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ABSTRACT

This teacher's guide for use in the elementary grades was prepared as a result of the 1970 Local Materials Workshop on Outdoor Education, Madison, Wisconsin. It develops the concept of a land ethic as expressed by Aldo Leopold in "A Sand County Almanac". A filmstrip is employed to discover the meaning of several words pertinent to ecology--environment, ecosystem, community, habitat, niche, food chain or web, primary producers, consumers, decomposers, predators, camouflage, and succession. Settings for such discovery include the schoolyard, going to and from school, home, a nearby field, and Eagle Heights Woods. The filmstrip is explained in its entirety, illustrating each frame and its accompanying script. The filmstrip is not included. This work was prepared under an ESEA Title III contract. (BL)

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THIS BOOK





Instructional Materials About Our Community



a project of...

**The Instructional
Materials Center
Madison Public Schools
Madison, Wisconsin**

EAGLE HEIGHTS WOODS: MAN'S USE OF LAND

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This instructional set of materials was produced as a result of the 1970 Local Materials Workshop on Outdoor Education. This workshop was dedicated to the concept of a land ethic as expressed by Aldo Leopold in A Sand County Almanac.

“We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect . . . That land is a community is the basic concept of ecology, but that land is to be loved and respected is an extension of ethics.”

EAGLE HEIGHTS WOODS — Environment, Habitat, Community

What do we mean by such words as ecology, environment, habitat, community, niche, ecosystem, food chain, words that are often used today?

This set will help you discover the meaning of these words for yourself in the schoolyard, going to and from school, at home, in a nearby field and in Eagle Heights Woods.

The climate, the land, the plants, the animals — everything that surrounds us — make up our environment.

The ceaseless exchanges of materials and of energy between living things and their environment follow circular pathways, or cycles. Such cycling systems together make up an ecosystem.

Ecology is the study of the living organism's relationship to its environment.

Plants and animals living together in a given area and held together by their relationships with and dependence upon each other form a community.

The place within a community where an animal lives, finds food and shelter, and raises young is its habitat. For some animals one spot can provide all these needs; for others a variety of places is needed.

In natural communities, as in human communities, there are standard jobs which are filled by various individuals: the ecologist calls each of these a niche. Different natural niches are occupied by different species, in contrast to human communities, where different niches are filled by the same species. Hence a natural community is much more complex than a human community.

- Food Producers - the green plants
- Food Consumers -- the plant eaters, key-industry animals
 first level carnivores
 second level carnivores
 parasites
 scavengers, animals that eat dead things
- Decomposers and - mostly micro-organisms, bacteria, yeasts
Transformers - molds and other fungi

The flow of energy from the green plants through the consumers and decomposers makes up the food chain or web.

Armed with these definitions let us see what questions and answers we can find in these pictures to help us to better understand what this is all about.

BULLDOZER AT THE FOREST EDGE

Rising 200 feet above Lake Mendota's southwestern shore is a wooded hill known as Eagle Heights. For many boys and girls of Shorewood Hills School it is a familiar spot; a place for picnics and exploring. Nearby residents walk the trails with their dogs and binoculars, enjoying the natural beauty of a relatively undisturbed woods. It has always been a favorite area for University classes studying forest plants and animals. But, as more and more people use the hill, it is changing. The steeper trails are deeply eroded. Litter is scattered everywhere. A bronze plaque describing the Indian mounds is gone. On nearby lakeshore property a large building mars the lake view. The woods were further threatened when construction of the 900 section of Eagle Heights apartments began.

Early one Friday morning in the spring of 1966, the residents of buildings 29 and 31 at University Houses were awakened by grinding sounds of machinery and falling trees. A bulldozer was demolishing the woods! Fifty feet of shrubs and trees, mostly saplings, had been uprooted. The much-used cinder path leading to the lake was gone! How much more would be destroyed? Who was responsible for this? The residents questioned the bulldozer operator. But he was only carrying out orders and did not stop. Earth was needed to level the land for building new apartments. Then there would be lawn up to a new tree line. The luxuriant row of bushes and trees separating the older apartments from the new development would be ripped out. It was in the way of the large equipment.

