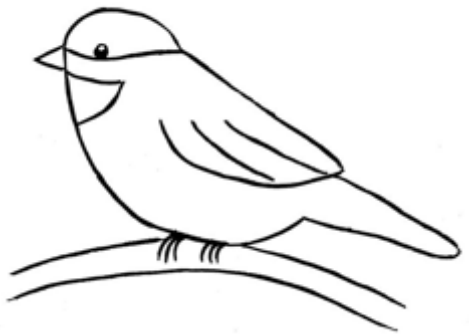
1. Roots and Soil
2. Microclimates – elevation, etc.
3. Edge Effects and Island Biogeography Theory – Intermediatary Disturbance Theory
4. Hydraulic Lift – discuss on walk

Planet Earth clips, go outside

WOODY PLANT BASICS: ECOLOGY

Led by Cat Chamberlain, Wayne Daly

MAIN AIMS

- Quick Update from last week...
- Ecology: defined
- Succession & Recruitment
- Ecological Relationships
- Conservation

ECOLOGY: the study of how organisms interact with their environment and other organisms.

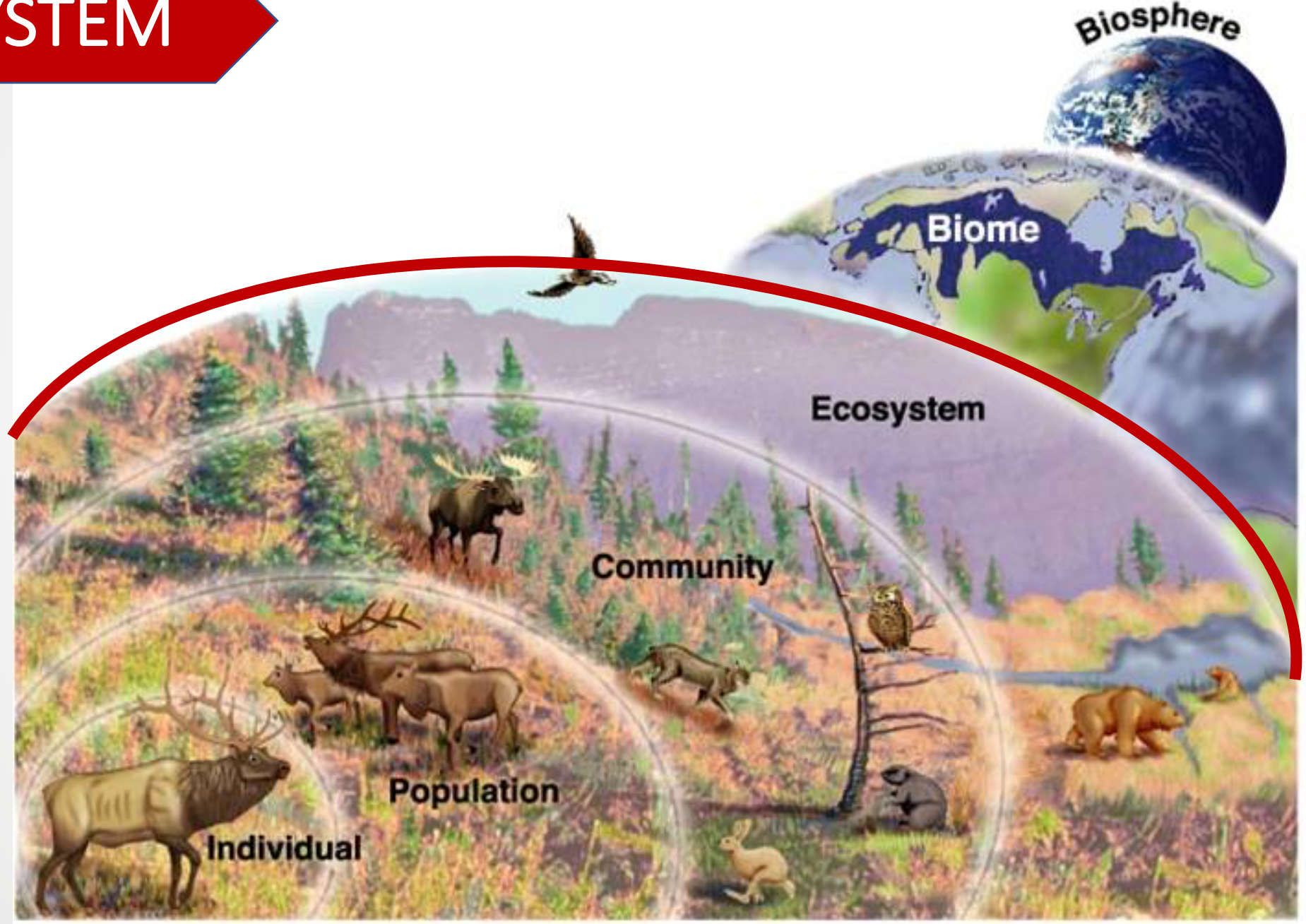
ABIOTIC: non-living, environmental factors

