

# Contents

- Food Chain,
- food web
- Ecological Pyramids

The function of an ecosystem can be studied under the three heads.

1. **Trophic Level Interaction** - gives idea about the energy flow through the ecosystem.

2. **Ecological Succession** - deals with the changes in features/members of an ecosystem over a period of time

3. **Biogeochemistry Trophic Level** - focused upon the cycling of essential materials in an ecosystem.

**Trophic Level Interaction** -. Three concepts

➤ **Food Chain**

➤ **Food Web**

➤ **Ecological Pyramids**

## Food chain

it is the sequence of eating and being eaten in ecosystem is known as food chain.

- A food chain may be defined as, “ the transfer of energy and nutrients through a series of organisms with repeated process of eating and being eaten ”.
- In an ecosystem, all the organisms are linked together with one another by food relationship.
- Each organism living or dead is potential food for some other organism.

## Examples

- Grass → grasshopper → Frog → Snake → Hawk (Grassland ecosystem)
- Phytoplanktons → water fleas → small fish → Tuna (Pond ecosystem)
- Lichens → reindeer → Man (Arctic tundra)

# FOOD CHAIN

OWL  
(Consumer)



FLOWER  
(Producer)



FROG  
(Consumer)



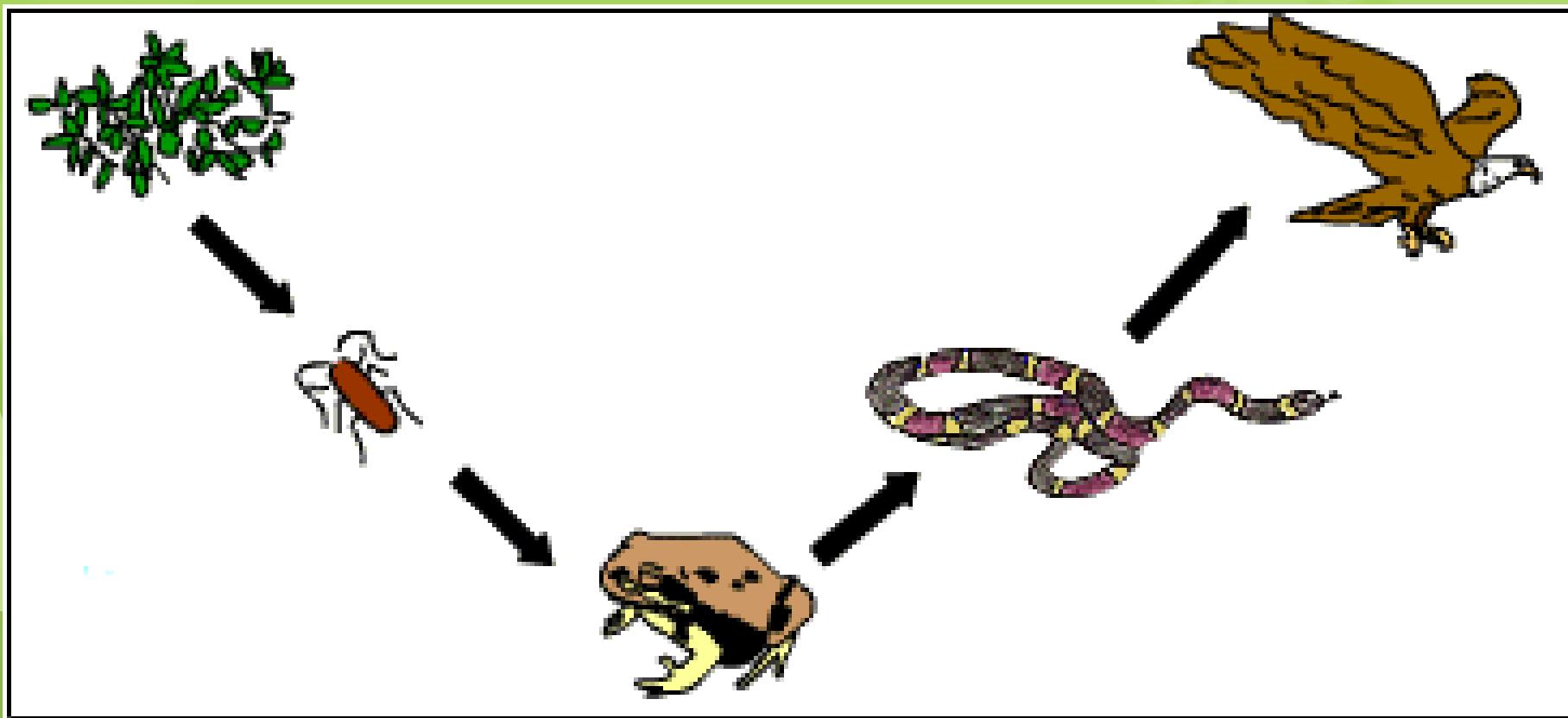
SNAKE  
(Consumer)



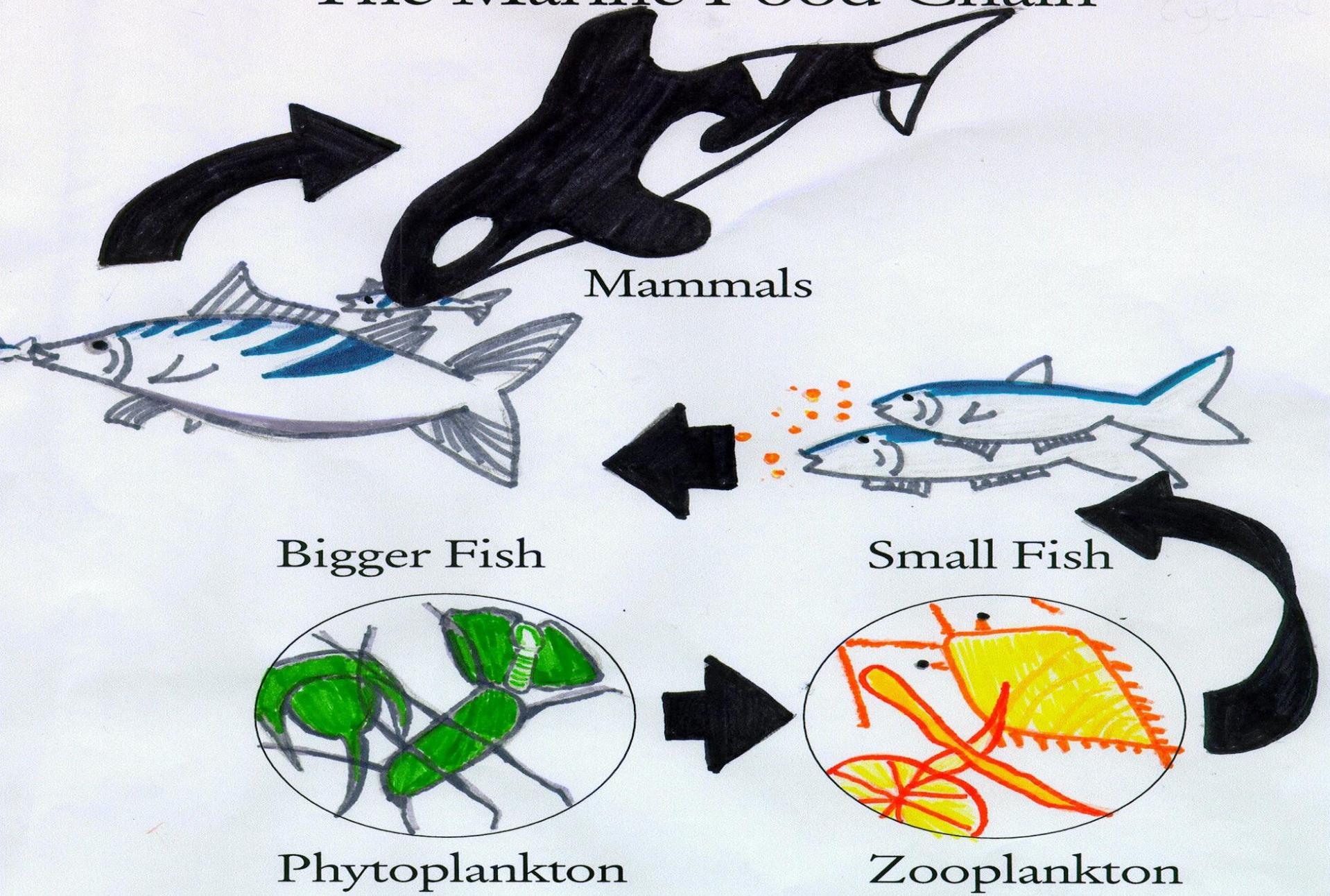
CATERPILLAR  
(Consumer)



