

Lesson #4  
Impacts of Growth on Ecosystems  
Chapter 5

---

---

---

---

---

---

---



Degradation of Land Resources

- Soil Concerns
  - Overgrazing
  - Soil Erosion
  - Desertification
  - Stalination
- Deforestation

---

---

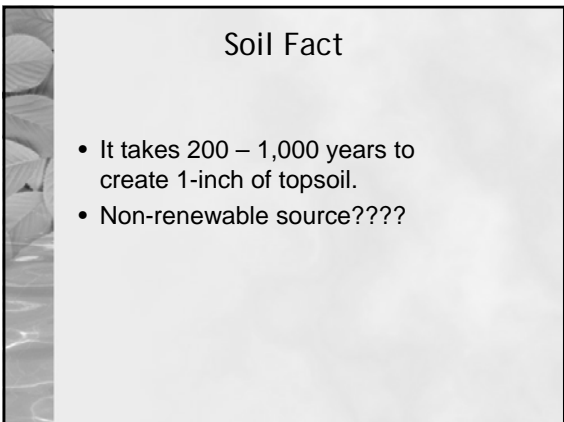
---

---

---

---

---



Soil Fact

- It takes 200 – 1,000 years to create 1-inch of topsoil.
- Non-renewable source????

---

---

---

---

---

---

---

## Soil Erosion

- Movement of surface litter and topsoil (O & A horizons) from one place to another by wind or water.
- Caused by:
  - Agricultural practices
  - Development
  - Cattle

---

---

---

---

---

---

---

---

## Desertification

- The formation and expansion of degraded areas of soil and vegetation cover in arid, semiarid, and seasonally dry areas, caused by climate variations and human activities.

---

---

---

---

---

---

---

---

## Salinization

- Accumulation (build-up) of salts in the soil due to flood irrigation.

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---



---

---

---

---

---

---

---

**Logging Roads Harmful Effects**

- Increase erosion & sediment runoff in waterways.
- Habitat fragmentation and biodiversity loss.
- Exposure of forests to invasion by non-native pests, diseases, & wildlife species.

---

---

---

---

---

---

---

## Logging Roads Harmful Effects

- Opening once inaccessible forests to forests, miners, ranchers, hunters, & off-road vehicles.
- In US, logging roads on public lands disqualify the land for protection as wilderness.

---

---

---

---

---

---

---

## Causes of Tropical Deforestation

Three main factors:

1. Population growth
2. Poverty
3. Government

---

---

---

---

---

---

---

## Other reasons

- Unsustainable forms of small-scale farming
- Cattle ranching
- Raise cash crops (soybeans, etc)
- Mining and oil drilling
- Commercial Logging
- Fuel wood

---

---

---

---

---

---

---

### How it's cleared

- Slash and burn method most popular to clear large tracts of land.
- Remove what's valuable and then set fire to clear the remaining vegetation.

---

---

---

---

---

---

---

### Why can't they just use the same land to farm on?

- Most of TRF nutrients are locked up in the biomass.
- Due to warm climate, detritus does not stick around there for long. Decomposes rapidly and then the nutrients are taken in by the plants.
- Therefore, soils of TRF are actually quite thin and nutrient-poor.

---

---

---

---

---

---

---

### Small-scale Farming cycle

- Crops will only grow up to five years on that original piece of burned forest. (normally 2 years).
- Cycle continues – landless poor slash and burn more forest.

---

---

---

---

---

---

---



---

---

---

---

---

---

---

**What is Biodiversity?**

- *Biological Diversity*
- The sum total of all organisms in an area, taking into account the diversity of *species*, their *genes*, their *populations* and their *communities*.

---

---

---

---

---

---

---

**Importance of genetic diversity?**

- Advantages of adaptation to various climates
- Reduces disease
- Reduces effects of inbreeding which can produce sick or weak offspring

---

---

---

---

---

---

---

### What is a Threatened Species?

- Is still abundant in its natural range but is declining in numbers and is likely to become endangered in the near future.

---

---

---

---

---

---

---

---

### What is an Endangered Species?

- Few individuals survivors that the species could soon become extinct over all or most of its natural range.
- [http://ecos.fws.gov/tess\\_public/TESSWebpageUsaLists?state=all](http://ecos.fws.gov/tess_public/TESSWebpageUsaLists?state=all)

---

---

---

---

---

---

---

---

### What is extinction?

- The disappearance of an entire species from the face of the earth.