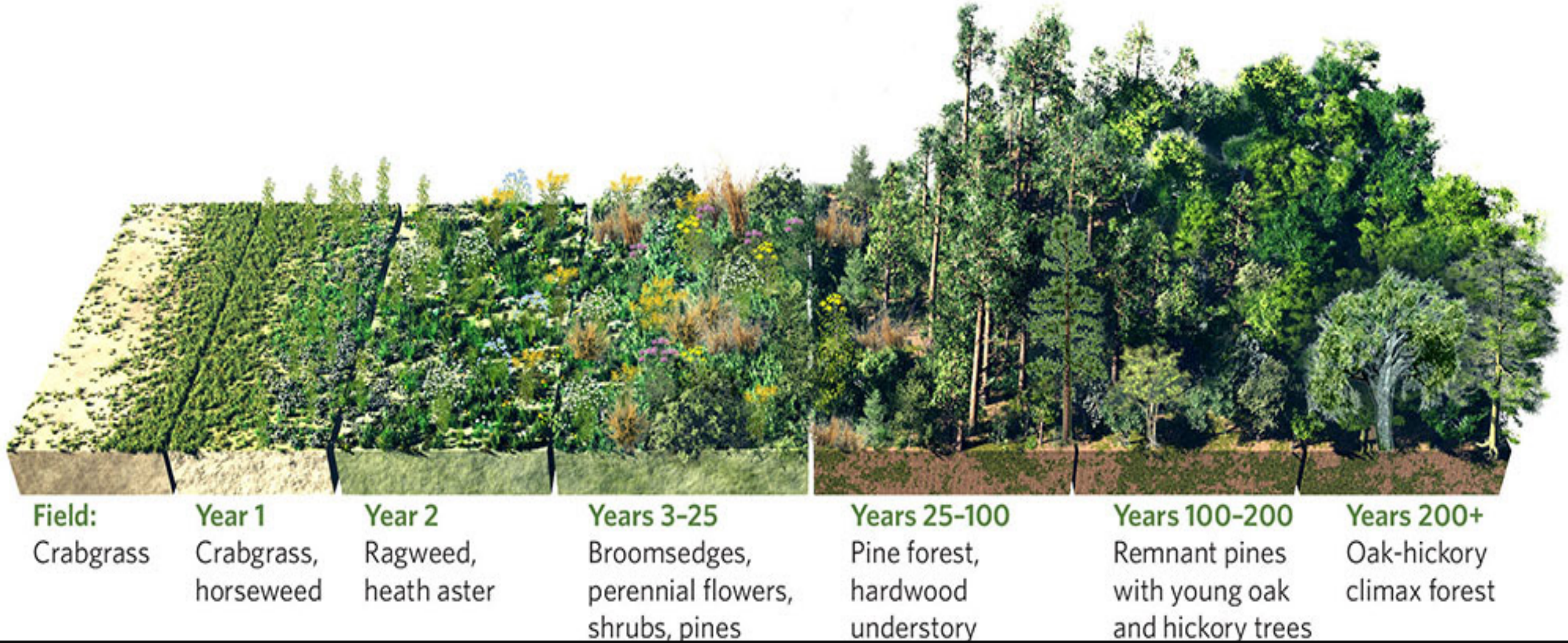
- Precipitation
- Wind
- Soil
- Water availability
- Temperature
- Sunlight
- Humidity

