

Biodiversity



Essential Standard 2.7

Explain how the lithosphere, hydrosphere, and atmosphere individually and collectively affect the biosphere.

Learning Objective 2.7.2

Explain why biodiversity is important to the biosphere.

I Can Statements

At the end of this lesson, you should be able to say, with confidence:

- I can explain what biodiversity means and what it is important in an ecosystem.
- I can explain why it is important to not only have a high number of individuals in a population, but also a variety of different species.
- I can explain why genetic diversity within a population is also important..

Biodiversity

Biodiversity refers to the variety of organisms in a given area.

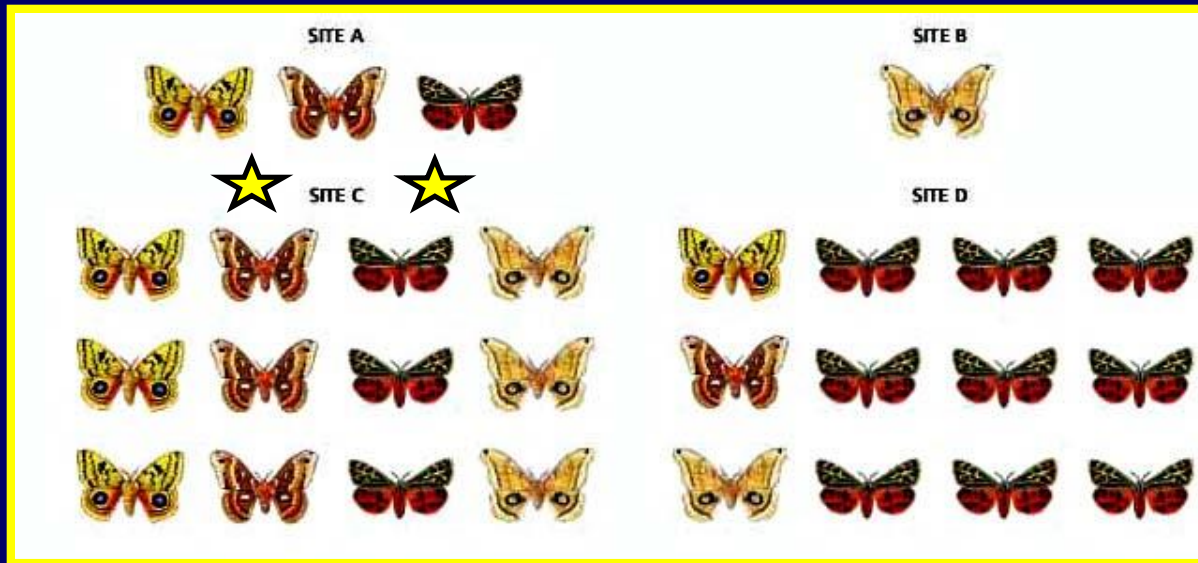
INDONESIA		USA	
Mammals:	667		468
Birds:	1604		888
Reptiles:	749		360
Plants:	30,000		20,000

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Indonesia has a greater number of different species than the USA, so Indonesia has greater biodiversity.

Species Richness

When measuring biodiversity, the number of different species and the number of individuals in each species are equally important.



Ecosystems with a large variety of species can withstand more disturbances because some species will probably be able to survive the changing conditions.

Genetic Diversity

Within species, genetic diversity is also important and signals a healthier population over time.



