Lesson C2–3

Defining Wildlife Habitat and Recognizing Its Importance

Unit C. Animal Wildlife Management

Problem Area 2. Wildlife Biology and Ecosystems

Lesson 3. Defining Wildlife Habitat and Recognizing Its Importance

New Mexico Content Standard:

Pathway Strand: Natural Resources and Environmental Systems

Standard: **I:** Recognize importance of resource and human interrelations to conduct management activities in natural habitats.

Benchmark: **I-D:** Employ environmental and wildlife knowledge to demonstrate natural resource enhancement techniques.

Performance Standard: **3.** Demonstrate wildlife habitat enhancement techniques.

Student Learning Objectives. Instruction in this lesson should result in students achieving the following objectives:

1. Describe and list the types of wildlife habitat.
2. List habitat requirements for selected species of animal wildlife.
3. Describe habitat mix.
4. List the goals of habitat production.
5. Describe selected management practices for small areas of habitat.

List of Resources. The following resources may be useful in teaching this lesson:

Recommended Resources. One of the following resources should be selected to accompany the lesson:

Porter, Lynn, Jasper S. Lee, Diana L. Turner, and Malcolm Hillan. *Environmental Science and Technology,* 2nd Ed. Upper Saddle River, New Jersey: Prentice Hall Interstate, 2003.

Stutzenbaker, Charles D. et al. *Wildlife Management Science and Technology*. 2nd Ed. Upper Saddle River, New Jersey: Prentice Hall Interstate, 2003.

Other Resources. The following resources will be useful to students and teachers:

Camp, William G. and Thomas B. Daugherty. *Managing Our Natural Resources*. New York: Delmar Publishers, 1995.

Daugherty, Thomas B. *AgriScience Laserdiscs Series, Forestry and Natural Resources*. New York: Delmar Publishers, 1997.

Lee, Jasper S. *Natural Resources and Environmental Technology*. Danville, Illinois: Interstate Publishers, Inc., 2000.

List of Equipment, Tools, Supplies, and Facilities.

Writing surface
Overhead projector
Transparencies from attached masters
Copies of student lab sheets
Pictures of Different Land Areas

Terms. The following terms are presented in this lesson (shown in bold italics):

biome
biotic pyramid
clear-cut
cover
desert
edge
estuary
featured species
firebreaks
home range
interspersion
metabolism
permafrost

savanna
space
species richness
stream
taiga
territory
tundra
understory
vegetation management

Interest Approach. Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here.

Show pictures of different land areas in the United States. Have students discuss what they see and the kind of wildlife that might be found. Indicate that this lesson will teach them about the area they saw as related to biomes. (If pictures are not available, refer to 10–4 win Wildlife Management for discussion.) Move from the interest approach into the objectives and anticipated problems for the lesson.

Summary of Content and Teaching Strategies

Objective 1: Describe and list the types of wildlife habitat.

Anticipated Problem: What are the types of wildlife habitat?

I. Habitat for animal wildlife can be classified based on ecosystems.

A. Ecosystems are in areas known as biomes. A ***biome*** is a large area with a distinct combination of animals and plants. There are five kinds of terrestrial biomes found in the United States.

1. Tropical areas are near the equator. Typically, they are those in forest or grassland with high temperatures. Tropical forested areas have high rainfall and tend to have two seasons: wet and dry. Birds, insects, frogs, and many other small animals occupy the tops of trees. Tropical grassland areas tend to have low rainfall but still provide habitats for small grasses and forbs. This provides a good habitat for grazing animals, snakes, rodents, and lizards.
2. Temperate forest habitats cover much of the southern U.S. and occupy many pine trees. The precipitation varies from moderate to heavy. Berries, acorns, fruit, and cones are produced for squirrel, deer, rabbit, and quail.
3. Grasslands and savannas host the predominant vegetation of grass. The precipitation is too low to support trees. There are many grazing animals such as deer, elk, and bison, and many other small rodents, reptiles, and birds. A ***savanna*** is an area similar

to grassland where the soil fertility is too low to support the growth of much grass. (These areas are primarily found in Africa, Australia, and India.)

4. Tundra and taiga are both cold climates found in North America. ***Tundra*** is in the Arctic area or at other high elevations. Tundra is characterized by low temperatures and permafrost. ***Permafrost*** is permanently frozen ground. Many lichens, mosses, a few shrubs, and some grasses grow in tundra. ***Taiga*** areas have large conifer forests that can withstand low temperatures and heavy loads of snow.
5. A ***desert*** is a sandy area with very dry habitat with little or no rain. Temperatures range from very hot to very cold. Moist areas may grow shrubs or scrub trees.

