

Calumet Environmental Education Program

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Understanding Calumet's Biodiversity

When we look around at the landscape of Calumet, we see many different habitats: the wetlands of Powderhorn Lake, the industrial sites and landfills, the woodlands of Eggers Woods, homes and neighborhoods, school lots and parks, rivers, parking lots and businesses, and even the prairies of Marian R. Byrnes (Van Vlissingen) Natural Area. Within these sites exist some of the most diverse and unique living communities. To fully grasp the characteristics of Calumet today, we must understand its natural history as well as the development and environmental destruction it has undergone, and how we can begin to rebuild with further understanding. A good place to start is with the concept of biodiversity, and why it is an important indicator of the environmental health of a particular region.

Biodiversity, short for **biological diversity**, is a term that encompasses diversity within ecosystems, species, and genes. Calumet is extraordinarily biologically diverse, which results mainly from our glacial history. The region's habitats were formed as a result of the Wisconsin glacier, which melted roughly 14 thousand years ago. As a result of this glacier, the Calumet area is comprised of three varied ecosystems: woodlands, wetlands, and prairies. The term **ecosystem diversity** refers to the differences between these three ecological units and others, such as the amount of rainfall, the fertility of the soil, and the types of organisms that reside within them.

Species diversity is the variety of species that exist within one particular habitat. For instance, within Hegewisch Marsh, species diversity includes the many turtles, snakes, beetles, birds, spiders, squirrels, trees, flowers,



Photo by Dick Todd

Biological Diversity encompasses diversity within ecosystems, species and genes.

grasses and more that all make their home in the marsh.

Genetic Diversity is what makes us as humans different from each other, in our looks and our abilities. This is also found in all species on earth providing

variation between individuals with the population. This genetic diversity helps species survive because individuals within the populations may be better adapted to environmental conditions keeping the species alive.

Why is Biodiversity so important?

Biodiversity is a central concept in understanding how life is sustained over time. Differences within species and between species have kept ecosystems alive for thousands of years. Changes due to weather, natural disasters, invasive species, and other processes can easily destroy many organisms, but if a diversity of organisms and species exists, it is more likely that some will survive.

Generally recognized uses and values of biodiversity have been split into four main

Important Dates

November 7
Inquiry Group
8:00-11:30am

November 8 & 11
Biodiversity Basics

January 24
Illinois Natural
History Survey
Purple Loosetrife
Workshop



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categories: direct use values, ecosystem services, recreation and aesthetics, and non-use (or indirect use) values.

Direct use values are methods of using organisms for our benefit specifically. Before Europeans came to the Chicago area, Native Americans in Calumet used basswood tree root to soothe burns and other plants for medicinal purposes.



Photo by Chicago Zoological Society

Sustainable usage of our resources in order to provide similar resources for future generations is also incorporated into direct use values.

Ecosystem services are

natural cycles within an ecosystem that benefit and incorporate members of that ecosystem, therefore allowing it to function and provide resources. In Calumet, many of the wetlands provide services such as filtering excess nutrients and chemicals out of surface water runoff, as well as regulating water levels and thus protecting us and other land dwellers from flooding and droughts.

The recreational and aesthetic value of biodiversity is explored through hiking, canoeing, baseball in the park, bird watching, photography, and other countless activities that we enjoy while spending time in green spaces.

Other values that we find in biodiversity, loosely categorized as indirect use values, are more abstract. These are values that aren't tangible but nonetheless can be shared, such as the way we feel when we learn about other organisms that are part of varied ecosystems, or knowing that natural areas will exist for thousands of years to come, or the inspiration that people garner from flowers, trees, or seeing a bird fly over head. It is often as simple as sitting in a park and feeling connected to the living organisms around us.

The elements of biodiversity in Calumet combine to create habitat for a unique and diverse group of species (2,257 species were sighted during the 24 hour BioBlitz on August 23-24, 2002), and they can all be appreciated and respected in many different ways. One thing that we all have in common is our interest in sustaining biodiversity so it can sustain future inhabitants, such as our children and our children's children, for years to come, as it already has for thousands of years.

Threats to Biodiversity

Since biodiversity is the basic building block for life over time, any alterations in an ecosystem can substantially change and affect its biodiversity. Especially in the past few hundred years, human industrial and municipal development has created a struggle for maintaining biodiversity in varied ecosystems, within communities and populations, and within particular species. The World Wildlife Fund teaches that the effects of humans on biodiversity can be summed up by five concepts that can be remembered by the acronym "HIPPO":

Habitat Fragmentation is a prevalent problem for migratory birds in Calumet. When native habitats are isolated into pieces with no "corridors" connecting them, species are more susceptible to the effects of living near habitats that they are not used to, as well as more vulnerable to intruders. Habitat destruction is a subset of this, especially in North America where less than 1 percent of our native tall grass prairie remains, and less than 5 percent of the primary forest remains in the continental U.S.

Invasive Species, such as purple loosestrife, garlic mustard, and zebra mussels decrease biodiversity by taking over an ecosystem. When a non-native species is introduced into an ecosystem (for example, zebra mussels were brought into the Great Lakes on the underside of ships from Europe), it has no natural predators and its population may grow, unchecked, and consume the resources that native species usually consume.

Pollution is any unnaturally occurring substance, from car exhaust to chemical

Threats to Biodiversity

Habitat Fragmentation

Invasive Species

Pollution

Population Growth

Over Consumption



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"I know of no other place in the region where the skies are so constantly filled with birds across such a wide front. In this respect the Calumet is almost maritime. Far from an ocean, of course, it is but the tatters of a once great marsh-- a marsh that refuses to die." -Joel Greenberg from his book [A Natural History of the Chicago Region](#)



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dumping, that affects an ecosystem's organisms. For example, steel companies would fill wetlands with slag, the by-product of steel manufacturing, which destroys plant growth.