99% identical DNA

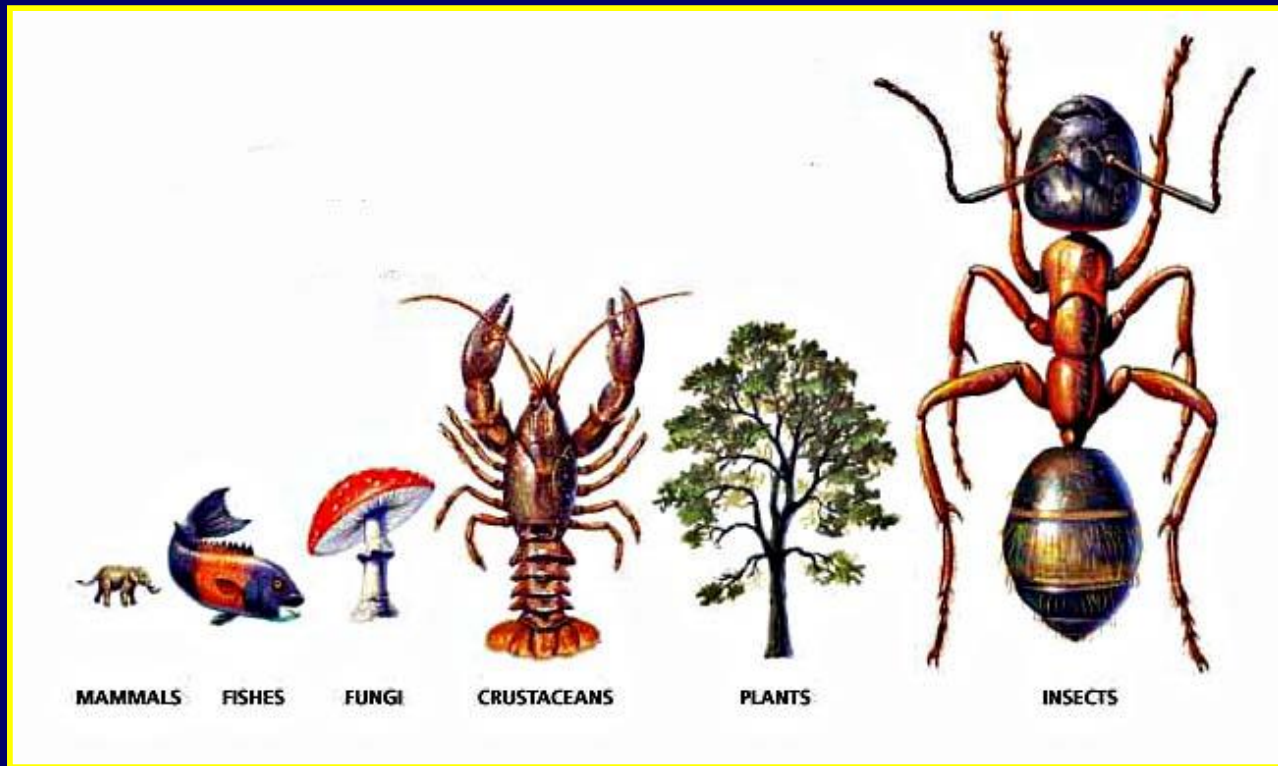
There are only about 7,000 cheetahs left in the wild and most live in protected sanctuaries.

Because their range has decreased so much, through interbreeding, their DNA is 99% identical.

With very little genetic diversity, one virus could wipe the entire population out.

Measuring Earth's Diversity

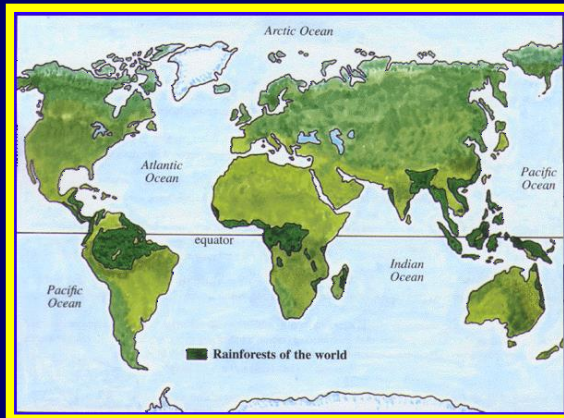
There are an estimated 10 – 30 million species on Earth with the largest proportion being insects.



In this image, the size represents the greater number of species. So, mammals have the least number of different species.

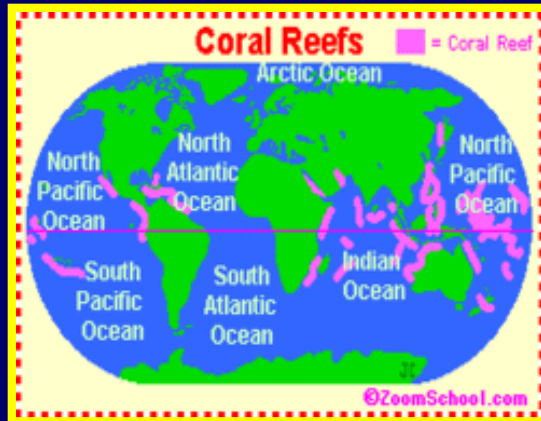
Ecosystem Diversity

Tropical rainforests are the most diverse of all the biomes, containing one-fifth of all species on Earth.



