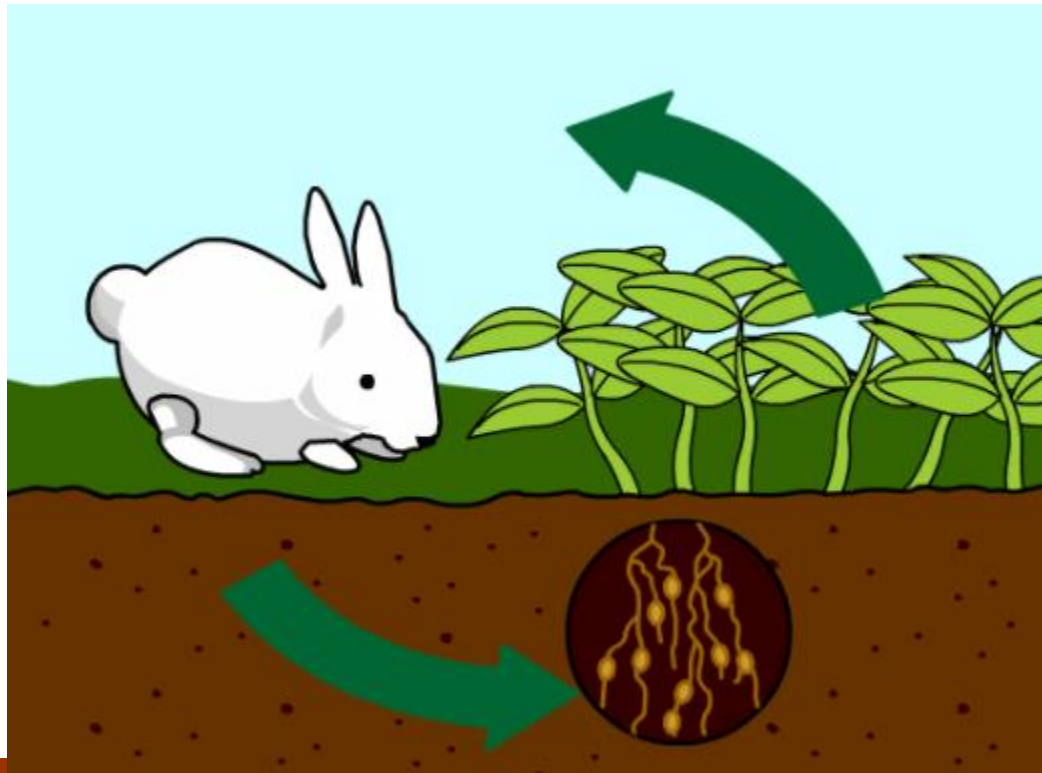


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UNIT 1

Interactions within Ecosystems

Topic #6: Nutrient Cycle



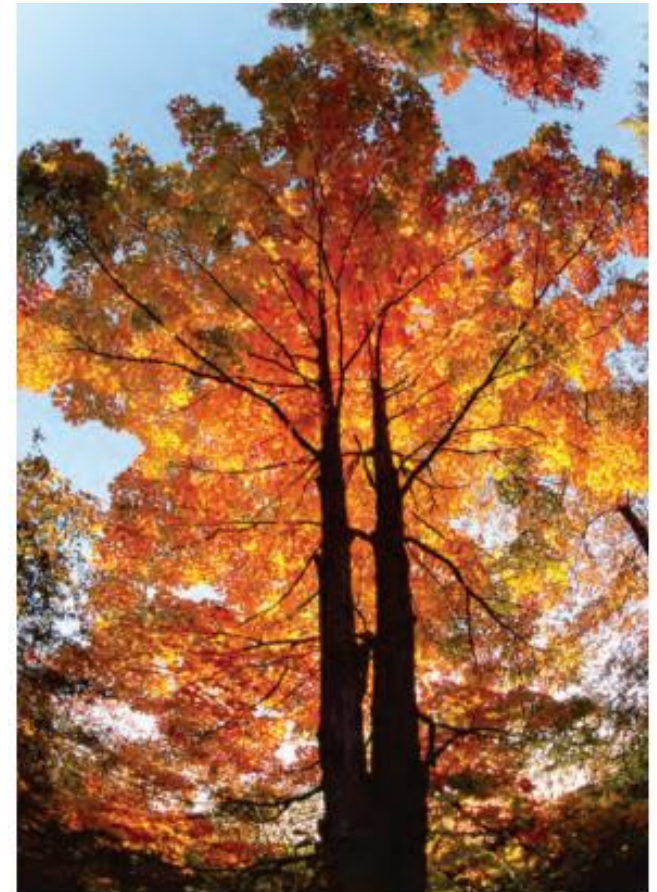
What Are Nutrients?

So far we have considered food only as an energy source.

