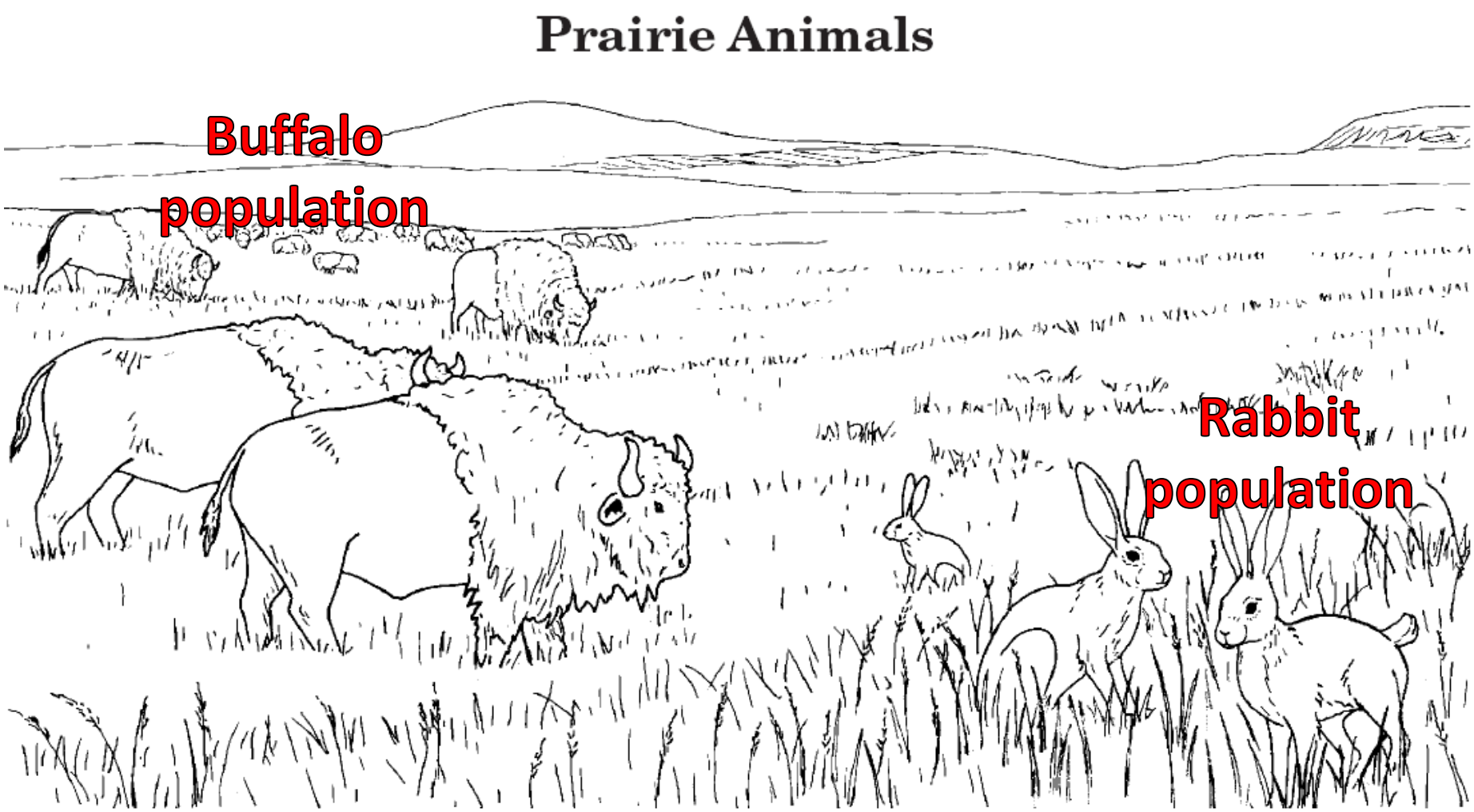
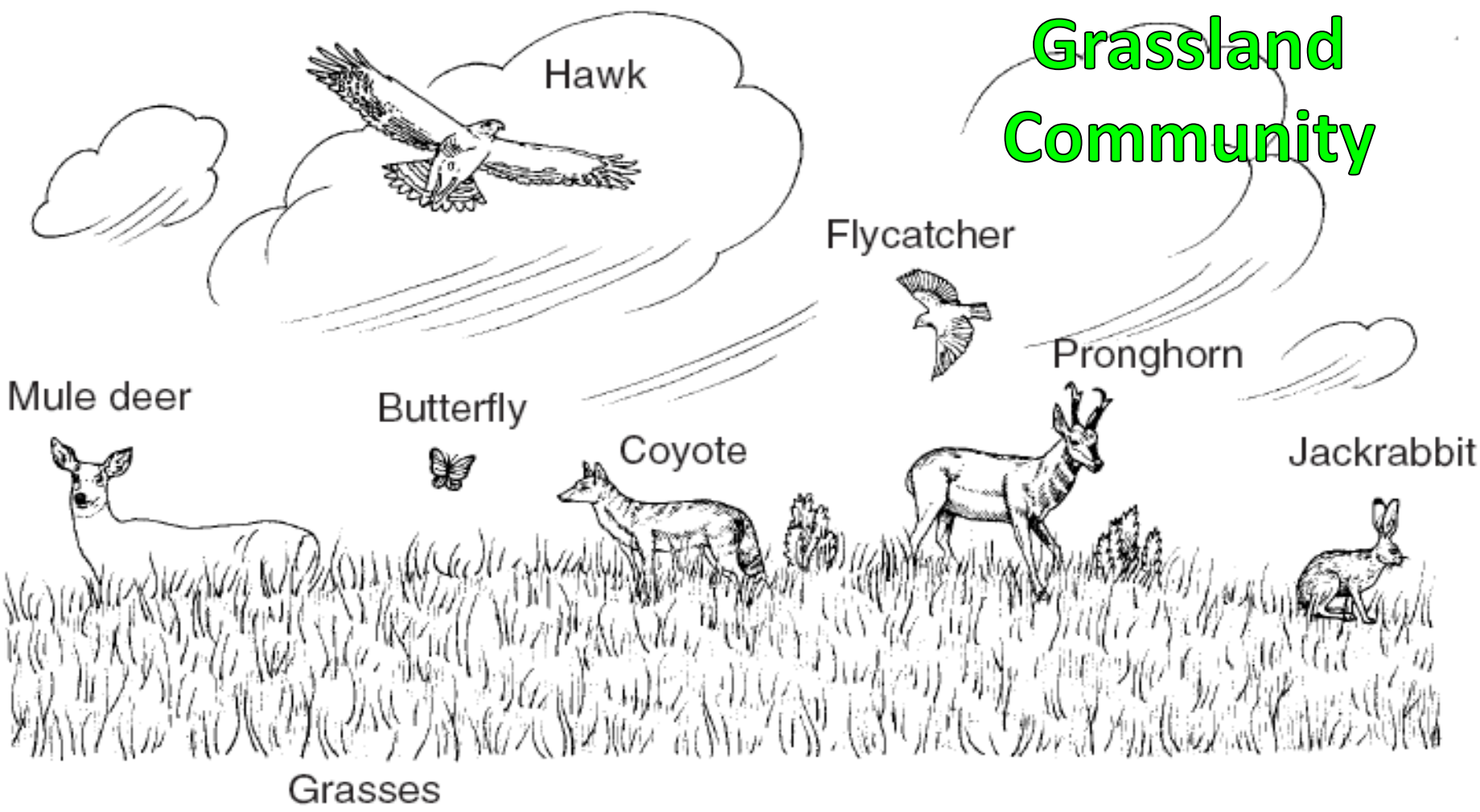
Photo by Brocken Inaglory
(c) 2003 Anup
Manoj Shah
Competition

