



Name: \_\_\_\_\_

Date: \_\_\_\_\_

School: \_\_\_\_\_



## Notes/Sketches



## Notes/Sketches



## Living Links

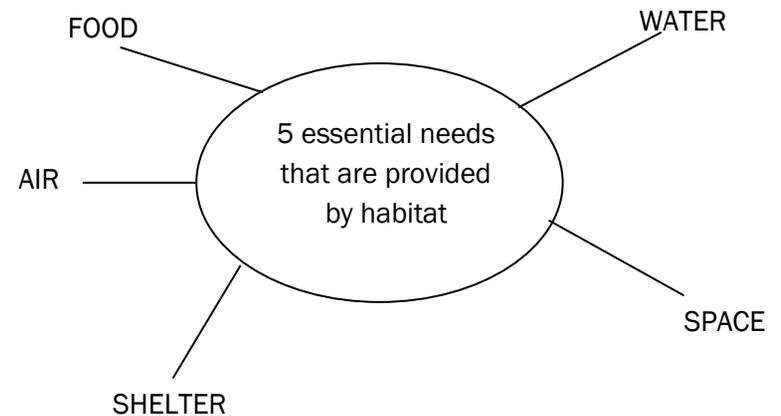
**Habitat:** An area that provides the essential needs to the survival of an organism. The habitat of beaver is not just the lodge; it is also the trees nearby and the pond it created.

**Microhabitat:** A very small part of a habitat, such as, underneath a log.

**Ecology:** The study of the intersections of living (biotic) and non-living (abiotic) components of the environment.

**Biodiversity:** The variety of living organisms and the ecosystems of which they are a part.

**Eco-services:** Species and ecosystems provide services for other species.





## Ecological Interactions



## Notes/Sketches

ACTIVITY: Mark down specific ecological Interactions that you see during your walk. Think of positive and negative interactions.

<u>Biotic (living)</u>	<u>Abiotic (non-living)</u>
People	Soil
Bacteria	Altitude
Plants	Climate
Fungus	Weather

### Human and Biotic Interactions

Example: Penicillin is a fungus used for medicinal purposes.



## Notes/Sketches



### **Human and Abiotic Interactions**

Example: Rocks and minerals are used as building materials.

### **Biotic and Abiotic Interactions**

Example: Lichens produce acids which dissolves rocks they grow on.



# The Aspen Forest

ACTIVITY: Observe as many life forms as possible. For every species you discover, try to guess its eco-services.

Example :

Observed: bur oak tree

Eco-service: provides food and homes for squirrels, beetle, wood for furniture, shelter for birds...



# Animal Address

Activity: Select one animal that you can observe and answer a few questions about its habitat.

Animal name:

Habitat

Food:

Water:

Shelter:

Space: (does it like lots of space or little?)

Is this animal endangered? Research it!

### Forests can be divided into 4 layers:

Canopy layer	leaves and limbs over 3 metres
Shrub layer	bushes and small trees
Herb layer	grasses, plants and decaying material
Underground layer	soil below the herb layer



# Biotic Index



# Life on the Forest Floor

## Biotic Index

Group	Number of different insects present (I)	Group Index Value (II)	(I) x (II)
A		4	
B		3	
C		2	
D		1	
		Cumulative Index Value	
		Stream Quality	

ACTIVITY: Examine a microhabitat. Use a magnifying glass and count the number of plants and animals living in your microhabitat. Draw one creature that you have not seen before and research its life cycle.