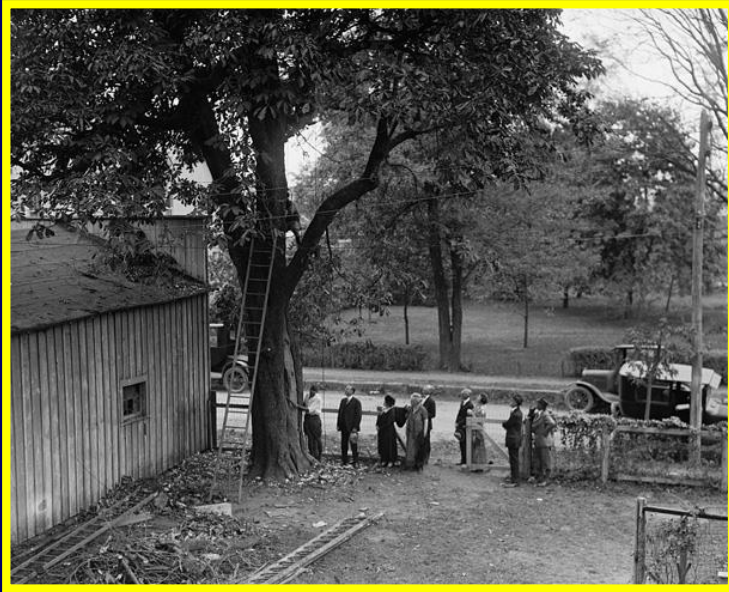
Ecosystem Diversity

Coral Reefs are the most diverse aquatic ecosystems, supporting more than 25% of all marine life.



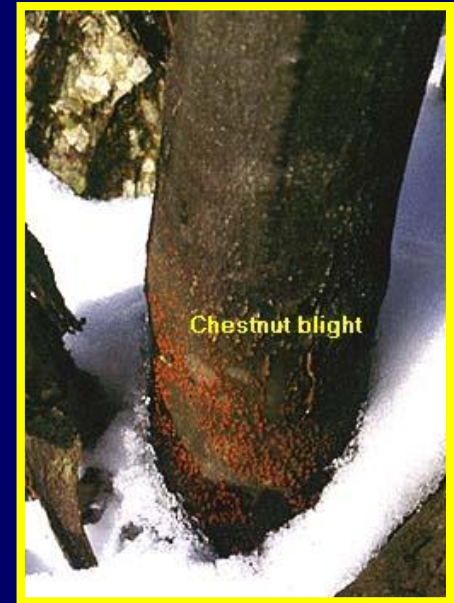
Importance of Biodiversity

The more diverse an ecosystem is, the more likely it will be able to rebound after a disaster.



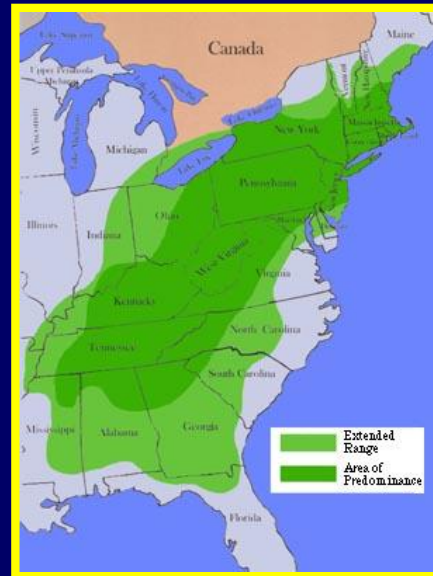
American Chestnut Tree

Once the most common trees in the Appalachian mountains, could grow to over 100 feet tall.



Chestnut Blight

Fungal disease began in 1904 and killed all the chestnut trees in the US by the 1950's.



Chestnut as a Resource



Blue Ridge Parkway, 1950's,
after the Chestnut Blight.

- Rot-resistant lumber
- Free hog feed
- Sale of chestnuts for “shoe money”
- Healthy populations of game animals
- Loss of chestnut trees ended sustainable farming in the mountains

Deer, wild turkey, squirrels, bear, and many other wild animals also depended upon the chestnuts for fall and winter food.

Populations of all these animals plummeted when the chestnut trees disappeared.

Interconnected Species

All populations of species are connected in some way.

