

Calumet Environmental Education Program

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What is biodiversity?

Important Dates:
Nov. 8th-
Educator Inquiry
Group at Washington
High School
March 28th-
Educator Inquiry
Group

The concept of biodiversity is a complex one even for scientists who have been studying it for decades. Therefore, no one should be discouraged in finding it hard to grasp. In its simplest form, biodiversity refers to the "full variety of life on Earth." This means that when we speak of biodiversity, which is short for biological diversity, we mean just that, the diversity of life. This definition, while very impressive and poetic, does not provide enough detail for us to be able to quantify biodiversity. And if we planning to use biodiversity as a measure of the quality or health of an area in order to make decisions about conservation, we need to be able to quantify it. In order to address this issue, scientists often divide biodiversity into three categories: habitat diversity, species diversity, and genetic diversity.

Habitat diversity refers to "the variety of places where life exists". Tall-grass prairies, old-growth forests, coral reefs, coastal wetlands; these are all habitats. They are unique assemblages of physical and biological components that support a variety of animals, plants, fungi, bacteria, and single celled organisms, that often can live no where else. The variety that exists in these places is the biggest level of biodiversity.

Species diversity refers to the number of different species found on the planet. It includes every species of ape, beetle, bird, fish, worm, mushroom, clam and many more. There are about 1.5 million named species on the planet. Scientists believe that there are anywhere between 5 and 15 million total species on Earth. In the family Hominidae, which includes gorillas, orangutans, chimpanzees, and humans beings, there are only 5 species. In the family Staphylinidae, the Rove beetles, there are over 3000 species just in the United States. The Rove Beetles contribute a lot more to species diversity than do the great apes.

Genetic diversity refers to the differences among individuals within species. For example, within domestic

dogs, there are a great variety of groups. Poodles are very different from beagles and beagles are very different from St. Bernards. Even though dogs can be amazingly different, all of them are members of the same species, *Canis familiaris*. Genetic diversity therefore does not refer to the genetic differences between species, but to the genetic differences between individuals of the same species.

The extinction of species is a natural process. Millions of species have gone extinct since the beginning of life on Earth. And millions have also been created through the process of evolution. But in the past

millennium, human beings have caused extinctions in numbers too large to be considered part of the natural process. Conservation efforts today focus on maintaining current levels of biodiversity, and ensuring that we do not continue to cause extinction in such large numbers, not just of species diversity, but of habitat and genetic diversity as well. Conservation efforts are often

focused on areas with high species diversity, such as tropical rainforests. But also of priority for conservation is habitat diversity, and a lot of effort is given to

*"Biodiversity is
the key to the
maintenance of the
world as we know
it."*

For more definitions and information on biodiversity see:

The Biodiversity Homepage for Chicago Wilderness:

www.chicagowilderness.org/biodiversity/

Three articles on defining biodiversity by prominent scientists:

www.defenders.org/bio-bi00.html

U.S. Fish and Wildlife Service's definition of biodiversity for kids.

<http://endangered.fws.gov/kids/biodivvs.htm>

The Field Museum's Projecter definition of biodiversity:

www.fimh.org/projecter/glossary.html

The Tree of Life, an online tree detailing the relationship between groups of animals, plants and more:

<http://tolweb.org/tree/phylogeny.html>

BEN is a clearinghouse for biodiversity education resources:

www.bioachet.org

World Wildlife Fund US Conservation Science Program:

www.worldwildlife.org/science

The Field
Museum

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Values of Biodiversity

Environmental conservation is a topic that is very personal to many people. It is important to know why environmental issues are important and understand them from a variety of perspectives. For some, conserving biodiversity is important from a practical standpoint. There are innumerable resources to be found in nature, from food crops to drugs to pest control, and we should maintain many of those available resources for us to call upon when necessary. This is a valid and logical reason to support conserving biodiversity. For others conserving biodiversity it is about responsibility. Humans have caused extinction in ways that were irresponsible, and now as a species we have to do our best to make up for that. For some it is simply love of nature. They love nature so much that they want to conserve biodiversity for the sake of biodiversity, not for any practical reason. For most people it is a combination of these reasons and more. What is important when we teach about biodiversity, is that we understand all of these values of nature. Much thought has been given by scholars to the idea of the value or worth of biodiversity. The following is a summary of values presented by Perlman and Adelson in their book "Biodiversity: Exploring Values and Priorities in Conservation." These values are more clearly described when we add sample statements of different types of worth that might be attributed to a large redwood tree, for example.

Use Values- Refer to the worth of items from direct or indirect use by humans

Direct Use Value- Value through direct consumption ("The redwood will be processed into timber.")

Indirect Use Value- Value through indirect consumption ("The redwood consumes carbon, which helps hold off global warming.")

Option Value- Value of maintaining the possibility of using a resource in the future ("We might want to cut this tree down for lumber 20 years from now.")

Nonuse Values- Values that represent the fact that individuals do not intend to use the items but would feel a "loss" if they were to disappear.

Existence value- The worth that one finds in knowing that an organism or ecosystem exists, even though we may never see it and get no direct use out of it. ("I have never seen a

redwood, but I get pleasure out of knowing they exist.")

Bequest Value- This value represents the worth that one gives to keeping an element of biodiversity intact for future generations. (" I get pleasure out of knowing that someday my grandchildren will see a redwood tree.")

Transformative/Amenity Value- These are values given to elements of biodiversity that express their potential to inspire or change your view about life. (" I am inspired every time I see a redwood. My view of the world and my life changed when I first saw a redwood, it inspired me to be less materialistic.") ■

Calumet: A stunning array of Biodiversity

On a cloudy Friday afternoon, August 23, 2002, over one hundred and fifty scientists gathered on the shores of Wolf Lake, waiting to begin what promised to be a very exciting day. Twenty-four hours later, exhausted and dirty, they gathered again, having completed what for most of them was their first BioBlitz.

The results of the BioBlitz have not been finalized but at the moment over 2,500 species have been counted. Over 900 species of vascular plants, 110 species of birds, 419 species of beetles, and 83 species of algae inhabit Eggers Woods, Powderhorn Lake, and Wolf Lake. In addition to these numbers, there are 100 species of wasps and over 150 kinds of butterflies and moths that live in these areas. If over 2500 species were found in 24 hours, imagine how many would have been found if they had searched for 48 or 72 hours. These results reflect only a portion of the biodiversity of Calumet, there is even more to discover.

All of this biodiversity exists in your backyard. Among the abandoned steel mills, the piles of slag, the trucks and barges, lay remnants of prairies and wetlands that continue to support an amazing array of wildlife. ■