### Water Quality Assessment Scale:

*Excellent*    Above 22

*Good*        22-17

*Fair*         16-11

*Poor*         Below 11

Total variety of species discovered in the microhabitat: \_\_\_\_\_



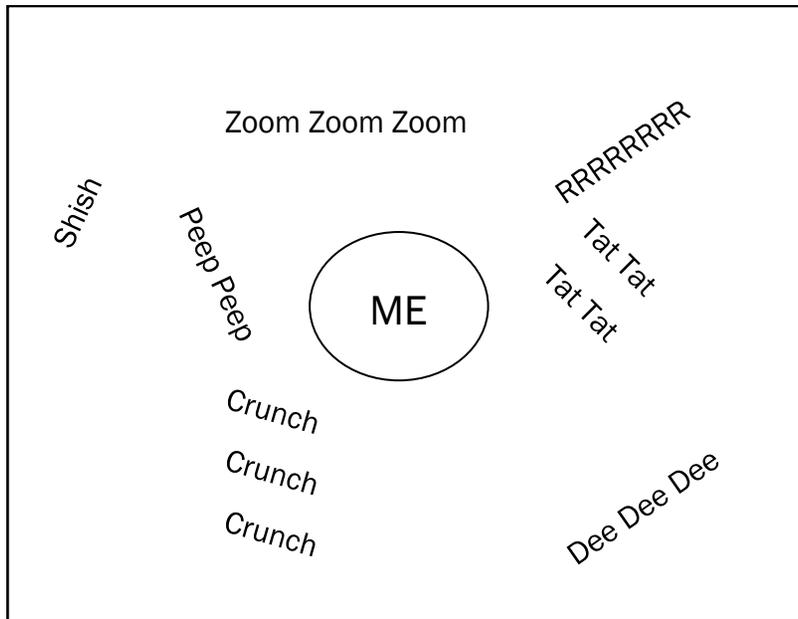
# Habitat Sound Map

Onomatopoeia: (ah-no-ma-ta-pee-ah) is a sound written as a word. Ex.: an owl may sound like, “who who who”

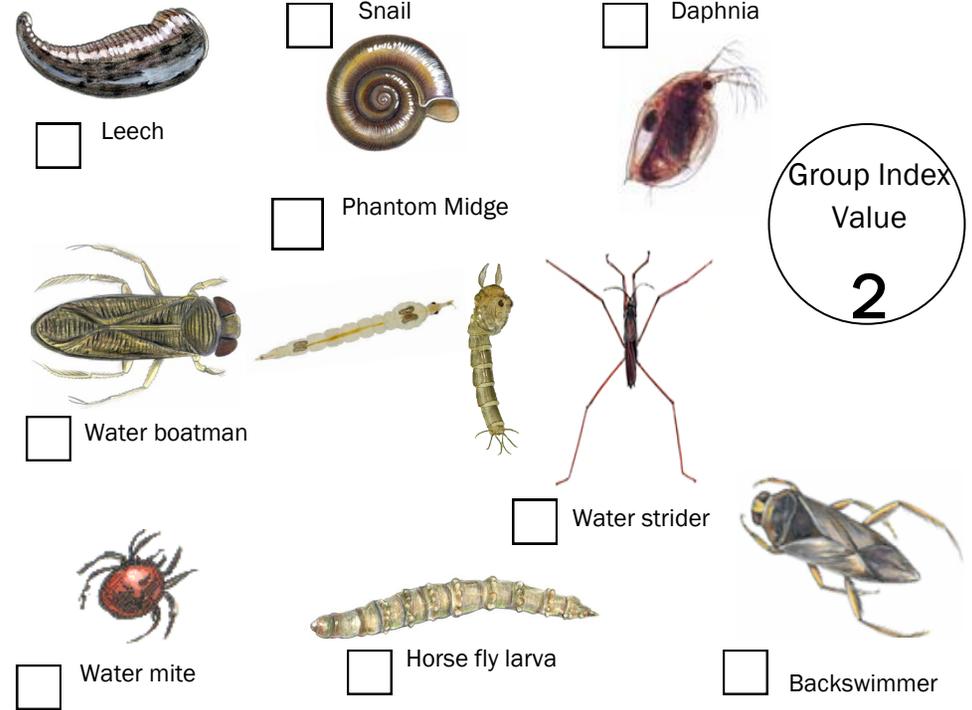
ACTIVITY: You are going to create a sound map. Write your name in the circle.

On the next page, record every sound you hear and the direction in came from.

For example

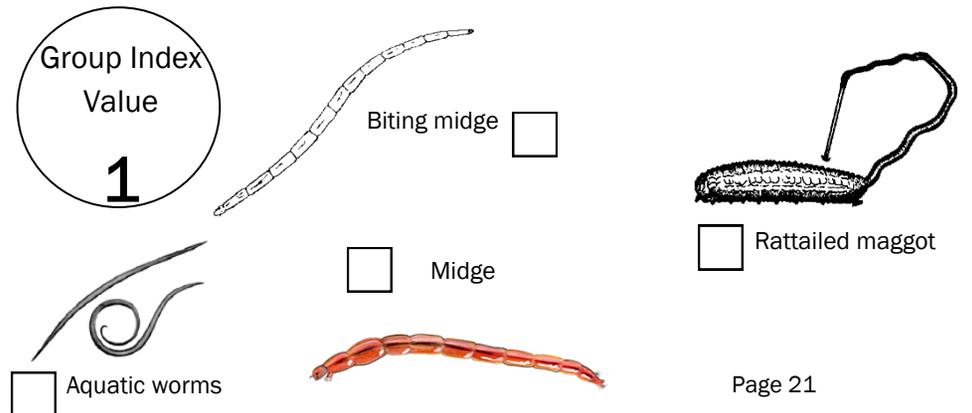


**Group C:** These organisms live in a wide range of conditions and are somewhat pollution tolerant. Their dominance generally signifies FAIR WATER QUALITY.