Food also contains nutrient materials

Nutrients are chemicals required for plant and animal growth and other life processes. For example:

- carbon,
- nitrogen,
- calcium,
- phosphorus
- oxygen
- hydrogen



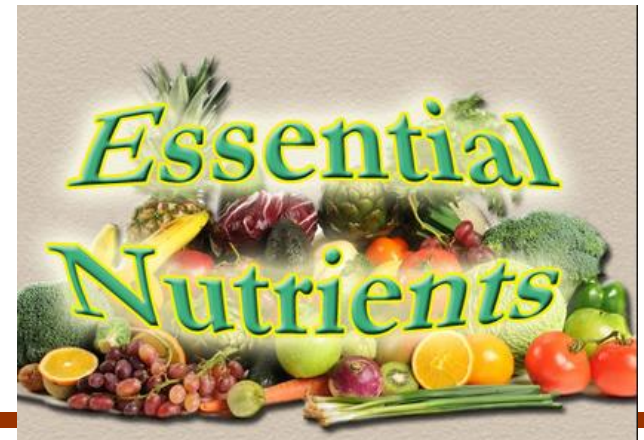
This maple tree was once a small seed.
All the nutrient materials used to build the trees came from the soil, air, and water.



Unlike energy, which comes from the continuous supply of sunlight, there is no such source of nutrients.

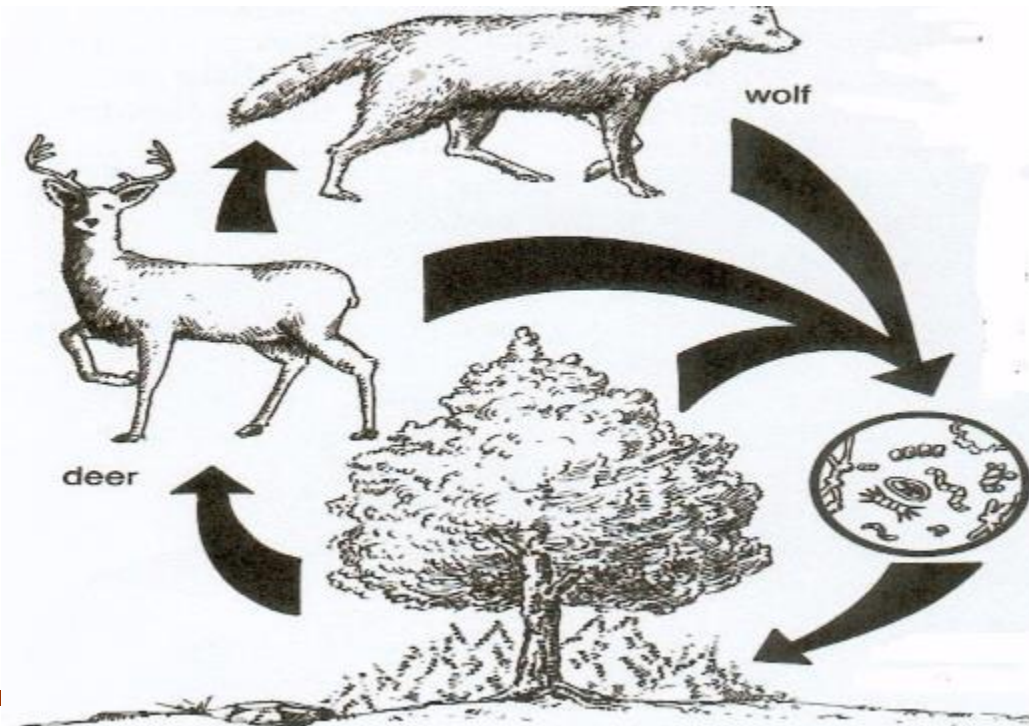
Same pool of nutrients supports all life—past, present, and future

Why doesn't the limited supply of nutrients run out?



NUTRIENT CYCLE

The nutrient cycle refers to the process that keeps elements supporting life circulating. It moves nutrients between the living and the nonliving

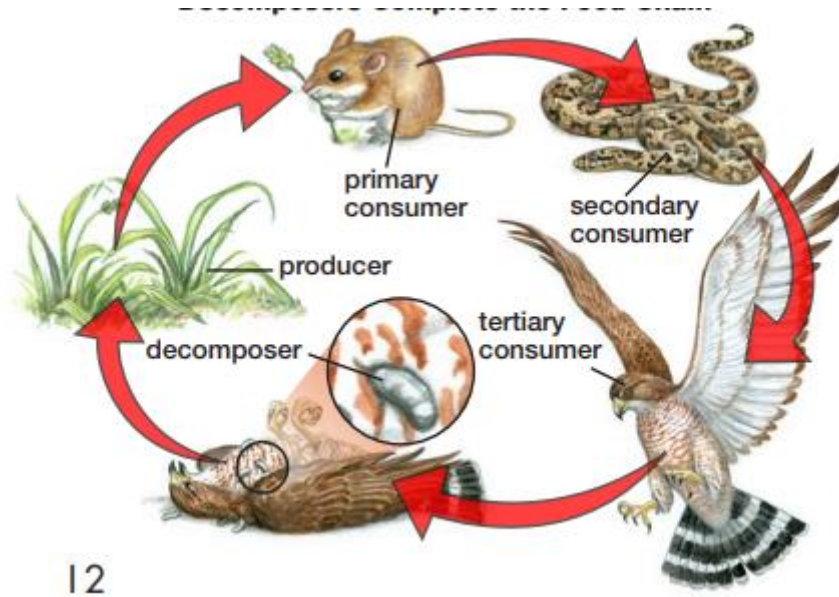


Bacteria and fungi decompose waste from other organisms.