BIOTIC: living organisms and their interactions

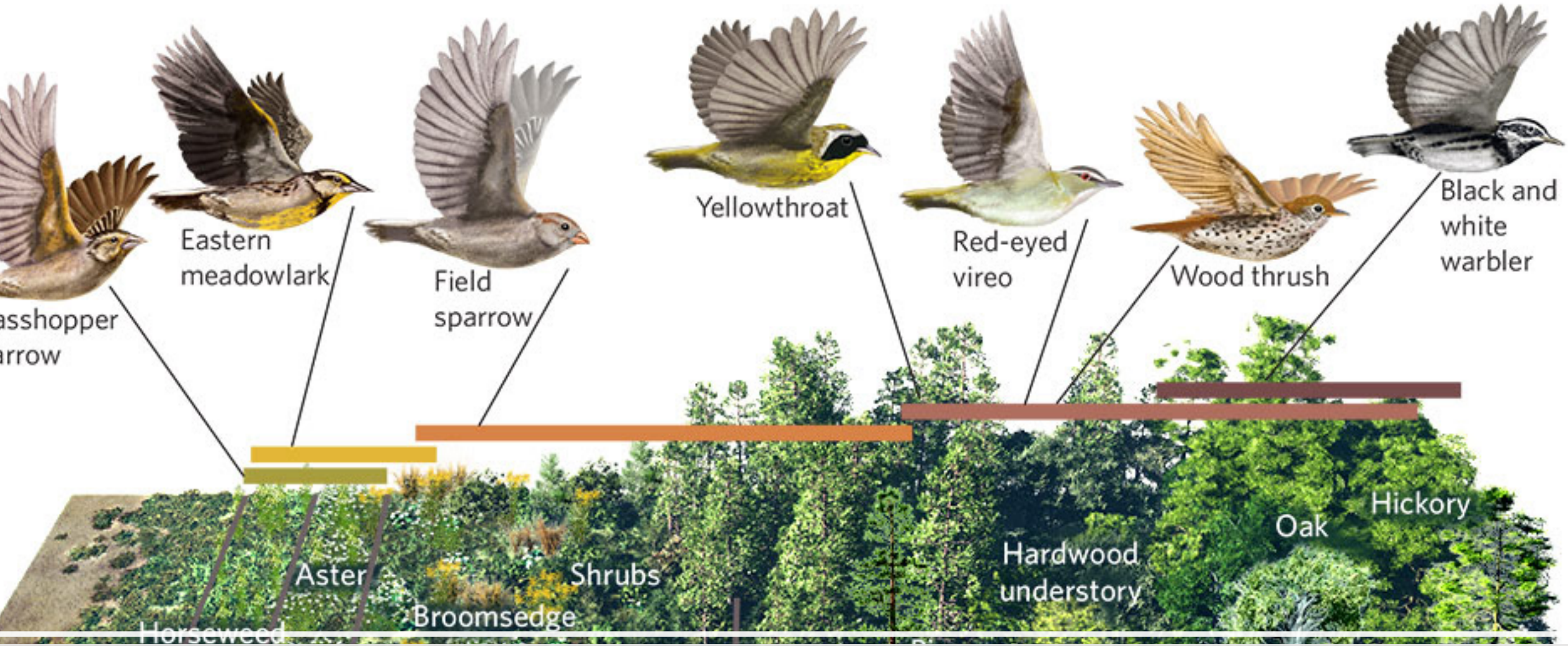
https://lakesuperiorbiology.weebly.com/biotic-factors.html

ECOSYSTEM


Biosphere
Biome
Ecosystem
Community
Population
Individual



ECOLOGICAL SUCCESSION



ECOLOGICAL SUCCESSION

RECRUITMENT:

when new individuals find a population or are added to an existing population

Seedling Recruitment:

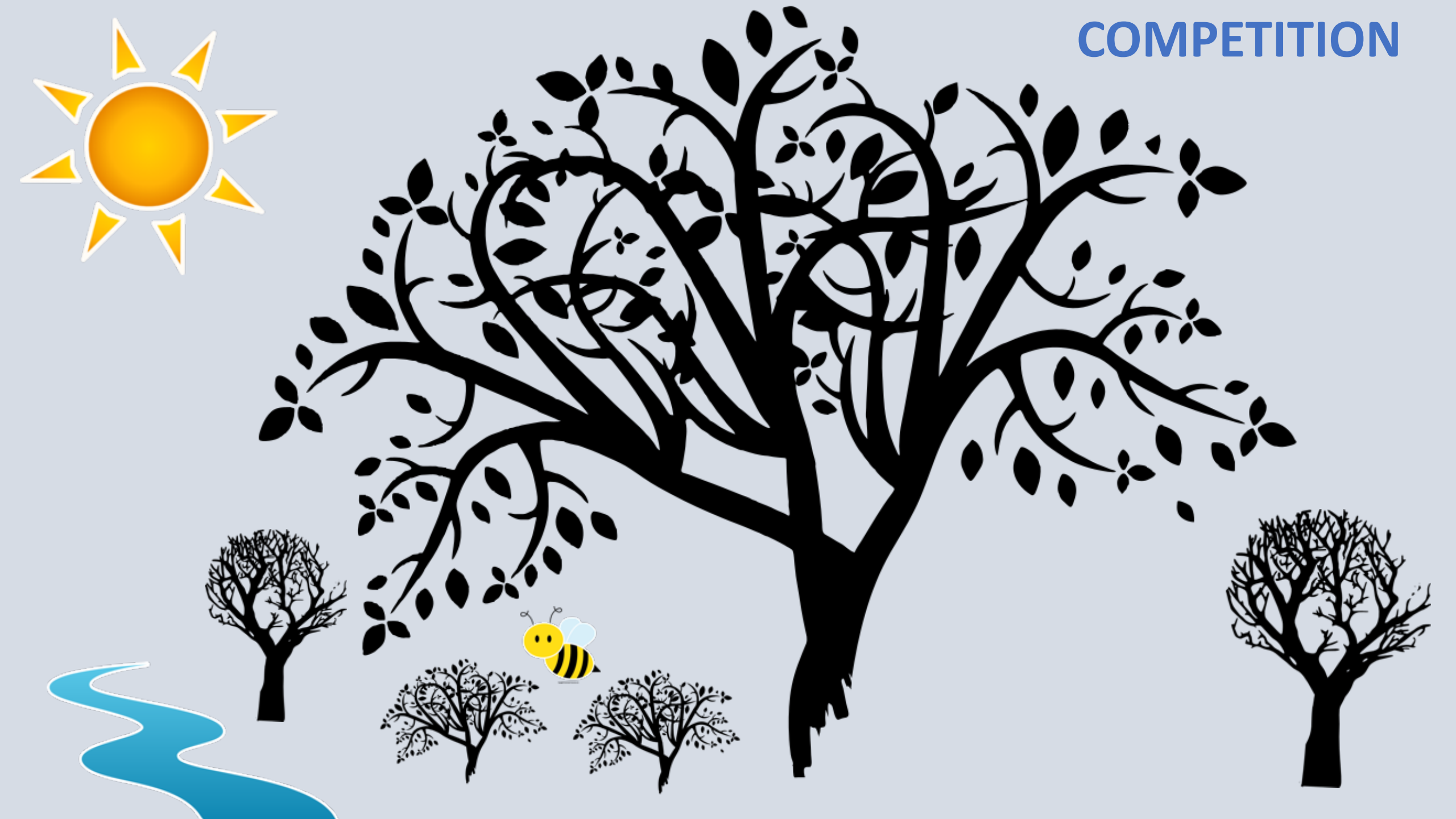
3 Stages

1. Germination
2. Survivorship
3. Growth

Ecological Relationships

- Competition
- Parasitism
- Predation & Herbivory
- Mutualism
- Commensalism

COMPETITION



PARASITISM

Tar Spot

Photo: Whitney Cranshaw

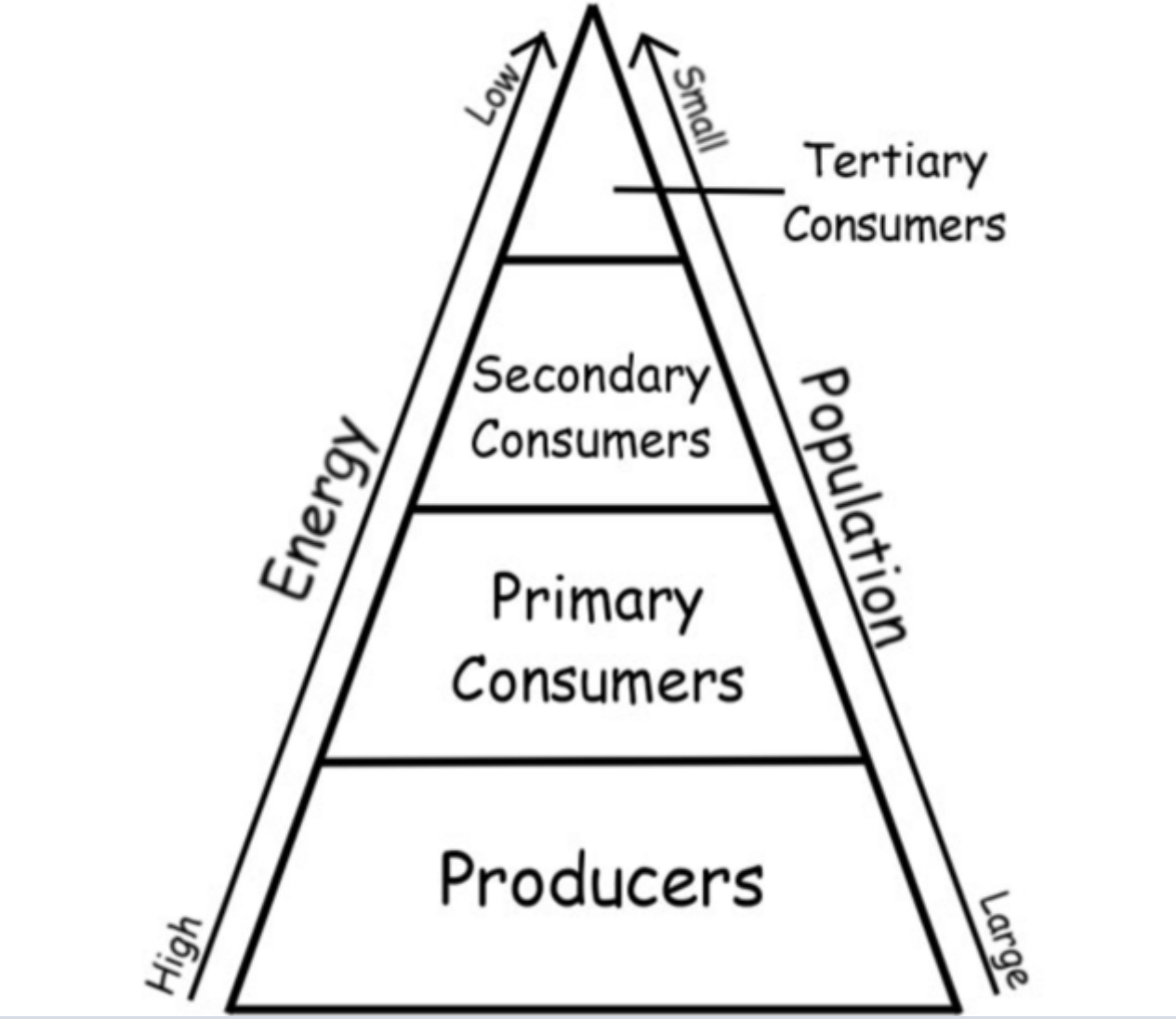
Witches' Broom
