

## OBJECTIVES

Audience will have an understanding of the concept of habitat and the basic requirements for all living things to maintain their existence. Compare and contrast the differences in habitats. They will learn how animals are adapted for life in their particular habitats. They should be able to describe the relationship between various plants and animals within a habitat—food chains, food webs. Explanations and examples will be given.

## TERMS

**Adaptations:** These are physical features (parts of their bodies they use as “tools”) or specific behaviors (things that they “do” with their bodies) to enable them to survive in their habitat. Animal species “adapt” over many generations through natural selection to better survive in their habitats.

**Biome:** An extensive community of plants and animals characterized by climatic and soil conditions, the largest ecological niche. In other words, biomes are large regions of generally similar climates and soils with corresponding associated vegetation types and major animal species. The chart above is very useful for understanding the major biomes.

*Note: Unless asked to cover it by the teachers, biomes are not typically discussed with elementary students.*

**Biodiversity:** A contraction of the phrase “biological diversity,” is a complex topic, covering many aspects of biological variation. In popular usage, the word biodiversity is often used to describe all the species living in a particular area.

**Climate:** The prevailing weather conditions of a region, as temperature, air pressure, humidity, precipitation, sunshine, cloudiness, and winds, Climate determines which plant and animal species can live in a region.

**Community:** All of the plant and animal species living in a designated area (e.g., a pond community, an oak/hickory forest community, etc.)

**Ecosystem:** Both the physical (nonliving or “abiotic”) environment and the living (biotic) community of plants and animals.

**Food chain:** A feeding hierarchy in which organisms in an ecosystem are grouped into trophic (nutritional) levels and are shown in a succession to represent the flow of food energy and the feeding relationships between them.

**Food web:** The complex intertwining of the interrelated food chains in an ecosystem.

**Habitat destruction:** Drastic changes in a species’ habitat that make it difficult or impossible for a species to survive.

**Habitat changes:** Alterations in a species’ habitat that may or may not significantly affect that species’ ability to thrive. These changes may be direct or indirect, may be human induced or may occur naturally.

**Natural selection:** A process in nature resulting in the

survival and perpetuation of only those forms of plant and animal life having certain favorable characteristics that best enable them to adapt to a specific environment.

**Niche:** The particular role of a species within the community, defined in terms of all aspects of its lifestyle (food, competitors, predator, and other resource requirements).

## BEFORE YOU START

Take a moment to discuss with the other docents where each of you will start. Remember that visiting a diverse selection of animals will allow you to compare and contrast their different habitat requirements.

## GETTING STARTED

It is important that right at the beginning of your tour you establish a good understanding of the definition of habitats—the immediate environment in which an animal or plant lives. Even lower elementary students have been exposed to the idea of habitats as the animals’ “home.” Most habitats include four basic components: food, water, shelter and space. You should point out that there many additional living requirements that animals need and these vary from species to species. In other words, **habitat is everything a species needs in its surroundings in order to survive.** Thus each species’ habitat is unique to that organism. For example, you may see both wild turkey and white-tailed deer in a Michigan woods at the same time, maybe even both eating acorns. However, if you look at all of the living requirements for each species they would not be the same—thus deer habitat is different than turkey habitat. For older students differentiate between populations, communities and ecosystems. Also, for the upper elementary, you can introduce the concept of “niche”—the role of a species in an ecosystem (the species’ “job”).

**Helpful hint:** For younger audiences, having them repeat new terms like “food chain” as a group 2–3 times helps them retain the term more readily.

**Note:** During this discussion—make sure it is a discussion—ask your audience questions and have them give examples and when they do, be sure to compliment them on their efforts.

## EXHIBITS TO HIGHLIGHT

Remember, these are only a few suggestions. You could discuss the habitat for any animal. Be sure to consult the animal data sheets for more detailed information on their habitat requirements.

**Arctic fox:** They are found on the tundra and the climate has low temperatures, cold, dry winds, and not much rain or snow. There is no vegetation taller than shrubs or small scrawny trees. The ground is covered with snow much of the year, hence the fox’s thick, white winter coat is an important adaptation. This harsh environment limits the availability of other species in its habitat, so when food is really scarce in the winter, they have been known to scavenge polar bear kills and

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even eat the feces of polar bears.

**North American river otter:** Otters are dependent upon bodies of fresh water: streams, lakes and estuaries. Please differentiate between river otters and sea otters. Riparian zones (the plant and animal communities and associated physical features found along bodies of moving water) are unique ecosystems. For a body of water to be suitable for otters it must also have healthy populations of fish, crustaceans, shellfish, etc.

**Bald eagles:** They have some of the same habitat requirements as otters. Habitat destruction, due to pollution (DDT) and human disturbances around nest sights, led to them becoming an endangered species in much of our country 40 years ago (threatened status in Michigan). Due to good conservation practices, their numbers have come back to the point that they have been off the federal endangered species list for many years.