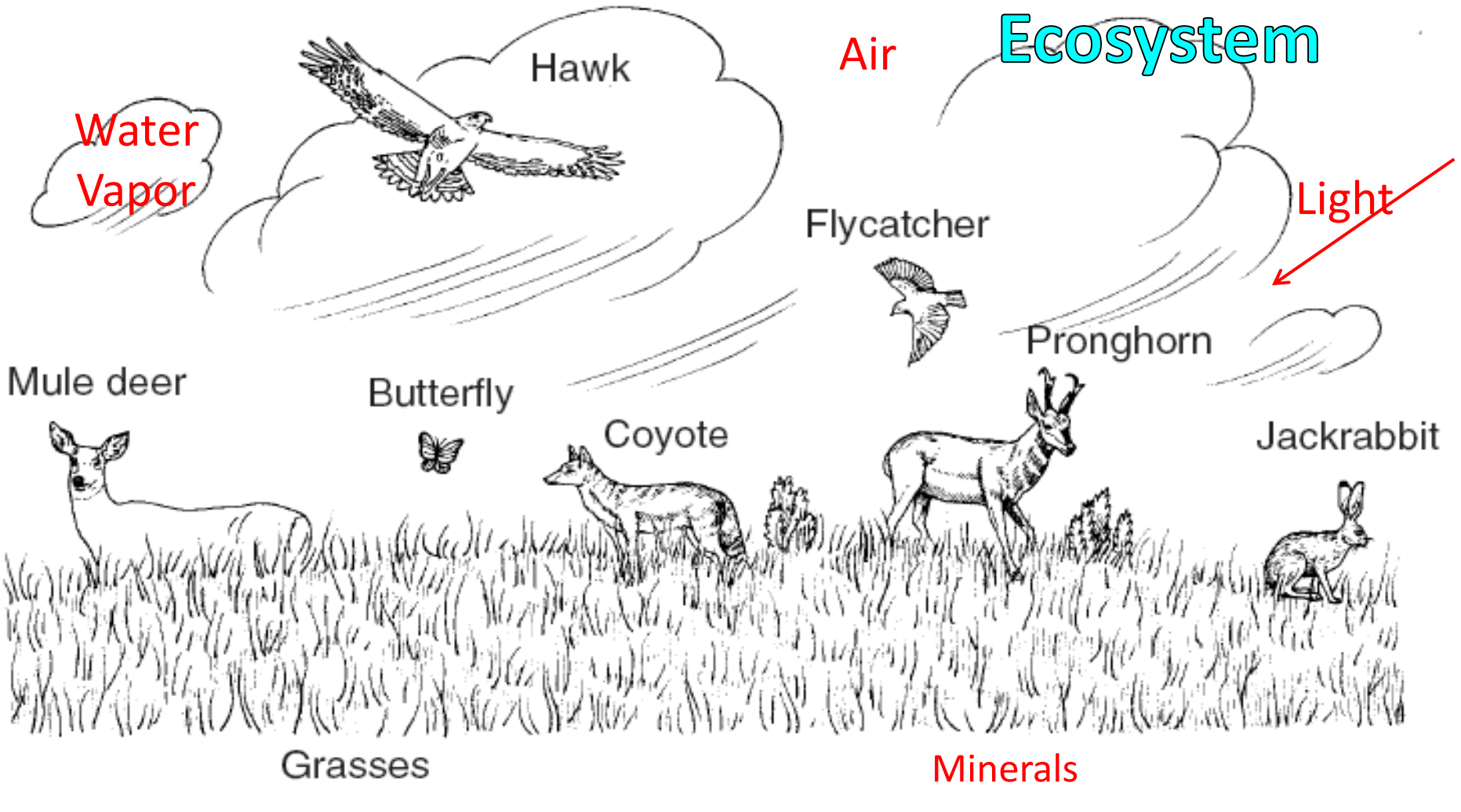
All of the members of a single species that live in an area make up a **population**.