on *Celtis occidentalis*

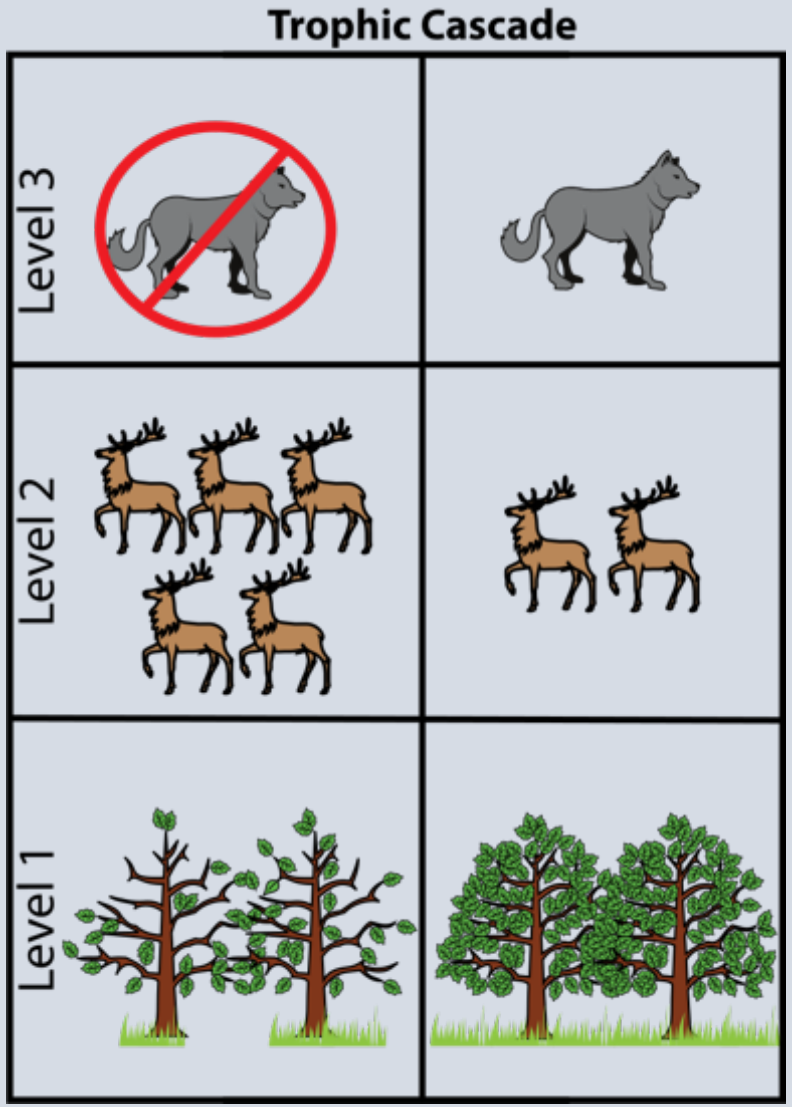
Beech Drops

Photo: Nancy Rose

Witches' Broom on
Lonicera

PREDATION: Trophic Cascades





http://cleangreenenergyzone.com/significant-levels-of-energy-pyramid-ecosystem/

Adaptations to Predation

HERBIVORY

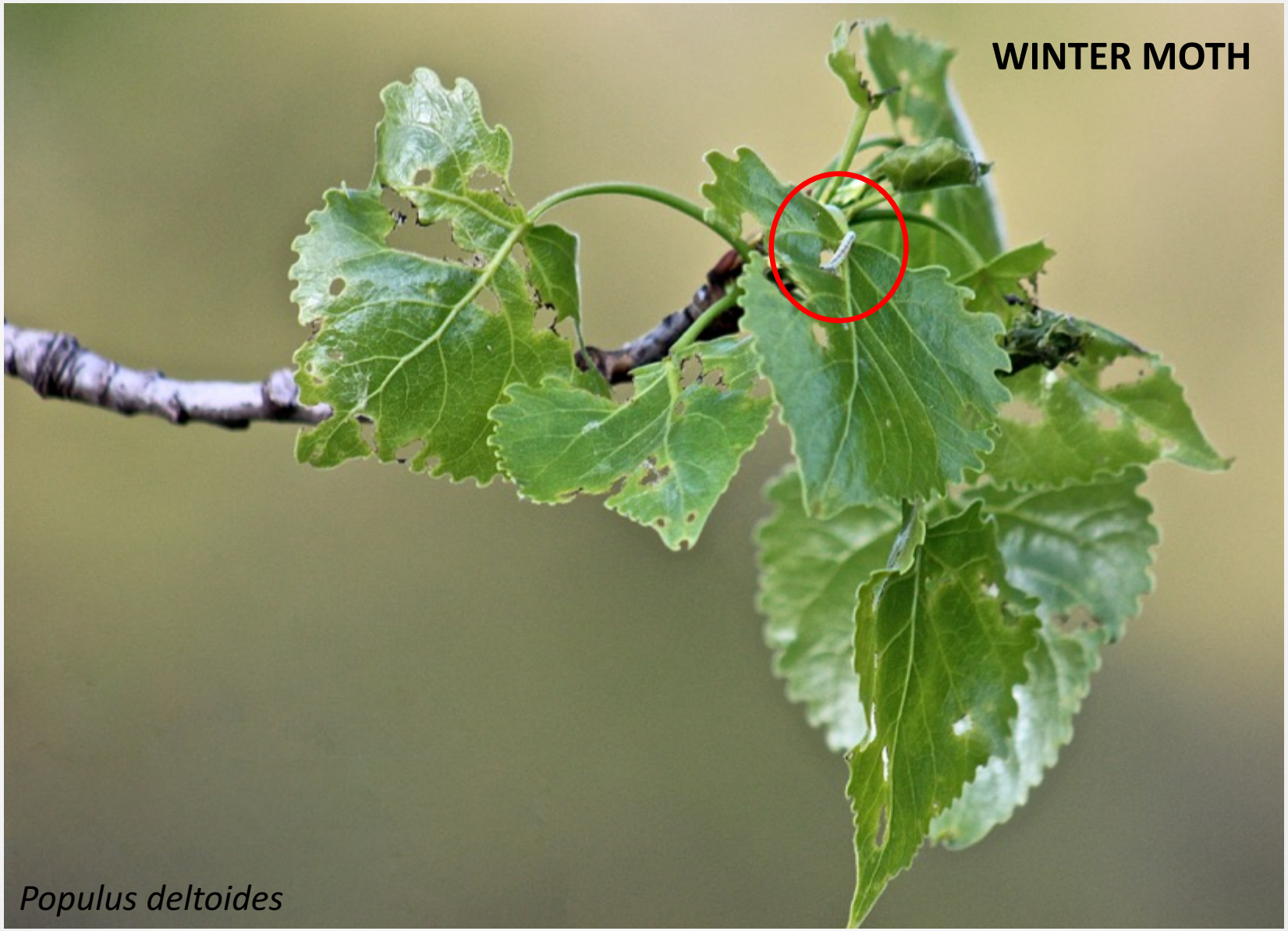


