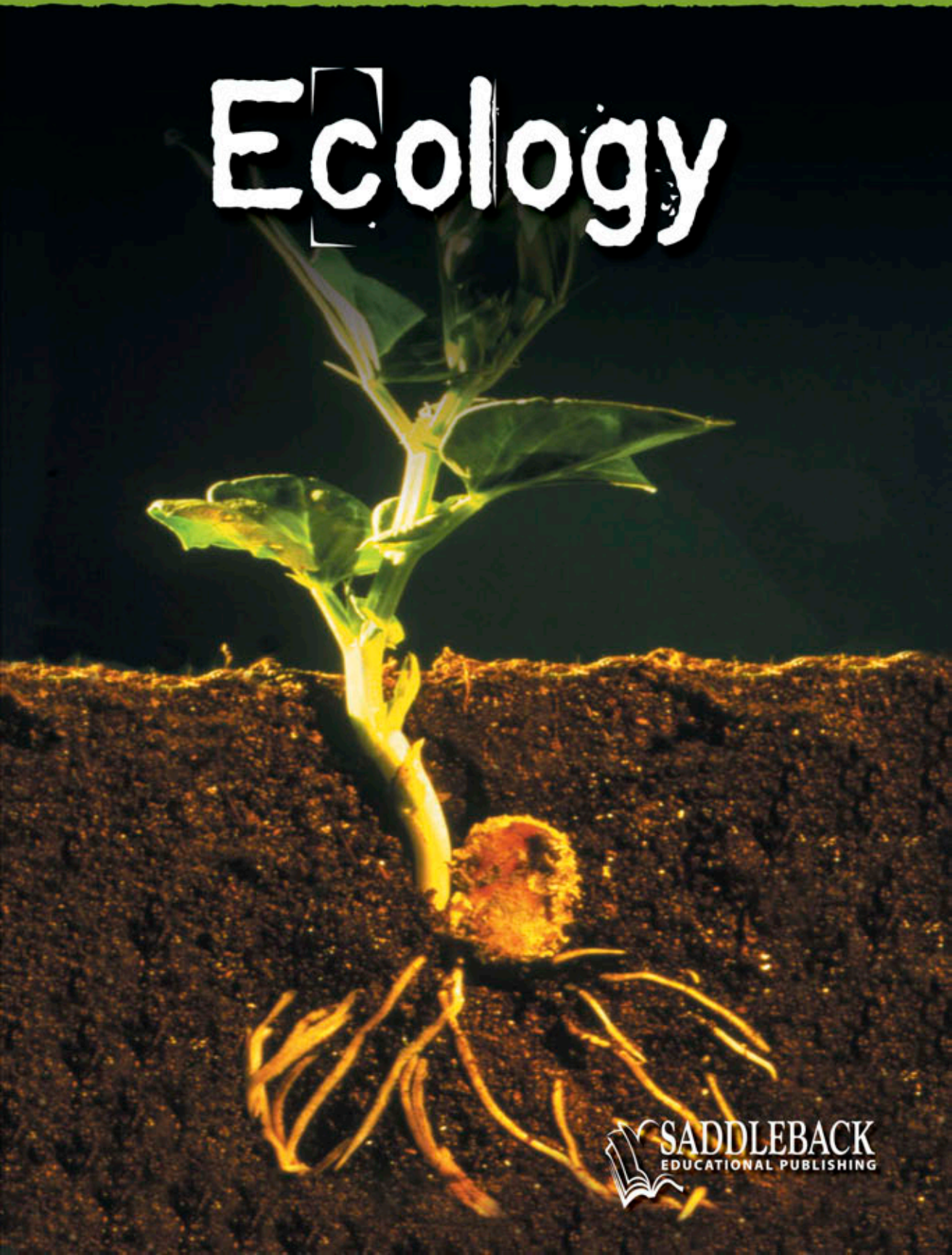
DISCOVERY SERIES

Ecology



SADDLEBACK
EDUCATIONAL PUBLISHING

CONTENTS

SADDLEBACK EDUCATIONAL PUBLISHING

Copyright © 2010

www.sdlback.com

LIVING IN HARMONY

Tribal people in South America have lived in harmony with their rainforest environment for thousands of years. They only take from the forest what they need to live. This ecological balance is now being threatened and tribespeople are gradually leaving their rainforest home.

