

## What is an ecosystem?

British botanist Roy Clapham (1904 -1990) created the term in 1930 to mean the combined physical and biological components of an environment. In 1935 British scientist Arthur Tansley (1871-1955)—who initially urged Clapham to coin the term—further refined it to mean “The whole system,...including not only the organism-complex, but also the whole complex of physical factors forming what we call the environment.”



**Figure 2.30:** Forest ecosystem. *Source: Todd Berget*

Today we define an *ecosystem* as a community of living and non-living things that work together as a unit. It includes the cycle of energy flowing from the sun to plants, to animals that eat plants, to predators that eat animals, and returning to the earth through excretion, decay and death. It includes the geology of an area, the type of rocks, components of the soil, and chemistry of the water and atmosphere. And it incorporates the climate, the amount of solar radiation, precipitation, and types of weather patterns. Central to the ecosystem concept is that *living organisms interact with the*

*other elements of their environment.* Ecosystems range in size from microscopic to global, to cosmic, and each can be part of larger ecosystems. While Upper Waterton Lake can be considered an ecosystem in itself, it is also part of the larger mountain, highland, and freshwater wetland ecosystems, the Flathead Watershed ecosystem, and the Crown of the Continent ecosystem.

Humans tend to put boundaries around ecosystems in order to study, understand, and describe them. However these artificially imposed boundaries are transparent and meaningless to the species residing within them. A large mammal that is protected in one ecosystem may be a pest in another, or a prize to hunters in still another. Yet this animal roams, feeds, and mates unaware of these boundaries. A bird of prey may breed in the northern fringes of a continent in the spring, yet return south to its wintering grounds in autumn, migrating between—and being part of—vastly diverse ecosystems to survive. The river by which the bird nests is considered a small part of the larger continental ecosystem in which the bird thrives.

As humans play an integral role in the ecosystems in which we live, we are constantly challenged in our efforts to comprehend, manage, and protect them. Over 50 years ago, visionary ecologist Aldo Leopold conceived many of the ideas that led to the development of current day ecosystem management. Today, most U.S. and Canadian agencies embrace “ecosystem management” in their policies. This includes a wide range of ideas and practice informed by scientific knowledge, ongoing research, natural boundaries, and human values.