

## Section 16.4 Vanishing Species

### I. Biological Diversity

= *the variety of species in a specific area.*

#### Where is biodiversity found?

\*The richest environment for biodiversity all seem to be warm places, i.e. *tropical rainforests, coral reefs, and large tropical lakes*



### II. Importance of Biodiversity

#### A. Importance to nature

1. Living things are *interdependent*.
2. If the symbiotic relationships among organisms are *broken due to the loss of one species*, then the remaining *species will also be affected*.

#### B. Biodiversity brings stability

- \* Ecosystems are stable if their biodiversity is *maintained*.

### C. Importance to people

1. Humans depend on other organisms for their needs. Ex: *Oxygen, food, clothing, etc.*
2. Active compounds found in drugs/medicine are usually derived from other living things.  
Ex: *Penicillin, quinine, cyclosporine*
3. Preserving biodiversity ensures there will be a supply of *living things, which may provide future drugs.*

### III. Loss of Biodiversity

1. **Extinction** = *the disappearance of a species when the last of its members dies .*
2. **Background extinction** = *the loss of one to ten species per year per million species .*

\*Unfortunately, the world exceeds this rate by many times *due to human needs .*

3. **Endangered species**=  
*when a species numbers become so low that extinction is possible.*

Ex: California condor,  
many sea turtles



4. **Threatened species** =  
*when the population of a species is likely to become endangered.*

Ex: African elephant



## IV. Threats to Biodiversity

**A. Habitat loss -**  
*greatest affect on populations*



## B. Habitat fragmentation

= *the separation of wilderness areas from other areas.*

\*This can contribute to:

1. Increased *extinction* of local species.
2. Disruption of *ecological processes*.
3. New opportunities for *invasions* by other species.
4. Changes in *overall biodiversity*.



## C. Edge Effect

= *the areas where one habitat or ecosystem meets another.*

Ex: Where water meets land,  
where a field meets a forest

\*When an edge changes,  
animals from one area  
might *migrate* into  
another, thereby bringing  
species from *different  
ecosystems* in contact  
with one another





## D. Habitat degradation

= *the damage to a habitat by pollution.*

Ex: Air, water, and land pollution, *acid* precipitation, *UV* waves



### 1. Water pollution

Ex: Excess *fertilizers* and animal *wastes*, detergents, heavy metals, and industrial *chemicals*.



### 2. Land pollution

- The average American produces about *1.8* kg of solid wastes daily.
- The use of *pesticides* and *other chemicals* can lead to degradation.

Ex: *DDT* was banned in 1972



## E. Invasive species (*exotic species*)

1. These are species that are introduced *on purpose* or *by accident* to a new area.

Ex: Goats to Santa Catalina Island (**48** native plant species disappeared).

2. When this happens, they can grow *exponentially* and can cause serious harm to *native* species in this area.

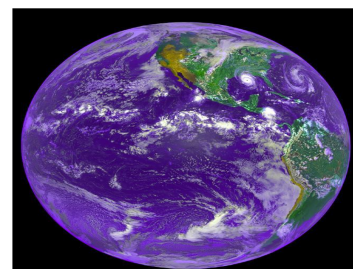


## Section 16.5 Conservation

*Conservation Biology* = the study and Implementation of methods to protect biodiversity.

\**Natural resources* = those parts of the natural environment that are useful or necessary for living things.

Ex: *sunlight, water, air, and plant and animal resources.*



## I. Legal protections of species

### A. US Endangered Species Act became law in **1973**.

-It made it **illegal** to harm any species on the endangered or threatened list, and made it illegal for **federal agencies** to fund any project that would **harm** organisms on their lists.



### B. Worldwide, the Convention on International Trade in Endangered Species (CITES) has established **lists** of species for which international trade is **prohibited** or **controlled**. (Endorsed by more than 120 countries.)



-A listed species is often called an **umbrella species**.

- **the habitat** in which the species lives must be **protected**
- **other species** are **protected** because they share the ecosystem



## II. Preserving habitats

A. Natural preserves and parks were created.

Ex: In **1872** the first national park was created = ***Yellowstone National Park***



## B. Habitat corridors

= ***protected strips of land*** that allow the ***migration*** of organisms from one wilderness area to another.





### III. Working with people

A. Parks and protected areas hire people to maintain and manage these areas.

Ex: *Park Rangers and Game Wardens*



B. Some areas are used for *sustainable use* only. We can harvest some of the natural *resources* without doing any harm.

Ex: Harvesting Brazil nuts in the Amazon

### IV. Reintroduction and species preservation programs

A. Black-footed ferrets once numbered in the tens of thousands, but *widespread destruction of their habitat and food supplies* (prairie dogs) in the 1900s brought them to the brink of extinction. Only *18 remained in 1986*.

Today, they are making a *comeback*, with approximately 750 black-footed ferrets *in the wild*, and another 250 living in *captive breeding facilities* (2008).




## B. Captivity

\*Some species no longer exist in the wild, but *humans* maintain a small number of individual organisms.

Ex: *Ginkgo tree*

## C. Protecting plant species

\**Seed banks* have been established for the survival of plants.



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- 1 Why are animals kept in zoos?
- 2 What are some problems of keeping animals in zoos?