nutrients return to soil to be taken up by plants



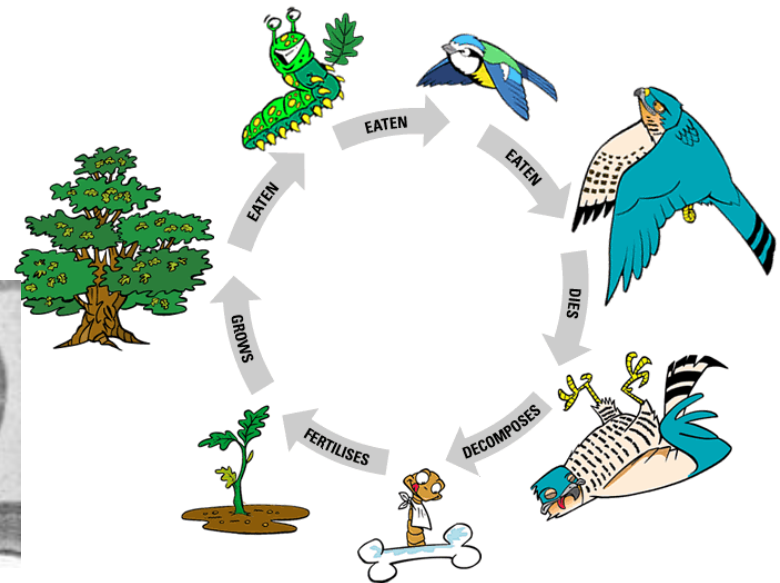
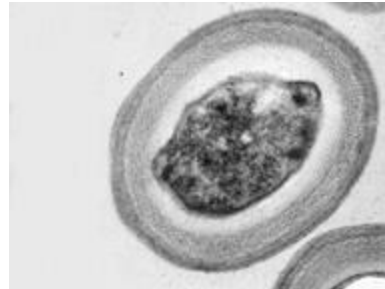
Decomposers



They are nature's recycles: They ensure that nutrients are returned to the soil so producers can use them for the purpose of photosynthesis. Without decomposers such as bacteria and mushrooms, the earth would be covered in waste and the flow of energy would be a one way street instead of a cycle.



Decomposers feed by producing weak acids that break down dead tissue into smaller part chemical particles. This process releases nutrient materials gases into the soil, water, and air, where they can be used by producers. In this way, every organism that dies is recycled. The nutrient materials are never used up.



