



BIODIVERSITY HOTSPOTS

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Introduction

- To protect the earth's biodiversity, conservation biologist have identified the emergency action plans and protect the biodiversity hotspots. – Norman Myers.
- 34 global terrestrial hotspots are there, which covers 2% of the earth's land surface.
- 50 % -world's flowering plants, 42 % of vertebrates (Mammals, birds, reptiles, amphibians)
- Acc. ***To International Union of Conservation of Nature (IUCN)***, large majority of world's endangered or critically endangered species, -92% of earth's amphibians, 86% of birds, 72% of mammals.

World's 35 Biodiversity Hotspots

I. Africa

1. **Cape Floristic Region**
2. **Coastal Forests of Eastern Africa**
3. **Eastern Afromontane**
4. **Guinean Forests of West Africa**
5. **Horn of Africa**
6. **Madagascar and the Indian Ocean Islands**
7. **Maputaland-Pondoland-Albany**
8. **Succulent Karoo**

II. Asia-Pacific

9. **East Melanesian Islands**
10. **Himalaya**
11. **Indo-Burma**
12. **Japan**
13. **Mountains of Southwest China**
14. **New Caledonia**
15. **New Zealand**
16. **Philippines**
17. **Polynesia-Micronesia**
18. **Southwest Australia**
19. **Forests of Eastern Australia (new)**
20. **Sundaland**
21. **Wallacea**
22. **Western Ghats and Sri Lanka**

III. Europe and Central Asia

23. **Caucasus**
24. **Irano-Anatolian**
25. **Mediterranean Basin**
26. **Mountains of Central Asia**