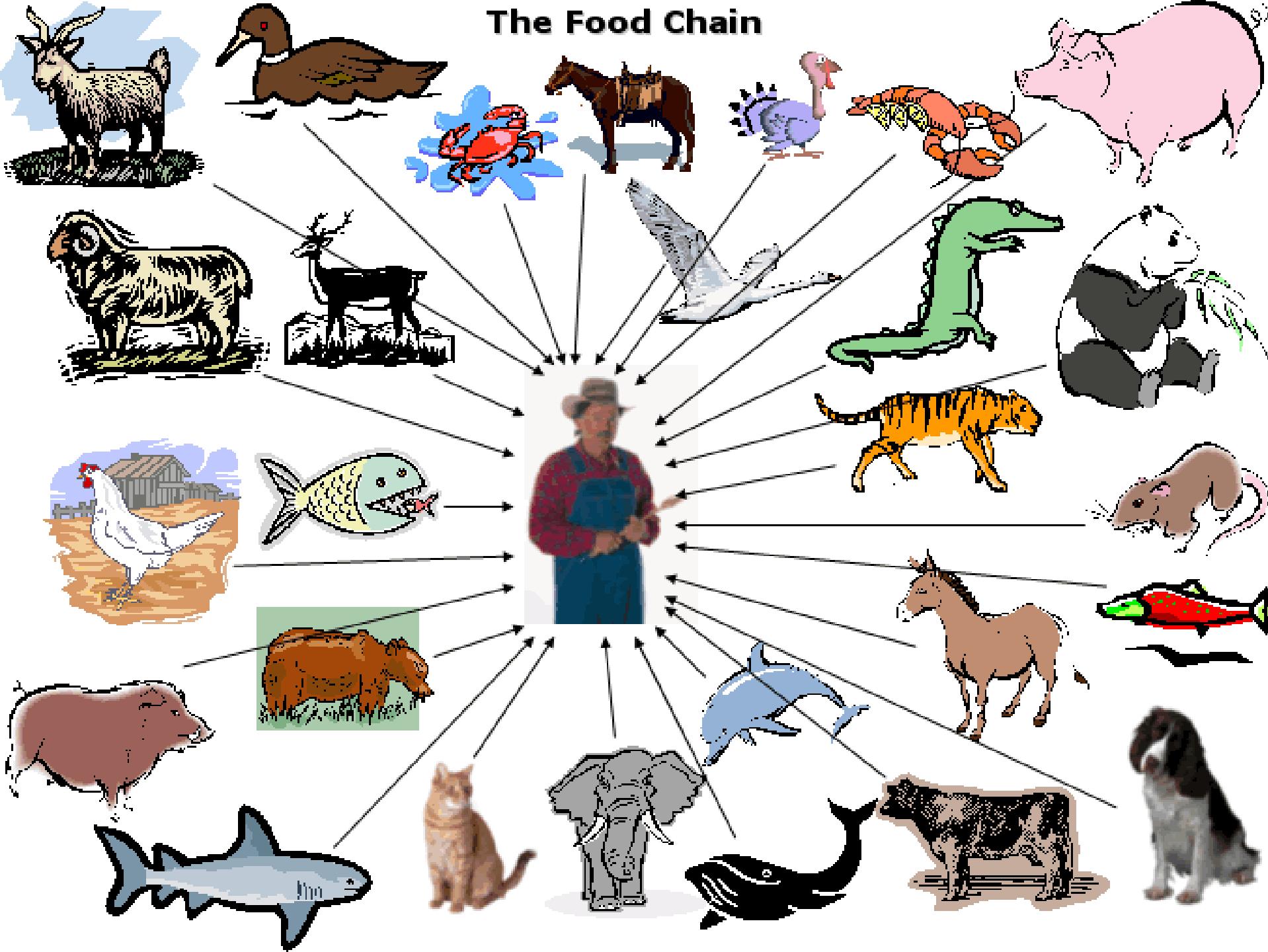
# Food Chains



# The Marine Food Chain



# The Food Chain

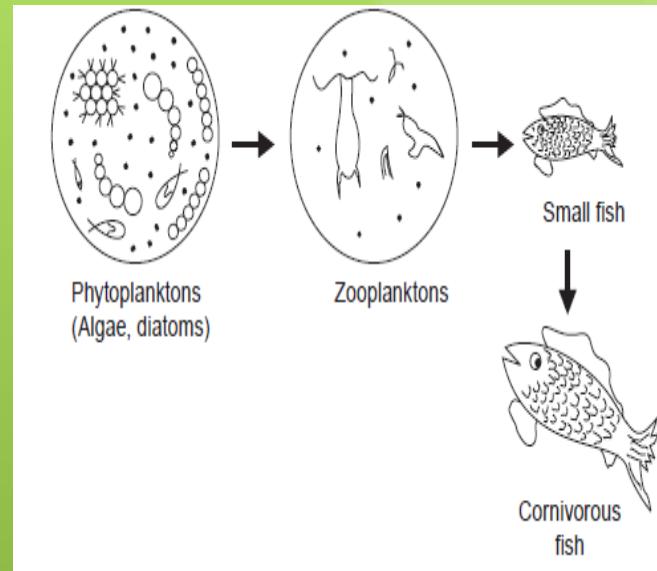


# Types of food chains

- 1. Grazing Food chain
- 2. Detritous Food chain

# Grazing Food chain

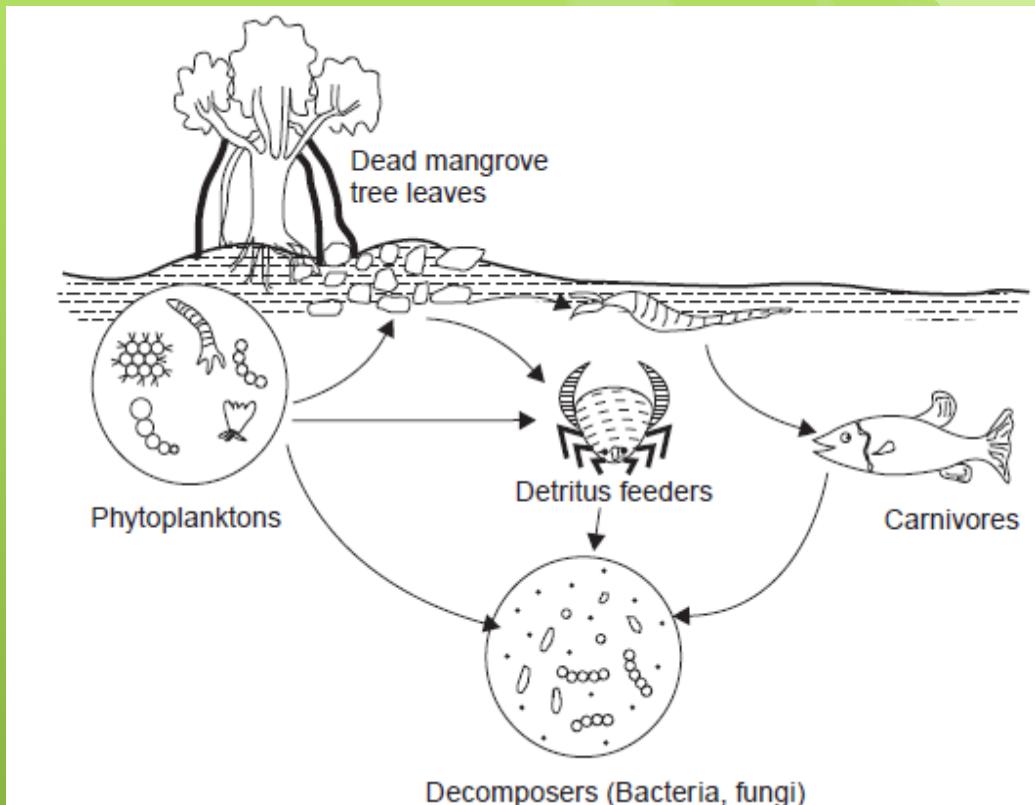
- It starts with green plants and culminates in carnivores.