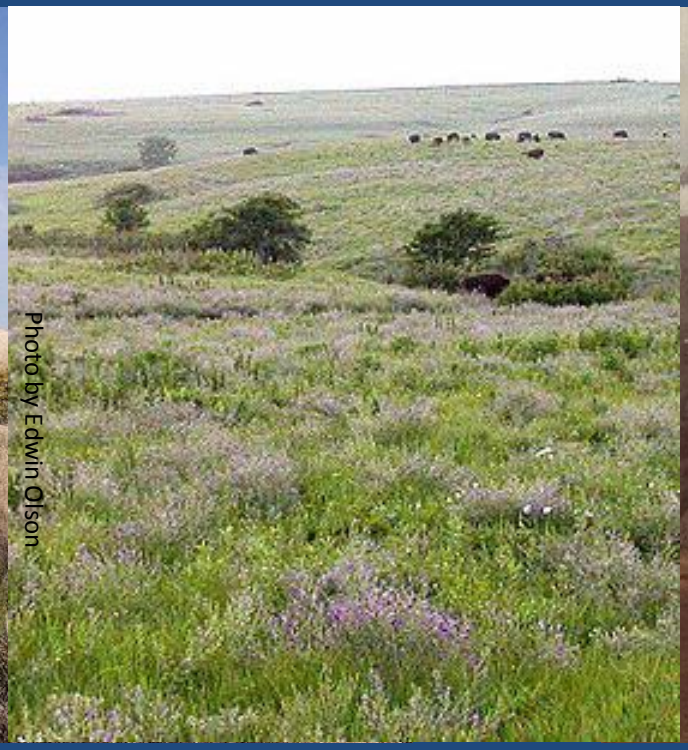
The populations of *living* things interacting in an area are called a community.