Population Growth has only recently become a problem for humans. As our population grows, we use more and more resources and habitat that would be sustaining other species.

Over consumption is a tendency that combines with population growth to use up arguably more resources than necessary from the habitat around us. This can upset a natural balance in a particular ecosystem, causing the biodiversity to decline. An example of this is our over consumption of disposable materials which increases our reliance on landfills to deal with the waste we create, which takes up a lot of space and often pollutes the area around the landfill itself.

We should be aware of these trends, and how, why, and where they cause biodiversity to decrease. In Calumet, many of these issues have been brought to attention for many reasons, one of which is conservation of biodiversity. The biodiversity that exists in Calumet is incredibly important, teaching us daily that awareness and appreciation of biodiversity can be shared throughout our communities. ■

Sources:

"Biodiversity Recovery Plan," Chicago Wilderness, Chicago: 1999.

"The Calumet Area Ecological Management Strategy," Chicago Department of the Environment, Chicago: 2002.

"Calumet Ecological Park Feasibility Study," National Park Service: 1998.

Greenberg, Joel. [A Natural History of the Chicago Region](#). University of Chicago Press, Chicago: 2002.

Harms, Valerie. [Almanac of the Environment](#). Grossett-Putman Books, New York: 1994.

Illinois State Museum: www.museum.state.il.us

"What's the Status of Biodiversity?" World Wildlife Fund
www.worldwildlife.org/windows/statusbiod.html



Photo by Forest Preserve District of DuPage County

For Further Reading:

The Biodiversity Homepage for Chicago Wilderness
www.chicagowilderness.org/biodiversity

Illinois Department of Natural Resources, education projects and materials
<http://dnr.state.il.us/lands/education/>

Illinois Natural History Survey, Center for Biodiversity
<http://www.inhs.uiuc.edu/cbd>

Great Lakes Information Network, habitats and native species
<http://www.great-lakes.net/envt>

World Wildlife Fund, biodiversity resources, HIPPO and impacts
www.worldwildlife.org/windows/statusbiod.html

Illinois EcoWatch Network, citizen scientist programs in Illinois
<http://dnr.state.il.us/orep/ecowatch>

CEEP, Calumet's ecosystems, cultural and historical roots
www.fmnh.org/ceep

Tree of Life, scientific description of species and their relations
www.tolweb.org

The Sierra Club Calumet Wetlands, past projects and links
<http://illinois.sierraclub.org/calumet>

Fun Website for Kids

World Wildlife Fund, Biodiversity 911, online activities
www.biodiversity911.org

The Sacred Balance Community Education Guide (Enclosed)

The activities in this booklet, which is meant to accompany a PBS television series, relate well to the biodiversity and community involvement themes of *Mighty Acorns*, *Earth Force*, and *UrbanWatch*. Consider using the activity *What Goes Around Comes Around* on page 8, and Nature's Air Conditioner when teaching about concepts related to *Matter Cycles* or *Oxygen Makers* on page 12 or *Enriching the Earth* on page 13 to teach about Life Webs. *A Community Web* on page 17 would be a great activity to introduce students to organizations in their community, and may be particularly useful to teachers working with the *Earth Force* program.

New Educator Resources Available from the IDNR

"Biodiversity of Illinois" CD-ROMs

CD-ROMs are now available free of charge to individual educators in Illinois. The field guide design offers full-color images, life history information, sounds, tracks, Illinois range, status, habitat descriptions and images and more. Information from the CD-ROMs can be printed. The CD-ROMs run on both Windows® and Macintosh® operating systems. [Grades 5-10]

Biodiversity of Illinois, Volume I: Aquatic Habitats CD-ROM
400 Illinois species and nine Illinois aquatic habitats are features

Biodiversity of Illinois, Volume II: Woodland Habitats CD-ROM
409 Illinois woodland species and four Illinois woodland habitats are included

Biodiversity of Illinois, Volume III: Prairie and Edge Habitats CD-ROM
505 Illinois species and seven prairie and edge habitats are included

Other new CD-ROMs with lessons, student activities, videos and more. (Limit one per educator and requests must be sent on school letterhead with grade levels noted)

"Kids for Trees" grades K-3
"Wild Mammals of Illinois" grades 4-6
"Illinois Birds" grades 4-6
"Aquatic Illinois" grades 5-9
"Illinois Biodiversity" grades 5-10

"Illinois Common Birds" and "Illinois Endangered and Threatened Birds"

Each two-sided poster depicts 25 species of birds along with the life history information for each species and other topics on the back. (Limit of two copies of each poster per educator)

"Illinois Trees: An Identification and Activity Book"

This new activity book is designed to supplement the information provided in the "Illinois Trees: Seeds and Leaves" poster. Students will become familiar with identification characteristics of leaves. It is not necessary to have a copy of the "Illinois Trees: Seeds and Leaves" poster to complete the activity book, but the posters are available upon request.

"A to Z from a Tree"

This is a new tree products poster with a 24"x 36" format for the educator and an 11" x 17" coloring sheet for the student. (Limit 2 large posters per educator)

To order the activity book, posters or CD-ROMs, contact the IDNR Division of Education:

Include the following information:

Title(s) of materials requested:

Your Name with Grade Levels:

Name and Mailing address of school:

Email: teachkids@dnrmail.state.il.us or **Write to:**

IDNR Division of Education

One Natural Resources Way

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