

Ecology Basics

Ecological Pyramids

Basic Food Web Structure

- Trophic Level
 - Feeding level
- 3 major levels
 - Producers (plants)
 - Consumers
 - Herbivores (plant-eaters)
 - Carnivores (meat-eaters)
 - Decomposers

History of the models

- Charles Elton, 1920s
- Studied eating behaviors of organisms
- Came up with models to use to view ecosystems

Ecological Pyramids

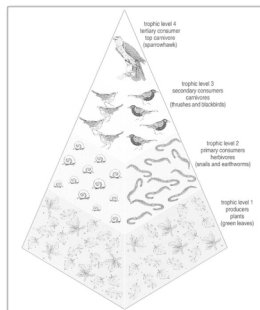
- ▲ Pyramids suggest a decrease (or increase) as you travel up trophic levels
- ▲ The pyramid of numbers
- ▲ The pyramid of biomass
- ▲ The pyramid of energy
- ▼ Meyer's inverse pyramid of range

Pyramid of Numbers

- Elton observed a correlation between size of organism and its numbers
 - The smaller the more there were
- He also observed the higher up the food chain they feed, the larger they were

Pyramid of Numbers

- Put the two together to form the concept of pyramid of numbers
 - The lower the trophic level, the more individuals there are
 - This is also true for the number of species



Pyramid of Numbers

- Pyramid of numbers isn't strong for management purposes
 - 1 deer does not equal 1 rabbit
- Can't easily come up with a number of predators that you can have based on the number of prey

Pyramid of Biomass

- Biomass is mass of tissue with the water removed
- An easy way to measure organic material
- Better for use in management as different types of biomass are closer to each other in energy

Pyramid of Energy

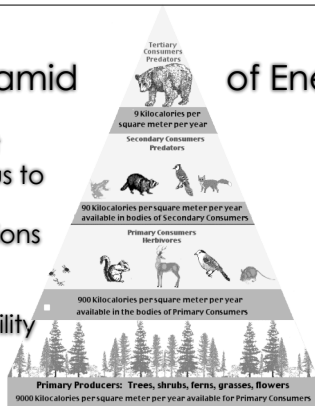
- Result of work done by Ray Lindeman at Cedar Lake in East Bethal
- He measured the caloric movement within the ecosystem
- Is credited with moving Ecology into a hard science

Pyramid of Energy

- Most energy is lost after the body uses it to run metabolism
- It is lost as heat
- Lost at a predictable rate
 - 90% is lost at each trophic level
 - Only about 10% is available to the next level

Pyramid of Energy

- 90% lost allows us to make predictions about energy availability



Inverse pyramid of range

- The larger an organism or the higher it feeds on the food chain, the larger its range.