The irate residents telephoned everyone they could think of who might possibly be concerned or responsible. Meanwhile the bulldozing continued. By 4 p.m. Friday, the job was nearly completed, and the men stopped for the weekend. Finally, through Professor Orie Loucks of the Botany Department, word of the bulldozing reached the Natural Areas Committee of the University. This committee had come into existence as a result of a similar episode in 1954-1955 when a part of Muir Woods on the campus was chosen by the University planners for the site of a new Social Sciences Building. The woods had been used as a choice area for teaching botany and ecology. Attempts to save Muir Woods failed after a bitter fight, but as a result of the controversy University officials clearly stated that there would be no further construction on any land used for teaching. To insure this policy, plans would be shown to the Arboretum Committee and the newly formed Natural Areas Committee. But this had not been done in the case of the Eagle Heights apartments. Some felt this was deliberate. The Chairman of the Natural Areas Committee notified the Chancellor of the University, who ordered an immediate halt to the construction and a meeting of all concerned. Those in charge of the project admitted their error. They promised to restore the bulldozed area to as natural a state as possible.

The hedge-row, which included some sizable trees between the two housing units was the main concern for University Houses residents. Although most of the damage had been done, a few trees were spared, and one portion was left intact.

To the planner, the forest edge and the hedge-row were just a mass of scraggly trees and shrubs, better to be replaced by fences and neat lawns. However, the scraggly trees and shrubs on the forest edge had been a very important part of the forest community. Such a border protects the inner forest from the drying effect of wind and sunlight. The dense low-growing plants, shrubs and saplings attracted a great variety of insects, birds and small mammals from both forest and field. The hedge-row too, provided food, protective cover and nesting sites for wildlife. For the people living in the apartments, the bushes provided beauty and privacy, a living fence which required no maintenance.

Eagle Heights Woods is now part of the University of Wisconsin's Arboretum lands. The bulldozed area was not planted in lawns. Instead, native shrubs, nannyberry, highbush cranberry, and bladder bush have been planted. Sumac is resprouting from its extensive root system. The weeds, especially the prickly Canada thistle, moved in immediately and four years later still are forming a dense tangle providing food and habitat for many small creatures. Initially they served a useful purpose in anchoring the upturned soil. A chain fence was erected to prevent further disturbance to the vegetation and erosion of the steep bank by new trails. Eventually, the shrubs and saplings will grow back to provide cover for wild life and a windbreak for the woods. The signs of destruction will be erased as a result of time and effort. How much better to have protected these areas in the first place!

This is not a unique case. Therein lies the tragedy. Too many people in responsible positions, developers of new areas and residents of old, do not understand and appreciate their environment. As a result, the list of areas destroyed through ignorance and misuse grows!

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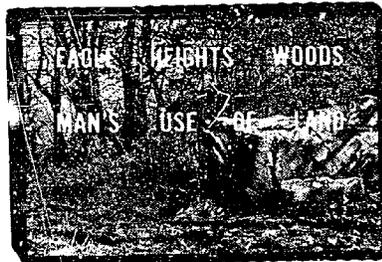
TERMS

1. Environment The climate, the land, the plants, the animals — everything that surrounds us.
2. Community A group of plants and animals living together in a given area and held together by their relationships with and dependence upon each other.
3. Habitat The place within a community where an animal lives, finds food and shelter, and raises young. Animals need a living room, dining room, and bedroom. For some animals one spot can serve all three; for others very different places are needed for each room.
4. Predators An animal that lives by capturing other animals for food.
5. Camouflage An animal's disguise to resemble some part of his environment.
6. Primary producers Green plants.
7. Consumers Animals that feed on plants or on other animals.
8. Chrysalis The hard shelled pupa of a butterfly.
9. Food chain A series of plants and animals linked by their food relationships. A green plant, a leaf-eating insect, and an insect-eating bird would form a simple food chain. Any one species is usually represented in several or many food chains.
10. Niche Standard jobs filled by various individuals in natural communities. Different natural niches are occupied by different species; in contrast to human communities, where different niches are filled by the same species.
11. Decomposer A plant or animal that feeds on dead material and causes it mechanically or chemically to break down.
12. Succession The gradual replacement of one community by another; as in the change from a bare field to a mature forest.