Group Index Value  
**2**

**Group D:** These organisms live in a wide range of conditions and are pollution tolerant. Their dominance generally signifies POOR WATER QUALITY.



Group Index Value  
**1**



# Water Quality Assessment

**Group A:** These organisms are generally pollution intolerant. Their dominance generally signifies GOOD WATER QUALITY.

Group Index Value  
**4**

Caddisfly larvae



Stonefly nymph



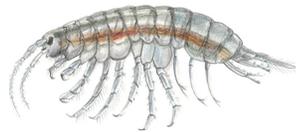
Mayfly nymph



**Group B:** These organisms live in a wider range of conditions and are somewhat pollution intolerant. Their dominance generally signifies MODERATELY GOOD WATER QUALITY.

Group Index Value  
**3**

Damselfly nymph



Sideswimmer

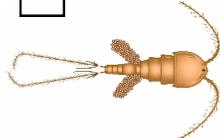


Copepod

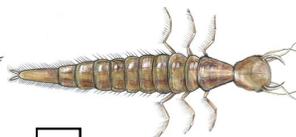
Whilygig beetle



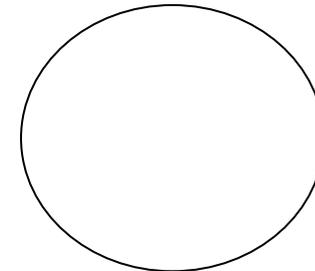
Dragonfly nymph



Water tiger



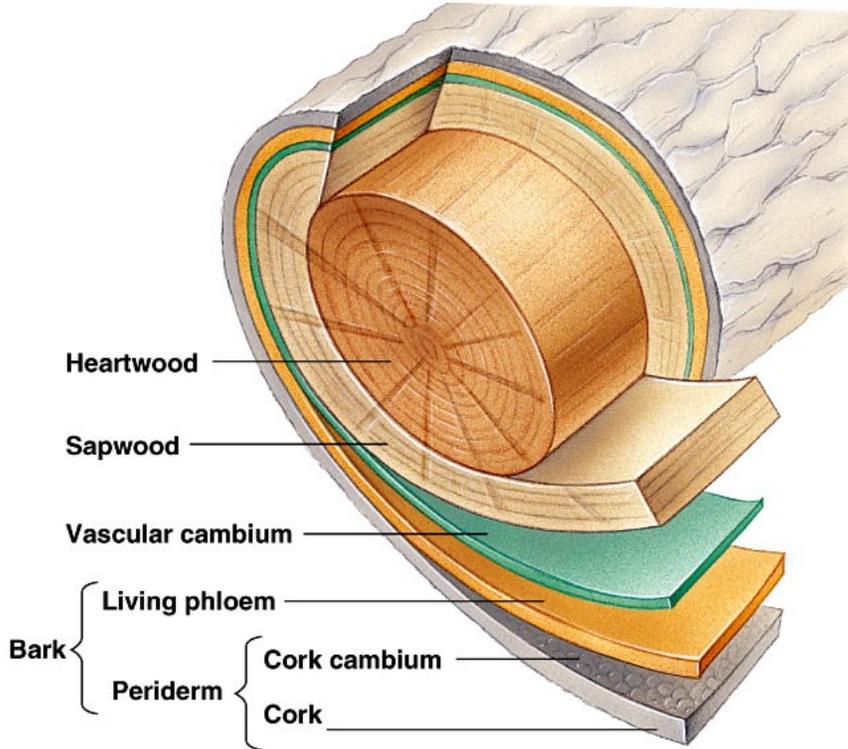
# Habitat Sound Map





# Dendro Disk

The word dendro comes from the greek, *dendros*, which means tree.