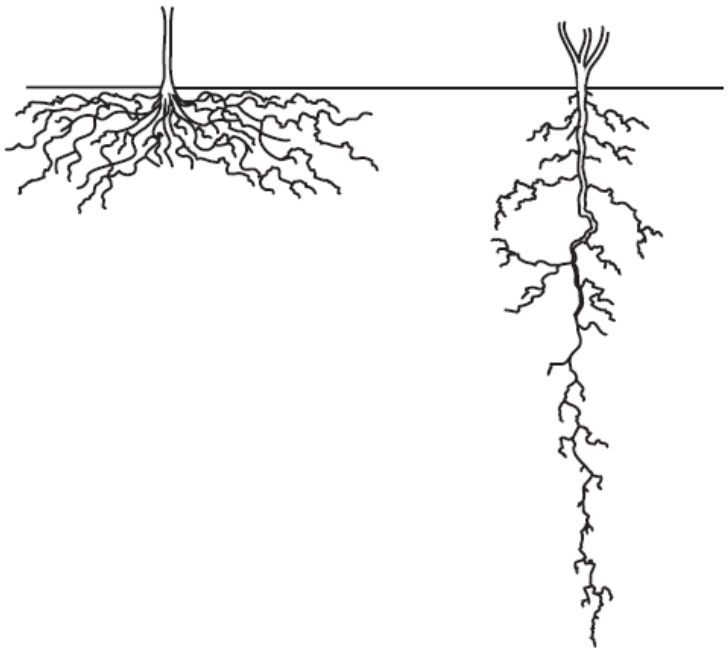
All of the living things and the *abiotic* factors in an area make up the ecosystem.



In any ecosystem there are a **finite** number of resources. This means that there is a ***limited amount*** of nutrients, water, habitats and energy.



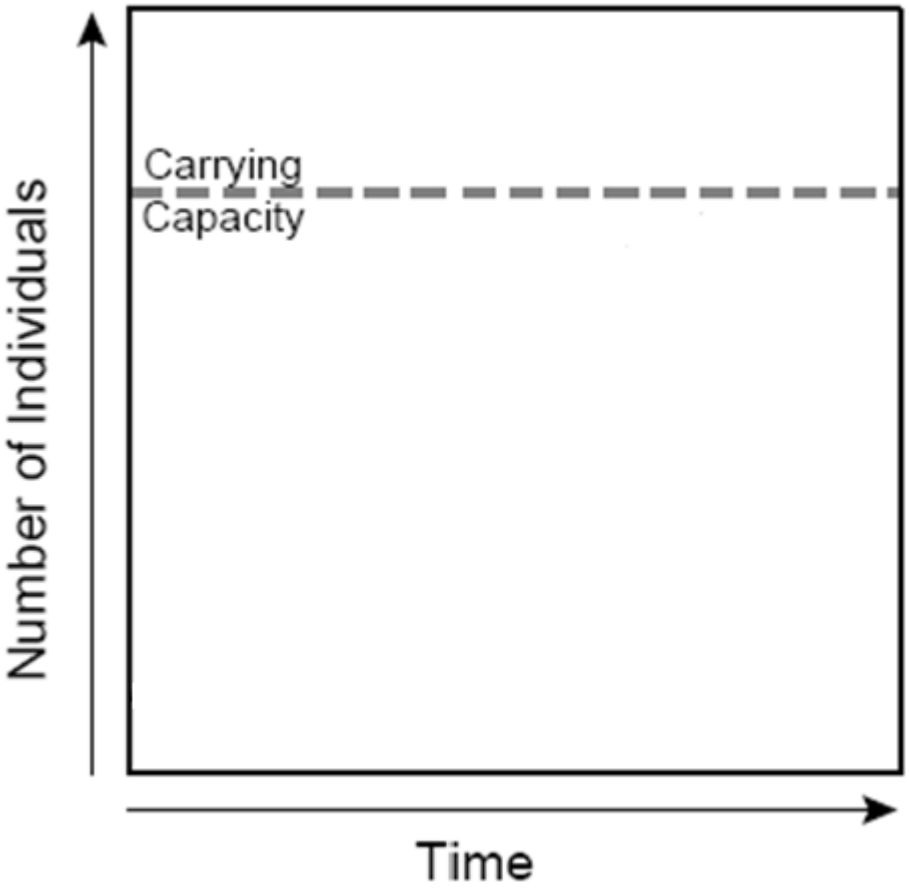
Because there is a limited amount of these resources, organisms must **compete** for them. Competition occurs when organisms *share a limited resource*.



Animals and plants in the desert compete over water that is scarce.

