

A Day in the Life of a New Mexico Food Web



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Goal

- Students will understand what a food web is and how various species fit into this important biological concept, and as some populations increase or decrease, how this can impact other species within the web.

Objectives

- Students understand the importance of food webs.
- Students will be able to define key vocabulary words such as herbivore, omnivore and carnivore.
- Students will be able to define autotroph and heterotroph.
- Students will know how drastic species population changes can impact the food web.
- Students will know that toxins accumulated within the food web can possibly affect many species over time.

Definitions

- **Autotroph** – organism capable of synthesizing its own food from inorganic material (e.g. plants photosynthesize their own food).
- **Bioaccumulation** – gradual accumulation of a substance, such as pesticides or other chemicals, in an organism.
- **Carnivore** – organism that eats mainly meat from other animals.
- **Decomposers** – organism that break down dead or decaying organisms or waste.
- **Detritivore** – organism that feeds on waste products or dead organic material (mostly animals).

Definitions

- **Food Chain** – is a linear network of links in a food web.
- **Food Web** – model depicting the many food chains linked together to show relationship of organisms in the ecosystem.
- **Herbivore** – organism that eats only plants.
- **Heterotroph** – organism that cannot produce its own food.
- **Omnivore** – organism that eats plants and animals.
- **Primary Consumer** – organism that feeds on primary producers. Organisms here are herbivores.

Definitions

- **Producers** – organisms that make their own food.
- **Saprovore** – organisms that feed on dead organic matter (mostly fungi).
- **Secondary Consumer** – organism that feeds on primary consumers. Organisms here can be omnivores or carnivores.
- **Tertiary Consumer** – organism that feeds on primary or secondary consumers. Organisms here are usually carnivores, but can be omnivores.
- **Trophic level** – position an organism occupies in a food web.

Food Webs

- Food webs are found all around us in the world. It is very important to understand this key biological concept.
- Food webs show us how all species interact and how energy is transferred between trophic levels.
- Food chains are part of food webs; both are visual representatives of how organisms acquire their energy.

Food Webs

- The sun gives plants energy.
- Photosynthesis produces food for plants. Plants are autotrophs.
- And as you move up a food web or chain, organisms consume other organisms to obtain their energy. These organisms are called heterotrophs.



Photo credits: Andrew Teaschner

Food Webs

- Deer browse on leaves, turkeys eat acorns and insects, black bears eat berries and elk, cougars eat deer and bighorn sheep. These are examples of organisms consuming other organisms.
- Deer are herbivores, turkeys and bears are omnivores and cougars are carnivores.



Food Webs

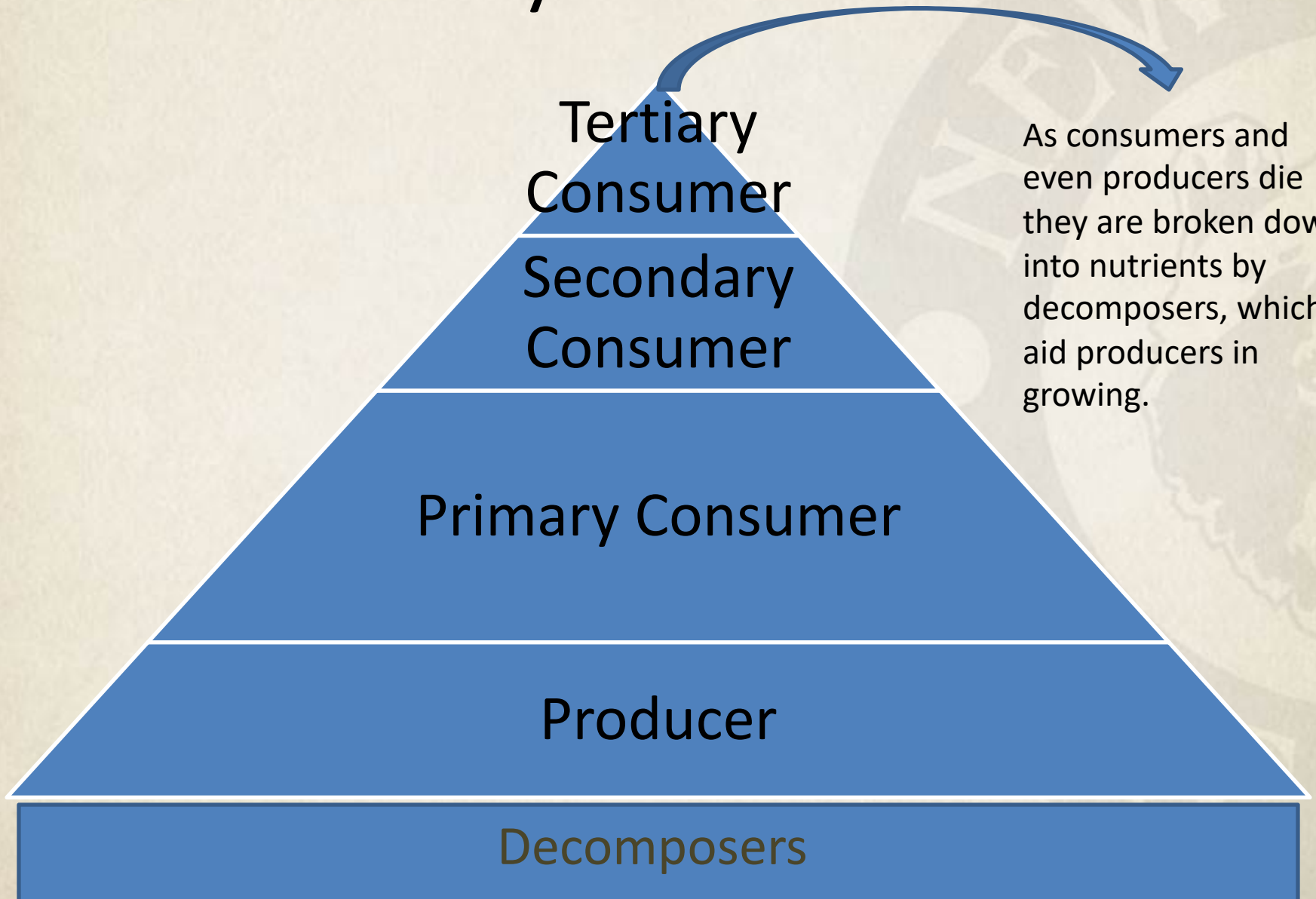
- Decomposers are important as they break down dead material that plants use as food to obtain their nutrients.
- *Can you name some decomposers in nature?*