Grass → Rabbit → Fox

# Detritous Food chain

- It starts with dead organic matter which the detritivores and decomposers consume. Partially decomposed dead organic matter and even the decomposes are consumed by detritivores and their predators



# Decomposers Vs. Detritivores?

- They actually are different, even though this difference is slight.
- Detritivores are organisms that feed on decomposing organic matter [ex: poop (fecal matter), leaf litter, detritus (marine snow)].
- Decomposers are organisms that consume ONLY dead organisms.

# Decomposers Vs. Detritivores?

- detritivore feeds on large parts of decaying plant, animal matter, and on waste material.
- A decomposer consumes and breaks down dead organisms or waste matter into simple substances.

- They both get nutrition from dead organic matter.
- The difference is that **detritivores** actually eat the **organic matter** (like earthworms eating their way through the soil) e.g. beetles, termites, ants, crabs, earthworms etc

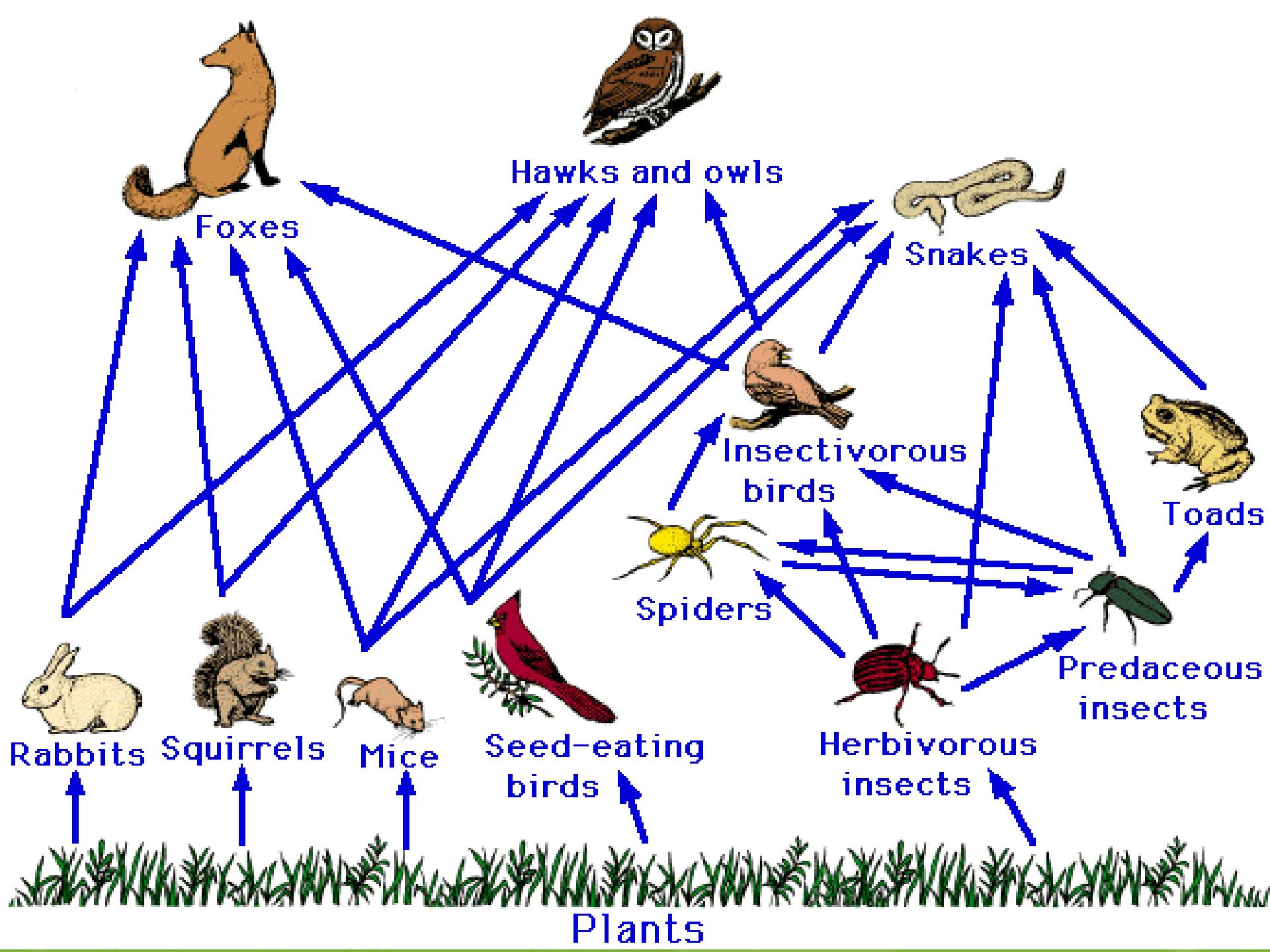
And

- decomposers secrete enzymes to digest the organic matter and then absorb the resulting molecules (like bacteria or fungi do).

- **Decomposers:** absorb nutrients on a molecular scale. They derive their nutrition by breaking down the complex organic molecules to simpler organic compounds and **ultimately into inorganic nutrients.** Various bacteria and fungi are decomposers.
- **Detritivores:** ingesting dead organic matter
  - : might feed on the droppings of scavengers/hunters or on the parts of carcasses/skeleton left behind
- **Scavengers:** generally being larger organisms which consume larger amounts of organic matter

# Food Web

- ❖ Under natural conditions, the linear arrangement of food chains hardly occurs & these remains connected interconnected with each other through different types of organisms.
- ❖ Interlocking pattern of several interlinked food chains is termed as FOOD WEB.
- ❖ A food web is a network of food chains where different types of organisms are connected at different tropic levels, so that there are a number of options of eating and being eaten at each tropic level.