---

---

---

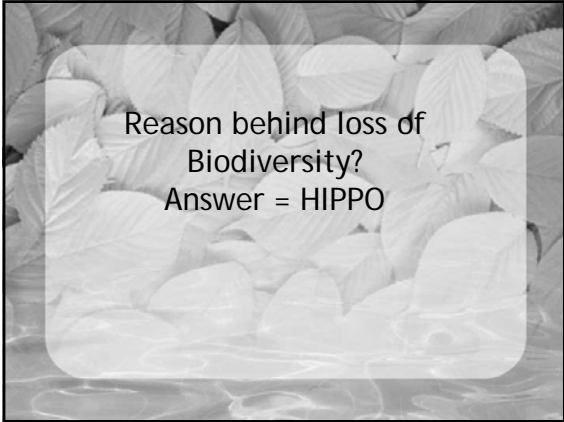
---

---

---

---

---



---

---

---

---

---

---

---



---

---

---

---

---

---

---



---

---

---

---

---

---

---



## Pollution

- Air
- Water
- Soil Contamination

---

---

---

---

---

---

---

---

## Population Growth

- Exacerbates several environmental issues

---

---

---

---

---

---

---

---

## Overexploitation

- Overharvesting of species
- Overconsumption of resources

---

---

---

---

---

---

---

---



---

---

---

---

---

---

---

What is the purpose of the ESA?

- Purpose of ESA: to conserve “the ecosystems upon which endangered and threatened species depend” and to conserve and recover listed species.
- Passed in 1973.

---

---

---

---

---

---

---

ESA

- Authorizes the National Marine Fisheries Service (NMFS) to identify and list E/T ocean species (includes salmon & whales).
- USFWS identifies and lists all other E/T species.

---

---

---

---

---

---

---

### ESA

- Makes it illegal for Americans to import or trade in any product made from an E/T species
- Exception: used for approved scientific purpose or enhance species survival.

---

---

---

---

---

---

---

### ESA

- Any species listed cannot be hunted, killed, collected, or injured in the USA.
- All species of plants and animals, except pest insects, are eligible for listing as E/T.

---

---

---

---

---

---

---

### ESA

- Any decisions that add or remove these species must be based on biology only.
- After getting listed, USFWS or NMFS is supposed to prepare a species recovery plan.

---

---

---

---

---

---

---

## ESA - Numbers as of 2004

- Total US Endangered – 987 (388 animals, 599 plants).
- Total US Threatened – 276 (129 animals, 147 plants).
- Totals – 1263 (517 animals, 746 plants).
- Animals: birds, reptiles, fishes, clams, insects, arachnids, etc.
- Plants: flowers, ferns, conifers, lichens, etc.

---

---

---

---

---

---

---

---

## ESA

- Have numbers changed??
- Total species listed in 1967 = 78
- Total species listed in 2001 = 1,254
- Today = 1,263

---

---

---

---

---

---

---

---

## ESA

- FWS also maintains a list of “candidate” species.
- These are species that are potentially going to be listed as E/T.
- FWS works with States and private partners to carry out conservation actions to prevent species from being listed.

---

---

---

---

---

---

---

---

## Habitat Conservation Plans (HCP)

- Agreement between gov't and private landowners.

---

---

---

---

---

---

---

---

## HCP

Protective measures include:

- Setting aside part of the species habitat as a preserve.
- Paying to relocate the species to another habitat.
- Paying money to gov't to buy suitable habitat elsewhere.

---

---

---

---

---

---

---

---

## HCP

Exceptions:

- Critical habitat and species protection can be exempted if the benefits of a project clearly outweigh the benefits of conserving a species.
- Only happen three times in history.

---

---

---

---

---

---

---

---

### What is CITES?

- Convention on International Trade in Endangered Species of Wild Fauna and Flora.
- Protects endangered species by banning the international transport of their body parts.
- Formed in 1963.

---

---

---

---

---

---

---

---

### CITES

- 160 nations have voluntarily agreed to participate in agreement.
- USA entered in agreement July 1975.
- Not one species protected by CITES has become extinct.

---

---

---

---

---

---

---

---

### Convention on Biological Diversity

- 1992
- Goals of convention include:
  - To conserve biodiversity
  - To use biodiversity in a sustainable manner
  - To ensure fair distribution of biodiversity's benefits

---

---

---

---

---

---

---

---