Unit 9: Global Change: 4.59: Biodiversity

Definitions:

- **Native**: lives within historical range (many, many years)
- **Invasive**: outside the historical range

https://en.wikipedia.org/wiki/Invasive_species

Important: Invasive species have fewer predators and/or can adapt much faster than native species, often r-selected species with fast growth

Plant philosophy: faster ones survive to get nutrients and solar radiation
Equilibrium: equal freedom or balance: equi= equal, librium=freedom

Classic case: Zebra mussels in the great lakes-carried in along with water ballast from Asia

Zebra mussels are an invasive, fingernail-sized mollusk that is native to fresh waters in Eurasia. Their name comes from the dark, zig-zagged stripes on each shell.

Zebra mussels:

- Probably arrived in the Great Lakes in the 1980s via ballast water that was discharged by large ships from Europe.
- They have spread rapidly throughout the Great Lakes region and into the large rivers of the eastern Mississippi drainage.
- They have also been found in Texas, Colorado, Utah, Nevada, and California.
- Zebra mussels negatively impact ecosystems in many ways, filtering out algae that native species need for food and they attach to--and incapacitate--native mussels.
- Power plants must also spend millions of dollars removing zebra mussels from clogged water intakes.

Other mistakes:

- Mongoose in Hawaii-kills birds (eats the eggs),
- Cane toads in Australia
- Kudzu vine from Asia, grows 1 foot per DAY
- Silver carp in great lakes (40#) Look up video!

Endangered species: likely to go extinct in the near future

- Habitat destruction
- Migration disruption
- Invasive species competition
- Disruption of food supplies (e.g. predator-prey)

Biodiversity: genetic diversity and genetic bottlenecks (recall the humpback whale)

Please watch this Bozeman Science video:

http://www.bozemanscience.com/ap-es-035-loss-of-biodiversity?rq=invasive%20species

HICOP: mnemonic

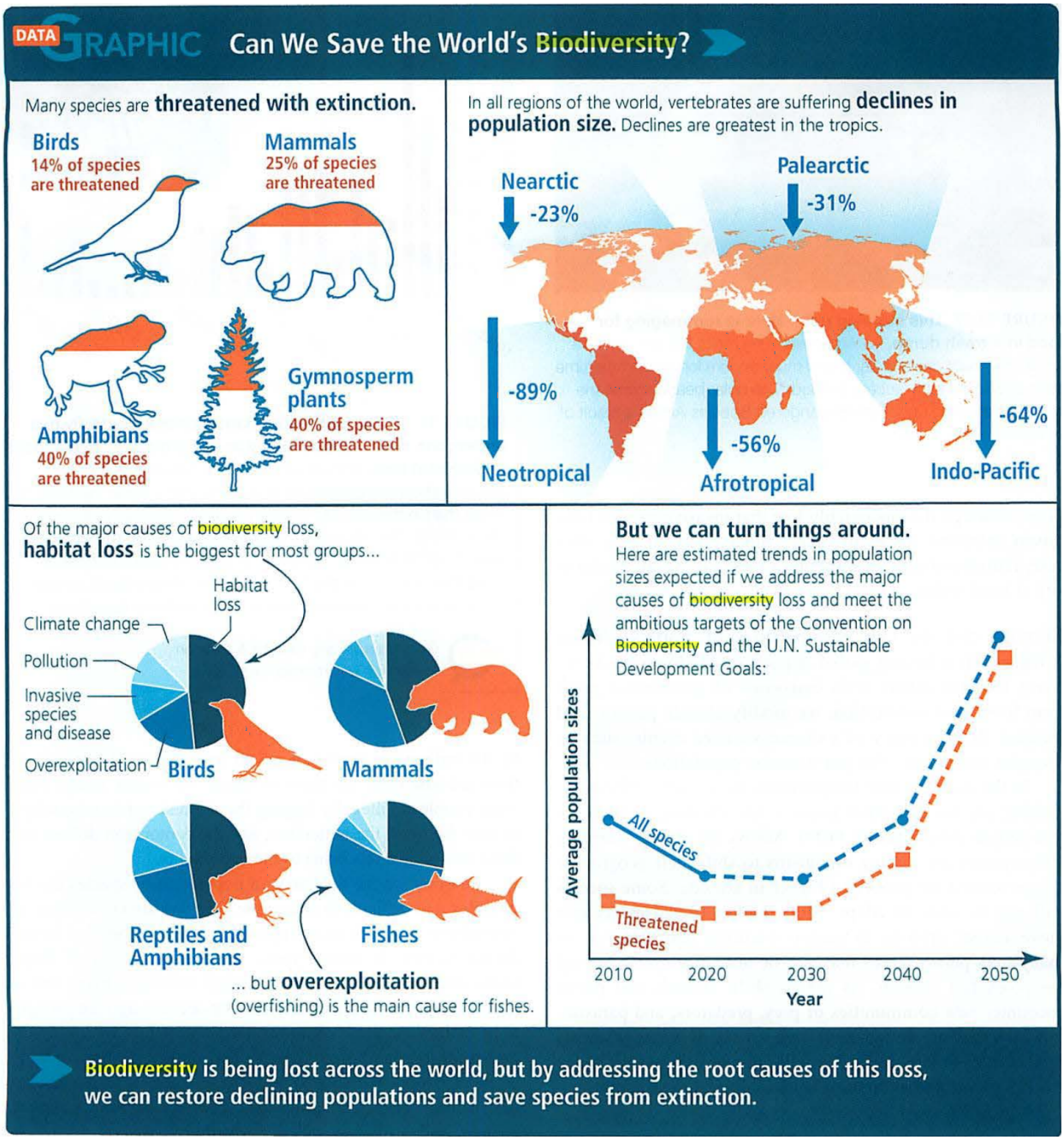
- Habitat loss
- Invasive species
- Climate change
- Overfishing
- Pollution