MOVIE ON **Life in the forest**

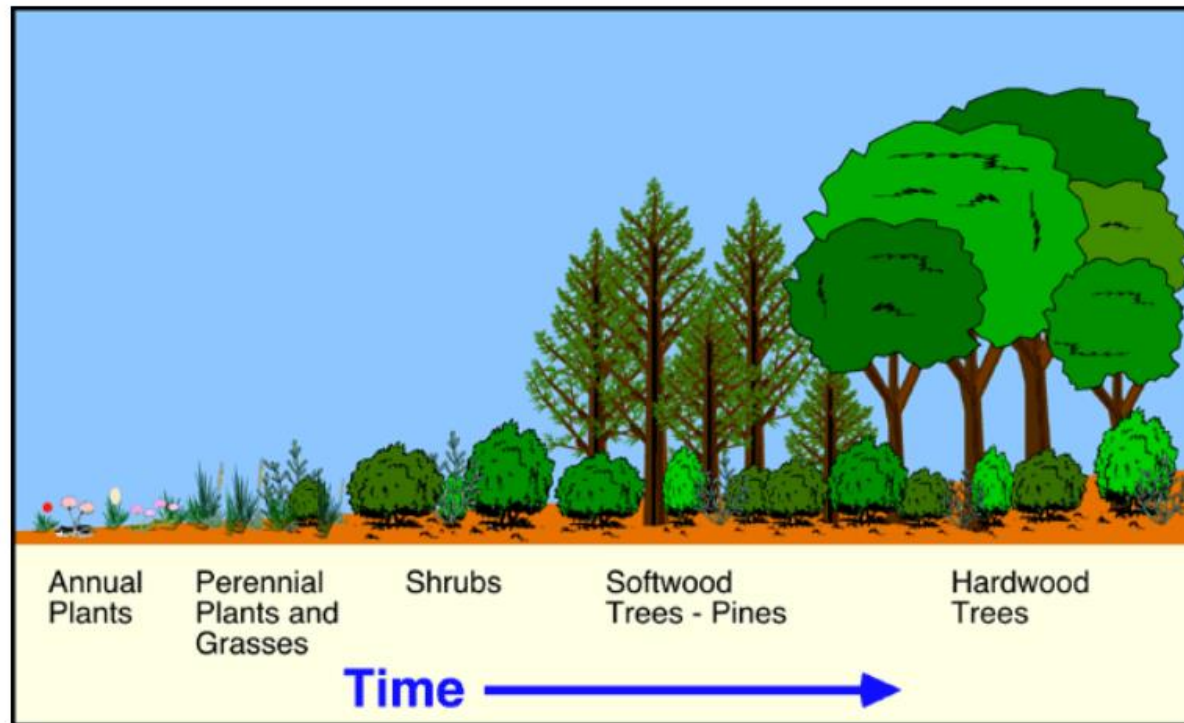


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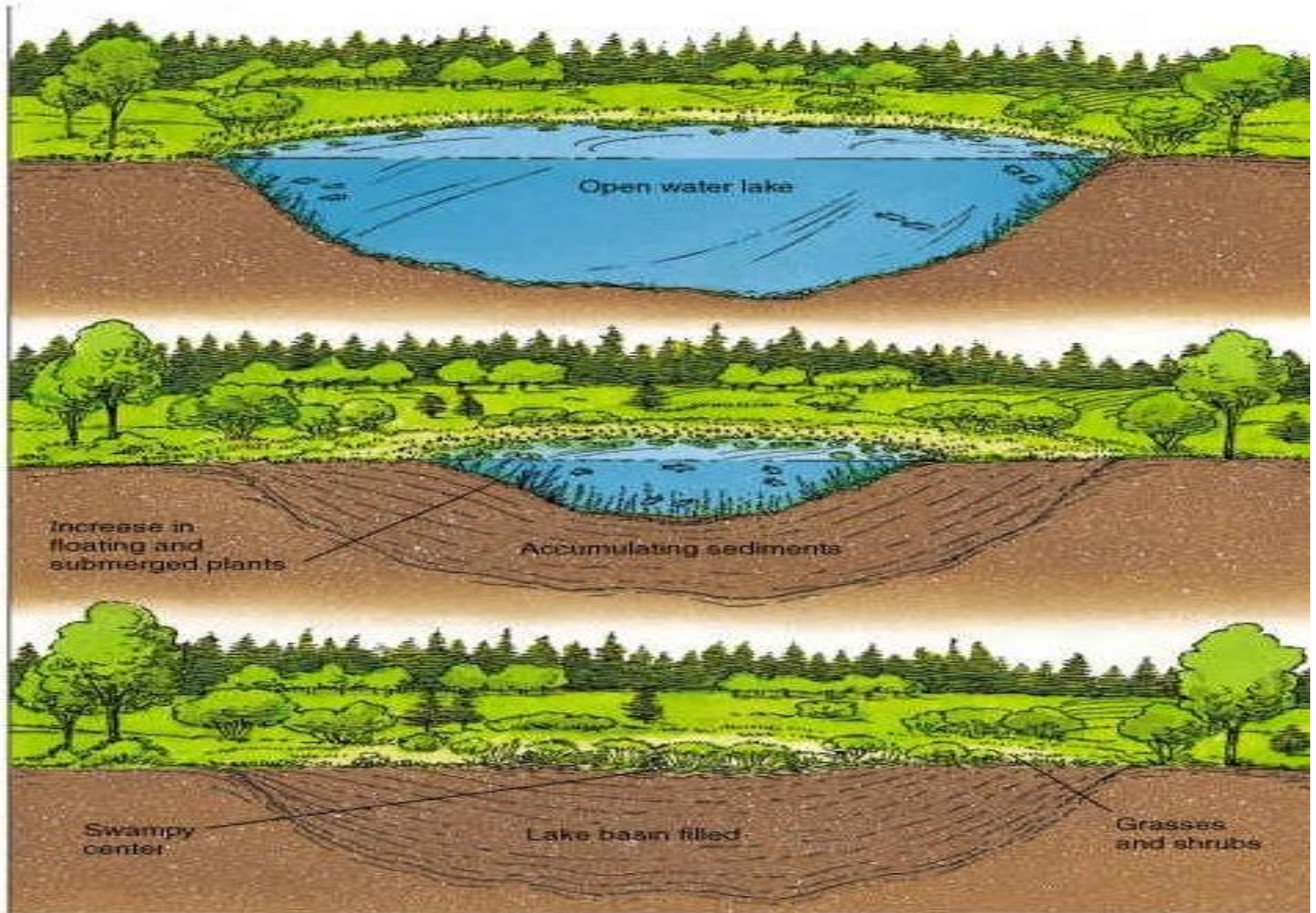
UNIT 1

