

Introduced Species Tour, Cedar Bog Description and Curriculum Resources

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

Description:

How did all the bush honeysuckle start in the woods? Are Chicory and Queen-Anne's-Lace native wildflowers? On this tour, discover introduced species, their impacts on the native species, predator-prey relationships and population dynamics.

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 lightening. Boardwalks may be slippery at any time of the year.

Science Academic Content Standards Addressed:

Life Sciences (Characteristics and Structure of Life)

1st. Explore that organisms, including people, have basic needs which include air, water, food, living space and shelter.

2nd. Explain that animals, including people, need air, water, food, living space and shelter; plants need air, water, nutrients (e.g., minerals), living space and light to survive.

Life Sciences (Diversity and Interdependence of Life)

2nd. Explain that food is a basic need of plants and animals (e.g., plants need sunlight to make food and to grow, animals eat plants and/or other animals for food, food chain) and is important because it is a source of energy (e.g., energy used to play, ride bicycles, read, etc.).

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

3rd. Describe how changes in an organism's habitat are sometimes beneficial and sometimes harmful.

4th. Describe how organisms interact with one another in various ways (e.g., many

plants depend on animals for carrying pollen or dispersing seeds).

5th. 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.

5th. Support how an organism's patterns of behavior are related to the nature of that organism's ecosystem, including the kinds and numbers of other organisms present, the availability of food and resources, and the changing physical characteristics of the ecosystem.

5th. 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).

6th. Describe how organisms may interact with one another.

7th. 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).

7th. Explain how the number of organisms an ecosystem can support depends on adequate biotic (living) resources (e.g., plants, animals) and abiotic (non-living) resources (e.g., light, water and soil).

7th. Investigate how overpopulation impacts an ecosystem.

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

7th. Summarize the ways that natural occurrences and human activity affect the transfer of energy in Earth's ecosystems (e.g., fire, hurricanes, roads and oil spills).

10th. Describe that biological classification represents how organisms are related with species being the most fundamental unit of the classification system. Relate how biologists arrange organisms into a hierarchy of groups and subgroups based on similarities and differences that reflect their evolutionary relationships.

10th. Explain that the variation of organisms within a species increases the likelihood that at least some members of a species will survive under gradually changing environmental conditions.

10th. Conclude that ecosystems tend to have cyclic fluctuations around a state of approximate equilibrium that can change when climate changes, when one or more new species appear as a result of immigration or when one or more species disappear.

10th. Describe ways that human activities can deliberately or inadvertently alter the equilibrium in ecosystems. Explain how changes in technology/biotechnology can cause significant changes, either positive or negative, in environmental quality and carrying capacity.

Life Sciences (Evolutionary Theory)

8th. Explain how variations in structure, behavior or physiology allow some organisms to enhance their reproductive success and survival in a particular environment.

8th. Explain that diversity of species is developed through gradual processes over many generations (e.g., fossil record).

8th. Investigate how an organism adapted to a particular environment may become extinct if the environment, as shown by the fossil record, changes.

10th. Explain that natural selection provides the following mechanism for evolution; undirected variation in inherited characteristics exist within every species. These characteristics may give individuals an advantage or disadvantage compared to others in surviving and reproducing. The advantaged offspring are more likely to survive and reproduce. Therefore, the proportion of individuals that have advantageous characteristics will increase. When an environment changes, the survival value of some inherited characteristics may change.

Scientific Inquiry (Doing Scientific Inquiry)

1st. Ask "what happens when" questions.

2nd. Ask "how can I/we" questions.

2nd. Ask "how do you know" questions (not "why" questions) in appropriate situations and attempt to give reasonable answers when others ask questions.

Social Studies Academic Content Standards Addressed:

History (Settlement)

5th. Describe the lasting effects of Spanish, French and English colonization in North America including cultural patterns evident today such as language, **food**, traditions and architecture.

History (Early Civilizations)

6th. Describe the early cultural development of humankind from the Paleolithic Era to the revolution of agriculture including: Hunting and gathering; Tool making; Use of fire; Domestication of plants and animals; Organizing societies; and Governance.

History (Industrialization)

10th. Explain the goals and outcomes of the late 19th and early 20th century reform movements of Populism and Progressivism with emphasis on: Urban reforms; Conservation; Business regulation and antitrust legislation; The movement for public schooling; The regulation of child labor.

People in Societies (Interaction)

4th. Explain the reasons people came to Ohio including: Opportunities in agriculture, mining and manufacturing; Family ties; Freedom from political and religious oppression.

Geography (Human Environmental Interaction)

3rd. Identify ways in which people have responded to and modified the physical environment such as building roads and clearing land for urban development.

4th. 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.

5th. 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.

6th. Describe ways in which human migration has an impact on the physical and human characteristics of places including: Urbanization; Desertification; Deforestation.

Geography (Places and Regions)

10th. Explain how perceptions and characteristics of geographic regions in the United States have changed over time including: Urban areas; Wilderness; Farmland; Centers of industry and technology.

Introduced Species Glossary:

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

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.

body covering. Feature that covers the body, such as fur or feathers.

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

carnivore. A flesh-eating animal.

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

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

community. Interacting population 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.

control. A group used as a standard of comparison for checking the result of an experiment.

diversity. A great deal of variety.

DNA. Deoxyribonucleic acid, a double strand of nucleotides, that is a self-replicating mater present in living organisms as the main constituent of chromosomes. It contain the genetic code that transmits the heredity pattern.

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.

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.

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.

immigration. Coming into the population.

natural. Existing in, or produced by nature.

nesting. To build or occupy a nest; settle in.

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

omnivore. An animal that feeds on both animal and vegetable substances.

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.

population. All the plants or animals of the same kind found in a given area.

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

prey. An animal taken by a predator as food.

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).

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

survival. The continuation of life or existence.

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.