EAGLE HEIGHTS WOODS — MAN'S USE OF LAND



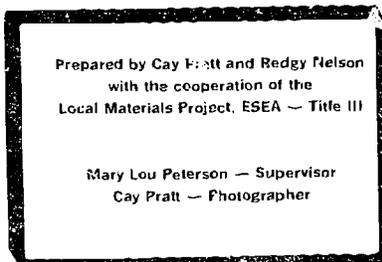
1 Colophon



2 Title

SPECIAL NOTE:

Please do not judge the quality of the beautiful full-color pictures in the film-strip by the appearance of the black-and-white photos in this guide! Obviously, there is no comparison between full-color and black and white pictures.



3 Credit Frame

Prepared by Cay Pratt and Redgy Nelson with the cooperation of the Local Materials Project, ESEA — Title III
Mary Lou Peterson — Supervisor
Cay Pratt — Photographer



4

How would you describe this school yard? (grass, bare soil, a few trees on the edge) When you are in your school, you are in one kind of environment. What is environment? The climate, the land, the plants, the animals — everything that surrounds us — makes up our environment. We influence and change our environment. Can you think of some ways we do this?



5

This is part of a natural environment. This is a part of the environment that man has disturbed only slightly. (Roofs seen in background are Eagle Heights apartments.)



6

Man is able to change his environment. What evidence can you see of man creating a poor or unattractive environment for himself and other creatures?



7

Here children are playing on the slope. It seems to be more fun playing here than on the swings or jungle gym. These children are changing their school's environment. Do you know how?



8

These children have changed their environment. Years of playing in this area wore away the grass and exposed the soil underneath. The playground was covered with asphalt to keep the children clean. Water that used to soak into the ground after rains now runs off the playground into storm sewers. Do you know of any plants or animals that can grow from asphalt covered ground? Can you change your environment?



9

Man often changes the environment by adding litter and debris to areas where he lives and works. Would this litter go away by itself?



10

Man must dispose of his litter and garbage. Here he is trying to clean up his environment. Where will they take this garbage?

10



11

Man can sometimes change his environment for the better. He has to decide how he wants to use the land. How does this land use in this area compare with the land use in the shopping center or school yard?



12

The environment is the climate, the land, the plants, the animals — everything that surrounds us. Man has the power to change his environment. Man's activities affect the natural communities in the environment.



13

What are communities? A community is a group of plants and animals living together in a given area. A community is held together by living organisms depending on one another. Plants and animals are living together in the natural fence of trees and shrubs. (The human "community" in the background depends on supplies from many other areas.)



14

A natural fence row like the one seen here provides safety and protection for many kinds of animals. What kinds of plants and animals would you expect to find in this community? (insects, rabbits, etc.)



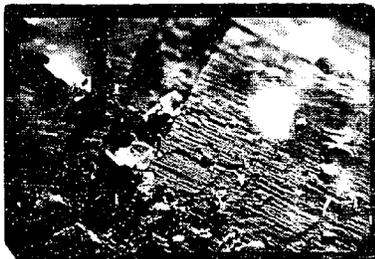
15

The open part of the field provides for different kinds of relationships. How might animals use this area?



16

Even within one large area like the woods there are many different communities. The ground layer or forest floor has many different kinds of life in it. Flowering plants (seed producers) and spore producing plants can be found. Ferns, mosses, fungi, and lichens can be found on the forest floor or on the trunks of some of the trees.



17

Often seen on the forest floor is evidence of animals. What animal can you think of that might drop acorn shells?



18

This chipmunk might be the one who used the log as a picnic table. In the Ojibway language a chipmunk was called Achitamom. Achitamom means head first. According to legend, "Panther created perpetual daylight for the hunting animals but chipmunk made the night to give the little animals a time of shelter. The enraged panther clawed at chipmunk making the stripes."