Hierarchy of a Food Web

- Examples of producers are trees, brush, flowers and grass.
- Examples of primary consumers would be elk, deer, grasshoppers and chipmunks.
- Examples of secondary consumers would be wild turkeys, lizards, foxes and coyotes.
- Examples of tertiary consumers would be cougars, black bears and bald eagles.
- Examples of decomposers would be maggots, earth worms and fungus.

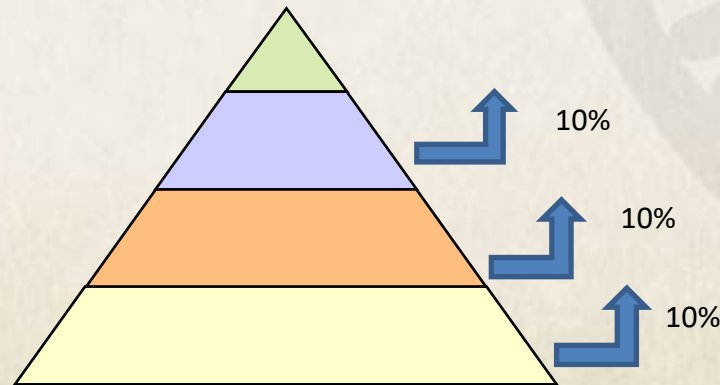
Hierarchy of a Food Web



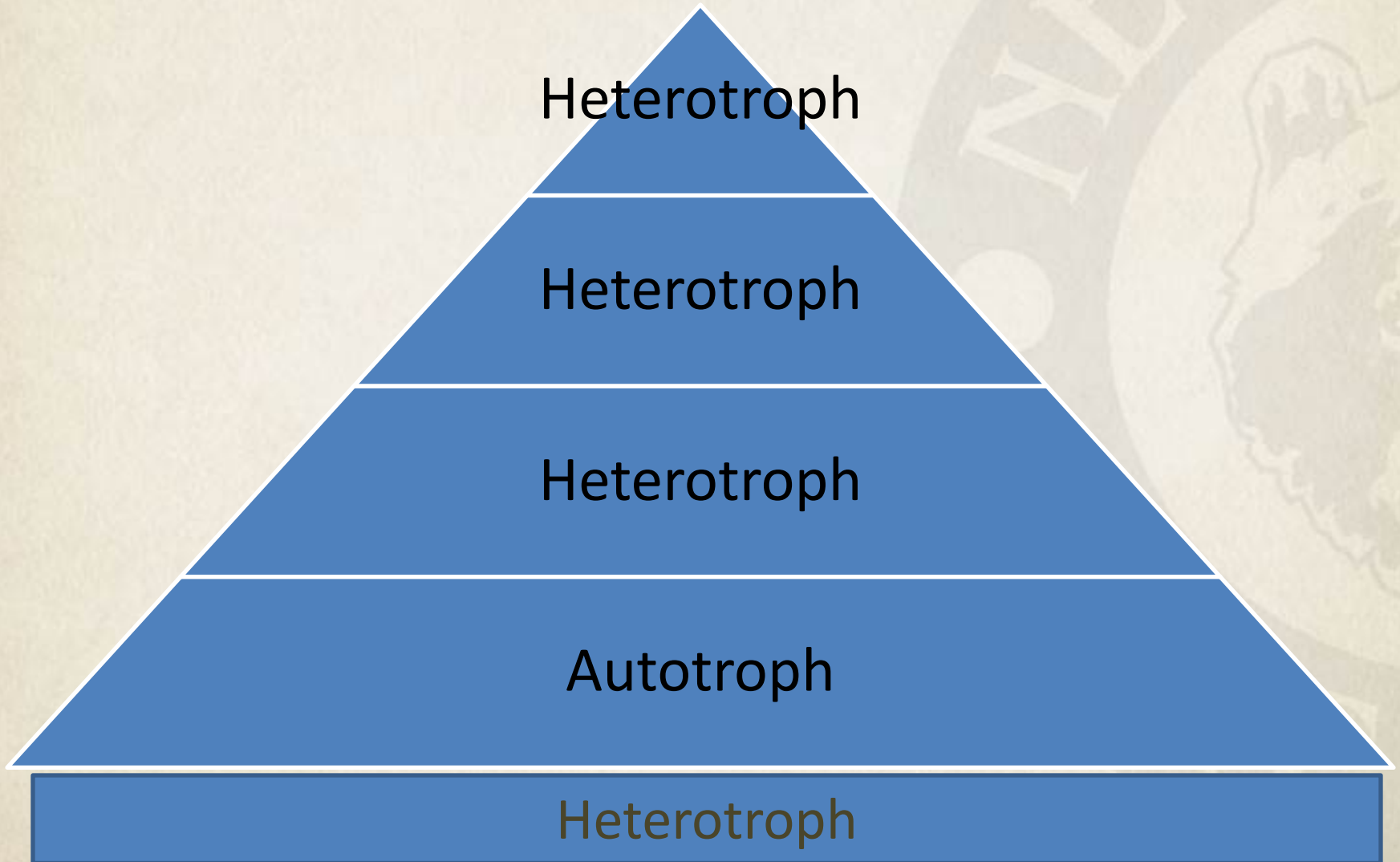