B. There are four aquatic biomes that may involve freshwater, saltwater, or brackish water habitats.

1. Lakes and ponds are natural or artificial reservoirs of earth that usually hold freshwater. The water temperatures vary with the surrounding climate and source of the water. Algae, insects, and other small creatures are sources of food for fish, shellfish, and other aquatic wildlife.
2. A ***stream*** is flowing water that moves from higher to lower elevation. Some of this water is from ground runoff, springs, or released by users. Creeks are small streams; rivers are large streams.
3. Oceans and seas result from the flow of freshwater streams into their saltwater body. Some species prefer the mix of fresh and saltwater as habitats.
4. Wetlands and estuaries have a big effect on land areas and serve as important habitats for some species of animal wildlife. Swamps and marshes are wetland area along inland streams. Many kinds of waterfowl use these areas. An ***estuary*** is the area where a stream flows into an ocean. The wildlife that live in an estuary can tolerate both freshwater and brackish water.

Have students read "Habitat Classification: Biomes" in Chapter 10 of Wildlife Management: Science and Technology, 2nd Ed. or a similar section in another book. Ask for student input to summarize the information on the writing surface or use TM: C2–3A to outline the information. Ask students to discuss their observations of any of these biomes. Students can also be asked to prepare reports on different biomes.

Objective 2: List habitat requirements for selected species of animal wildlife.

Anticipated Problem: What are habitat requirements for selected species of animal wildlife?

II. Wildlife species have life requirements that must be met by their habitat to insure well-being.

A. All living organisms require food.

1. Food provides the nutrients needed to live, grow, and reproduce.
2. A key component of food is energy. The series of transfers of food energy from one organism to another is called a ***biotic pyramid***.
3. The internal process by which an organism gets energy from food is ***metabolism***.

B. Water is the basic need of life.
   1. Water's chemical structure is H2O.
   2. With terrestrial habitats, water determines what species of plants will grow. These plants will determine which animals will live there.
   3. In aquatic habitats, there are damaging pollutants such as siltation, sewage, and other pollutants.
   4. Some wildlife animal species get most of their water through the food that they eat, while many need a watering area for drinking once or twice a day.

C. Cover is needed for most wildlife species, and is sometimes referred to as shelter.
   1. ***Cover*** is the vegetation or other material that provides safety in a habitat.
   2. Animals use cover for nesting, resting, and protection from predators and adverse weather.

D. Space provides air, food, and cover for wildlife species.
   1. ***Space*** is the area around an organism.
   2. Space requirements vary with season, animal, and quality of the habitat.
   3. The space an animal normally uses for living is called ***home range***. It is where the animal gets food, water, and cover.
   4. Within a home range, an individual animal may establish a territory. A ***territory*** is an area smaller than the home range. For example, squirrel may only travel a few feet around their den in a tree to acquire food.

Have students refer to Table 10–2 in Wildlife Management: Science and Technology, 2nd Ed. or other publication that lists habitat requirements of species. Have each student to select one species and report on its habitat needs.

Objective 3: Describe habitat mix.

Anticipated Problem: What is habitat mix?

III. Many animal wildlife species require more than one stage of succession in their habitat.

A. Interspersion supports a greater variety of wildlife.
   1. ***Interspersion*** is mixing lots of different stages within an area.
   2. The best way of measuring the amount of interspersion is to use the interspersion index principle. This involves counting the number of times a habitat changes from east to west and north to south in aerial photographs.
   3. Without dispersal, animals have limited access.

B. Edge is a concept also known as ecotone.
   1. ***Edge*** is the area where two habitats meet.
   2. Habitats with a large amount of edge provide more food, water, and cover for a variety of species than areas of the same vegetation type.

3. Edge quality is measured by the transition that occurs. Edges with high contrast have more species of animal wildlife than those with low contrast. For example, edge between Stage 2 and Stage 5 has higher contrast than edge between Stages 2 and 3.

Have students read "Habitat Mix" in Chapter 7 of Wildlife Management: Science and Technology, 2nd Ed. or other book. Afterward, use student input to discuss the major concepts. TM: C2–3B may be used. Also, use TM:C2–3C to show contrast of abrupt edge in a forest or refer students to Figure 7–17 in Wildlife Management: Science and Technology, 2nd Ed. .