Interactions within Ecosystems

Topic #7: Succession







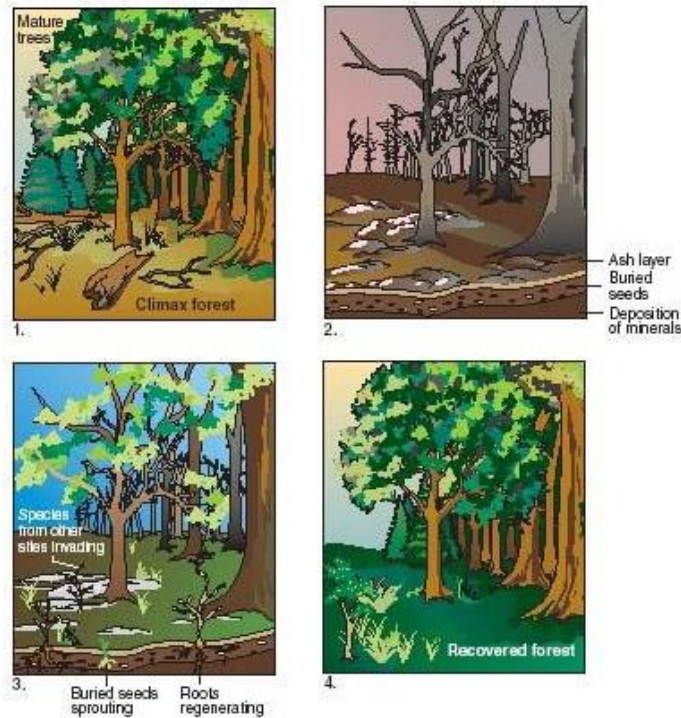
Caption

(a) What begins as a lake gradually fills with organic and inorganic sediments, which successively shrink the area of the pond. A bog forms, then a marshy area, and finally a meadow completes the successional stages. (b) Aquatic succession in a mountain lake. [Photo by Bobbé Christopherson.]



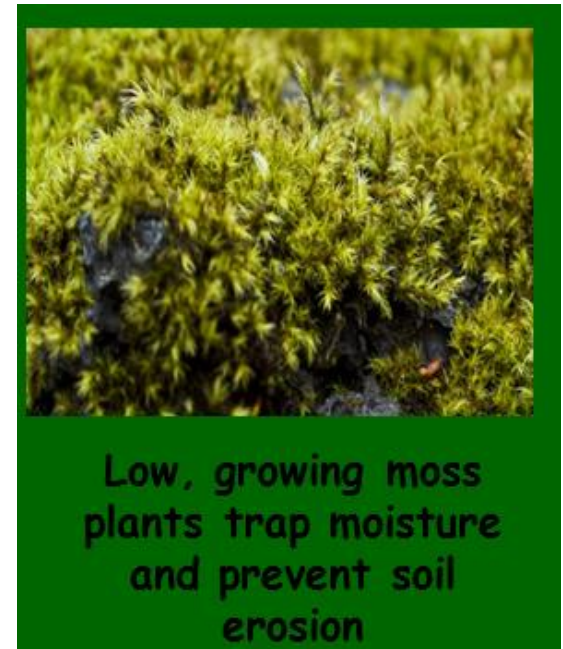
Ecological Succession

Succession- Refers to the series of changes that every community undergoes over long periods of time



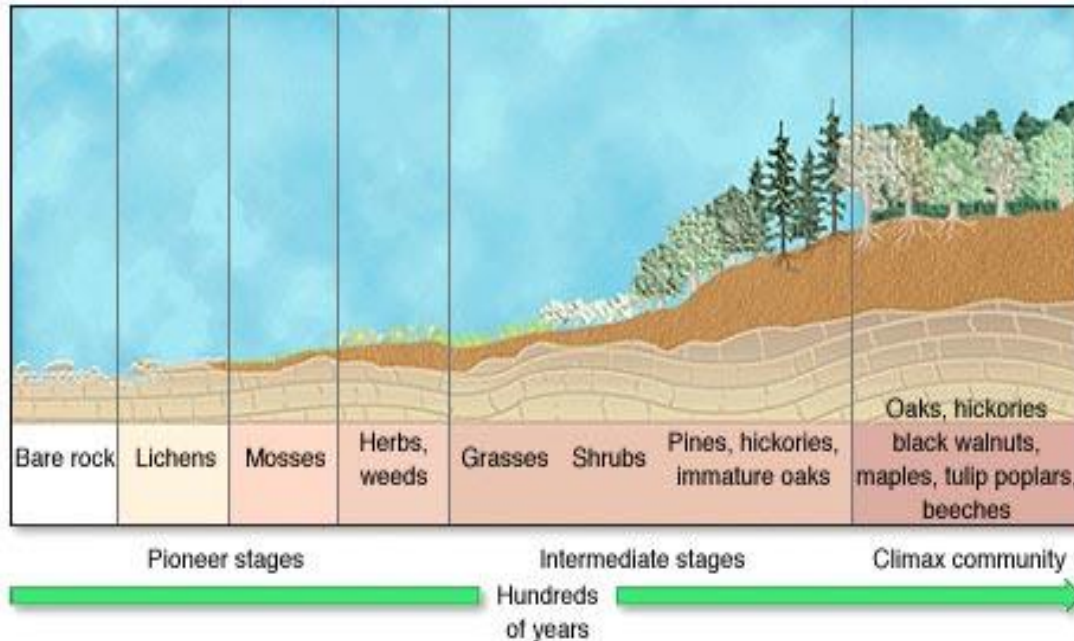
What is the process of succession?

Pioneering Plants and Animals (the first organisms to appear in succession) appear in an area, forming a primitive community.





A **climax community** is the final stage in succession. A stable group of plants and animals that is the end result of the succession process.



