

Trees as Habitats



Background

Many threatened or endangered species are at risk because of disruptions to their habitats. While some species can rely on diverse sources of food or places to breed, a surprising number of species are very specific in their requirements. For example, certain butterflies can only lay their eggs on particular host plants that provide food for their caterpillars. Some bird species have very particular nesting requirements that are only met by certain kinds of trees. Wildlife depend upon having enough of the right kind of habitat available for their survival and reproduction.

Maintaining a diversity of trees in forest habitats supports a wide diversity of animals in the forest ecosystem—producers, consumers and decomposers. The producers are the trees themselves and the other forest plants that provide food for other wildlife. The consumers eat the plants or get energy from eating animals that feed on plants. The decomposers include fungi, bacteria, earthworms and insects that break down dead material. They recycle the waste products of the forest, turning dead plants and animals into usable nutrients such as nitrogen and phosphorus that can be absorbed by tree and plant roots.

There is also diversity in the layers of the forest. The canopy layer is made up of branches and leaves of the tallest trees. Beneath that is the understory layer made up of smaller trees and shrubs. Beneath that is the forest floor, where wildflowers, grasses, seedling trees, mosses and fallen leaves, branches and trees are found. Underneath them all is the soil and the roots of trees and other plants. Wildlife often spend the majority of their time in one of these layers. For instance, red squirrels spend much of their time in the canopy, while wild turkeys spend most of their time on the forest floor.

Some very important habitats include those found in dead or decomposing trees. Not only do they provide nutrients to the forest as they decompose, they also provide places where animals live. Tree cavities are important nesting sites for birds and mammals. Many insects, spiders, reptiles and even bats can be found under tree bark.

One of the most direct relationships between trees and other species are those between trees and wildlife that use them for a food source. Leaf feeders may be found almost any time a tree has its leaves, and tree flowers can provide important food for flower specialists. Bark and wood are consumed by a variety of insect larvae, and sap that leaks from trees often attracts butterflies as well as wasps and some flies. Mammals often feed on very energy-rich fruits produced by trees like oaks, chestnuts and beech trees. Those organisms that directly consume tree tissues as food may themselves become food for predators. Caterpillars are eaten by birds and wasps and can serve as the “nursery” for the larvae of certain wasps and flies. Predators help to control the numbers of the plant feeders.

Discussion

Ask the participants to brainstorm what they are likely to observe as evidence of animals using trees, such as nests, burrows, insect galls, chewed leaves or branches, borings in tree bark, caterpillar “tents”, rolled leaves, claw marks on trees or fur caught in tree bark. Keep a list of the ideas from the brainstorming session.

Objectives

- Identify habitats in living, dead and decaying trees
- Understand the relationships between trees and the animals that inhabit them
- Practice observation skills, including making inferences from observations

Grade Level

9-12

Subjects

Science

Materials

- Magnifying lenses or hand lenses (optional)
- Small notebooks
- Pens and pencils

Next ask the participants for any ideas about how the addition of one species, such as a moth or caterpillar that eats only one kind of tree's leaves, might attract or support other species in the ecosystem or might damage the ecosystem. Try brainstorming about how the different uses of the tree as habitat might change over the seasons or over the entire life of the tree.

Activity

1. Take the group to a field site where they can do observations. Divide the group into teams of three or four.
2. Each team should observe three to four trees, ideally in different stages of their lifecycle, including dead standing or dead fallen trees or decomposing logs. Make sure that each team has a notebook and pencil for recording observations and drawing sketches of the habitats. Remind the teams to take care not to disturb any established habitats while they are making their observations.
3. The following are some questions to help guide their observations:
 - Ask them to look at the condition of each tree—is it alive or dead? Does it look healthy?
 - Which animals prefer live trees and which prefer dead trees?
 - What roles do trees play in the lives of animals and what roles do animals play in the lives of trees?
 - What value might dead trees have in a forest?
 - What difference do the seasons play in the kinds of animals that you might observe?
4. When the teams are done with their observations, ask them to leave the area as clean as they found it—do not leave any litter behind.
5. Discuss with the groups the differences between what they thought they would observe from the brainstorming session and what they actually observed in the field.

Extension Activities

1. Find an area with a number of small trees or larger trees with low branches in order to find examples of animals that are using the foliage and branches as habitat. Bring a white sheet of cotton, nylon or canvas (about 2-3 feet square) and a soft pole, length of bamboo or a piece of plastic tubing to use as a tapping stick. With two to four participants holding the corners of the sheet under a leafy branch, have one team member rap the wood of the branch gently but abruptly five or so times to dislodge small animals from the leaves and branch surfaces. Observe and record what appears in the collecting sheet. If you bring field guides with you, you can also try to identify the types of species. When you are done observing the animals, gently deposit them at the base of the tree where they were collected.

Repeat the activity at another tree of the same species. What are the most common types of organisms found in that tree species? Then try the activity with a completely different tree species and see whether the same types of organisms are present in that tree species or if they are quite different.

2. Mark off two square areas of equal size (about one meter by one meter) with string—one in the shade of a tree, and one nearby in the sun. Divide the participants into two groups. Pass out magnifying glasses or hand lenses to each group. Ask the participants to count how many insects they find in each area. They should compare the total number and variety of organisms found in the shade with the total number and variety of organisms found in the sun. Use the following questions to guide discussion:
 - What influence does the shade have on the number and type of insects found?
 - Do insects appear to prefer to be in the shade or the sun?
 - What influence does the shade or sun have on the activity of insects observed? Are they more active, less active, or about the same?
 - What other factors could you investigate besides sun and shade?