Objective 4: Identify goals of habitat production.

Anticipated Problem: What are the goals of habitat production?

IV. Habitat management influences the kinds and diversity of species attracted to the area.

A. The first basic goal of wildlife habitat management is to provide a habitat for a specific wildlife species.

1. Most habitat is managed for a featured species or for species richness.
2. A ***featured species*** is a species that will be promoted through improved habitat. It is important to manage a habitat to provide for the needs that are in shortest supply.
3. When managing a habitat for a featured species, it is important to manage a habitat to provide for the needs that are in shortest supply. This may be water, food, or cover.
4. In selecting habitat management practices, the effects of practices on species other than the featured species must be studied.

B. The second basic goal is to provide habitats for many different wildlife species.

1. ***Species richness*** is the number of different species found in an area.
2. The following are a part of the wildlife management plan to promote species richness: a mixture of successional stages is present; unbroken block sizes are of 10 to 40 acres; the edges have high contrast; and a wide variety of vegetation layers is present within each area containing only one successional stage.
3. When managing habitat for species richness, the goal is to provide some habitat for as many species as possible.

Have student read information on the goals of habitat management, such as this section in Chapter 7 of Wildlife Management: Science and Technology, 2nd Ed. or other textbook. Reading can be done as supervised study, homework, or aloud in class. Afterward, use student input to cover the content. Place terms and definitions on the writing surface or use TM: 2C–3D.

Objective 5: Describe selected management practices for small areas of habitat.

Anticipated Problem: What are some selected management practices for small areas of habitat?

V. There are several practices used in managing habitats for wildlife. The major practices include: vegetation management, seeding, water sources, fire, fertilizer, and site preservation.

A. ***Vegetation management*** is using practices that promote the growth of desired plant species.

1. Vegetation management can involve removing understory to promote habitat for large animals. ***Understory*** is the vegetation that grows beneath trees in a woodland.
2. Creating clearings is done by clear-cutting small areas within thickly-wooded areas to attract deer and elk. ***Clear-cut*** means that all the trees in an area are cut.
3. Thinning an area is done by selectively removing some of the trees in a wooded area. This creates holes in the tree canopy and allows more room for smaller trees to grow.

B. Establishing food plots by seeding promotes wildlife populations into an area.

1. Seeding is used to increase the plant population.
2. Using species preferred food helps target desired populations into an area.
3. Some common plants used in seeding include: grasses, forbs, and trees.

C. Animals must have water sources in order to live.

1. Ponds, streams, and even lakes are good sources of water for many types of wildlife animals.
2. It is important to keep these areas free of pollution in order to insure a healthy population.

D. Carefully planned fires are a benefit to habitat growth.

1. Fires should never be used in dry areas because wildfires can develop.
2. ***Firebreaks*** are shallow ditches or trenches that outline the fire in order to assure that it is controlled.
3. Fire removes twigs, leaves, and other dead vegetation on the ground that has accumulated over the years.
4. Properly using fire helps to renew understory and allows for browse to grow.

E. Fertilizer is used to assure nutrients for adequate plant growth.

1. Soil testing may be needed in order to determine the kind of fertilizer to use.
2. Plant species require different nutrients, so it is important to research these topics before purchasing a fertilizer.
3. When fertilizing, apply evenly over the land. It will produce best results on grasses, forbs, and trees.

F. In some cases, it is best to leave the area undisturbed.

1. The area must be studied in advance because some practices may destroy food supplies and habitats of animal wildlife and cause them to leave.

Have students read information on habitat management practices (Chapter 10 of Wildlife Management: Science and Technology, 2nd Ed. has a section on this topic.) After reading, use student input to outline the major concepts on a writing surface or use TM: C2–3E. Use TM: C2–3D to show an example of how layers are distributed in hardwood forests.

Review/Summary. Focus the review and summary of the lesson on the student learning objectives. Have students explain the content associated with each objective. Use specimens of plant material for students to use in demonstrating their knowledge of the objectives. Use student responses as the basis for reteaching. Questions at the end of the chapter in the textbooks and in the activity manuals may be used in the review/summary process.

Application. Application can involve one or more of the following student activities:

Evaluating Wildlife Land-Use at School—LS: C2–3A

Evaluation. Evaluation should focus on student achievement of the objectives for the lesson. Various techniques can be used, such as student performance on the application activities. A sample written test is attached.