Does not always mean big trees

Grasses in prairies

Cacti in deserts

Abiotic factors determine the type of climax community that will become established

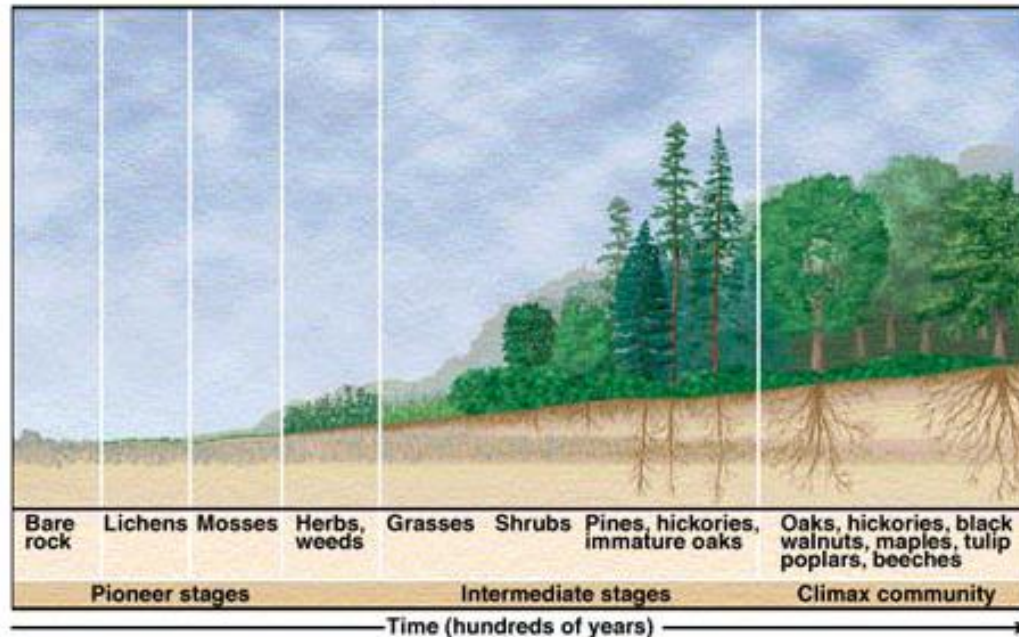


These are Climax Communities

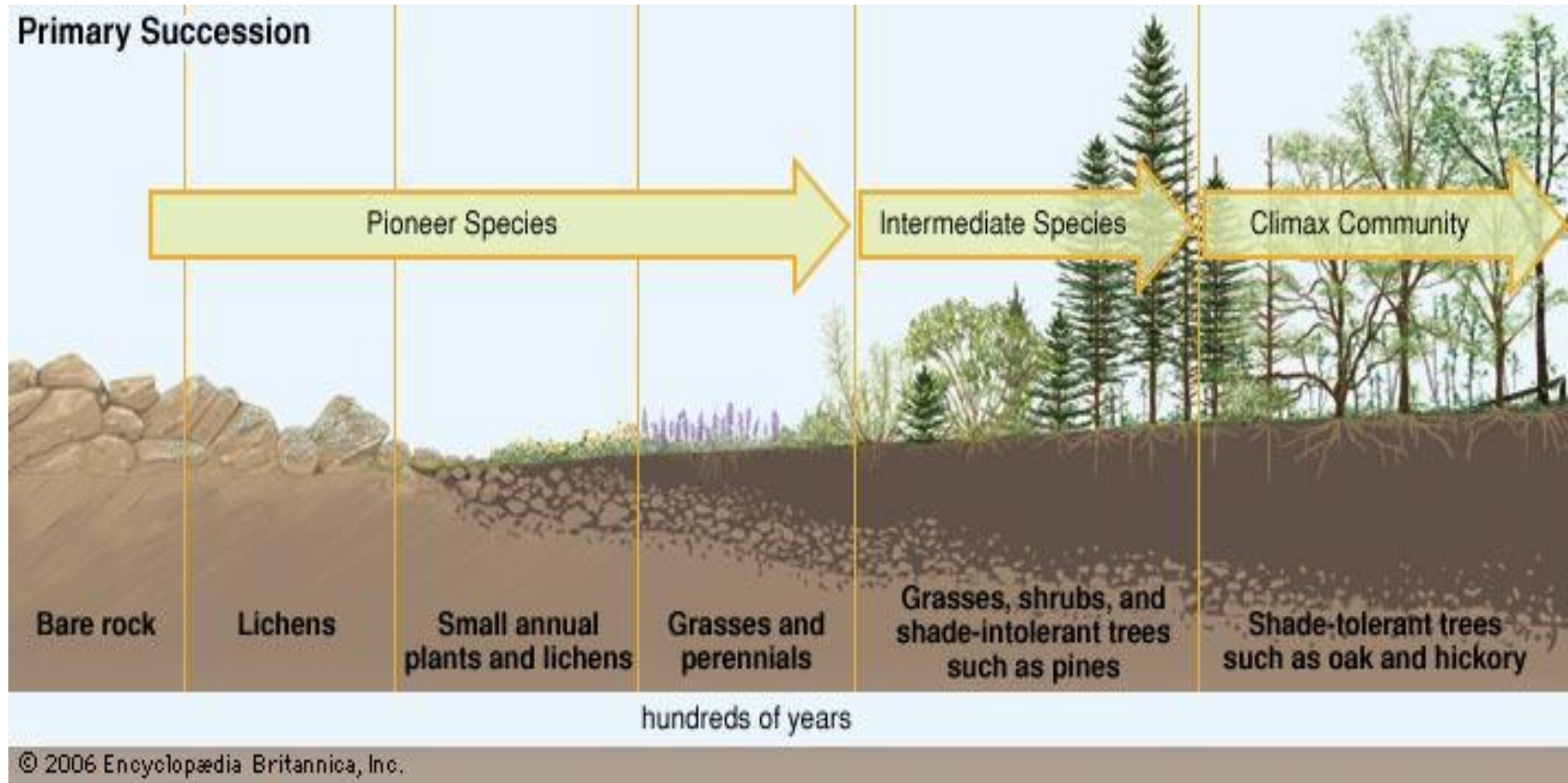


Two Types of Succession:

1) Primary Succession: A sequence of changes that begin in an area where there is no soil or other forms of life. (For example, bare rocks that eventually become a coniferous forest).



Primary Succession



Primary Succession

- Insects, small birds, and mammals have begun to move in.
- What was once bare rock now supports a variety of life



