

**Niche**, refers to the role that a species plays within its ecosystem. In balanced ecosystems, each species occupies its own niche. The niche is like the organism's profession - what it does to survive.

**Habitat** refers to the place where an organism lives. The habitat of a species is different than its niche, it is the particular part of the environment in which it lives. The habitat of an organism is part of its niche. The organism's habitat is its address - where it lives.

Every organism has its own habitat. The habitat of slime molds is the damp floor of the forest. The organism's habitat is where the organism is best adapted to survive. For example, a fish is adapted to life in water because it has gills to get oxygen.



Plants and animals live where they can gather or find the necessary resources to satisfy their needs. Every habitat includes factors that limit the kinds and numbers of organisms that live there. Goldfish and pond plants require fresh water. On the other hand, the barnacles that cling to the ship must live in salt water. In some cases, creatures can adapt themselves to a changing habitat.

A single area may satisfy the needs of many kinds of plants and animals. These organisms that associate together in a common habitat form communities. Communities exist in various places, including on the sea shore, in deserts, in freshwater lakes, and in tropical forests.

### **Competition:**

**Competition** between organisms exists in every ecosystem. Organisms are forced to compete against their own species and also different species in order to survive. The stronger and more fit organisms have an advantage over those who are weaker, and they have a better chance of surviving.

Competition arises when organisms have requirements in common and they must compete to meet their own needs. The more needs organisms have in common, the more intense the competition. When the resources that are being competed for become scarce the competition becomes more intense, and eventually one of the species becomes eliminated.

Competition between the same species is called **intraspecific competition**. Many birds of the same species compete for the best nesting grounds. In cases when food or water is scarce, members of the same species will compete for food in order to survive.

Competition between different species is called **interspecific competition**. Different species often compete for space, food, or water. For example the lion and the



hyena both compete for zebra.

The majority of feeding relationships in an ecosystem are based on competition, food chains and food webs. Each species has its own niche, that species has a particular habitat and has a particular way of obtaining its own food. But when two different species overlap or interfere with one another, competition occurs. When worst comes to worst, those with the most helpful adaptations will survive and the less-well adapted will not.

### **What are pests?**

Pests are living organisms that are not wanted around us. Examples of pests include unwanted dandelions growing in the lawn; rodents or insects that eat fruits, vegetables or other crop species; micro-organisms that cause disease in forest, fish, or crop resources, etc. A pest is any organism that man believes is undesirable, has a negative impact on the human environment, or is in competition with human use of a resource, either natural, or cultivated.

### **Early Pesticide Use:**

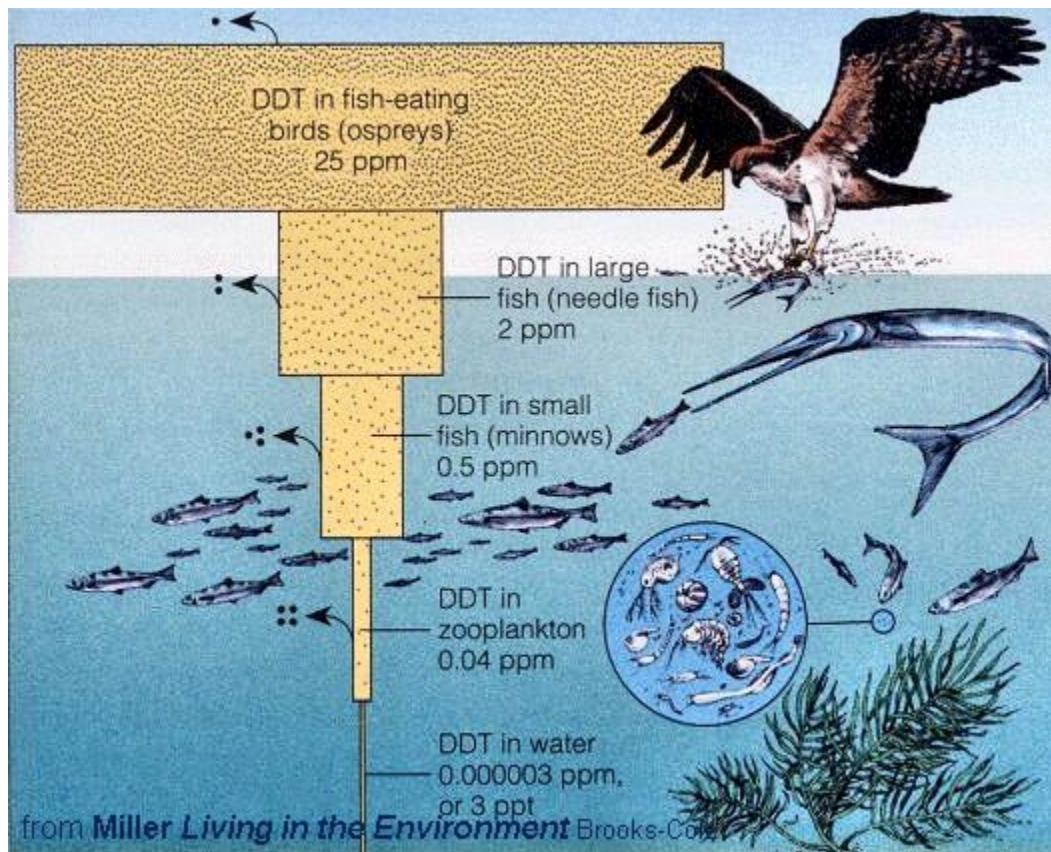
Early pesticides included the use of toxic inorganic metallic salts such as copper sulfate, lead salts, arsenic, or mercury. These substances were generally effective against the intended pest, but also created some environmental problems because they also killed other beneficial organisms, and polluted water and soil resources used by man. Most early pesticides were non-biodegradable (meaning that they were not broken down within the ecosystem). As a result, these early pesticides began to accumulate in the environment, contaminating water and soil resources, eventually poisoning humans.

### **Modern Pesticides:**

By the twentieth century, chemists began to develop organic pesticides that were designed to be less toxic to man and more specific toward the intended pests. Although this was initially believed to be a step in the right direction, man soon discovered that the organic pesticides also caused unexpected environmental effects. Some of these pesticides were fat soluble. This characteristic led to a problem known as **bioaccumulation**.

As each organism feeds on one lower in the food chain, the fat soluble pesticide began to be concentrated in ever higher amounts as one moved toward the top of the food pyramid. Since every organism eats far more than its own body mass in food, the tiny amounts found in each organism in the lower levels of the food web began to accumulate in greater concentrations in species located at higher trophic levels.

One example of this problem is illustrated by the damage done to predatory birds as a result of bioaccumulation of DDT. As a result of this problem DDT has been banned from use in North America.



We classify pesticides as:

First Generation Pesticides – pesticides from natural sources. Example – nicotine extracted from plants is an insecticide.

Second Generation Pesticides – pesticides made in a laboratory, like DDT.