**Gray wolves:** This species was once found throughout most of North America, South America, Europe and Asia. One reason for that is its ability to live in many different vegetation types. They can also successfully prey upon a variety of larger prey species. Their populations were decimated from pre-European settlers habitat destruction was secondary to unrestricted killing by humans until they became protected in the 1970s.

**Forest guinea hogs:** This heirloom breed of hog was bred by early North American pioneers to be winter hardy and able to forage for food on its own. It did just fine in the mixed hardwood forests found in the eastern half of our country. They are actually an example of a domesticated species that was allowed “free range” to forage on its own. They and other hog breeds have escaped over the years and feral hogs cause great habitat damage in places like Smokey Mountain National Park.

**Red panda:** This species is good example of a species that is a specialist—it has very narrow habitat requirements—in this case in its food choice. Although red pandas are omnivores, two thirds of its diet in the wild consists of bamboo. Animals that have narrow habitat requirements are much more vulnerable to habitat changes.

**African lions:** This species is found in the grasslands of Africa (savanna) because its prey species are large herbivores that depend on the savanna for food. Grassland ecosystems have many different names: savanna, prairie, pampas, and steppes. The lion is a good species to talk about food chains and webs.

**Bird & Reptile House:** The two multi-species exhibits are both good examples of tropical rain forests and illustrate more realistic animal interactions. Each species occupies a unique niche. Chuckwallas are found in deserts and depend on specific micro-habitats. They, like all reptiles, need to have places within their habitat where they can thermoregulate.

**Magellanic penguins:** This species is useful for correcting misconceptions about where penguins live. There are only two species of penguins that live out their life entirely on the ice of Antarctica (Emperor and Adele). Magellanic penguins are considered “warm water” penguins, even though where they live the water is still very cold. There are actually some species of penguins that are subtropical: Galapagos and African. Suitable nesting habitats (remote shorelines of the southern South American coast) are often limited which leads to fierce competition for nest sites.

**Moose:** Moose generally live in forested areas where there is snow cover in the winter, and prefer moist conditions where there are lakes, ponds, and swamps. Moose are limited to cool regions because of their large bodies, inability to sweat, and the heat produced by fermentation in their gut. They cannot tolerate temperatures that exceed 80°F (27°C) for long. In summer, moose seek shade and cool themselves in ponds and streams.

**Back yard habitats:** Point out that this area does not include animal exhibits, but that visitors have a good chance to see native Michigan wildlife. Back yards create habitats for hundreds of species of plants and animals—especially if people take the time to learn what the habitat needs are of the species they wish to attract. A back yard may not include all of the habitat requirements for a species, but if it contains only one or two, that animal may be seen. Planting the right species of plants in the right locations, placing nest boxes or brush piles—these kinds of actions can make an amazing difference in the suitability of your yard for wildlife. Notice how our back yard demonstration area mixes cultivated areas with adjacent areas that are left to grow naturally and are coordinated with nooks with benches for resting and the observation deck for viewing wildlife. Careful planning can help prevent the appearance of unwanted species, too. Well designed back yards can also create wonderful habitat for the young of another unique species—humans!!

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**For middle and high school students, you can discuss the concepts of biomes**

BIOME	TEMPERATURE	RAINFALL	TYPICAL PLANTS	TYPICAL ANIMALS
Tundra	-70-61°F (-57-16°C)	4-20 in (10-50 cm)	Lichens, mosses, dwarf willows	Ptarmigan, snowy owl, lemming, caribou, musk ox, arctic fox
Coniferous forest	-65-70°F (-54-21°C)	14-78 in (35-200 cm)	Black spruce, white spruce, balsam fir, white birch, aspen	Spruce budworm, tussock moth, moose, snowshoe hare, lynx
Deciduous forest	-22-100°F (-30-38°C)	24-89 in (60-225 cm)	Oak, hickory, beech, maple, black walnut, yellow poplar	White-tailed deer, gray squirrel, skunk, opossum, black bear
Temperate grassland	23-86°F (-5-30°C)	12-78 in (30-200 cm)	Little and big bluestem, gramma grass, buffalo grass	Meadowlark, burrowing owl, prong horned antelope, badger, jackrabbit, coyote
Desert	36-135°F (2-57°C)	0-10 in (0-25 cm)	Prickly pear cactus, saguaro cactus, creosote bush, mesquite, sagebrush	Diamond-backed rattle snake, Gila monster, roadrunner, kangaroo rat, wild pig
Savanna	55-104°F (13-40°C)	10-36 in (25-90 cm)	Baobab tree, acacia tree, grasses	Zebra, giraffe, wildebeest, elephant, antelope
Tropical rain forest	64-95°F (18-35°C)	50-475 in (125-1,250 cm)	Contain about 50% of the world's terrestrial plant and animal species, yet rain forests encompass only about 6% of the world's land area	