*Fox*



*Rat*



*Gull*



## A common food web

*Puffin*



*Kittiwake*



*Auklet*



*Salmon*



*Cephalopod*



*Sand lance*



*Decomposers*



*Zooplankton*

*Phytoplankton*

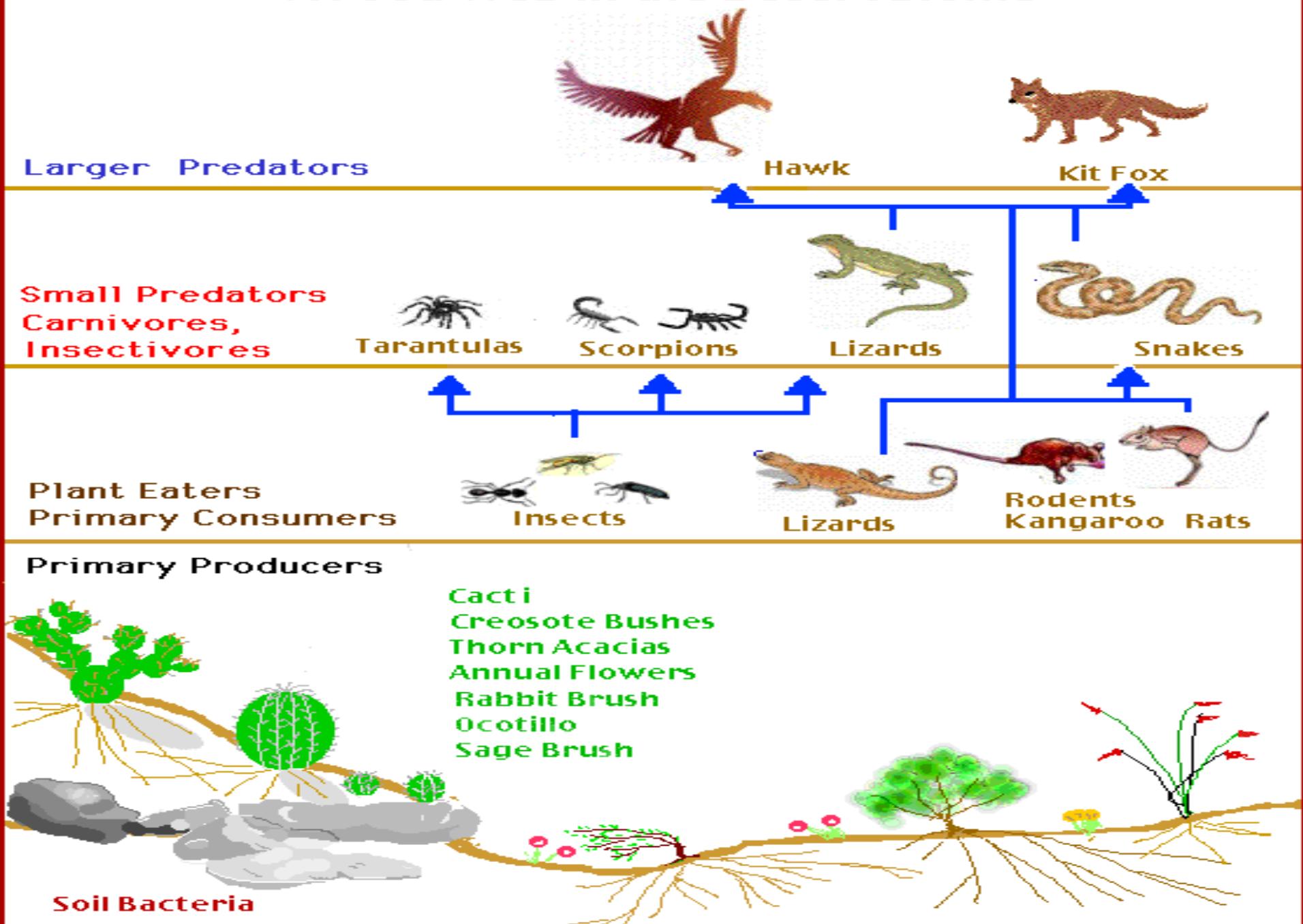


*Water & Nutrients*

*Sun*

*Air*

# A Food Web in the Desert Biome



What is food chain and  
food web

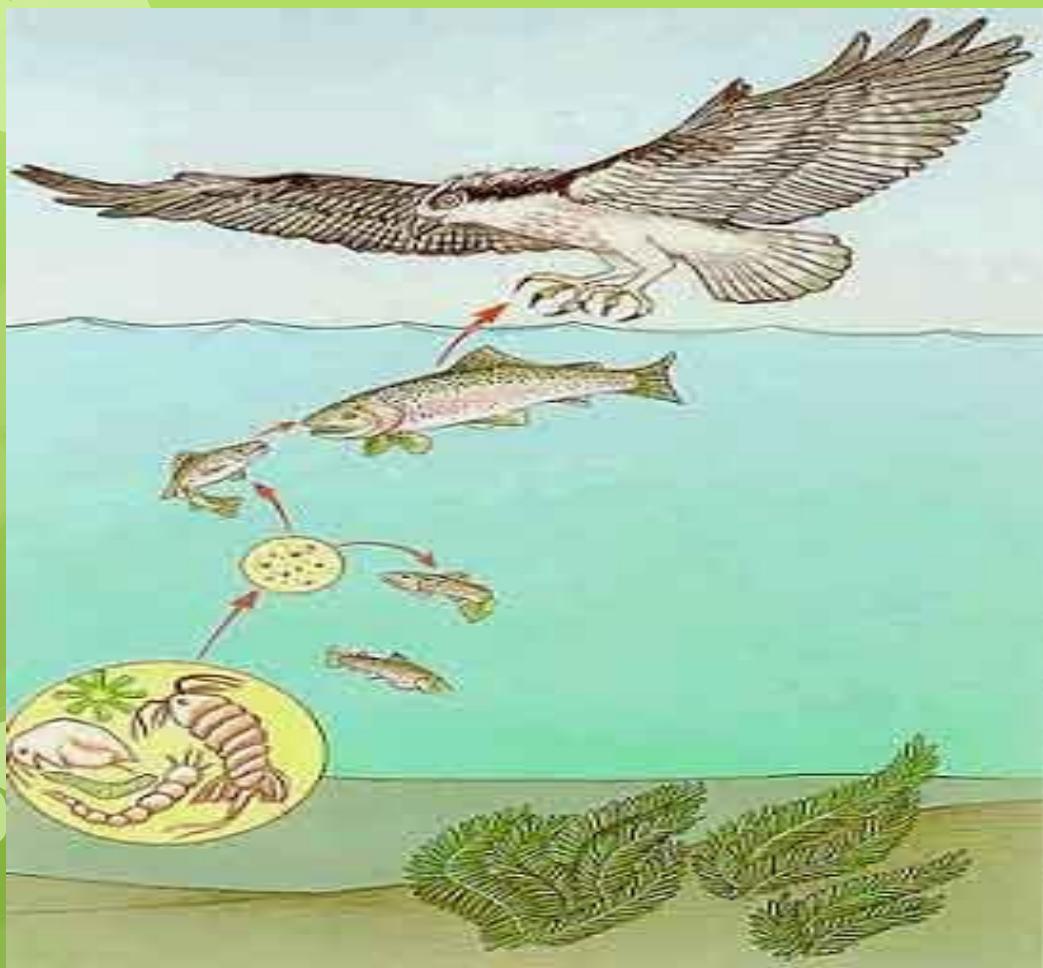
# Significance of food chains and Food webs

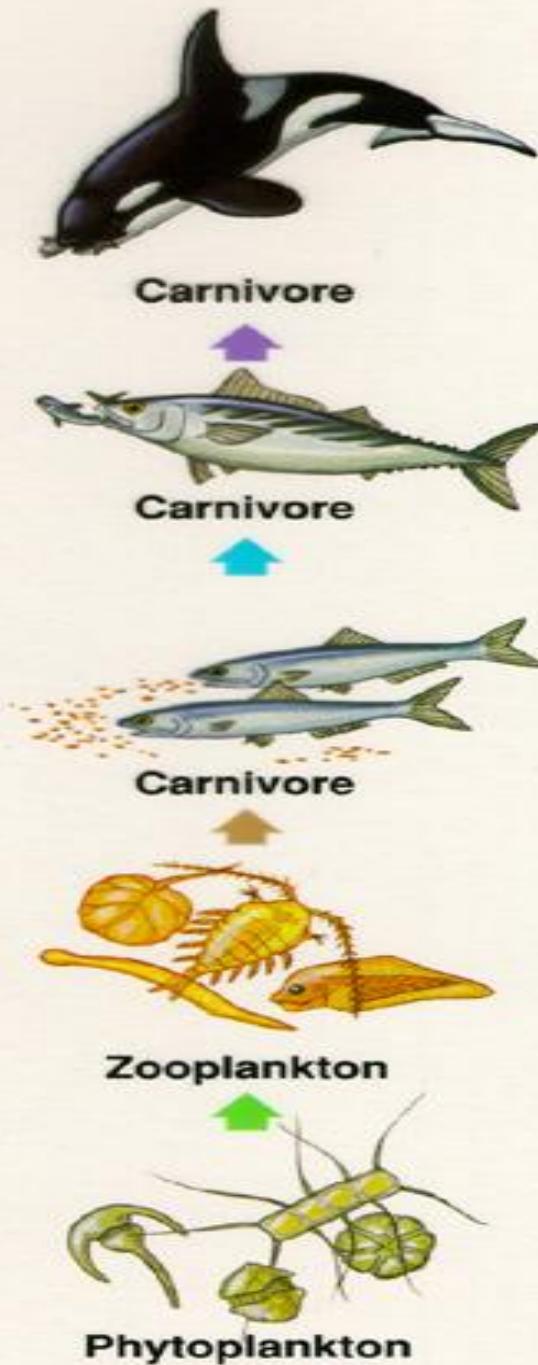
- FC & FB play a very significant role in the ecosystem because the two most important functions of energy flow and nutrient cycling takes place through them.
- The fC also help in maintaining and regulating the population size of animals and thus, he maintain the ecological balance.