Look up IUCN
List of threats: HIPPCO another mnemonic

- Habitat destruction
- Invasive species
- Population growth-human
- Pollution
- Climate change
- Overexploitation

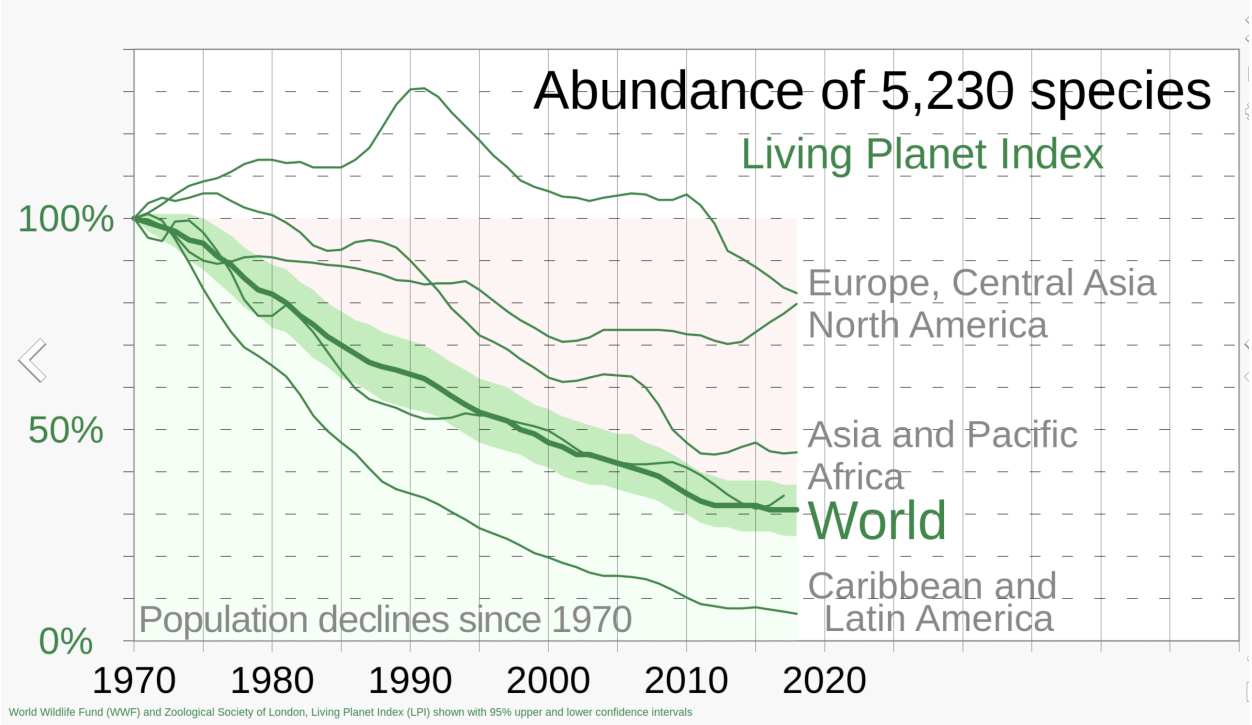
Laws to know:

- Marine mammal protection act: prohibits killing of marine mammals in the US
- Lacey Act: prohibits interstate shipping of illegally harvested plants and animals (big in Hawaii)
- Endangered species act (**ESA**): 1973 protects endangered species in US
- **CITES**: international law, Convention on international trade in endangered species, 1973



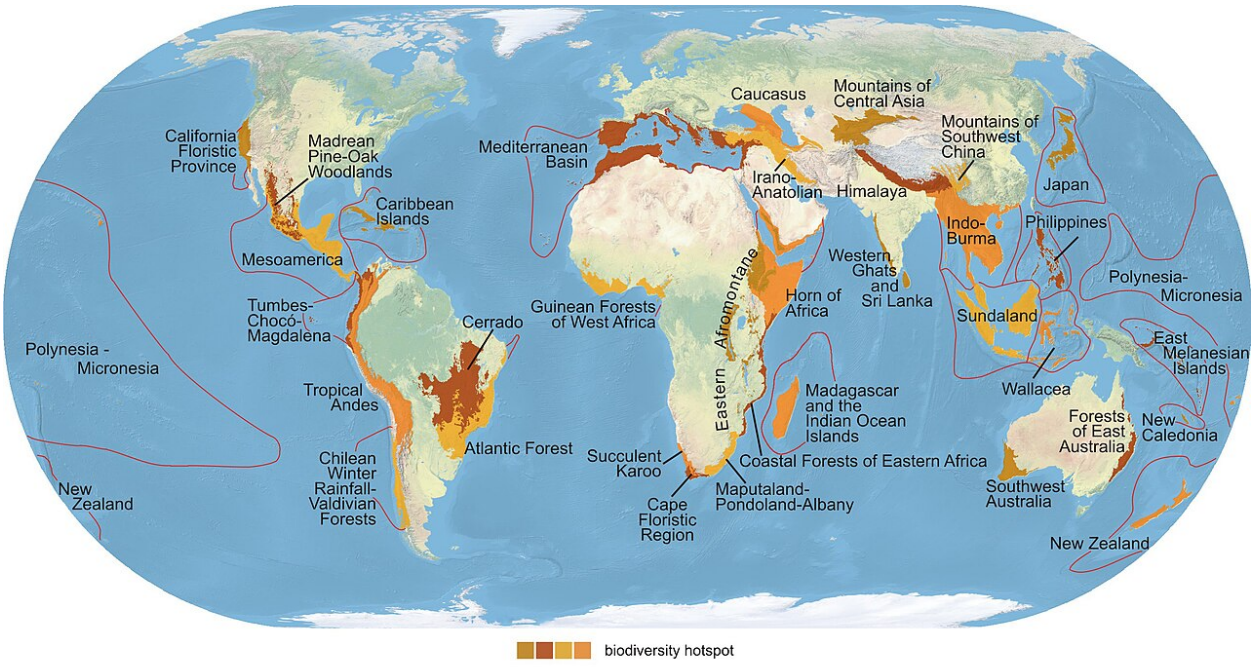
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The World Wildlife Fund's Living Planet Report 2022 found that wildlife populations declined by an average 69% since 1970



Screenshot 2024-04-22 at 12.53.16 PM.png

Global biodiversity hot spots:



Conservation International (conservation.org) defines 35 biodiversity hotspots — extraordinary places that harbor vast numbers of plant and animal species found nowhere else. All are heavily threatened by habitat loss and degradation, making their conservation crucial to protecting nature for the benefit of all life on Earth.

1280px-Biodiversity_Hotspots_Map.jpg

Map of life dashboard: https://mol.org/dashboard/home

Finally, look up our island on the biodiversity maps...why?

Migrated from Apple Server Wiki. Original page ID: _4j487S

Revision #2
Created 2026-09-29 15:58:19 UTC by Admin
Updated 2026-09-29 16:19:41 UTC by Admin