[In Pursuit of the Mous, the Snaile and the Clamm by Mary Durant, 1968, Meredith Press.]



19

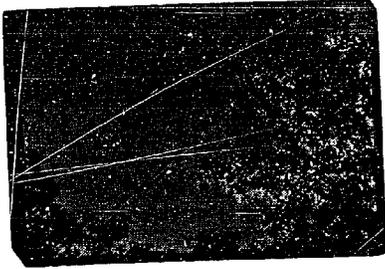
The middle layer of the forest has many shrubs and young trees. Their flowers and seeds, branches and leaves provide a home and food for many animals. Can you name a few? (insects, catbird, rose-breasted grosbeak, etc.)



20

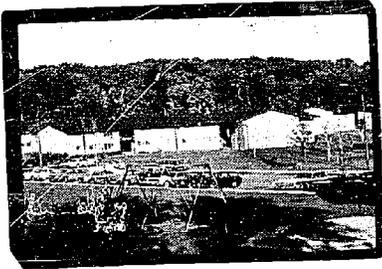
Life in the treetops makes up another community. The trunks, boughs, and leaves provide homes and food for many more animals. Can you name some?

[At the upper elementary grades, this can be pursued further in the Local Materials set, "Three Layers of Green."]



21

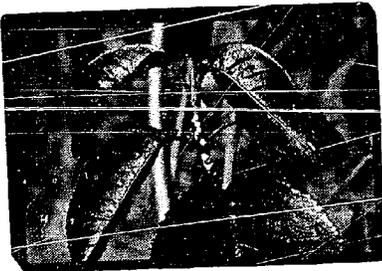
Each animal has its own needs for shelter, food, and a place to raise young. The area which provides these things is the animal's habitat.



22

How are these needs met in the human "community"?

[An interesting list could be compiled showing how widely dispersed are the areas which supply the needs of the human being.]



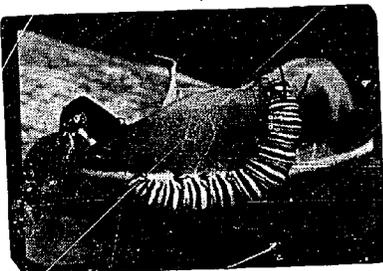
23

Here a nannyberry bush has provided the right place for an insect to lay eggs. Many species of insects survive over winter only as eggs. The adults die in late fall, but the eggs are protected over winter on twigs or stems.



