



SeaWorld/Busch Gardens Ecology & Conservation Background Information

What is Ecology?

Ecology is a study of relationships. Ecology is the study of the interrelationships between living things and their environment. Important aspects of ecology include adaptations and natural selection.

To study ecology, we examine ecosystems. An ecosystem is a unit of plants, animals, and nonliving components of an environment that interact. Their interrelationships determine each species' form and survival.

What is an environment? The term environment refers to the total surroundings and forces that act upon a living thing. These surroundings include physical factors such as light, heat, water, weather, and structure of the earth. These surroundings also include other plants and animals.

Adaptations are body parts or behaviors. Adaptations are body parts or modifications of a species that make it more suited to live in its environment. Adaptations help a species to survive so that it can reproduce. They may make the animal better at moving, feeding, hearing, smelling, surviving when food is scarce, escaping predators, reproducing, etc.

For example, flippers, flukes, and a blowhole are some of a whale's adaptations. Whales are adapted for life in the sea with flippers and flukes for swimming and a blowhole directed toward the water's surface for breathing.



A walrus lives in the arctic ecosystem. Tusks are an adaptation for helping a walrus pull itself up onto an ice floe.

Survival and Natural Selection

To eat ... or to be eaten? Every animal must eat to survive, and in every ecosystem there are predators and prey. To understand the relationship and delicate balance between predators and prey, scientists use a tool called a food chain. A food chain is a diagram that

shows the transfer of energy via "who eats whom" in an ecosystem.

In a single ecosystem there may be many food chains that interconnect in many ways. A combination of food chains in an ecosystem is called a food web. Food webs show us that if one population is impacted by environmental changes, many others will also be affected.

Which ones will survive? Natural selection refers to processes that result in the survival and reproduction of individuals best suited for the environment.

All animals tend to produce more offspring than the environment can sustain. Not all individuals can survive. Some fish lay millions of eggs, only a few of which live to be adult fish and reproduce. But which ones will survive?

Variety is the spice of life—and the basis for natural selection. Individuals within a population are not all exactly the same. Genetically, they vary. Individuals with favorable variations survive, and those with less favorable variations die. Survivors reproduce others with favorable traits.

This way, plants and animals whose biological characteristics better fit them for their environment are better represented in future generations. So through successive generations, gradual and continuous changes occur in the population.

Conservation

Environments change, too. Some changes are short term, such as the change between summer and winter. Other changes occur gradually over time, such as the end of the ice ages. When the environment changes, different adaptations are beneficial. Individuals without the necessary adaptations die.

When environmental changes occur too quickly, and populations don't have time to adapt, species can go extinct.

You're a part of your ecosystem. Humans interact with the ocean ecosystem. We use the ocean for transportation, harvesting food and minerals, and recreation. And because all water eventually reaches the ocean, the things we do on land also affect the oceans.

Some of our interactions with the ocean ecosystem can be harmful. In the past, humans have destroyed habitats, dumped various pollutants into the ocean, and overharvested certain animals.

Human activities can speed up environmental changes. By changing the environment quickly and radically, we can completely destroy a habitat for which an animal is adapted. The environment we leave behind may be so different from the animal's habitat that the animal lacks the adaptations necessary to survive there. If there are no members of the



Coral reef habitats are some of the most diverse in the world. Unfortunately, some areas are also the most endangered. Off-shore pollution, oil spills, dredging, and increased recreation have harmed reefs off Florida, in the Caribbean and off Australia.

population that can survive the environmental change, the entire population will become extinct.

When we divert water into cities for drinking... when we build a marina... when we fish... if we purchase seashells or walrus ivory... even when we flush the toilet, we are interacting with the ocean ecosystem.

Taking care of our ecosystem. Applying our knowledge of ecology to the wise management of resources is called conservation. Conservation means taking care of the environment by wisely managing its resources. You can do this by interacting with the ecosystem in responsible ways. You are conserving when you observe fishing limits, when you recycle, and when you vote on laws to conserve resources.

As we consider using ocean resources, we must also recognize that we are a part of this ecosystem. We have the responsibility to study our ecosystem and learn how it works so that we know how our interactions will affect it. The more we know about an ecosystem, the better we can predict how our actions might affect it. This knowledge is important when we make decisions about how we may or may not use ocean resources.



Historically hunted for their fur, sea otters are now protected. They still face threats from oil spills and entanglements in gill nets.