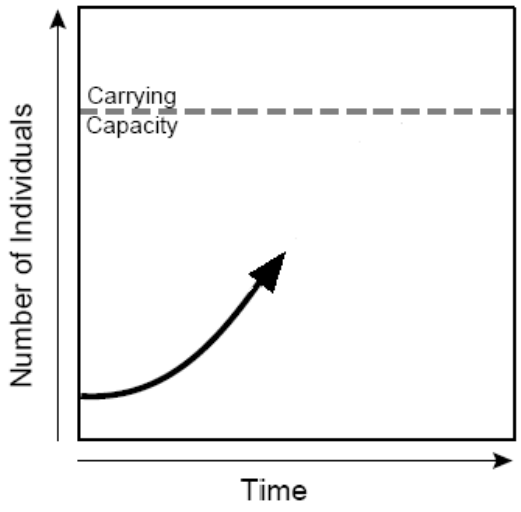
Carrying Capacity

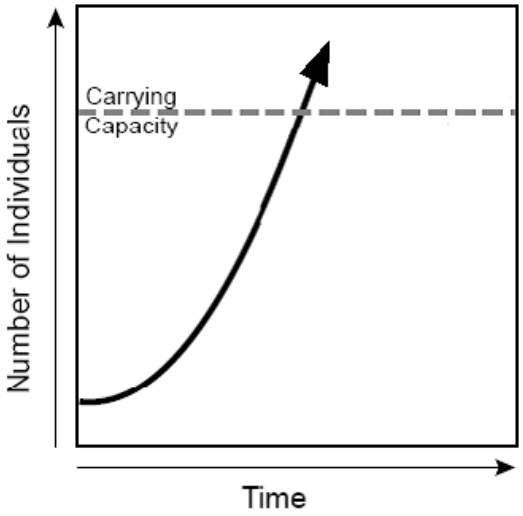
Because organisms compete for these limited resources, not every member of a species will survive. The maximum size of a population due to limited resources is known as the **carrying capacity**.

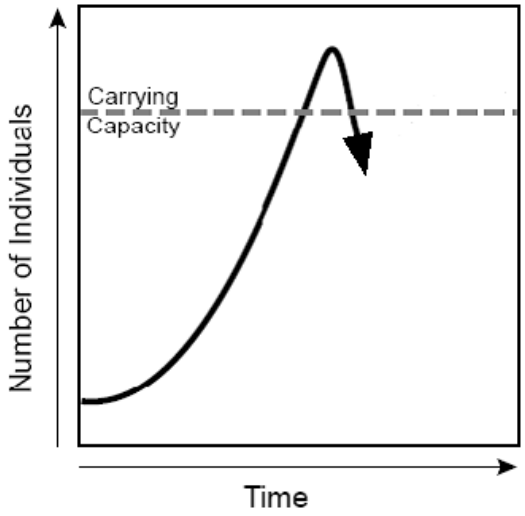


Carrying Capacity

The size of a population will grow until it reaches the carrying capacity and there are not enough resources for every organism. When this happens, the population will shrink as organisms die.



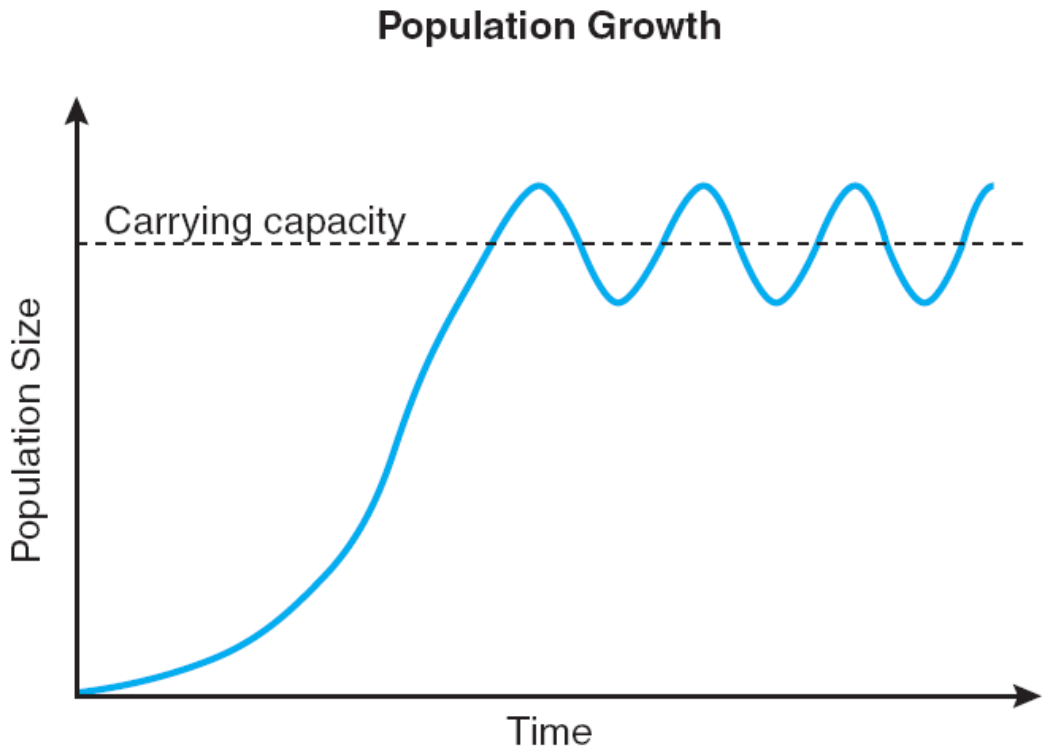




Carrying Capacity

In healthy populations, the number of organisms will stay fairly constant right around the carrying capacity.