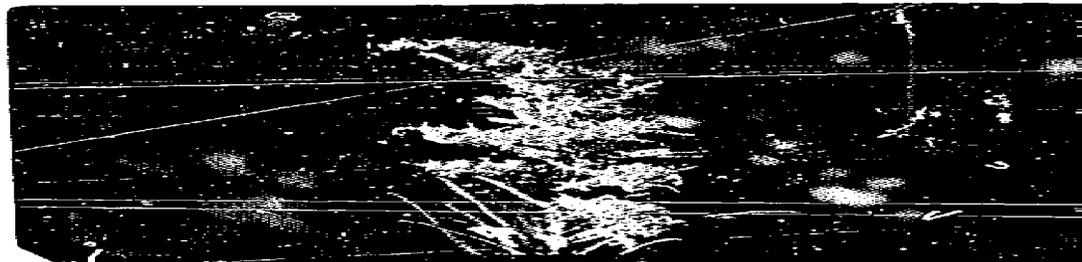
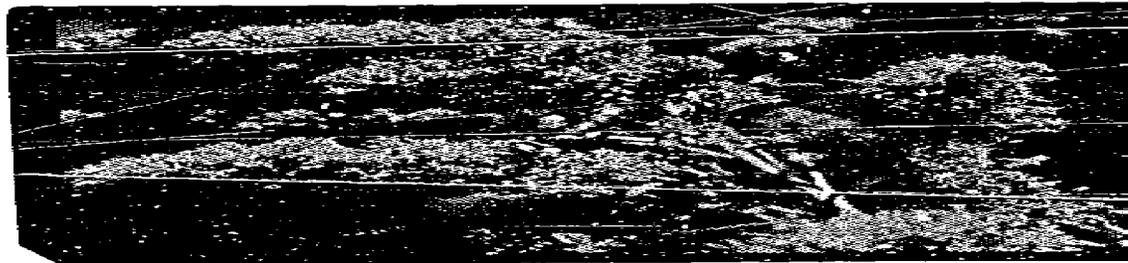
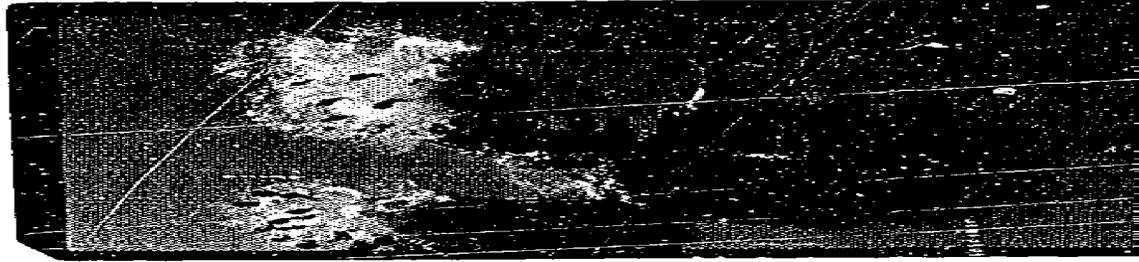
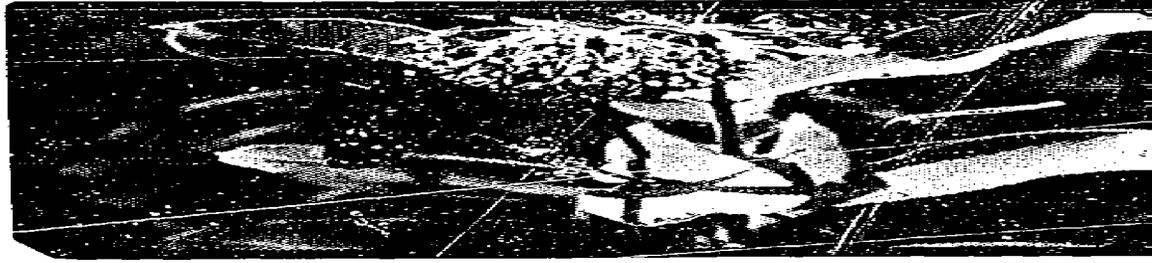
24

In spring, insects called treehoppers emerge from eggs and begin to feed on plant sap. To protect themselves from predators, other animals that might eat them, the treehoppers look very much like thorns. This disguise is called natural camouflage.



25

In nature some animals eat plants. The plants are primary producers. The animals that eat the producers are consumers. These consumers are in turn eaten by other larger animal consumers. The monarch caterpillar we see is feeding on the milkweed plant. What animal might eat the caterpillar?



26

Even after emerging from the chrysalis, the monarch butterfly often sucks nectar from the milkweed flower.

27

In addition to the monarch, the milkweed provides food for other animals. Even though many of these milkweed seeds may be eaten, enough will survive to produce new milkweed plants in the spring.