Photo: Suz Mrozak

HERBIVORY

BROWSERS: moose, deer

GRAZERS: bison, cows, sheep

MUTUALISM

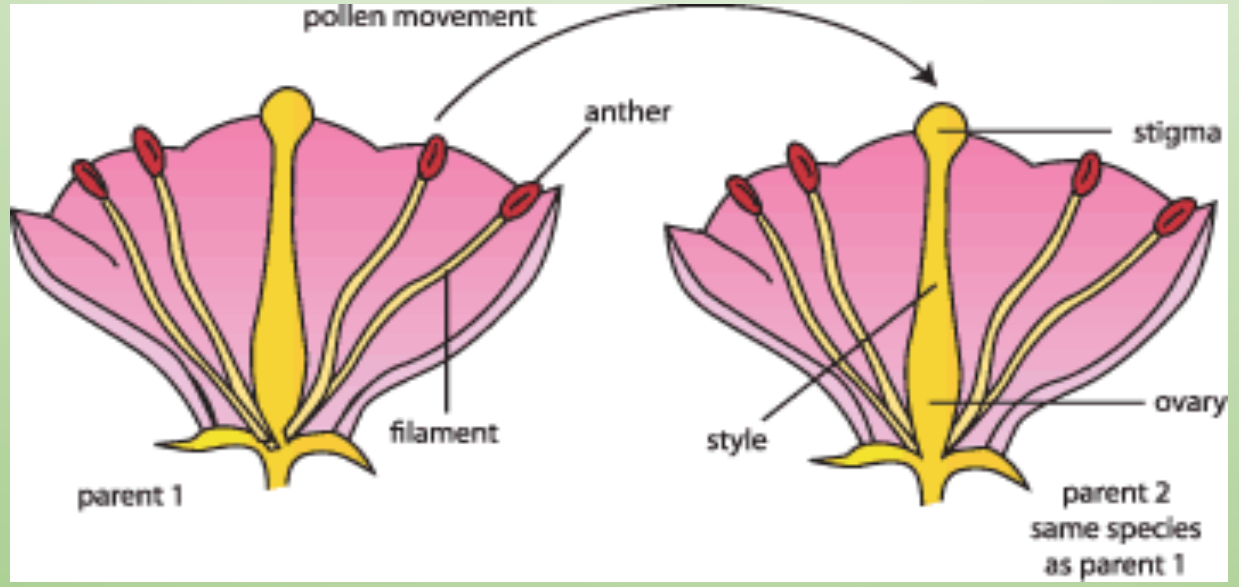
POLLINATION

MYCORRHIZAL NETWORKS

POLLINATION

What is Pollination

Transfer of pollen from stamen to a stigma, ovule, flower, or plant to allow fertilization



