

Reading Selection**Notes Section****Interdependence of Life**

Selection adapted from *Science for All Americans*

Every species is linked with a **multitude** of others in an ecosystem. Plants provide food, shelter, and nesting sites for other organisms. For their part, many plants depend upon animals for help in reproduction (bees pollinate flowers, for instance) and for certain nutrients (such as minerals in animal waste products). All animals are part of food webs that include plants and animals of other species (and sometimes the same species). The predator/prey relationship is common, with its **offensive** tools for predators-teeth, beaks, claws, venom, etc. -and its **defensive** tools for prey-camouflage to hide, speed to escape, shields or spines to **ward** off, irritating substances to repel. Some species have become so adapted to each other that neither could survive without the other (for example, the wasps that nest only in figs and are the only the insect that can pollinate them).

There are also other relationships between organisms. Parasites get nourishment from their host organisms, sometimes with bad consequences for the host. Scavengers and decomposers feed only on dead animals and plants. And some organisms have mutually beneficial relationships -for example, the bees that sip nectar from flowers and incidentally carry pollen from from one flower to the next, or the bacteria that live in our intestines and **incidentally synthesize** some vitamins and protect the intestinal lining from germs.

But the interaction of living organisms does not take place on a passive environmental stage. Ecosystems are shaped by the non-living

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environment of land and water- solar radiation, rainfall, mineral concentrations, temperature, and topography. The world contains a wide diversity of physical conditions, which creates a wide variety of environments: fresh water and oceanic, forest, desert, grassland, tundra, mountain, and many others. In all these environments, organisms use **vital** earth resources, each seeking each its share in specific ways that are limited by other organisms. In every part of the **habitable** environment, different organisms **vie** for food, space, light, heat, water, air, and shelter. The linked and **fluctuating** interactions of life forms and environment compose a total ecosystem; understanding any one part of it well requires knowledge of how that part interacts with the others.

The interdependence of organisms in an ecosystem often results in approximate **stability** over hundreds or thousands of years. As one species **proliferates**, it is held in check by one or more environmental factors: **depletion** of food or nesting sites, increased loss to predators, or invasion by parasites. If a natural disaster such as flood or fire occurs, the damaged ecosystem is likely to recover in a **succession** of stages that eventually results in a system similar to the original one.

Like many complex systems, ecosystems tend to show cyclic fluctuations around a state of approximate equilibrium. In the long run, however, ecosystems inevitably change when climate changes or when very different new species appear as a result of migration or evolution (or are introduced deliberately or **inadvertently** by humans).