As consumers and even producers die they are broken down into nutrients by decomposers, which aid producers in growing.

Energy Transfer in a Food Web

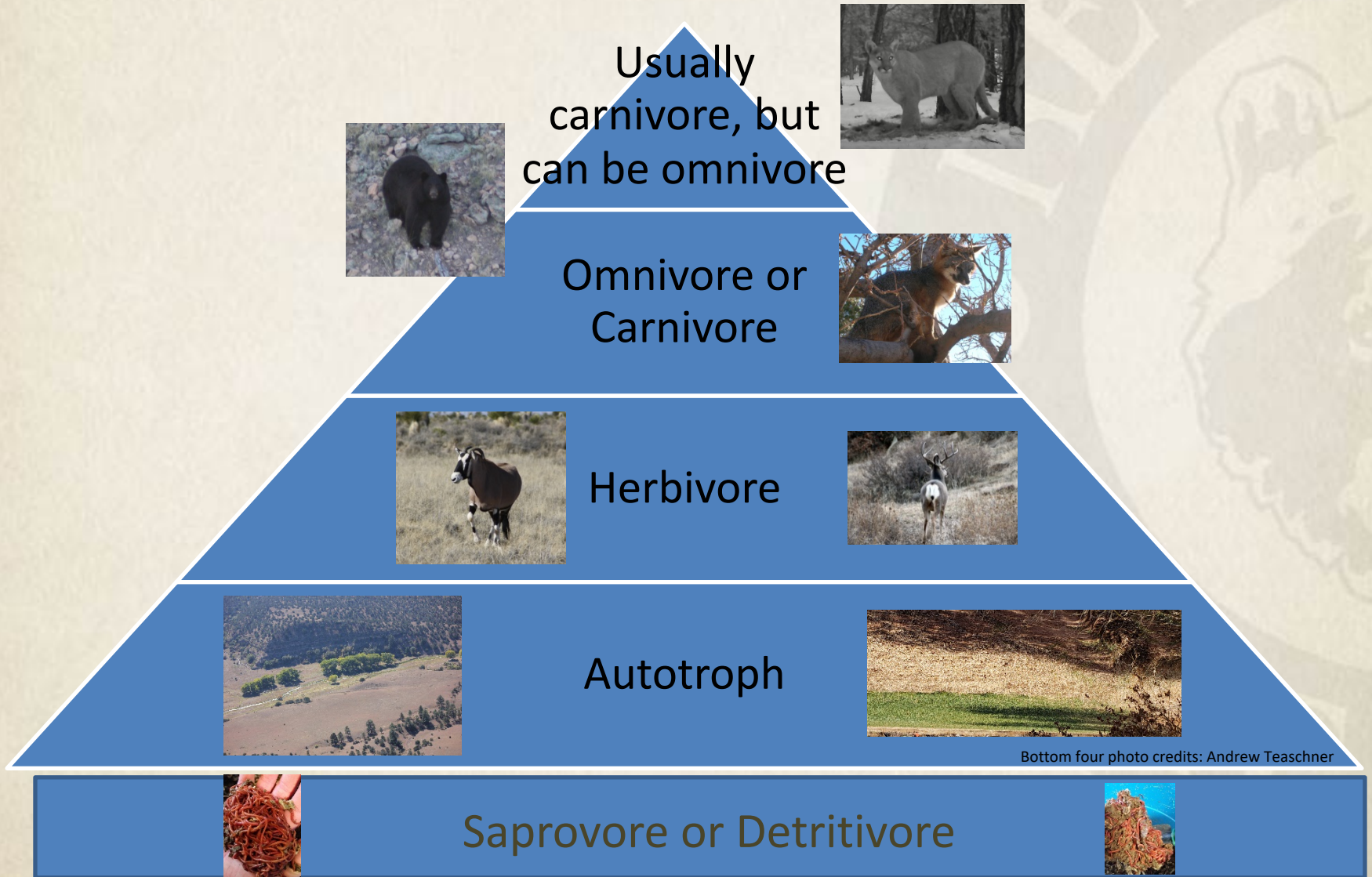
- Only about 10% of energy is transferred between trophic levels. 90% is used by each trophic level for mechanical & heat processes.
- That is why when you look at a pyramid it is wider at the bottom than the top.
- There are more producers than herbivores, and more herbivores than omnivores/carnivores.