Movement of Pollen

Pollen Grains Immobile

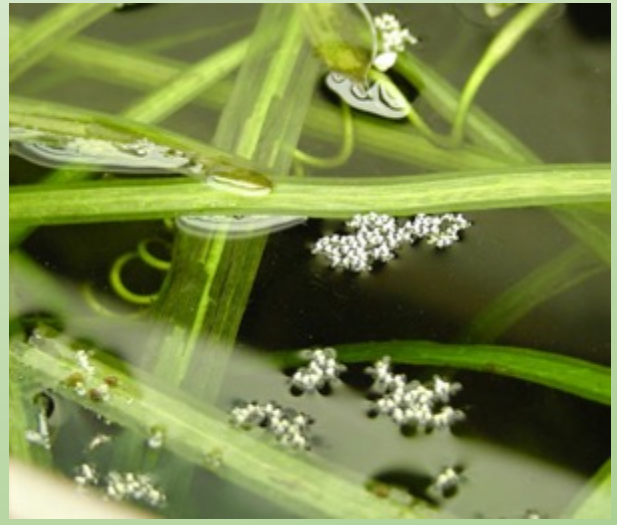
Need external agent to reach stigma

Biotic

- **ANIMAL**

Abiotic

- **WIND**
- **WATER**



BIOTIC

- Pollen transferred from plant to plant by way of an animal
- Most flowering plants
- Usually occurs in the form of mutualism

BIOTIC

ABIOTIC

- No need to attract pollinators
- Plant produces a lot of pollen
- More common in colder climates

ABIOTIC

Pollinator Decline

- Anthropogenic Pressure
- Massive consequences for Humans

What can we do?

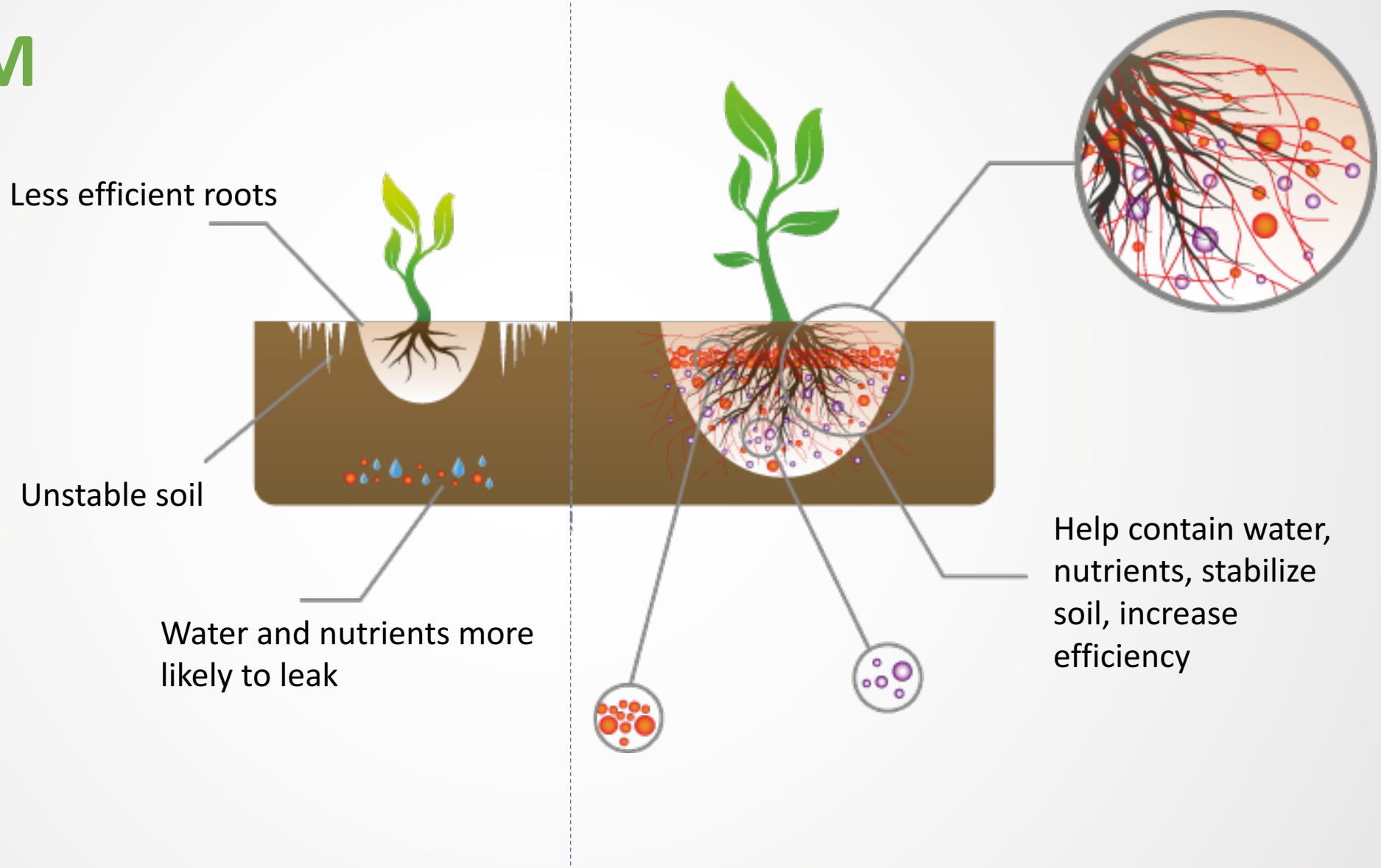
- Wide Variety of plants – mixture of colors and shapes
- Connectivity and green space
- Use pollinator friendly presticides – e.g. Neem oil
- Spread the word!

