

## Habitats and Ecosystems Tour, Cedar Bog

### Description and Curriculum Resources

<b>Tour:</b>	Habitats and Ecosystems
<b>Availability:</b>	Wednesday, Thursday, and Friday September, October, April, May, June 9:30 a.m. – 2:30 p.m.
<b>Time Allowance:</b>	1 to 1½ hours on site
<b>Cost:</b>	\$3.00 admission per student
<b>Grades:</b>	Adaptable to all grades Maximum 100 students

#### **Description:**

Food webs; biotic and abiotic factors; succession; adaptations; energy flow and population dynamics will be explored in detail during this guided tour.

The bog is accessible by a mulch path and boardwalks; wheelchairs will need assistance. Please ask for parent volunteers to help with students on the trail. The students need to understand that field trips are an extension of classroom learning. Classroom rules still apply. Cedar Bog staff cannot conduct a tour and discipline the students as well.

Tours will occur regardless of the weather, except in the event of severe storms with high winds, thunder and lightning. Boardwalks may be slippery at any time of the year.

#### **Science Academic Content Standards Addressed:**

##### **Earth and Space Sciences (Earth Systems)**

**3<sup>rd</sup>.** Investigate the properties of soil (e.g., color, texture, capacity to retain water, ability to support plant growth)

**5<sup>th</sup>.** Explain how the supply of many non-renewable resources is limited and can be extended through reducing, reusing, and recycling, but cannot be extended indefinitely.

**7<sup>th</sup>.** Analyze data on the availability of fresh water that is essential for life and for most industrial and agricultural processes. Describe how rivers, lakes and groundwater can be depleted or polluted becoming unavailable or unsuitable for life.

**7<sup>th</sup>.** Describe how temperature and precipitation determine climatic zones (biomes) (e.g., desert, grasslands, forests, tundra and alpine).

##### **Earth and Space Sciences (Processes that Shape Earth)**

**4<sup>th</sup>.** Describe how wind, water and ice shape and reshape Earth's land surface by eroding rock and soil in some areas and depositing them in other areas producing characteristic landforms (e.g., dunes, deltas and glacial moraines).

##### **Earth and Space Sciences (The Universe)**

5<sup>th</sup>. Describe the characteristics of Earth and its orbit about the sun (e.g. three-fourths of Earth's surface is covered by a layer of water [some of it frozen], the entire planet surrounded by a thin blanket of air, elliptical orbit, tilted axis and spherical planet).

### **Life Sciences (Characteristics and Structure of Life)**

2<sup>nd</sup>. Identify that there are many distinct environments that support different kinds of organisms.

2<sup>nd</sup>. Explain why organisms can survive only in environments that meet their needs (e.g., organisms that once lived on Earth have disappeared for different reasons such as natural forces or human-caused effects).

### **Life Sciences (Diversity and Interdependence of Life)**

2<sup>nd</sup>. Investigate the different structures of plants and animals that help them live in different environments (e.g., lungs, gills, leaves and roots).

2<sup>nd</sup>. Compare the habitats of many different kinds of Ohio plants and animals and some of the ways animals depend on plants and each other.

3<sup>rd</sup>. Classify animals according to their characteristics (e.g., body coverings and body structure).

4<sup>th</sup>. Classify common plants according to their characteristics (e.g., tree leaves, flowers, seeds, roots and stems).

5<sup>th</sup>. Describe the role of producers in the transfer of energy entering ecosystems as sunlight to chemical energy through photosynthesis.

5<sup>th</sup>. Explain how almost all kinds of animals' food can be traced back to plants.

5<sup>th</sup>. Trace the organization of simple food chains and food webs (e.g., producers, herbivores, carnivores, omnivores and decomposers).

5<sup>th</sup>. Summarize that organisms can survive only in ecosystems in which their needs can be met (e.g., food, water, shelter, air, carrying capacity and waste disposal). The world has different ecosystems and distinct ecosystems support the lives of different types of organisms.

5<sup>th</sup>. Support how an organism's patterns of behavior are related to the nature of that organisms present, the availability of food and resources, and the changing physical characteristics of the ecosystem.

5<sup>th</sup>. Analyze how all organisms, including humans, cause changes in their ecosystems and how these changes can be beneficial, neutral or detrimental (e.g., beaver ponds, earthworm burrows, grasshoppers eating plants, people planting and cutting trees and people introducing a new species).