The carrying capacity is dependent on the amount of water, habitats, nutrients and energy available in an ecosystem.



Competition

When organisms of the same species compete for *limited resources*, it is called ***intraspecific competition***.

Intra- means within

Competition

Intraspecific competition can involve *defending a territory* or *acquiring mates*.

Competition

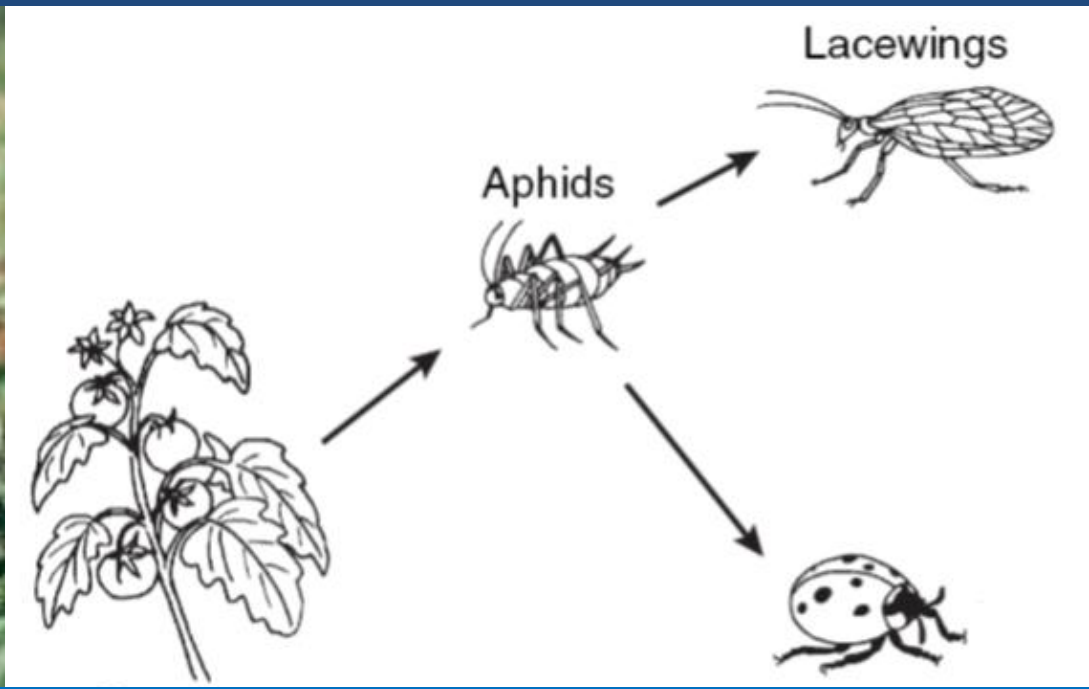
Plants spread their seeds to prevent competition within a population for water, sunlight and nutrients.

Seeds carried by wind.

Seeds carried by animals.

Competition

Interspecific competition is between organisms of two *different* species that have overlapping **niches**.



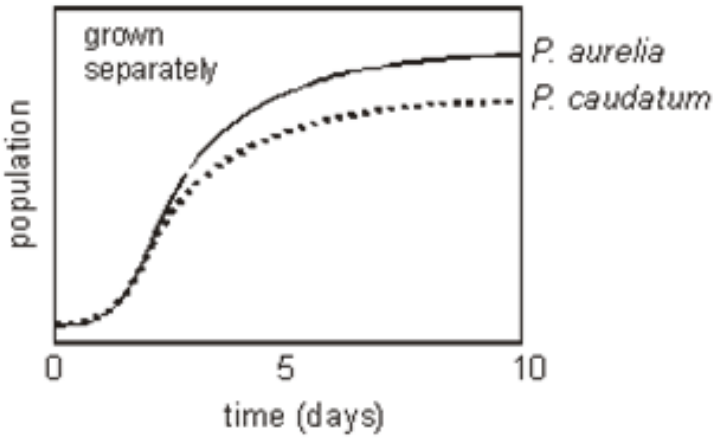
Inter- means between

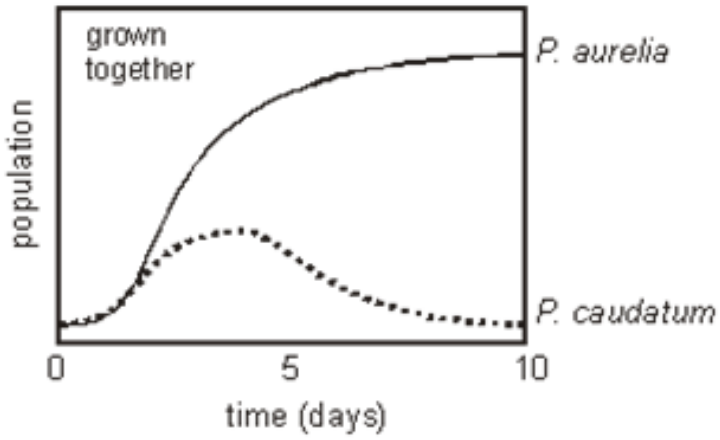
Competition

An ecological **niche** is a description of a population's use of resources and response to the environment.