28

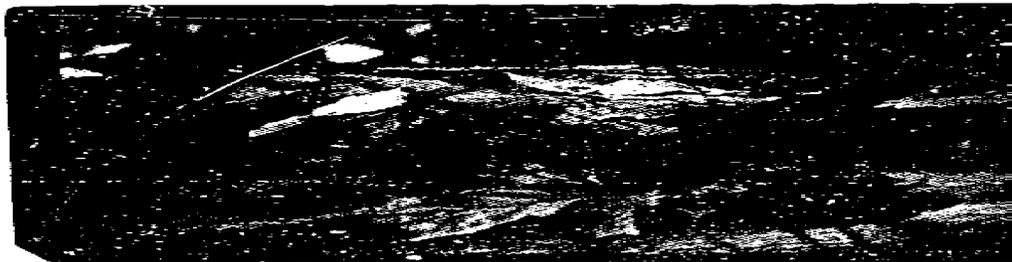
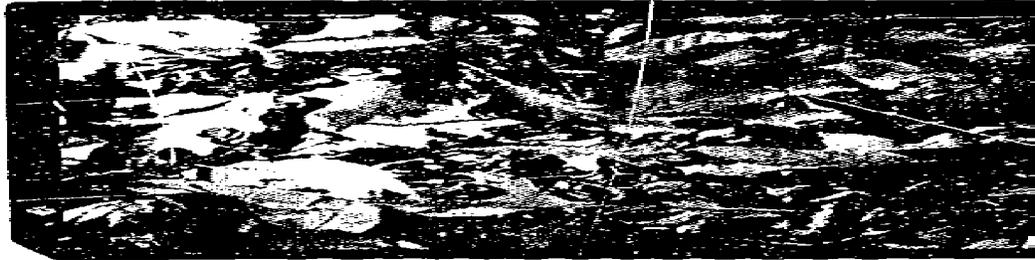
The relationship of producers (plants) and consumers (animals) in a community is called a food chain. Can you see the bee on the goldenrod? The plant is providing food for the bee. The bee provides food for other larger animals. What might eat the bee?

29

The rose-breasted grosbeak might be the next step in the food chain. What might eat the grosbeak?

30

Plants are also helped by some of the animals that feed on them. How might the beetle help this goldenrod?





31

A community is made up of many relationships. Each animal and plant, like this Jack-in-the-pulpit, has some job in the community. Each of the plants and animals depend upon one another. The specific job of each is called its niche.



32

Because each plant or animal in the community has a specific job or niche, very little goes to waste. The leaf litter seen here is the habitat for many kinds of insects and other small animals. What kind of animals would you expect to find here?



33

Waste materials, such as the dead leaves, are broken down into material that can be used again by the plants. Basswood leaves like these are rich in minerals. Animals such as earthworms eat the leaves and excrete the broken down parts to the soil.



34

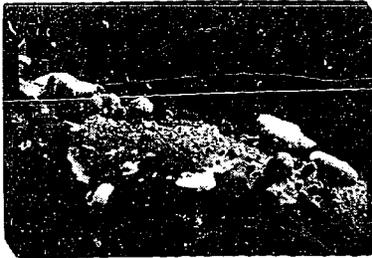
Even dead wood is full of life. The lines or grooves in the old log are eating channels of an insect called a bark beetle larva. Earthworms and insects help fill the niche of decomposer.



35

Look closely to see what you can find in an old piece of decaying wood.

[Boy looking at bark beetle larva in wood]



36

Fungi such as those seen here and bacteria are other important decomposers. They hasten the decaying process and help return mineral and organic matter to the soil. Very little material is wasted in a natural community. Instead it is used over and over again. Does man's community do as well?



37

Even when man's community disrupts or destroys a natural community, as happened in this area several years ago, the natural community will in time re-establish itself, if it is given the opportunity. This process is known as succession. (See "Bulldozer at the Forest Edge" on page 3 of this guidebook.)



38

Weeds, such as this mullein, are among the first to move into an area that has been disturbed. What purpose do these weeds serve? (erosion control, food and habitat for animals)



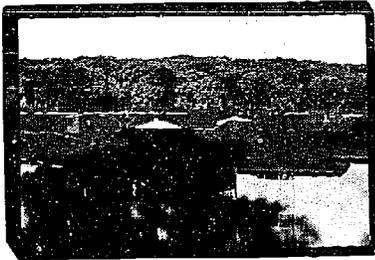
39

Later, shrubs such as sumac begin to grow in the area. Sumac provides a good habitat for many forms of life in the community. Can you name some animals that might make their home here?



40

Later sumac will give way to trees of the woods. The natural community will have regained its territory.



41

Man is the only creature who has the power to change natural communities permanently! What responsibility goes with this power?



42

The End.