7<sup>th</sup>. Investigate how organisms or populations may interact with one another through symbiotic relationships and how some species have become so adapted to each other that neither could survive without the other (e.g., predator-prey, parasitism, mutualism and commensalism).

7<sup>th</sup>. Explain that some environmental changes occur slowly while others occur rapidly (e.g., forest and pond succession, fires and decomposition).

7<sup>th</sup>. Explain that photosynthetic cells convert solar energy into chemical energy that is used to carry on life functions or is transferred to consumers and used to carry on their life functions.

**Physical Sciences (Nature of Energy)**

5<sup>th</sup>. Define temperature as the measure of thermal energy and describe the way it is measured.

**Science and Technology (Understanding Technology)**

5<sup>th</sup>. Investigate positive and negative impacts of humans activity and technology on the environment.

**Science and Technology (Abilities to do Technological Design)**

5<sup>th</sup>. Explain how the solution to one problem may create other problems.

**Scientific Inquiry (Doing Scientific Inquiry)**

1<sup>st</sup>. Ask “what happens when” questions

1<sup>st</sup>. Explore and pursue student-generated “what happens when” questions

5<sup>th</sup>. use evidence and observations to explain and communicate the results of investigations.

**Scientific Ways of Knowing (Nature of Science)**

5<sup>th</sup>. Identify how scientists use different kinds of ongoing investigations depending on the questions they are trying to answer (e.g., observations of things or events in nature, data collection and controlled experiments).

**Scientific Ways of Knowing (Science and Society)**

5<sup>th</sup>. Identify a variety of scientific and technological work that people of all ages, backgrounds and groups perform.

**Social Studies Academic Content Standards Addressed:**

**History (Chronology)**

5<sup>th</sup>. Create time lines and identify possible relationships between events.

5<sup>th</sup>. Explain the impact of settlement, industrialization and transportation on the expansion of the United States.

**People in Societies (Cultures)**

5<sup>th</sup>. Compare the cultural practices and products of diverse groups in North America including: artistic expressions; religion; language; food; clothing; shelter.

**Geography (Places and Regions)**

5<sup>th</sup>. Describe and compare the landforms, climates, population, vegetation and economic characteristics of places and regions in Ohio.

**Geography (Human Environmental Interaction)**

5<sup>th</sup>. Identify how environmental processes (i.e., glaciation and weathering) and characteristics (landforms, bodies of water, climate, vegetation) influence human settlement and activity in Ohio.

5<sup>th</sup>. Identify ways that people have affected the physical environment of Ohio including: use of wetlands, use of forests; building farms, towns and transportation systems; using fertilizers, herbicides and pesticides; building dams.

5<sup>th</sup>. Explain how the characteristics of different physical environments affect human activities in North America.

5<sup>th</sup>. Analyze the positive and negative consequences of human changes to the physical environment including: Great Lakes navigation; highway systems; irrigation; mining; and introduction of new species.

### **Geography (Places and Regions)**

5<sup>th</sup>. Describe and compare the landforms, climates, population, culture and economic characteristics of places and regions in North America.

5<sup>th</sup>. Explain how climate is influenced by: Earth-sun relationships; landforms; vegetation.

### **Citizenship (Rights and Responsibilities)**

5<sup>th</sup>. Explain the obligation of upholding the U.S. Constitution including: obeying laws; paying taxes; serving on juries.

### **Social Studies Skills and Methods (Thinking and Organizing)**

5<sup>th</sup>. Draw inferences from key relevant information.

### **Social Studies Skills and Methods (Problem Solving)**

5<sup>th</sup>. Use a problem-solving/decision –making process which includes: identifying a problem; gathering information; listing and considering options; considering advantages and disadvantages of options; choosing and implementing a solution; developing criteria for judging its effectiveness; evaluating the effectiveness of the solution.

### **Habitats and Ecosystems Glossary:**

**abiotic.** Non-living.

**adaptation.** Adjustment to environmental conditions, modifications of an organism or its parts that makes it more fit for existence under the conditions of its environment.

**biogeochemical cycles.** Relating to the partitioning and cycling of chemical elements and compounds between the living and nonliving parts of an ecosystem.