ECOLOGY

By
TERRY JENNINGS

INTERDEPENDENCE

Interdependence (in • tər • də • **pen** • dənts) means the way in which living organisms depend on each other in order to stay alive, grow, and breed. Bees, for example, depend on pollen and nectar from flowers for their food. Flowers, in turn, depend on bees to fertilize them so that they can produce seeds to make more flowering plants. Plants, in turn, produce oxygen gas, which all organisms need to live.

WHAT IS ECOLOGY?

Nothing in the natural world lives entirely on its own. Every living thing, or *organism* (**ōr** • gə • ni • zəm), is affected by its surroundings. It is also affected by the other plants and animals around it. Environmental *factors* have an effect on animal and plant life. These factors include temperature, light, water, air, soil, and the weather. Living things also affect each other. The study of these relationships is called *ecology* (ē • **kä** • lə • jē). Ecologists try to find out how animals and plants fit into the world around them. The scientists also want to know how different organisms are connected to and work with other species.

BIOMES

Ecologists divide the living world up into units called *biomes* (**bī** • ōmz). Biomes are shaped mainly by climate. They share the same types of plant life. Some of the main biomes include deserts, mountains, tropical rainforests, tropical grasslands, temperate forests, *coniferous* (kə • **ni** • fə • rəs) forests, and polar regions.

SCIENCE EXPLAINED: PRODUCTIVITY

Ecologists call the speed at which living things grow and breed productivity. Productivity is different in different places. Hot, dry areas such as the Sahara Desert are not very productive. Neither are the very cold regions of the Antarctic continent. The most productive ecosystems of all are tropical rainforests. The warm, wet conditions are perfect for the growth of plants. These plants provide food for huge numbers of animals.

ECOSYSTEMS

An *ecosystem* (ē • kō • sis • təm) is not just the plants and animals living in an area. In the case of a rainforest, it is made up of the trees, soil, air, water, minerals, and climate. It also includes the bacteria, *fungi* (**fung** • gī), plants, birds, insects, reptiles, and other organisms that live there. In a single ecosystem there may be hundreds or even thousands of species.

HABITATS

A *habitat* is any place where a group of organisms can live. Ponds, streams, rock pools, and prairies are all habitats. Large habitats, like forests, are made up of many smaller habitats. Each species of wild plant and animal has adapted to live in a particular habitat. Penguins, for example, are perfectly suited to their polar environment. They have flippers that allow them to swim through the water to catch fish. They also have thousands of tiny feathers and a layer of fat under their skin that allows them to handle the severe cold of the Antarctic.

BIODIVERSITY

All around the world, ecologists are naming and counting every kind of living organism. This helps us to understand the amazing variety of life on Earth. It also shows us how living things have changed over time. So far, ecologists have found and described more than 1.5 million different *species* (types of animals or plants). They include all kinds of plants and animals, fungi, bacteria, and other simple forms of life. No one knows the total number of species on Earth. It could be as many as 10 to 15 million. New species are discovered every week. This incredible variety of life is known as *biodiversity* (bī • ō • də • **vər** • si • tē).

NIGHT VISION

Many flying insects, including most moths and *praying mantises* (**prā** • yēng **man** • tə • səs), are active only at night. In order to study the numbers and varieties of these insects, ecologists sometimes use special light traps. These traps give off a faint, bluish light. The light is hardly visible to the human eye. Insects are attracted to it because their eyes are very sensitive to the light's wavelength. The insects are caught, identified, recorded, and then released.