# Trophic level

- The producers and consumers are arranged in the ecosystem in a definite manner and their interaction along with population size are expressed together as trophic level.

# Trophic level





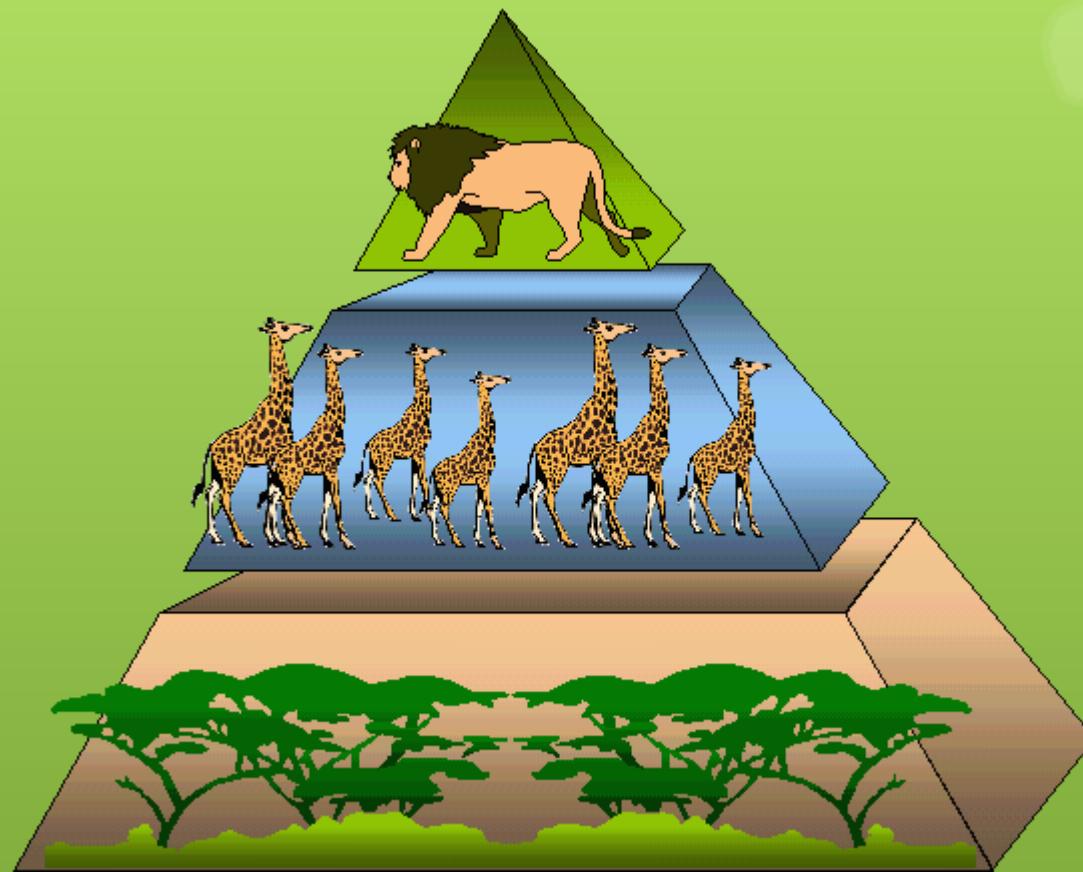
## Ecological Pyramids:

- ❖ An "*Ecological pyramid*" is a graphical representation that shows the relative amounts of energy or matter contained within each trophic level in a food chain or food web.
- ❖ An ecological pyramid shows the relationship between consumers and producers at different trophic levels in an ecosystem
- ❖ There are **three ecological pyramids** recognized by ecologists:

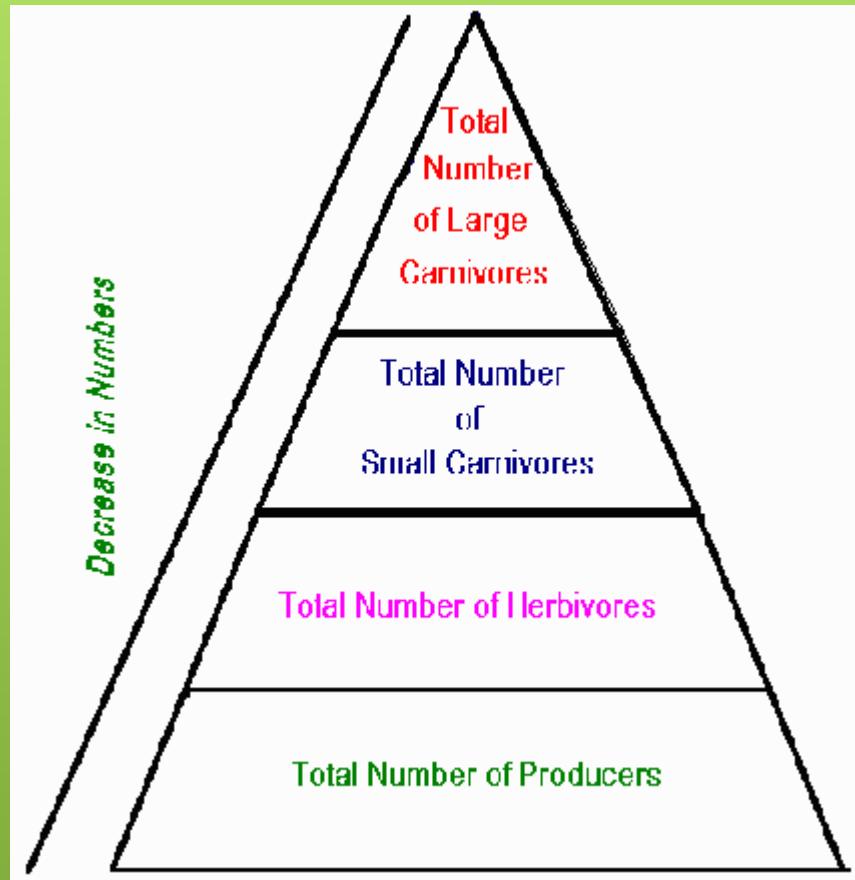
# ECOLOGICAL PYRAMID

- Graphic representation of trophic structure and function of an ecosystem, starting with producers at the base and successive trophic levels forming the apex is known as an ecological pyramid.

# ECOLOGICAL PYRAMID

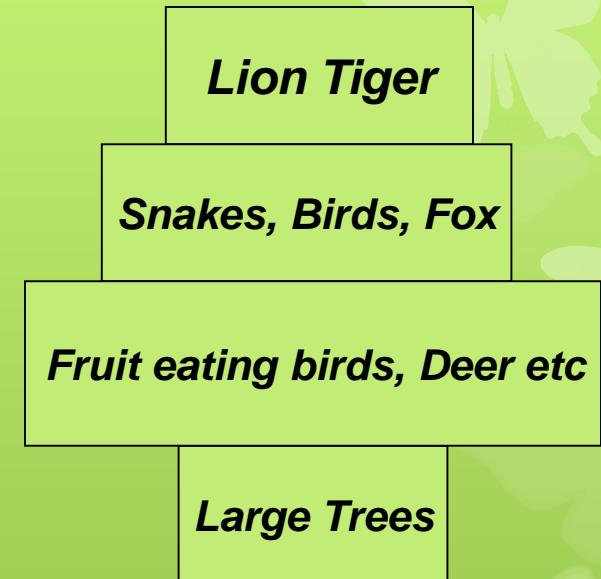


# Number pyramid



## 1) Pyramid of Numbers:

Shows the relative number of individual organisms at each trophic level.

