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## Introduction to Aquatic Ecology

**Ecology** is the scientific study of how organisms interact with each other and with their environment. This includes relationships between individuals of the same species, between different species, and between organisms and their physical and chemical environments. **Aquatic ecology** includes the study of these relationships in all aquatic environments, including oceans, estuaries, lakes, ponds, wetlands, rivers, and streams.

An **ecosystem** is a community of living organisms and their physical and chemical environment, linked by flows of energy and nutrients. Ecosystems function as a discrete ecological unit, and can be defined at a variety of scales. For example, the Athabasca River basin can be considered an ecosystem, as can a small pond, a log, or the entire planet. The boundaries of an aquatic ecosystem are somewhat arbitrary, but generally enclose a system in which inflows and outflows can be estimated. Ecosystem ecologists study how nutrients, energy, and water flow through an ecosystem.

The physical characteristics of aquatic habitats affect the types of organisms found there. Living organisms in a particular environment are directly affected by environmental characteristics such as nutrient concentrations, temperature, water flow, and shelter. Only the organisms that are able to survive in the conditions of a particular habitat and use the resources available there will thrive. Interactions between living organisms also affect the type of organisms found in an aquatic ecosystem, as competition for resources (e.g., food, habitat) and predation affects species abundance and diversity. In turn, the living organisms in an environment can influence some aspects of their environment (e.g., beaver dams can change water flows).

Understanding the basic components of aquatic ecosystems and the interaction among living organisms and their environment can lead to better management of human impacts on these systems.



Lakes, ponds, wetlands, rivers, and streams are all important aquatic environments in the lower Athabasca region.

Source: Hatfield Consultants 2009  
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