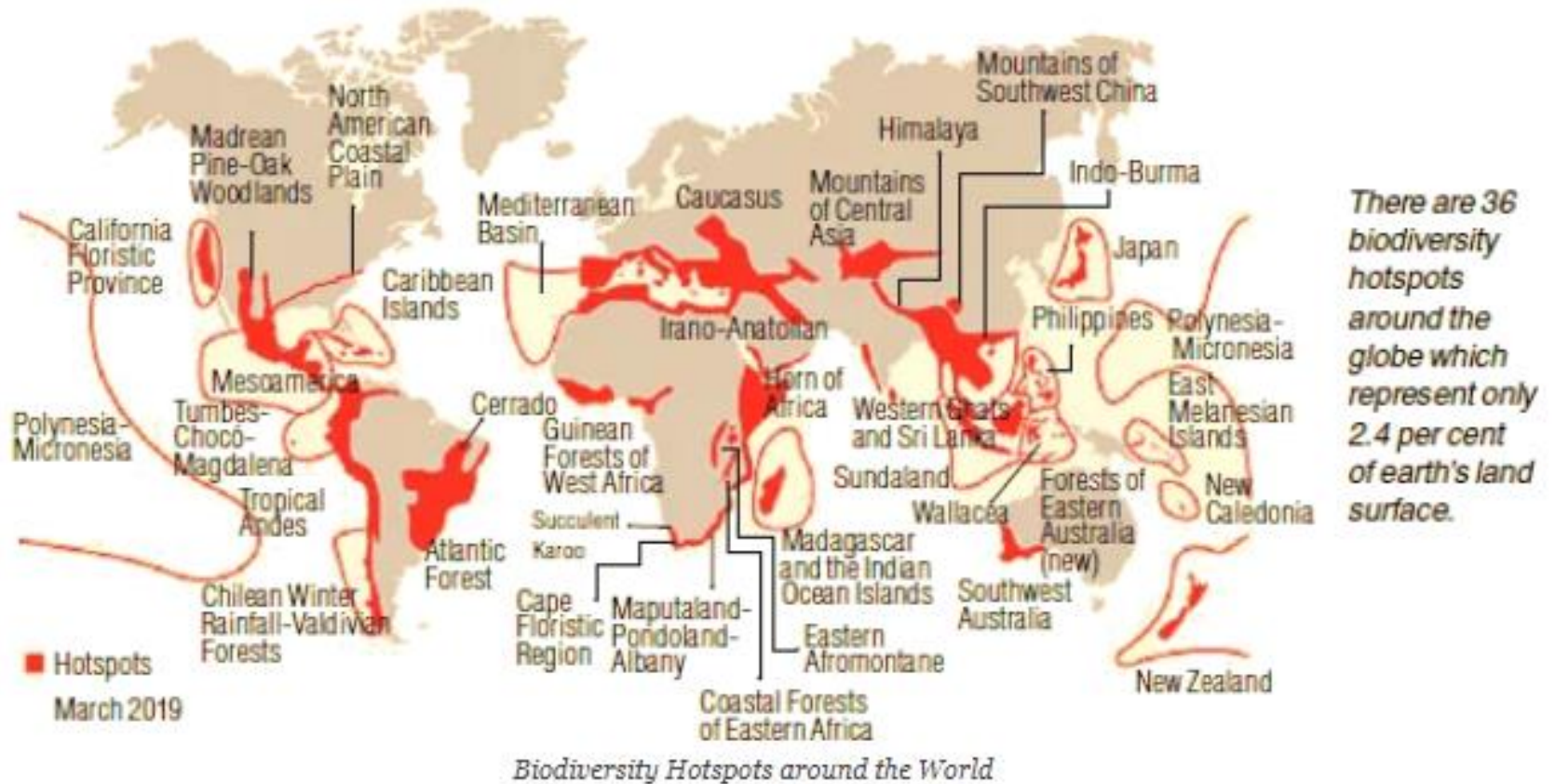
IV. North and Central America

27. **California Floristic Province**
28. **Caribbean Islands**
29. **Madrean Pine-Oak Woodlands**
30. **Mesoamerica**

V. South America

31. **Atlantic Forest**
32. **Cerrado**
33. **Chilean Winter Rainfall-Valdivian Forests**
34. **Tumbes-Chocó-Magdalena**
35. **Tropical Andes**

