Ecosystems and Habitats

There are many similarities between BIOMES (which we have studied) and ECOSYSTEMS and HABITATS (which we are about to study). There are also some key differences.

Let’s look at the definitions, and then highlight the differences.

* BIOME: A large region of Earth with similar **abiotic** **components** (temperature, precipitation, soil…) and similar **biotic components** (plants and animals).
* HABITAT: The place, including the **abiotic** and **biotic** components, in which a particular organism (plant or animal) normally lives.
* ECOSYSTEM: A **community** of organisms, in their environment, as well as all of their interactions with each other and with the **abiotic components** of their surroundings. An ecosystem is *a system*. It is a collection of parts, and how they work together.

One major and simple difference between Biomes, ecosystems and habitats is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The largest of the three is the \_\_\_\_\_\_\_\_\_\_\_\_\_, then \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The smallest is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

A biome may contain many ecosystems. An ecosystem will contain many habitats.

A second important distinction is that both BIOMES and HABITATS refer to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is much more.

An ECOSYSTEM is both the place and all of the interactions, *the workings*, the actual relationships and processes that go on to make the whole thing function.

Often the terms are mistakenly used somewhat interchangeably. This can be confusing, but we will do our best!

Consider the following example:

* Within the boreal forest biome, there is a large clearing (a place with no trees) with a pond in the centre, surrounded by a wetland marsh. Next to the pond, in the marsh there is a rotting log. The marsh and pond are home to many organisms: fish, frogs, turtles, mushrooms, dragonflies, insects, flowers, grasses, lily pads… . Many of these animals and all of the plants spend their entire life in this marsh. For them the marsh is their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Within the marsh, some of the creatures never leave the pond. To them the pond is their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Some of the organisms like the mushrooms and some of the insects may spend their entire life on the rotting log. To them the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is their habitat. The marsh \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ includes all of these habitats, all of these animals, plants and fungi. The marsh \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ also includes all of the interactions (who eats whom, which animals live on or in which plants, how the oxygen and carbon dioxide are cycled through the system, how various plants compete for water, nutrients and sunlight).
* It can be quite complicated!

**TYPES OF BIOTIC INTERACTIONS:**

So, as mentioned ECOSYSTEMS include all of the interactions that occur within an environment, but what kinds of interations are we talking about?

A very simple example is **PREDATION** or the predator/prey relationship. As you know

Predator:

Prey:

\* NOTE: A single animal can be both a predator and prey! For example a weasel kills and eats mice and is therefore a predator, but the same weasel may be killed and eaten by an owl and, thus, be prey.

In a healthy ecosystem the predator/prey relationship is in balance. If the predator population is too large, the prey population will decline, and the predators must either find a new food source or die of starvation. If the predator population becomes too small, the prey population will grow and they may face starvation of illness.

In a healthy ecosystems these populations shrink and grow together.

Another kind of biotic interaction is **SYBIOSIS** (symbiotic relationship). Sybiosis is the close interaction/living together of two different types of organism (species). This relationship can be beneficial, harmful or neither.

There are many types. These are the main 3:

1. Commensalism (Commensalistic Relationship): One species benefits, one species (mostly) unaffected.

Ex: A. Barnacles on a whale:

i. Barnacles benefit by getting transported to new sources of \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

ii. The whales are not harmed or helped by the presence of the barnacles.

B. Cattle and cattle egrets:

i. The egrets follow the cattle and eat insects that are exposed as the cattle eat grass.

ii. The cattle are not significantly affected.

C.

2. Mutualism (Mutualistic Relationship): Both species benefit.

Ex: A. Bees and flowers

i.

ii.

B. Bacteria and humans.

i.

ii.

C.

3. Parasitism (Parasitic Relationship): One organism benefits, one is harmed.

Ex: A. Tapeworms and Humans:

i.

ii.

B. Fleas and dogs:

i.

II.