SURVEYING VEGETATION

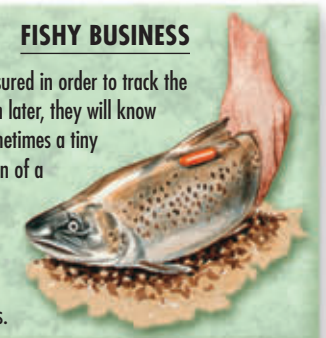
Ecologists spend a great deal of time mapping vegetation. *Vegetation,* or plant life, can change for natural reasons or because of human actions. Some areas, such as forests, deserts, and mountains, are very large or difficult to get to. Ecologists may use photography from an aircraft or a satellite to help them map these regions. Certain types of satellite photographs show different plants and vegetation in different colors, as in this image of Hawaii.

TRICKS & METHODS

To be good at their work, ecologists need to observe, measure, and record all the different parts of the area they are studying. They must count or map the different species of plants and animals. They also need to record where the organisms grow, their movements, and how they live, feed, and breed. Then they must measure the physical features of the environment. These features include soil moisture and acidity, temperature, wind speed, light intensity, and humidity. By comparing all these measurements and observations, ecologists can decide what conditions particular species need to survive. They also figure out what effects certain changes will have on the plants and animals in an ecosystem.

FISHY BUSINESS

Ecologists sometimes tag fish they have weighed and measured in order to track the fish's movement and growth. If the fish is caught again later, they will know how far it has traveled and how much it has grown. Sometimes a tiny radio *transmitter* (**tranz** • mi • tər) is fitted under the skin of a fish, or fixed to its tail. The fish is returned to where it was first caught and tracked by a boat. The boat has a radio receiver that picks up signals from the transmitter attached to the fish. Sometimes similar transmitters are used to track birds and larger land animals.

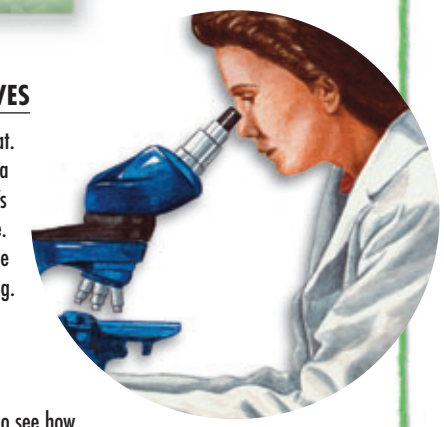


WATCHING WATER

Testing water for pollution is an important job for an ecologist. Sooner or later the water that we have used in our homes, schools, and factories finds its way into a river or the sea. This usually happens after it has been cleaned by a water treatment plant. But not all water is cleaned. *Polluted* (dirty) water is not always easy to spot. Ecologists regularly take samples of water from lakes, rivers, streams, and the sea. Back in the laboratory, they *analyze* (study) the water to see what chemicals it contains. Ecologists also regularly check on the wildlife living in the water. Any changes in wildlife population can mean the water is polluted.

FOOD DETECTIVES

It is important for an ecologist to know what foods wild animals eat. However, clues are not always easy to see. Ecologists have developed a *technique* (method) called fecal analysis to help them study an animal's diet. They collect the fresh droppings and put them into a preservative. Then, by examining tiny pieces under a microscope, they can see what the animal has been eating.



ALL CREATURES GREAT & SMALL

This ecologist is using a small trap called a Longworth trap. He wants to see how many mice, voles, snakes, and shrews are living in an area of woodland. Some nesting material and food is placed in the box part of the trap. Then, when a small animal enters, it steps on a trip wire that shuts the door of the trap. The next day the animal can be identified, weighed, measured, and then released. Sometimes a large number of such traps are set in a line across an area of forest, swamp, or prairie. They give a clear picture of what kinds of small animals are living there.