Answers to Sample Test:

Part One: Matching

1=b, 2=e, 3=h, 4=c, 5=d, 6=i, 7=j, 8=g, 9=f, 10=a

Part Two: Completion

1. savanna
2. stream
3. desert
4. taiga
5. Vegetation management

Part Three: Short Answer

1. The three types of vegetation management are removing understory, creating clearings, and thinning.
2. The six major habitat management practices are vegetation management, seeding, water sources, fire, fertilizer, and site preservation.
3. The five kinds of terrestrial biomes are tropical, temperate, grasslands and savannas, tundra and taiga, and deserts.

Sample Test Name_____

Test

Lesson C2–3: Defining Wildlife Habitat and Recognizing Its Importance

Part One: Matching

Instructions. Match the term with the correct response. Write the letter of the term by the definition.

a. biotic pyramid
b. metabolism
c. cover
d. space
e. home range
f. territory
g. dominance
h. interspersion
i. edge
j. biome

_____ 1. The internal process by which an organism gets energy from food.
_____ 2. The space an animal normally uses for living.
_____ 3. The mixing of many different stages within an area in managing habitat.
_____ 4. The vegetation or other material that provides safety in a habitat.
_____ 5. The area or territory around an organism.
_____ 6. The area where two habitat meet.
_____ 7. A large area with a distinct combination of plant and animal life.
_____ 8. When one or a few species control habitat conditions that influence other species.
_____ 9. An area smaller than the home range that is well defined to other members of the same species.
_____ 10. A graphical way of showing a food chain.

Part Two: Completion

Instructions. Provide the word or words to complete the following statements.

1. A _____ is an area similar to grassland where the soil fertility is too low to support the growth of much grass.
2. A _____ is flowing water that moves from higher to lower elevations.
3. A _____ is an area that forms a very dry habitat with little or no rain.
4. _____ areas are in cold climates where large conifer forest grow.
5. _____ _____ is using practices that promote the growth of desired plant species.

Part Three: Short Answer

Instructions. Provide information to answer the following questions.

1. What are three types of vegetation management?

2. What are the six major habitat management practices?

3. What are the five kinds of terrestrial biomes?

TM: C2–3A

HABITAT CLASSIFICATION

- Classification may be into biomes.
- Biome- large land area with distinct combinations of plants and animals; influenced by climate, precipitation, soil, and other factors.
- Kinds of biomes:

Terrestrial:

- Tropical
- Temperate
- Grasslands and Savannas
- Tundra
- Taiga
- Desert

Aquatic:

- Lakes and Ponds
- Streams
- Oceans and Seas
- Wetlands and Estuaries

TM: C2–3B

HABITAT MIX

Animals may prefer more than one stage of succession in their habitat- a mix.

Interspersion- mixing many stages within an area.