Rabbit are herbivores that eat plants. They live in burrows they dig in the ground. They are preyed on by several carnivores, and they reproduces quickly which reduces competition among predators.

Competition





When organisms compete for a niche, one will out-compete the other and the losing population will <u>rapidly decline and could die out</u>.

Anole Lizard

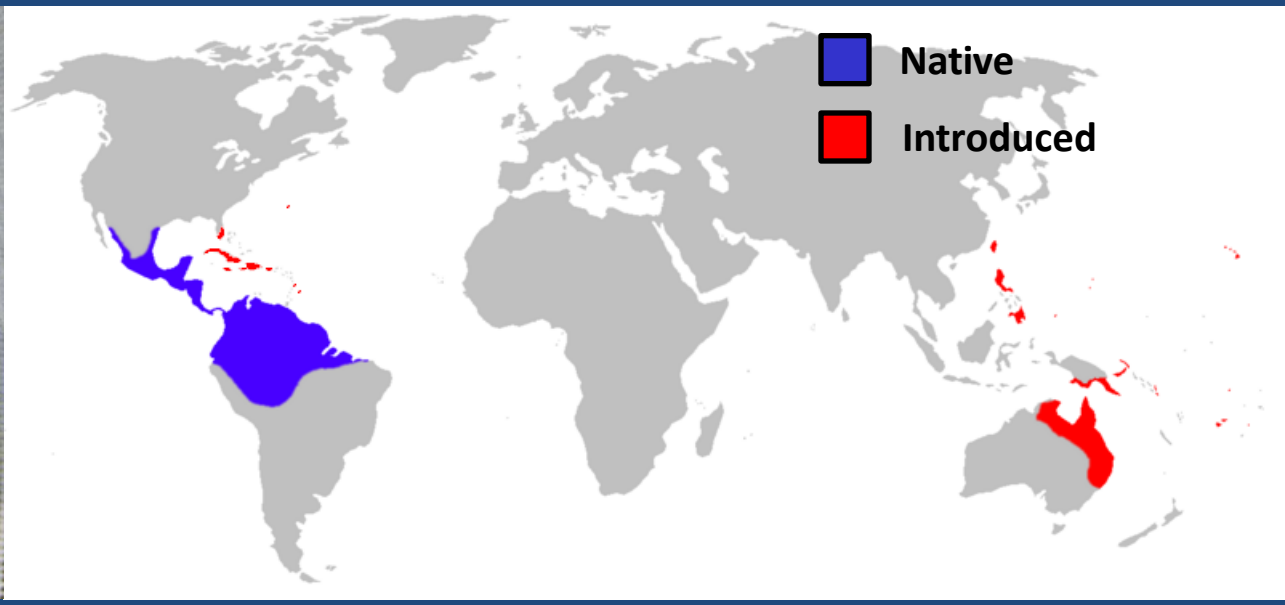
Competition

Populations can **avoid competition** by filling *different niches*. This allows both populations to thrive.

Different species of anole lizards live in different areas (tops of trees, tree trunks, bushes) to avoid competition with each other.