**biological evolution.** Changes in the genetic composition of a population through successive generations.

**biomass.** The amount of living matter.

**biome.** Major ecological community (tropical rain forest, grassland, or desert).

**biotic.** Relating to life.

**capacity.** The maximum amount or number that can be contained or accommodated.

**characteristic.** A distinguishing trait, feature, quality, or property.

**classification.** Systematic arrangement in groups or categories according to established criteria.

**community.** Interacting populations that live in a defined habitat.

**conservation.** A careful preservation and protection of something; especially planned management of a natural resource to prevent exploitation, destruction, or neglect.

**consumer.** An organism requiring complex organic compounds for food, which it obtains by preying on other organisms or by eating particles of organic matter.

**cycle.** An interval of time during which a sequence of a recurring succession of events or phenomena is completed.

**decay rate.** The rate at which a radioactive isotope disintegrates until a final non-radioactive isotope is formed.

**decomposers.** Organisms such as bacteria and fungi that feed and breakdown dead organisms returning constituents of organic substances to the environment.

**diversity.** A great deal of variety.

**ecological.** The interactions and relationships between organisms and their environment.

**ecosystem.** The complex of a community of organisms and its environment functioning as an ecological unit.

**emigration.** A category of population dispersal covering one-way movement out of the population area.

**environment.** The complex of physical, chemical, and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival.

**evidence.** Facts or observations on which a conclusion can be based.

**evolution (biological).** Changes in the genetic composition of a population through successive generations.

**extinct.** A species of organisms that no longer exists.

**food chain.** An arrangement of the organisms of an ecological community according to the order of predation in which each uses the next usually lower member as a food source.

**food web.** The totality of interacting food chains in an ecological community; interacting food chains in an ecological community.

**glaciation.** To subject to glacial action in which a large body of ice moves slowly down a slope or valley, or spreads outward on a land surface.

**habitability.** Suitable for a dwelling place.

**habitat.** The place or environment where a plant or animal naturally or normally lives and grows.

**herbivore.** A plant-eating animal.

**heredity.** The sum of the qualities and potentialities genetically derived from one's ancestors; the relation between successive generations, by which characteristics persist.

**heritable.** Capable of being inherited or of passing by inheritance.

**landform.** A natural feature of a land surface.

**life.** An organism that has the capacity for metabolism, growth, reaction to stimuli, and reproduction.

**life cycle.** The series of stages in form and functional activity through which an organism passes from fertilized ovum to the fertilized ovum or the next generation.

**microorganisms.** An organism of microscopic or ultramicroscopic size.

**natural.** Existing in, or produced by nature.

**natural selection.** The principle that in a given environment individuals having characteristics that aid survival will produce more offspring, and the proportion of individuals having such characteristics will increase with each succeeding generation.

**observe.** To watch carefully, especially with attention to details or behavior for the purpose of arriving at a judgment.

**organic.** Compounds containing carbon and chiefly or ultimately of biological origin.

**organism.** An individual constituted to carry on the activities of life by means of organs separate in function but mutually dependent; a living being.

**pollution.** A substance that, when added to the environment causes the environment to be harmful or unfit for living things.

**predator.** An animal that lives by capturing prey as a means of maintaining life.

**prey.** An animal taken by a predator as food.

**producer.** Any of various organisms (such as a green plant) which produce their own organic compounds from simple precursors (such as carbon dioxide and inorganic nitrogen) and many of which are food sources for other organisms.

**reproduction.** The process by which organisms give rise to offspring and which fundamentally consists of the segregation of a portion of the parental body by a sexual or an asexual process, and its subsequent growth and differentiation into a new individual.

**resource.** Industrial materials and capacities (as mineral deposits and waterpower) supplied by nature (earth science) and substances used by an organism for survival (biology).

**respiration.** The physical and chemical processes by which an organism supplies its cells and tissues with the oxygen needed for metabolism and relieves them of the carbon dioxide formed in energy-producing reactions.

**species.** A group or organisms consisting of similar individuals capable of exchanging genes or interbreeding.

**system.** 1. A group of body organs that together perform one or more vital functions. 2. An organized group of devices, parts or factors that together perform a function or drive a process (weather systems, mechanical systems).

**technology.** Human innovation in action that involves the generation of knowledge and processes to develop systems that solve problems and extend human capabilities. The innovation, change, or modification of the natural environment to satisfy perceived human needs and wants.

**theory.** A supposition or a system of ideas intended to explain something, especially one based on general principles independent of the thing to be explained.

**trait.** An inherited characteristic.

Cedar Bog is operated by the Ohio Historical Society, a nonprofit organization that serves as the state's partner in preserving and interpreting Ohio's history, archaeology, and natural history.