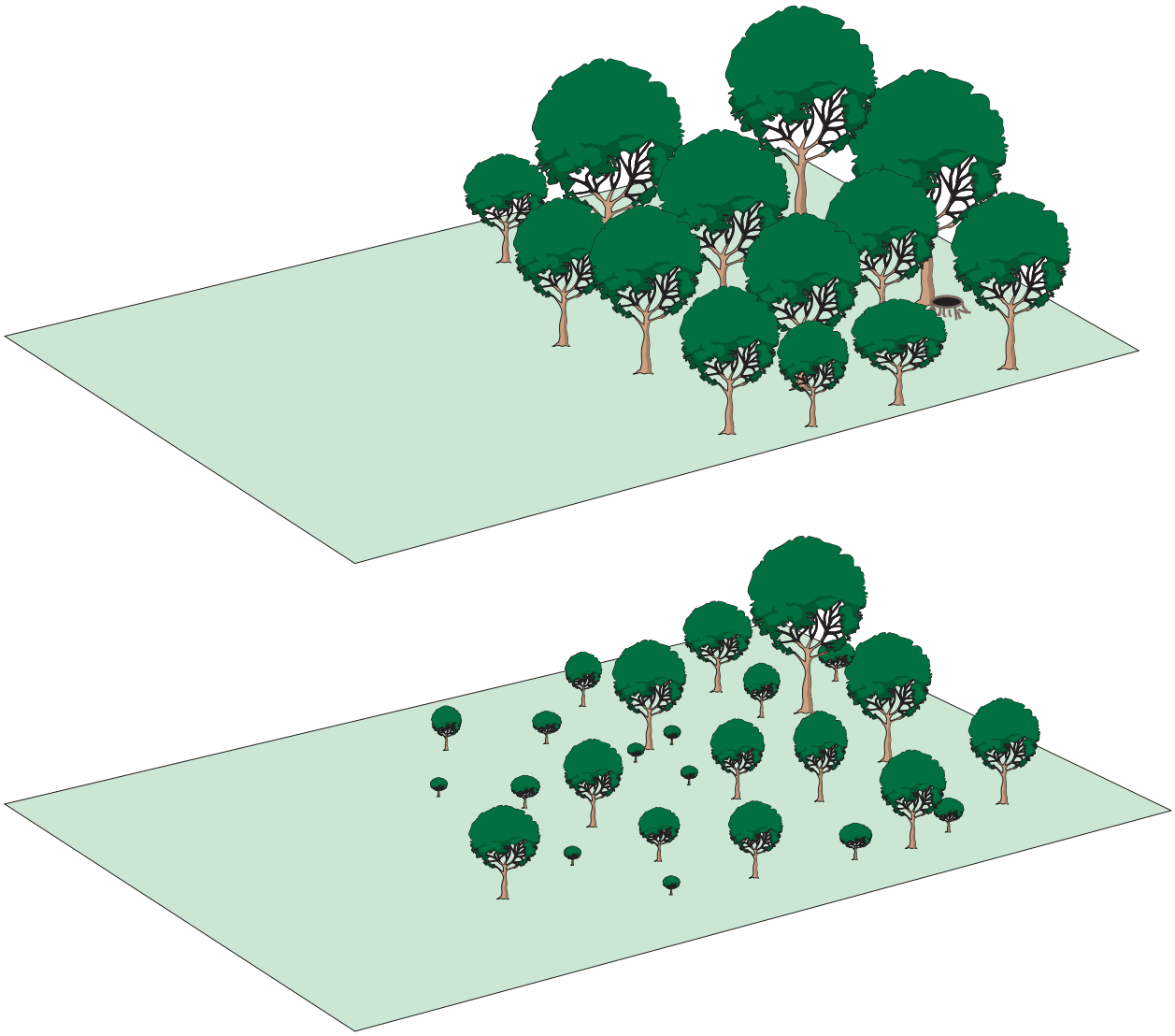
- **food, water, and cover are distributed throughout habitat.**

Edge- where two habitats meet; a mixture from two habitats.

- **greater amounts of edge appeal to a wide range of species.**

TM: C2–3C

HABITAT EDGE



(Courtesy, Interstate Publishers, Inc.)

TM: C2–3D

HABITAT MANAGEMENT GOALS

- **Manage for a specific wildlife species**
  - Featured species- a species promoted through habitat improvement
  - Species requirements are matched to capability of habitat
- **Manage for different species**
  - Species richness- number of different species in an area
  - A mixture of successional stages are used
  - Unbroken blocks of successional stages
  - Edges have high contrast
  - Variety of vegetative layers