Competition

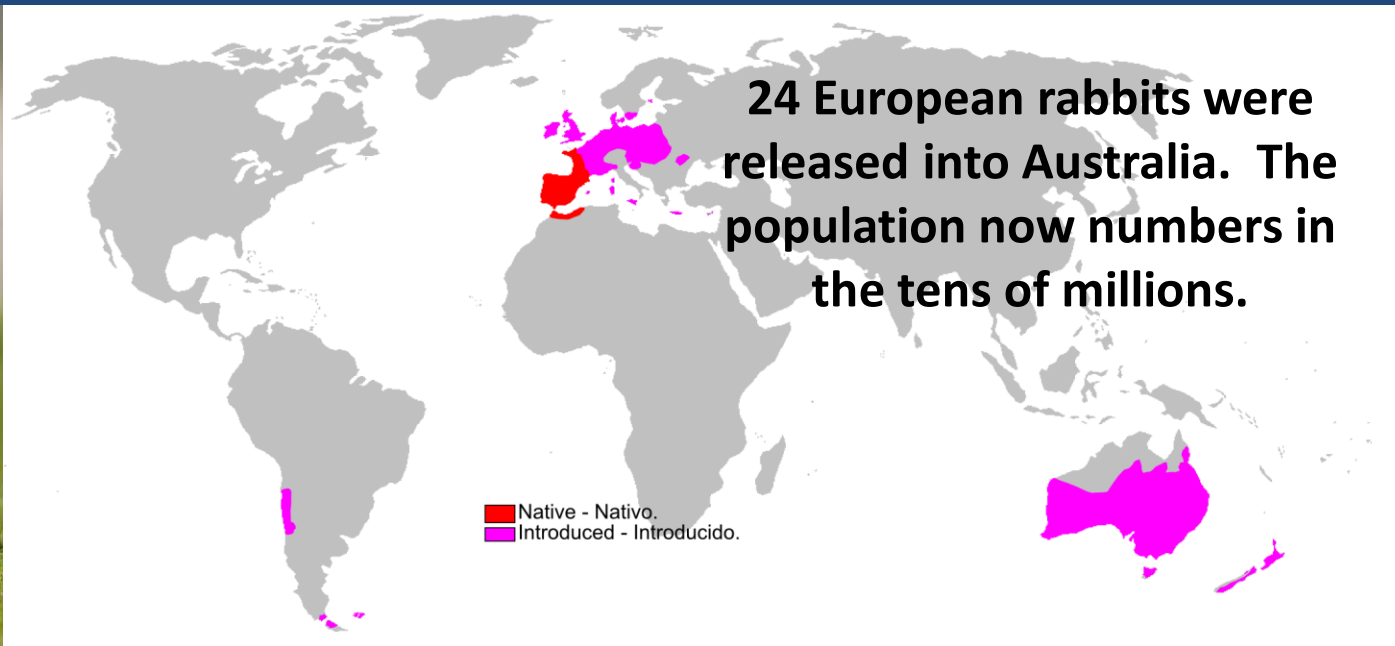
Ecosystems are disrupted when non-native species are introduced by humans.



The Cane Toad is poisonous, and many predator populations have declined because they die when they eat the non-native toads.

Competition

These species will <u>compete</u> with native populations to fill a niche, but they often <u>have *no natural predators*</u> to keep their populations from growing out of control.



24 European rabbits were released into Australia. The population now numbers in the tens of millions.

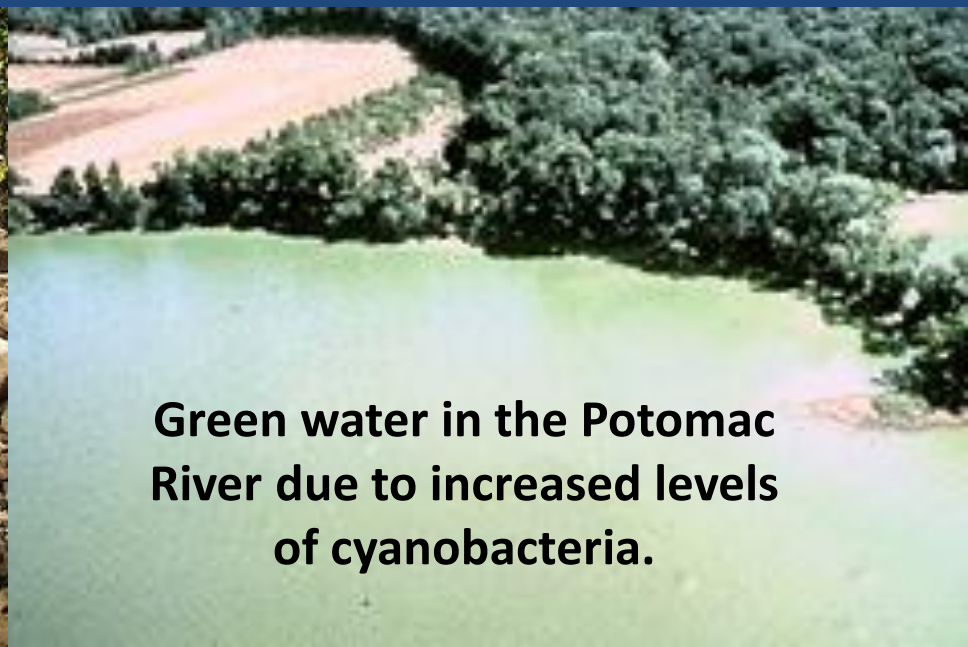
Competition

Deforestation also *increases competition* in ecosystems by reducing the number of habitats and producers that are available.

Competition

Runoff from farmlands adds nitrogen to water and helps *microorganisms* out-compete plants and animals for other vital resources like light and oxygen causing a reduction in diversity.

Photo by Sasha Trubetskoy



Green water in the Potomac River due to increased levels of cyanobacteria.