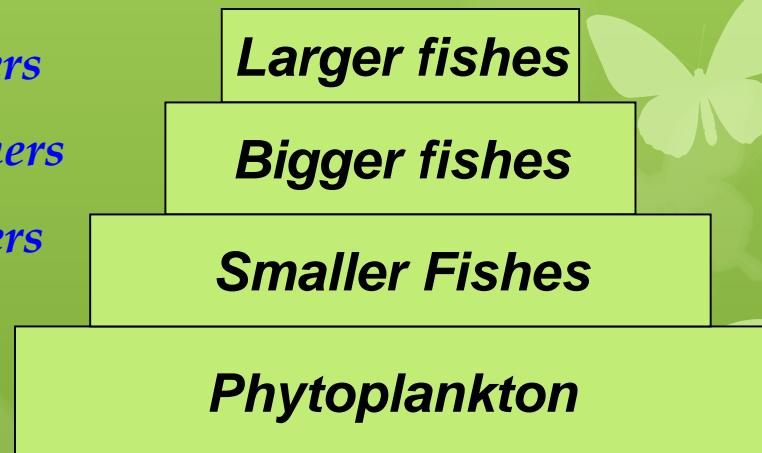


**Forest Ecosystem**



**Grassland Ecosystem**

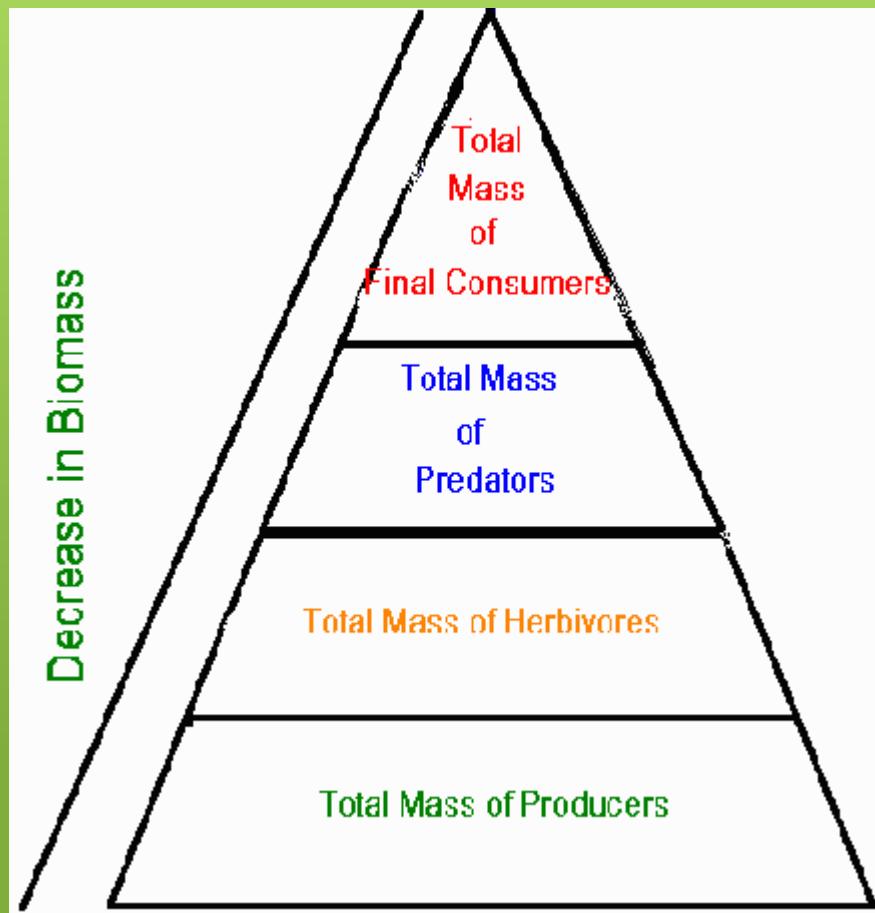
*Producers*  
*Primary Consumers*  
*Secondary Consumers*  
*Tertiary Consumers*



**Pond Ecosystem**

## 2) Pyramid of Biomass:

- ❖ A pyramid of biomass represents the total dry mass (in grams per square metre of area) of all the organisms in each trophic level at a particular time.