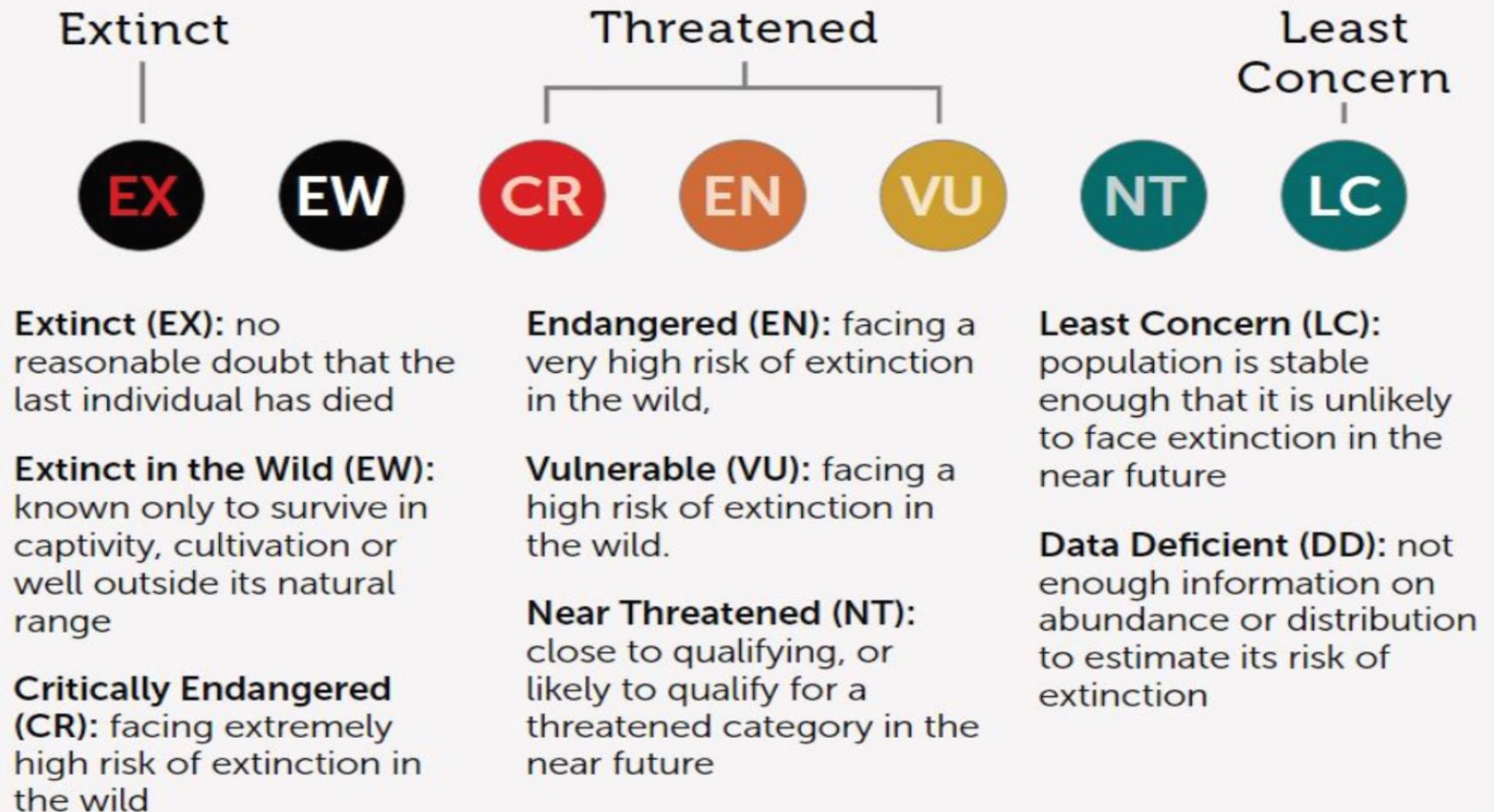
36 Biodiversity Hotspots - Globe



Biodiversity Hotspots around the World

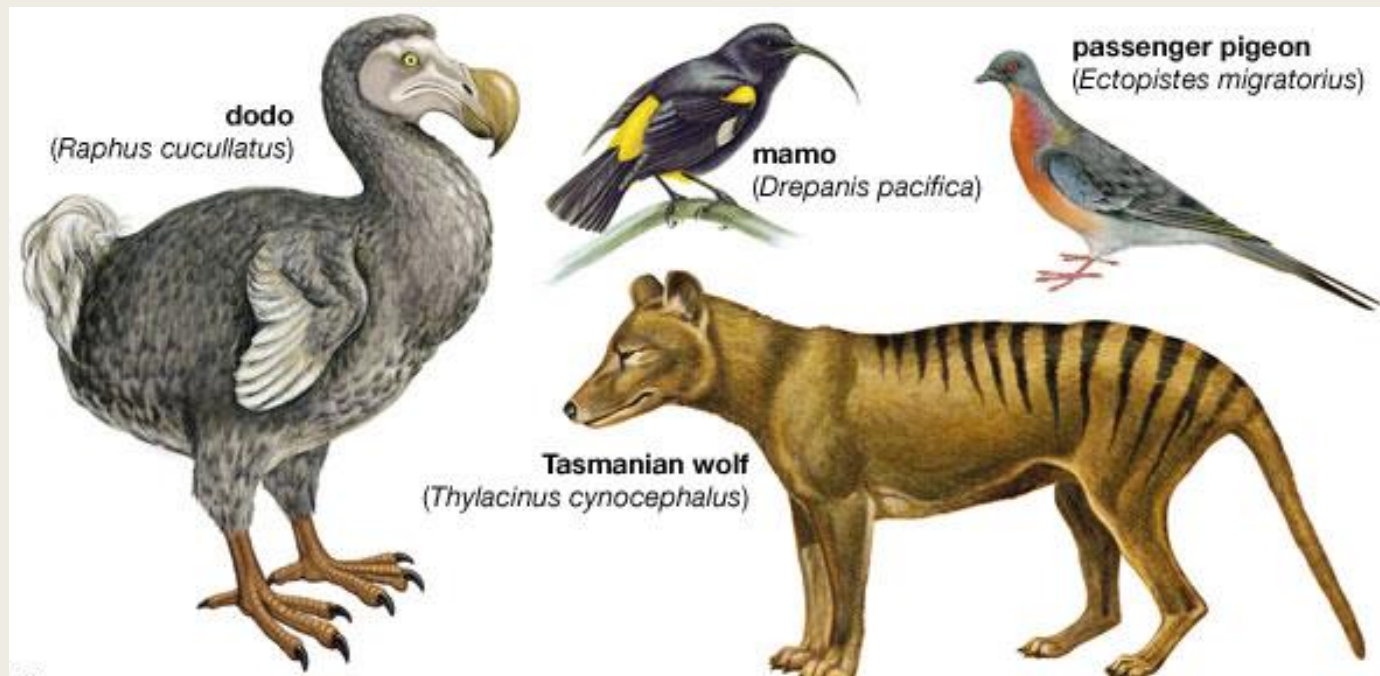
Since 1964, IUCN -established a “Red List”

THE RED LIST CATEGORIES



Extinct Species

- Extinct Species: Species that are no longer known to exist in the wild.
- <https://www.indiatoday.in/education-today/gk-current-affairs/story/world-wildlife-day-2020-here-are-7-significant-wildlife-species-that-went-extinct-in-2019-1652013-2020-03-03>



Endangered Species

- Endangered: Species is found less in number and verge to be extinct.
Eg. Asian elephant, *Elephas maximus* (endangered).