Bee Hotel

MUTUALISM

Without Mycorrhizae

With Mycorrhizae

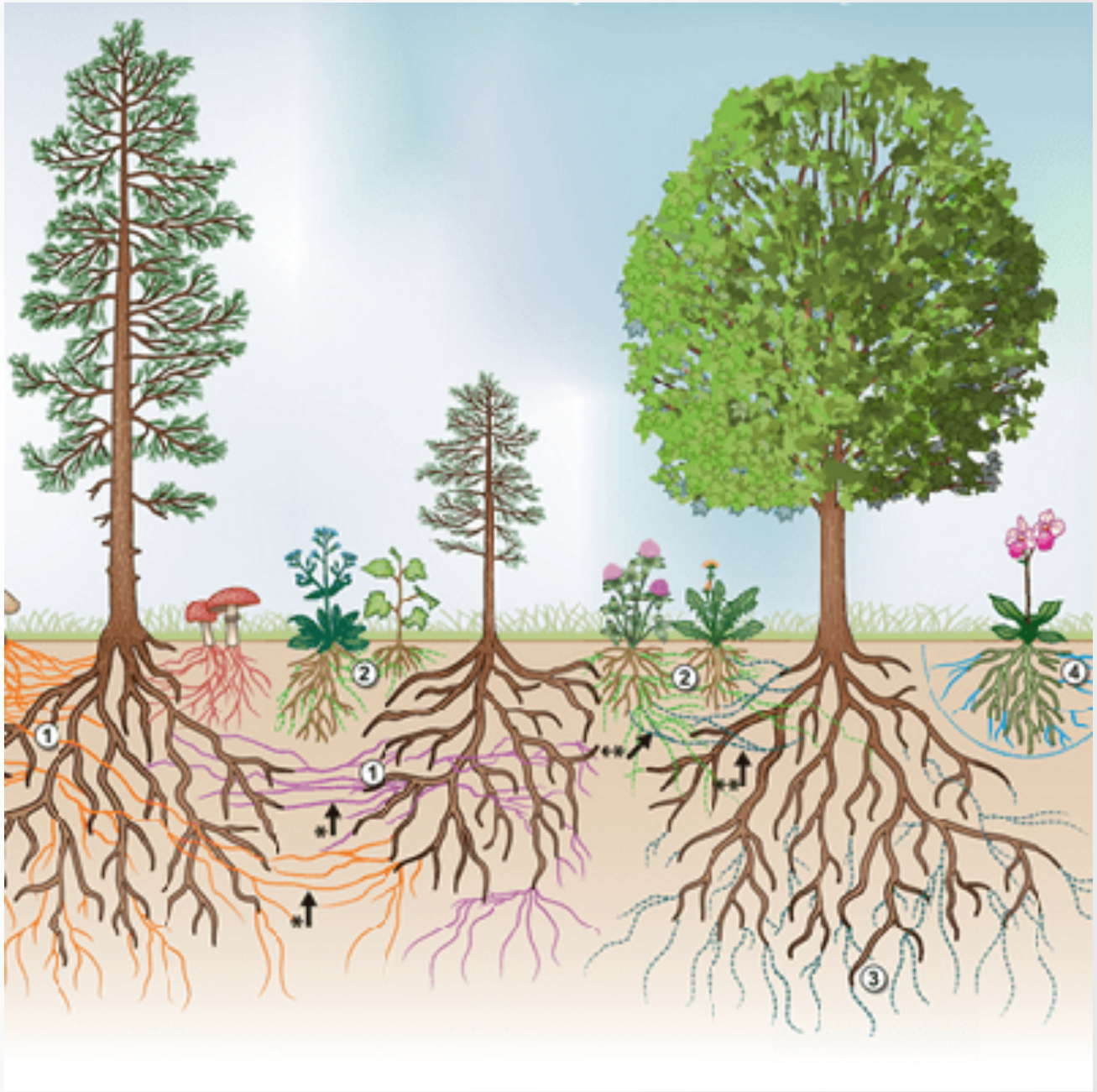


Mykos = fungus
Rhiza = root

MYCORRHIZAE

Communication Network:

- Herbivory
- Masting Events
- Disease



http://www.gardenopoliscleveland.org/

COMMENSALISM

Lichen Benefit, Trees Indifferent (usually)

Interdisciplinary Field

- Physiologists
- Botanists
- Microbiologists
- Zoologists
- Behavioralists