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Bark: offers protection from dehydration and elements  
Cork cambium: living layer that grows new bark  
Vascular cambium: living layer that grows new sapwood  
Sapwood: transports the water from the roots to branches



# Water Quality Assessment

## Collection

Invertebrates may be used as bio-monitoring tools to determine water quality for several important reasons:

Invertebrates are in close contact with water and are directly affected by changes in water quality

Invertebrates are relatively immobile and therefore cannot escape any immediate change in the environment

Invertebrates have long life cycles and are sensitive to changes in their environment

Invertebrates are relatively easy to sample and identify

## Data Analysis

The Biotic Index you are using today uses extremes in the tolerance level of invertebrates to pollution. The chart on page 20 – 21 depicts some of the major invertebrates and assigns them to one of the three groups depending on their tolerance to pollution.

Examine the contents of your buckets. For each of the groups (A,B,C & D), count the number of different invertebrates present in the sample. Record these numbers on the table, Biotic Index, on page 22.

Multiply the number of insects present with the corresponding group index value. Record these numbers on the Biotic Index table.

Find the cumulative index value by adding together the three individual group values. Record this number on the Biotic Index table.

Compare this cumulative value with the Stream Quality Assessment Scale. What is the water quality in the aquatic ecosystem?



# Wetland Biodiversity

Water boatmen: multiply by 40

Water fleas: multiply by 30

Water mites: multiply by 30

Water striders: multiply by 20

Predaceous diving beetle (larva): multiply by 15

Duckweed plant (seasonal):

spring/fall x 10

summer x 1000

Based on your own observations, how would you figure out the number of different wetland plants in a given area? By what number would you multiply an individual cattail? Bulrush?

The total number of living organisms in this wetland is : \_\_\_\_\_



# Dendro Disk Worksheet

You can learn a lot about a tree by ‘reading’ a cross-section of the trunk. What can you find out about the tree slice you have been given to analyze? Look at the annual rings of your slice and then answer the questions below.

1. How old is the tree? \_\_\_\_\_ years
2. Count and record:
  - A. number of good growing years \_\_\_\_\_
  - B. number of poor growing years \_\_\_\_\_

Dendro tip

Each year is represented by a thicker, lighter circle and a thinner, darker circle.

A wide ring indicates good growing conditions—sunshine, plenty of rainfall, not too much competition from other trees, no major disease, pest or fire.

A narrow ring indicates poor conditions—flooding, droughts, pests, overcrowding

3. Count back in rings to when you were born. How old was this tree when you were born?

$$\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$

Number of rings      Your age      Age of tree when you were born



## The Meadow

ACTIVITY: Examine your quadrant. Record the number of leaves that you found. What else was found within your quadrant? Draw a meadow food web.



## Wetland Biodiversity

ACTIVITY: Calculate the number of living things you could in the marsh/swamp. Calculate the total number of living organisms based on your samples.

Guideline: For every mosquito larva you find, multiply by 500

Copepods: multiply by 1,000

Damselfly nymphs: multiply by 20

Dragonfly nymphs: multiple by 20

Leeches: multiple by 10

Predacious diving beetles: multiply by 20

Side swimmers: multiply by 20

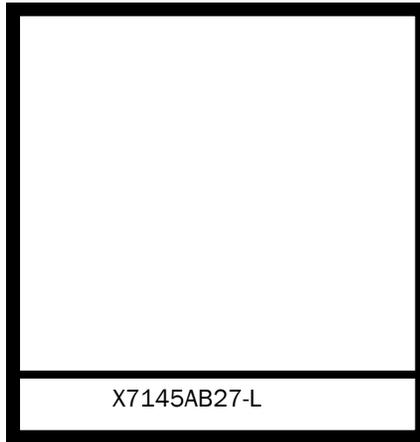
Snails: multiply by 30



## Critter Wrap Sheet

Critter Name : \_\_\_\_\_

### Mug Shot



How does  
it eat?

How does it move?

What colour is it?

Describe its shape:



## Wetland Biodiversity

Observations: Note the diversity of species found in wetland habitats. For every species, think about what eco-services it provides for other organisms.

### Wetland Plant Types:

Emergents: plants that grow above the surface of the water; such as cattails.

Floaters: plants that have either a root attached to the substrate, such as water lily, or float free, such as duckweed.