**Snakes, Frogs,  
Birds etc.**

**Cows Sheep,  
Deer, Rabbit**

**Grasses**

## **Grassland Ecosystem**

*Carnivores*

*Herbivores*

*Producers*

**Lion, Tiger,  
etc.**

**Elephant, Deer etc.**

**Trees**

## **Forest Ecosystem**

**Fish, Water beetles etc.**

**Zooplanktons**

**Phytoplankton's**

## **Pond Ecosystem**

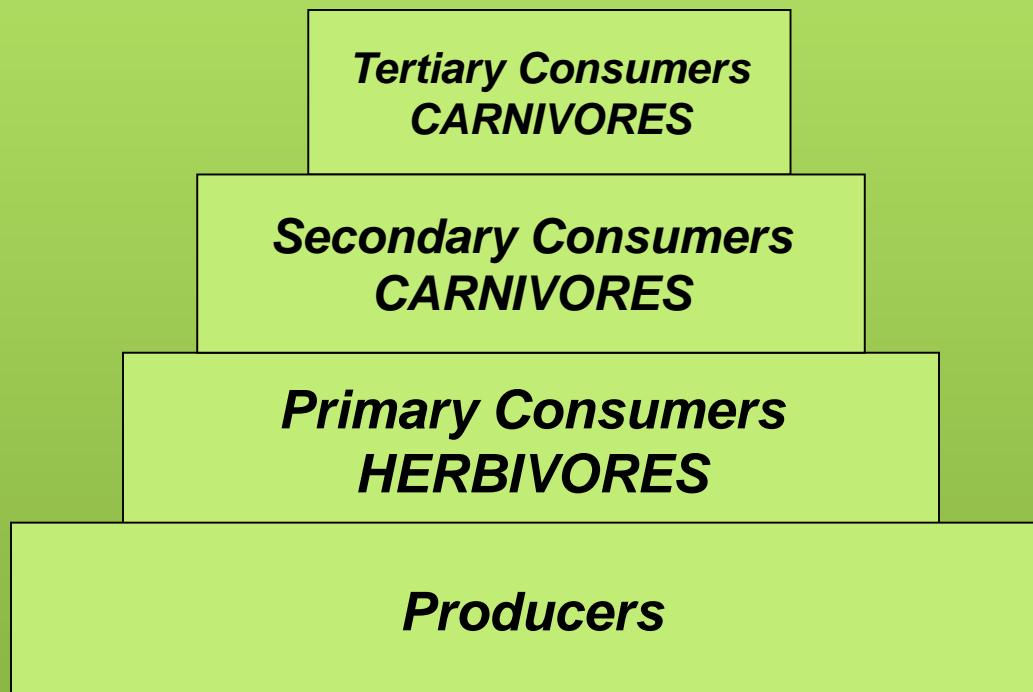
*Carnivores*

*Herbivores*

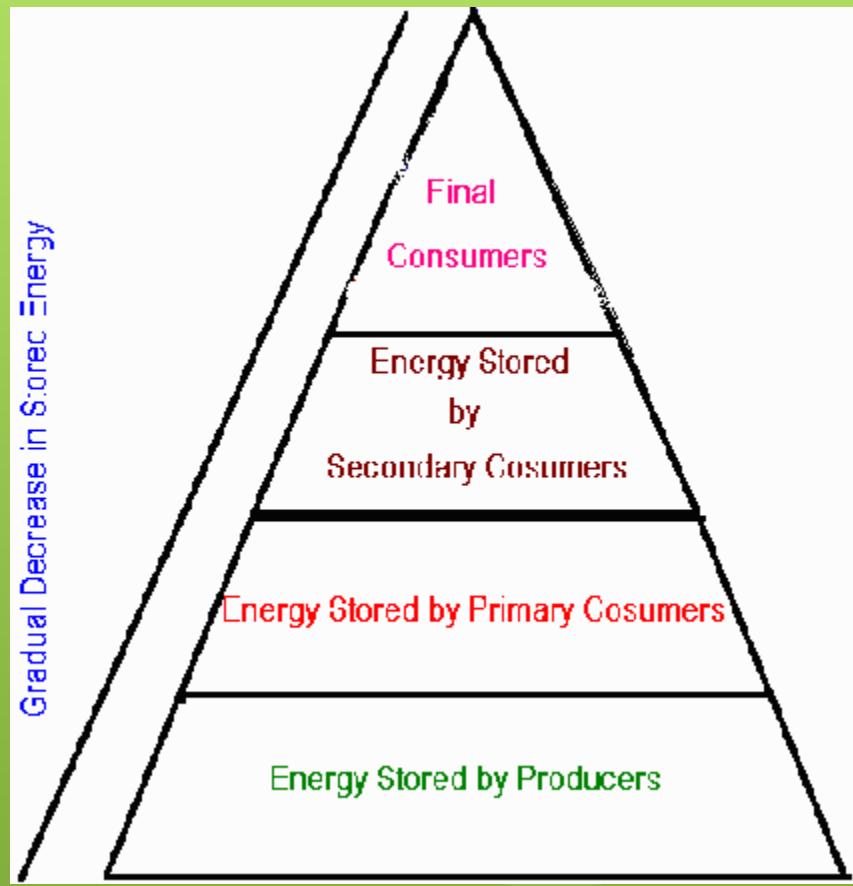
*Producers*

### 3) Pyramid of Energy:

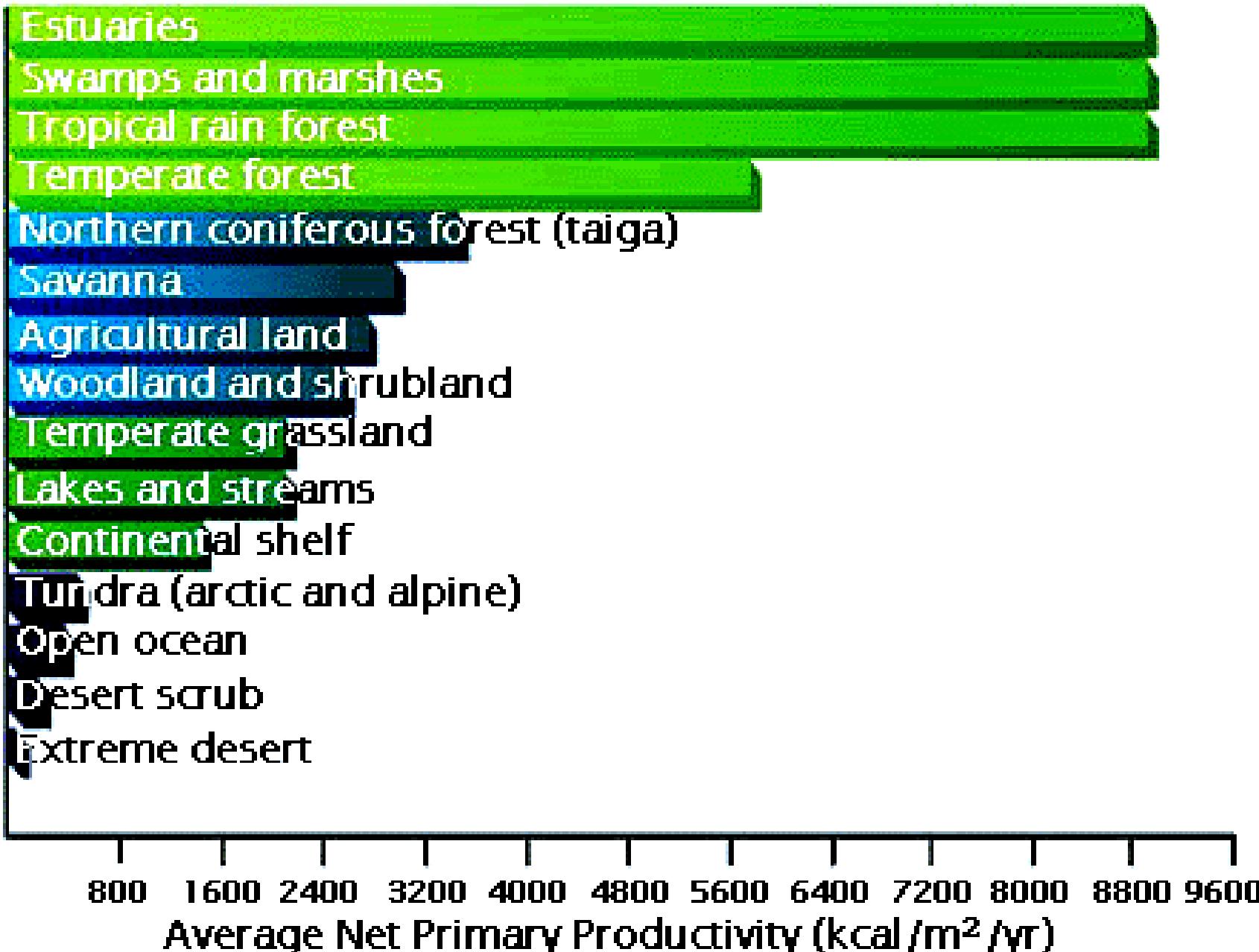
- ❖ A pyramid of Energy represents the rate of energy flow and/or productivity at successive trophic levels. The pyramid of energy are always upright.