Early in the 20th century, perhaps 100,000 elephants roamed across Asia. Since then, their population likely has been cut in half. They're killed not just for their ivory tusks but also for their meat and hides—and sometimes in retaliation for the damage they do to crops.



Vulnerable Species

- A vulnerable species is a species which has been categorized by the International Union for Conservation of Nature as likely to become endangered unless the circumstances that are threatening its survival and reproduction improve.
- The Black spider Monkey, Dudong



Endemic Species



The Nilgiri tahr (*Nilgiritragus hylocrius*) is an ungulate that is endemic to the Nilgiri Hills and the southern portion of the Western & Eastern Ghats in the states of Tamil Nadu and Kerala in Southern India. It is the state animal of Tamil Nadu.

The **Nilgiri laughing thrush** (*Montecincla cachinnans*) is a species of **laughing thrush** endemic to the high elevation areas of the **Nilgiris** and adjoining hill ranges in Peninsular India.



Endemism or Endemic species of India

- ♣ Species, which are confined to a particular area, are called endemic species.
- ♣ Our country has a rich endemic flora and fauna.
- ♣ About 33% of the flowering plants, 62% of amphibians, 50% lizards.

Endemic species of plants in India

| Group | No. of species |
|---------------------|-----------------------|
| Pteridophyta | 200 |
| Angiosperms | 4950 |

Endemic species of animals in India

| Group | No. of species |
|-------------------|-----------------------|
| Freshwater | 64 |
| Marine | 14 |
| Amphibia | 123 |
| Reptilia | 182 |
| Mammalia | 44 |

Definition: The hot spots are the geographic areas, which possess the high endemic species.

Criteria for recognizing hot spots

1. Richness of the endemic species is the primary criterion for recognizing hot spots.
2. Hot spots should have a significant percentage of specialized species.
3. Site is under threat.
4. Should contain gene pools of potentially useful plants.

Reason for rich biodiversity in the tropics

1. Tropics have a more stable climate.
2. Warm temperatures and high humidity provide favorable conditions.
3. No single species domination, thus giving an opportunity for many species to coexist.
4. Among plants, rate of out-crossing appear to be higher in tropics.

Area of hot spot

- ♣ The term hot spot was introduced by Myers (1988).
- ♣ There are 25 such hot spots of biodiversity on a global level out of which two are present in India, namely the Eastern Himalayas and Western Ghats.
- ♣ These hot spots covering less than 2% of the world's land area are found to have about 50% of the terrestrial biodiversity.
- ♣ According to Myers et al (2000) an area is designated as a hotspot when it contains at least 0.5% of the plant species as endemics.
- ♣ About 40% of terrestrial plants and 25% of vertebrate species are endemic and found in the hotspots.

To Qualify as a Hotspot

- According to CI, to qualify as a hotspot a region must meet two strict criteria:
- It must contain at least 1,500 species of vascular plants (> 0.5% of the world's total) as endemics,
- and it has to have lost at least 70% of its original habitat. In 1999,
- CI identified 25 biodiversity hotspots in the book “Hotspots: Earth’s Biologically Richest and Most Endangered Terrestrial Ecoregions”.
- Collectively, these areas held as endemics about 44% of the world’s plants and 35% of terrestrial vertebrates in an area that formerly covered only 11.8% of the planet’s land surface.
- The habitat extent of this land area had been reduced by 87.8% of its original extent, such that this wealth of biodiversity was restricted to only 1.4% of Earth’s land surface.

BIODIVERSITY HOTSPOTS IN INDIA

1.Himalaya: Includes the entire Indian Himalayan region (and that falling in Pakistan, Tibet, Nepal, Bhutan, China and Myanmar)

2.Indo-Burma: Includes entire North-eastern India, except Assam and Andaman group of Islands (and Myanmar, Thailand, Vietnam, Laos, Cambodia and southern China)

3.Sundalands: Includes Nicobar group of Islands (and Indonesia, Malaysia, Singapore, Brunei, Philippines)

4.Western Ghats and Sri Lanka: Includes entire Western Ghats (and Sri Lanka)



Two of which are found in India

1. **Eastern Himalayas** : Indo-Burma region
2. **Western Ghats** : Sri Lanka region

1. Eastern Himalayas: Geographically these areas comprise Nepal, Bhutan, and neighboring states of Northern India. There are 35,000 plant species found in the Himalayas, of which 30% are endemic. The Eastern Himalayas are rich in wild plants of economic value.