<http://p2-raw.greenpeace.org>



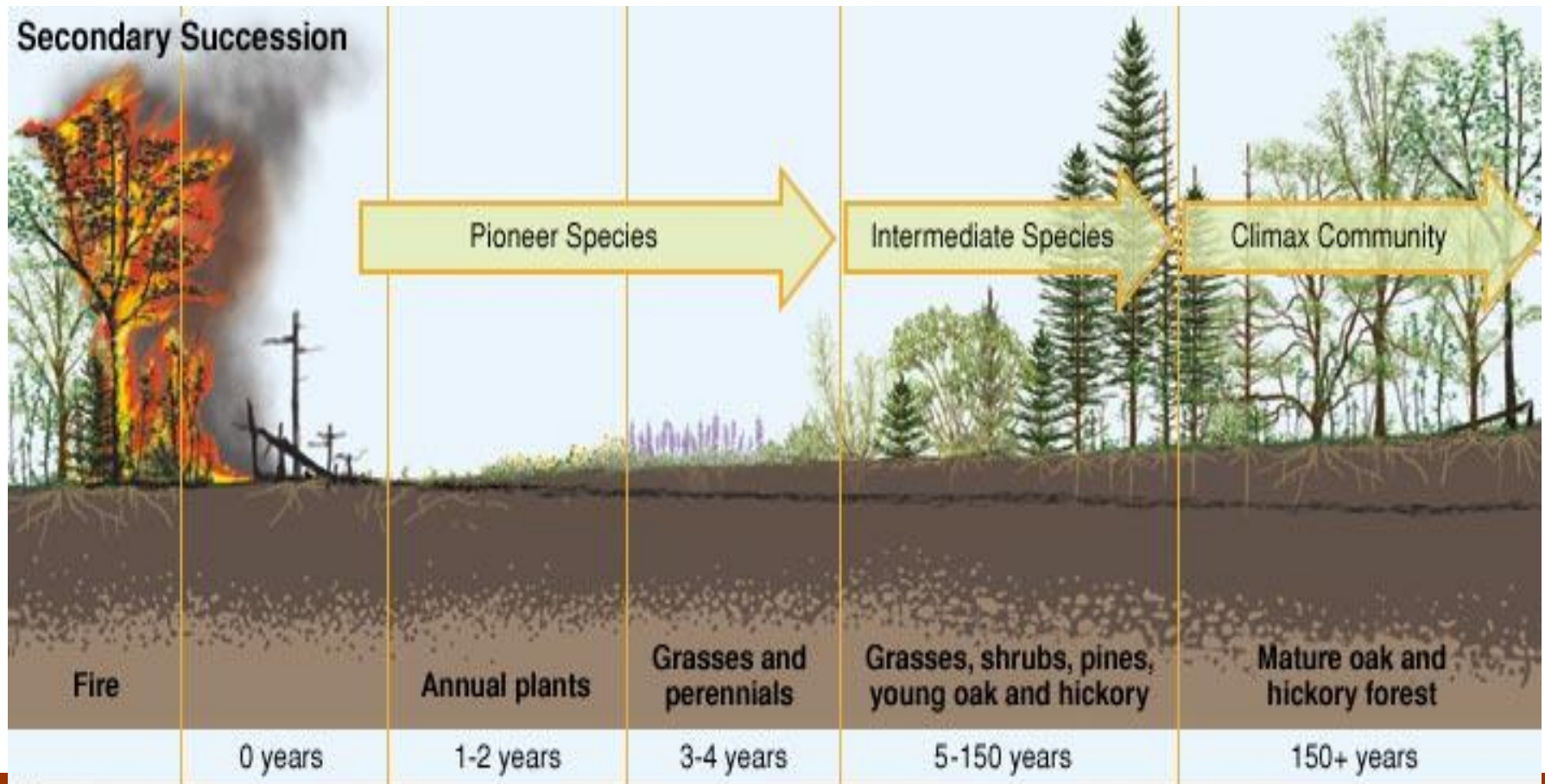
2. Secondary Succession: a sequence of changes that begin with soil already there because of an existing community that has been destroyed by such things as fire, clear cutting or volcano



**Secondary
succession**



Secondary Succession



Disturbances will start the process of succession again



Forest fires



Volcanoes



Avalanche



Deforestation



Secondary Succession

- Insects, small birds, and mammals have begun to move in
- What was once bare rock now supports a variety of life



<http://p2-raw.greenpeace.org>



Succession can have environmental changes such as...