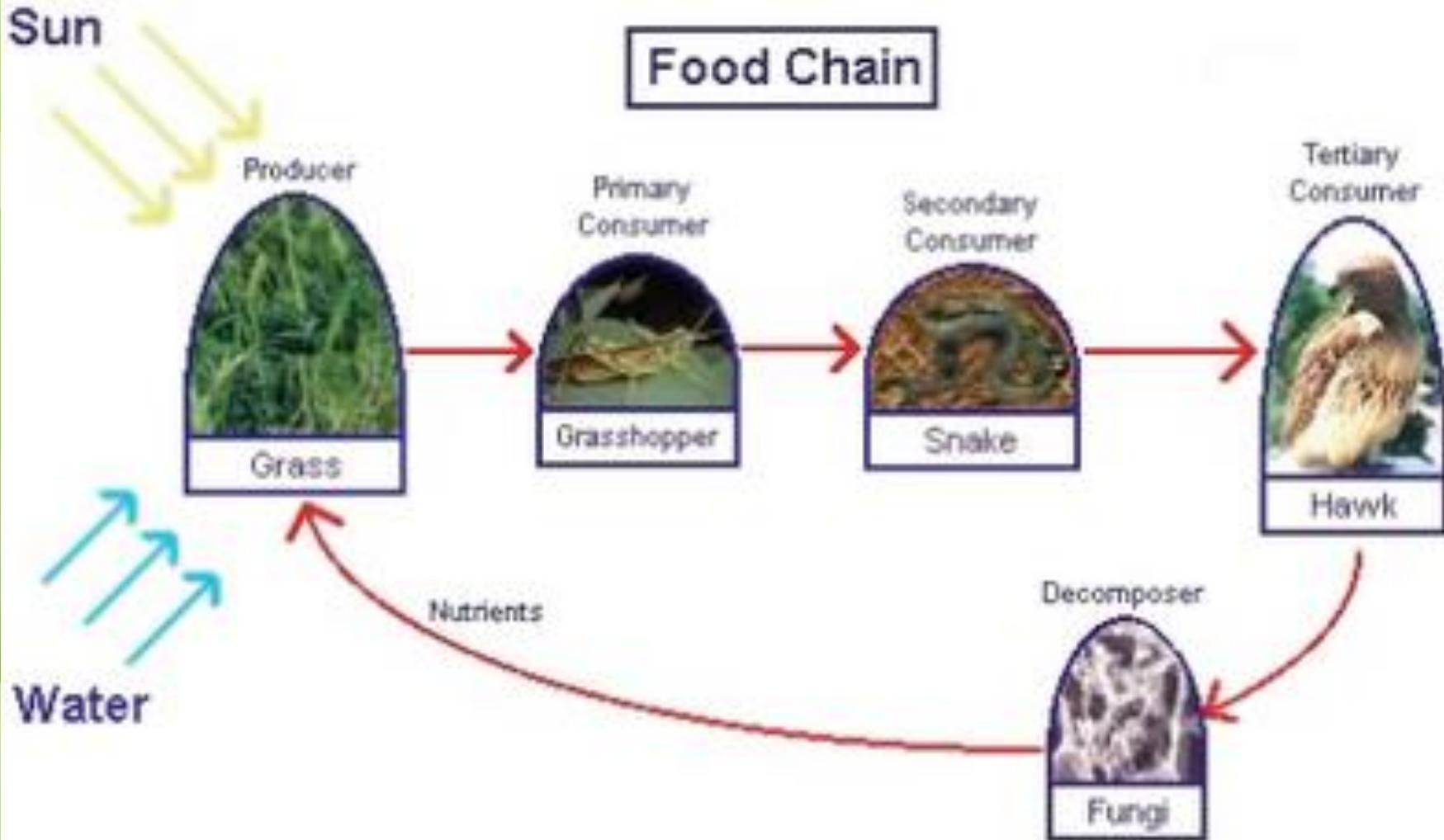
# Energy pyramid



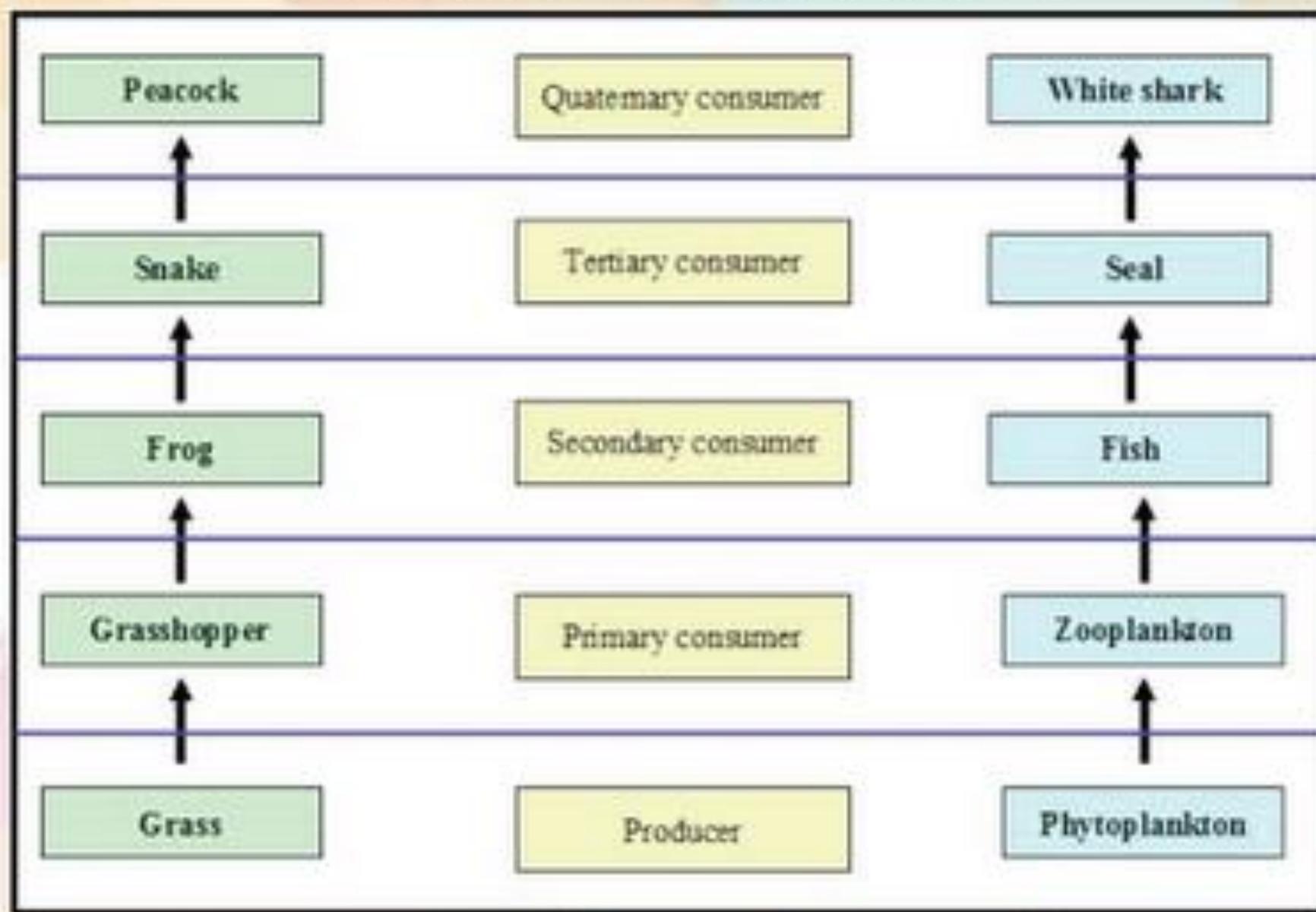
# Type of Ecosystem



## Food Chain



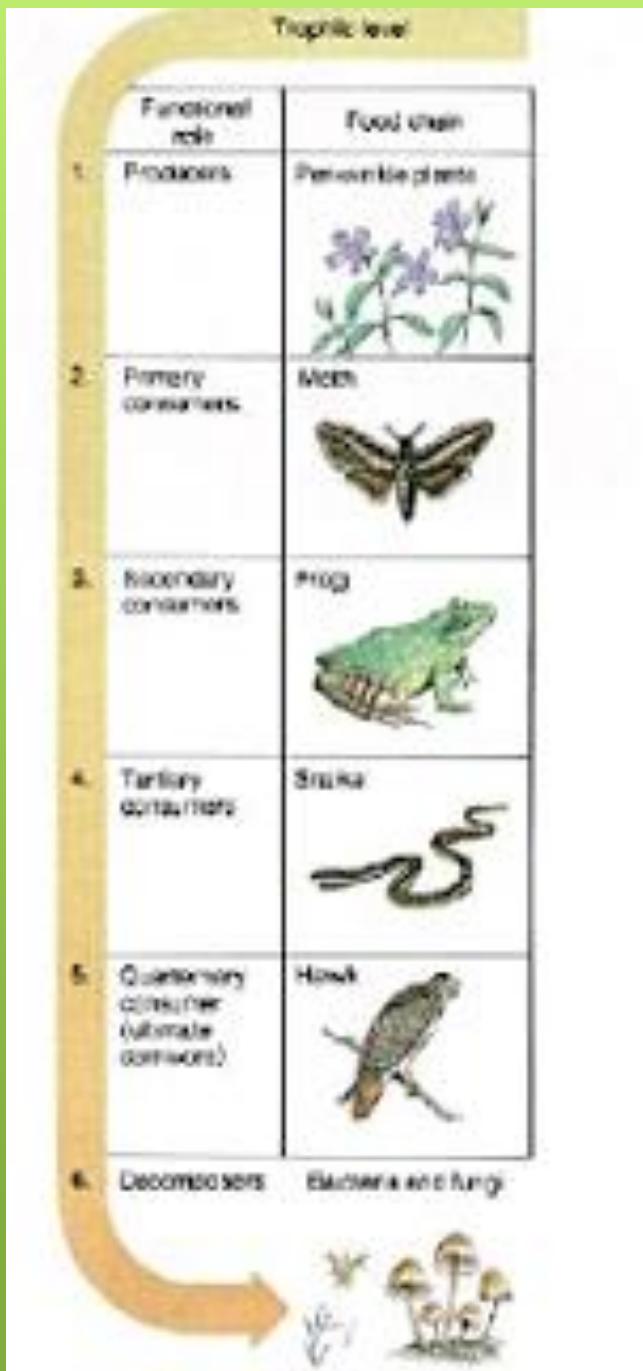
# Role in Food Chain



# Food Web

- interconnected food chains in ecosystem.





## Autotrophs

## Heterotrophs

