Islands
Maputaland-Pondoland-Albany

Asia-Pacific

East Melanesian Islands
Eastern Himalaya
Indo-Burma
Mountains of Southwest China
New Caledonia
New Zealand
Philippines
Polynesia-Micronesia
Southwest Australia
Sundaland
Wallacea
Western Ghats
Sri Lanka