Examples: Rice, banana, citrus, chilli, jute, and sugarcane

2. Western Ghats: The area comprises Maharashtra, Karnataka, Tamil Nadu and Kerala and has 40% of the total endemic plant species, 62% amphibians and 50% lizards are endemic in Western Ghats. It is reported that only 7% of the original forests are existing today while the rest has been deforested or degraded.

Some common plants: Ternstroemia japonica, Rhododendron and Hypericum

Some common animals: Blue bird, lizard hawk



Facts & Figures – Western Ghats

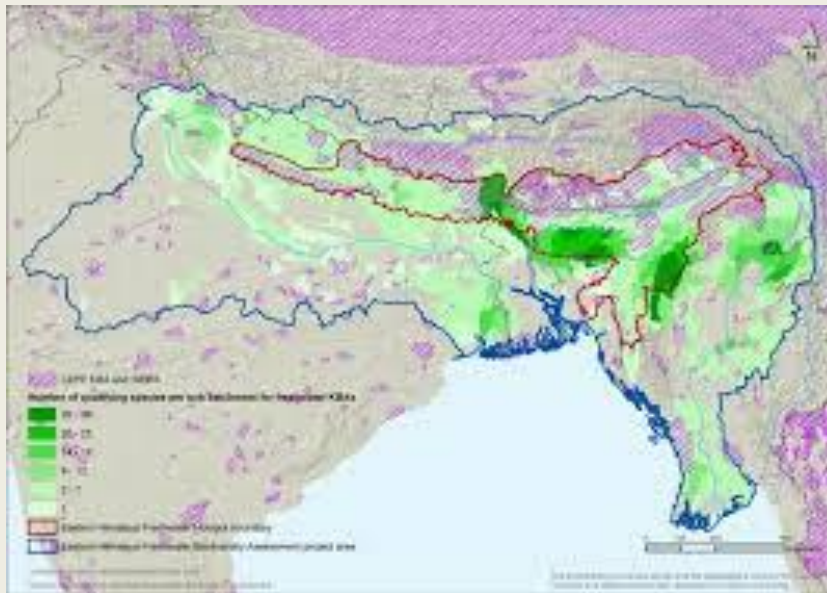
- The Western Ghats are one of the world's biodiversity hotspots with over 5,000 flowering plants, 139 mammals, 508 birds and 179 amphibian species.
- At least 325 globally threatened species occur here.
- The range covers 60,000km² and forms the catchment area for a complex of river systems that drain almost 40% of India.
- At 2695m, Mt Anamudi in Kerala, India is the highest peak in the Western Ghats.
- The Western Ghats are being considered as a UNESCO World Heritage Site.

Species in Western Ghats



The Himalayan Biodiversity Hotspot

- It extends over an arc of 3000 km and includes the entire Indian Himalayan region and this region which fall in Paksitan, Tiber, Nepal, Bhutan, China and Myanmar.
- The Indian Himalayas Hotspot has eight endemic threatened species, four endemic threatened mammals and four endemic threatened amphibians.



Himalayas – Hotspots



1. Back-Striped Weasel 2. Nandapha F
3. Red Panda 4. Takin

Sundalands- Biodiversity

- Sundaland holds about 25,000 species of vascular plants, 15,000 of which are found nowhere else. There are at least 117 endemic plant genera in the hotspot; 59 of these endemic genera are found in Borneo, 17 in Sumatra, and 41 on the Malay Peninsula.
- Of the approximately 770 bird species that regularly occur in Sundaland, nearly 150 are endemic.
- Native species include the Critically Endangered Bali myna.
- Of Sundaland's more than 380 mammal species, more 170 are endemic to the hotspot.
- The best known are the orangutans, represented by two species: the Critically Endangered Bornean orangutan (*Pongo pygmaeus*) and the Critically Endangered Sumatran orangutan (*P. abelii*).
- 1,000 known species of freshwater fish in the hotspot.
- 240 species of amphibians, nearly 200 of which are endemic.

International Organisations to Conserve Biodiversity Hotspots

- Critical Ecosystem Partnership Fund (CEPF)
- Conservation International (CI)
- Global 200 Ecoregions(WWF)
- Bird life International (Endemic Bird Area - EBAs)
- Plant Life International
- Alliance for Zero Extinction

Thank You