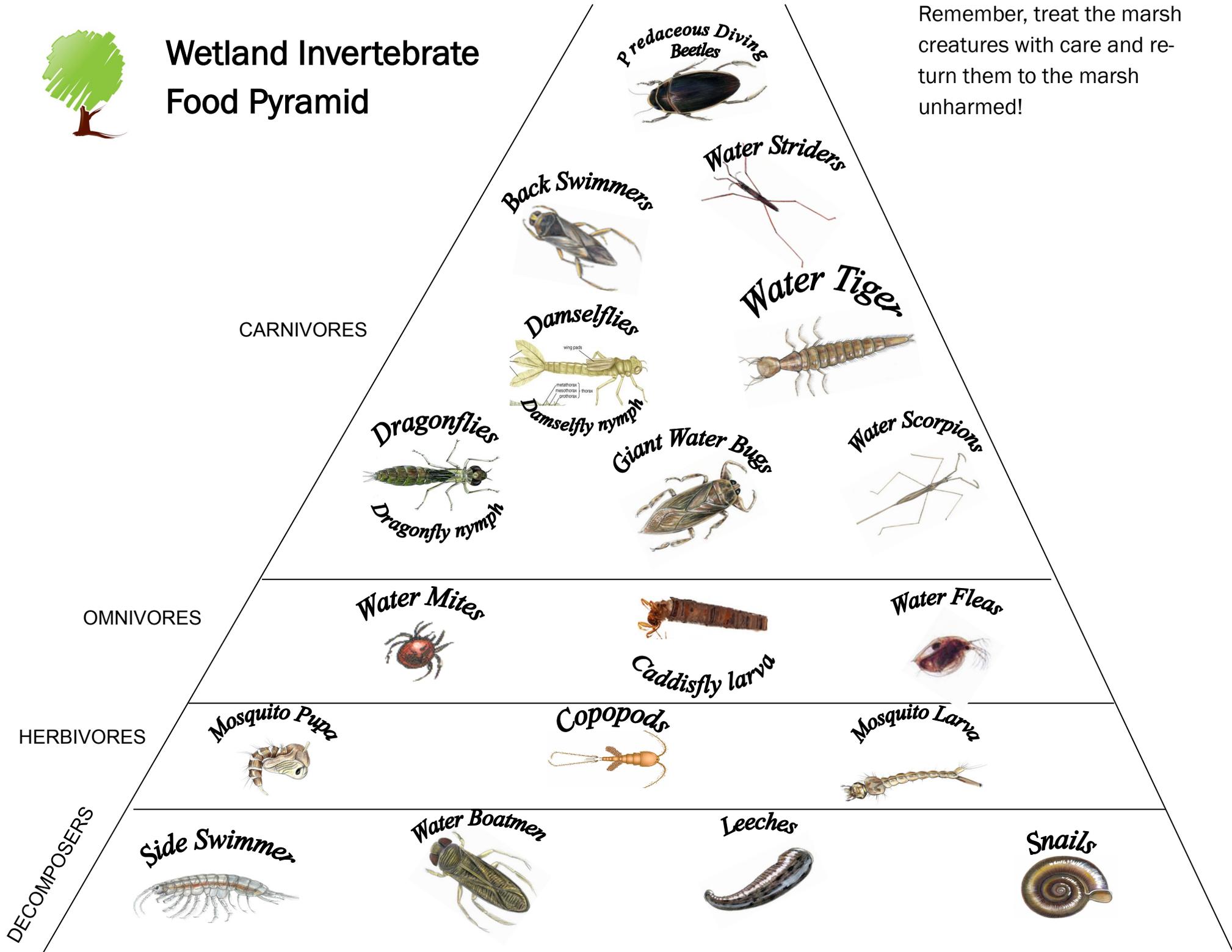
Submergents: plants that live entirely underwater, such as coontail.

Upland: Plants that grow in the area of the wetland that begins at the water's edge and moves upland.



# Wetland Invertebrate Food Pyramid

Remember, treat the marsh creatures with care and return them to the marsh unharmed!



CARNIVORES

OMNIVORES

HERBIVORES

DECOMPOSERS

*Predaceous Diving Beetles*



*Water Striders*



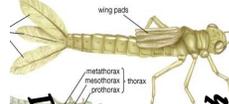
*Back Swimmers*



*Water Tiger*



*Damselflies*



*Damselfly nymph*

*Dragonflies*



*Dragonfly nymph*

*Giant Water Bugs*



*Water Scorpions*



*Water Mites*



*Water Fleas*



*Caddisfly larva*



*Mosquito Pupa*



*Copopods*



*Mosquito Larva*



*Side Swimmer*



*Water Boatmen*



*Leeches*



*Snails*