Food Webs

Recycling of Matter

Symbiotic Relationships

Predator – Prey Relationships

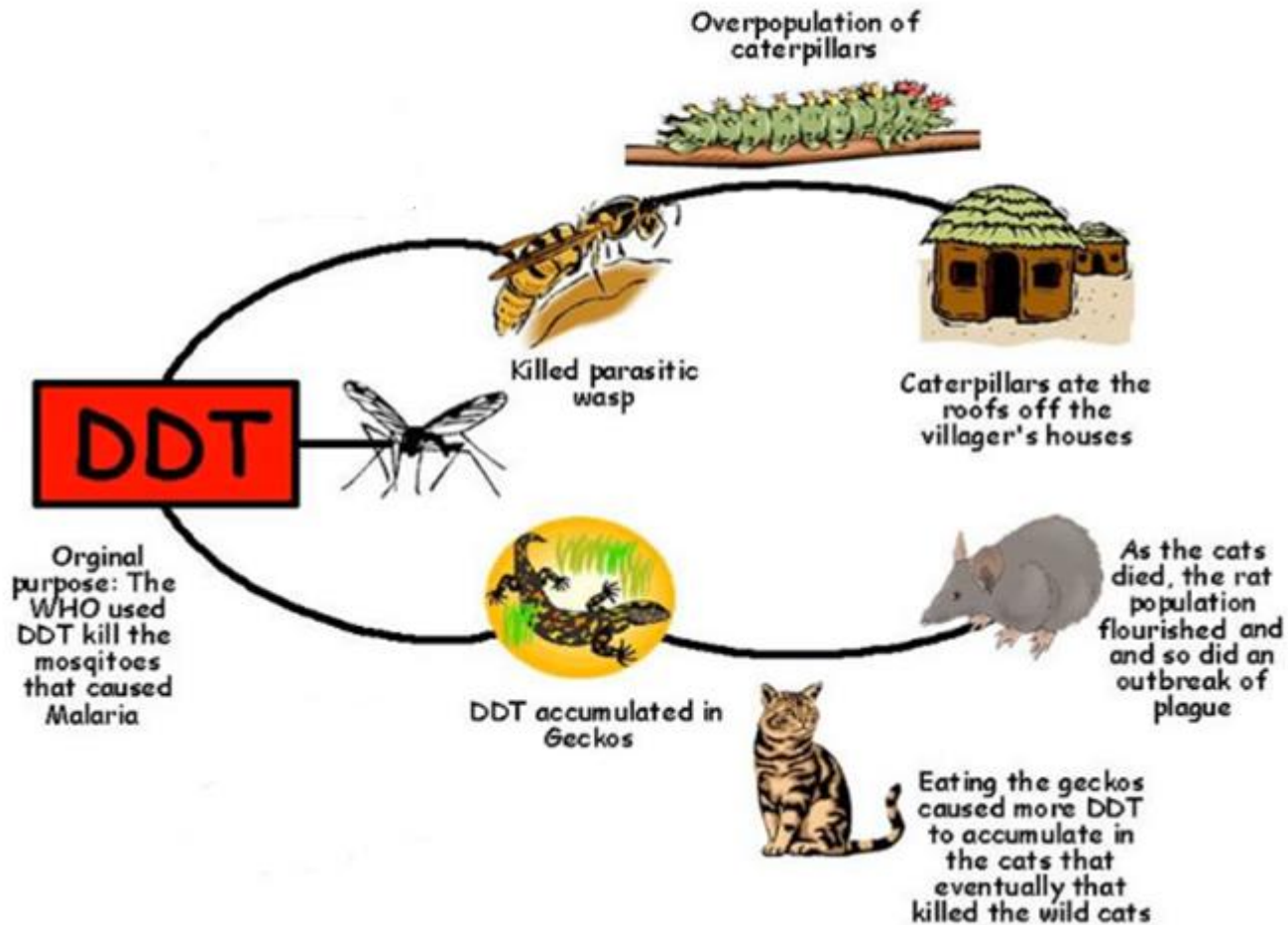
Competition Relationships

When you remove even one species, it can cause a ripple effect through the entire ecosystem.

Borneo

Effect of DDT Use in Borneo

In the early 1950's the people in Borneo, suffered from Malaria the World Health Organization had a solution, kill the mosquitoes with DDT. This is what happened.



Final Solution in Borneo

They parachuted cats into Borneo to eat the rats.



The End