1. Soil composition
2. Plant types
3. Animal types
4. Amount of light



A summary of changes that occur during succession:

- **Pioneer species colonize a bare or disturbed site. Soil building.**
- **Changes in the physical environment occur (e.g., light, moisture).**
- **New species of plants displace existing plants because their seedlings are better able to become established in the changed environment.**
- **Newly arriving species alter the physical conditions, often in ways that enable other species to become established.**
- **Animals come in with or after the plants they need to survive.**
- **Eventually a climax community that is more or less stable will become established and have the ability to reproduce itself.**
- **Disturbances will start the process of succession again.**



Web sites

- <http://www.hww.ca/hww.asp?id=5&pid=0>



Science 7

UNIT 1

Interactions within Ecosystems

Topic #8: The Human Impact



The Human Impact...

How do you think we have impacted our environment?

1. Harvesting resources
2. Habitat loss/ destruction
3. Introduced species
4. Pollution



Harvesting Resources

The demand for natural resources has increased due to the increase in the human population.

Our technologies have enabled us to remove the resources we need.

Silviculture is the the growing and cultivation of trees.



Habitat Loss/ Destruction

Removing vegetation and soil removes shelter and food for animals.



Changes on land alter drainage of water which affects rivers and lakes.



Introduced Species

Biodiversity refers to the number of species in an ecosystem



Introduced species (exotic species) is an organism that is not native to the place or area where it is considered **introduced** and instead has been accidentally or deliberately transported to the new location by human activity.



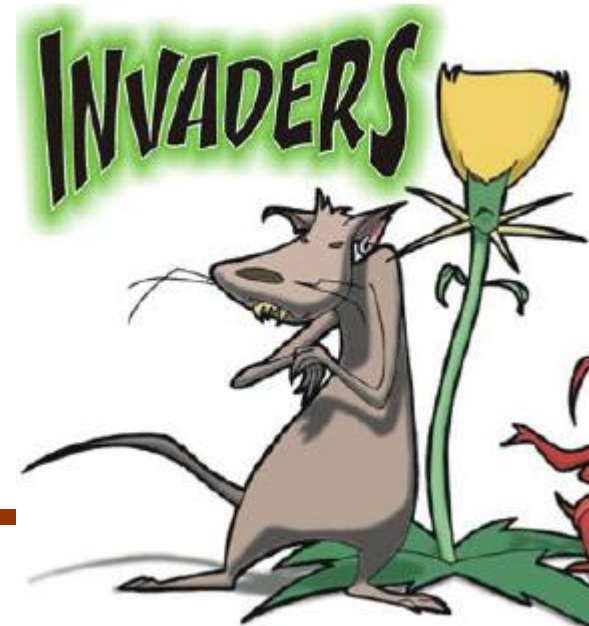
Also called alien, exotic or nonnative species.

Ecology

Introduction of New Species

Exotic species – introduced outside its native range (generally implies human involvement)

Invasive species – spreading rapidly in numbers and in space



Introduced species can have negative impacts on the environment and affect ecological processes.



If two species do share similar niches in an ecosystem, competition for survival may occur.



Introduced Animals In Newfoundland and Labrador

- **Moose 1904**
- **Eastern chipmunk 1962**
- **Coyote**
- **Snowshoe hare 1860**
- **American mink 1934**
- **Deer mouse**
- **Norway rat**
- **Masked shrew**
- **Green Crab**
- **Spruce Grouse**
- **Wood Frog**
- **American Toad**



Introduced Insects In Newfoundland and Labrador

- Birch Leaf Mining Sawfly
- Cabbage White Butterfly
- European Earwig
- European Skipper
- Long Horned Beetle
- Multicolored Asian Lady Beetle



Introduced Plants In Newfoundland and Labrador

- **Meadow Thistle**
- **Black Knapweed**
- **Gout Weed**
- **Purple Loosestrife**
- **Japanese Knotweed**
- **Yellow Iris**



Pollution

Pollutants refers to anything added to the environment that is harmful to a living thing.

For example, pesticides pass from insect pests into food chains, where they may kill beneficial organisms such as birds or frogs.

Fertilizers wash from farmers' fields into waterways, where they cause excessive growth of water plants



Habitat Conservation

Pros	Cons
Sustainability of resource	artificial habitats
Preservation of biodiversity	economic loss (jobloss, etc.)
Eco-tourism	limited human use



Local Groups Interested in Protecting the Environment

- Protected Areas Association
- Conservation Corps Newfoundland & Labrador
- OceanNet



National Groups Interested in Protecting the Environment

- Parks Canada



- Nature Conservancy of Canada



- David Suzuki



David
Suzuki
Foundation



International Groups Interested in Protecting the Environment

- Friends of the Earth



- World Wildlife Fund



- Ducks Unlimited