TM: C2–3E

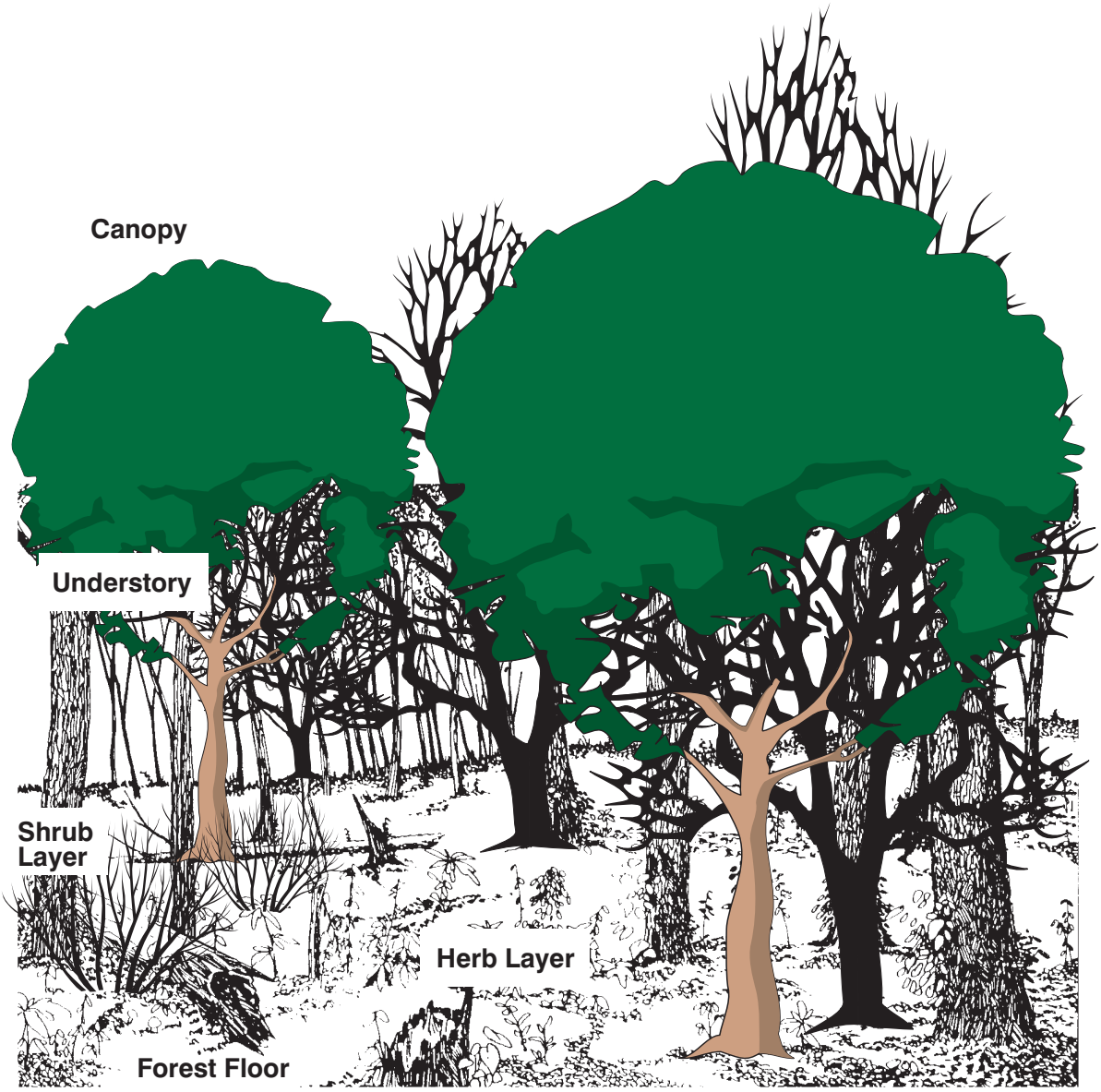
HABITAT MANAGEMENT

Practices:

- **Vegetation Management- promote growth of desired plant species**
  - Remove understory
  - Create clearings (clear-out)
  - Thinning
  - Combinations
- **Seeding**
- **Water sources**
- **Fire**
  - planned
  - control
- **Fertilizer use**
- **Site preservation**

TM: C2–3F

LAYERS IN A HARDWOOD FOREST



(Courtesy, Interstate Publishers, Inc.)

 Name_____

Lab Sheet

Evaluating Wildlife Land-Use at School

Purpose:

The purpose of this activity is to identify a problem involving wildlife on your campus and organize a project to attempt to solve it.

Objectives:

1. To identify a land-use or wildlife problem at your school.
2. To work as a group to identify ways of solving the problem.

Materials: (These are the materials needed for each group of students.)

1. A sheet of paper and pen or pencil for making a list.
2. Materials needed for project chosen.

Procedure:

1. Make a list of activities that might be harmful to the wildlife living on your school campus.
2. With your classmates, brainstorm ways that you could improve or lessen the impact of harmful activities on your campus. Some examples may include:
   a. Add permanent trash containers to the school campus to reduce the litter thrown onto the grounds.
   b. Start a recycling project with aluminum cans.
   c. Add trees, shrubs, or other plants or flowers to the school's landscaping to make additional homes for wildlife.
3. Look at the list of possible problems and suggestions for improvements and select one that your class can realistically handle.
4. Each group in your class should prepare a presentation to give to the whole class. Include a written description and illustrations of how the plan will work. Remember the include anyone who may be logically involved such as groundskeepers, custodians, school board members, etc.

Questions:

1. What activities were brainstormed?

2. Which activity was chosen? Why?