How Organisms make a living



-vore in a Hierarchy



Examples of Organisms in a Food Web

Tertiary Consumers



Secondary Consumers

Coyote image credit: Office.com



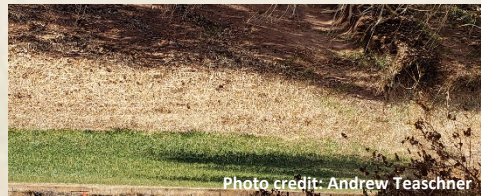
Primary Consumers

Grasshopper image credit: Office.com



Producers

Producers Image credits: Office.com



Examples of Organisms in a Food Web

Tertiary Consumers



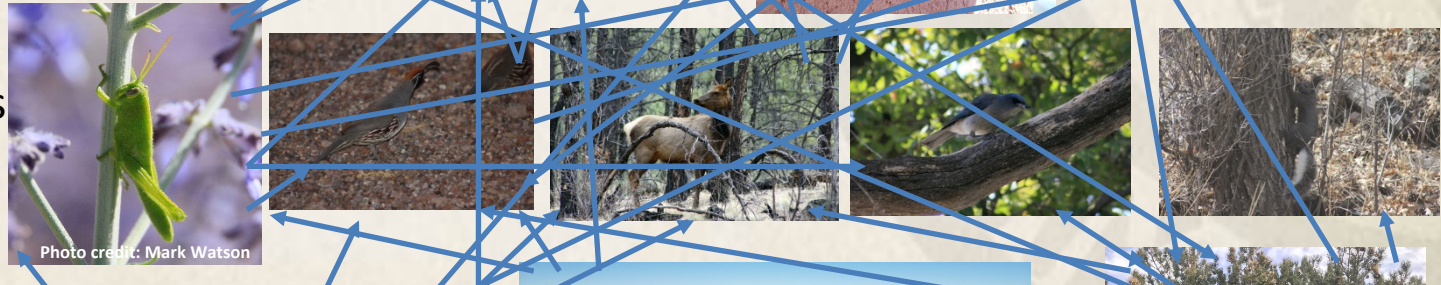
Secondary Consumers

Coyote image credit: Office.com



Primary Consumers

Grasshopper image credit: Office.com



Producers

Producers Image credits: Office.com



Bioaccumulation (Biomagnification)

- When pesticides containing DDT were used, the chemicals entered the water system.
- All species in the system from plankton to fish accumulated DDT
- This drastically impacted higher organisms on the food web such as bald eagles and ospreys when they fed on fish that had DDT.

Bioaccumulation (Biomagnification)

- Eagles would feed on fish and over time the accumulation of DDT infected fish meat eaten by eagles, impacting eagle populations.
- DDT affected bird egg development and egg shells were not developing correctly.
- Caused bald eagles populations to drastically decline.



Photo credits: Mark Watson

Thank You!



Please plan on going hunting, fishing, or trapping in the future and know that your purchase of a license for any of these activities helps fund wildlife & fisheries management in the Land of Enchantment!