Lesson C5–5

Managing Wildlife Populations

Unit C. Animal Wildlife Management

Problem Area 5. Game Animals Management

Lesson 5. Managing Wildlife Populations

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 the relationships between animals and plants or other animals.
2. Describe population density and the population curve.
3. Identify problems associated with managing wildlife.

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:

Stutzenbaker, Charles D. et al. *Wildlife Management Science and Technology*. 2nd ed. Upper Saddle River, New Jersey: Prentice Hall Interstate, 2003. (Textbook Chapter 7)

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

Porter, Lynn, et al. *Environmental Science and Technology*. 2nd ed. Upper Saddle River, New Jersey: Prentice Hall Interstate, 2003. (Textbook and Activity Manual) (Chapter 17)

List of Equipment, Tools, Supplies, and Facilities

Writing surface
Overhead projector
Transparencies from attached masters

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

Birth rate
Commensalism
Competition
Death rate
Mutations
Mutualism
Parasite
Population
Population density
Population curve
Population response
Predation
Predator
Prey
Sterility

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.

Start a class discussion about the importance of wildlife and the benefits that wildlife provide (examples could include: beauty, food, natural balance, etc.). Create a list of the responses from the class. Now discuss the threats to wildlife (examples could include: habitat destruction, overpopulation, pollution, etc.). Also create a list of these responses. Now discuss how mankind can help eliminate these threats to wildlife. This is wildlife management. Allow this discussion to lead into the content of this material.

Summary of Content and Teaching Strategies

Objective 1: Describe the relationships between animals and plants or other animals.

Anticipated Problem: What relationships can animals have with plants or other animals?

I. Relationships between animals and plants or other animals can take many forms. These include:

   A. ***Competition*** occurs when animals compete for the same food or water. Usually, the strongest animal wins.

   B. ***Predation*** occurs when one species (the ***predator***) hunts and eats another (the ***prey***). Predation provides natural control of wildlife populations.

   C. The relationship could also be parasitic. A ***parasite*** lives in or on a host species and damages the host by taking food and water away from the host. Examples include ticks and roundworms.

   D. The opposite of a parasitic relationship is a ***commensalism*** which is when a species lives on or in a host without causing any harm. An example would be birds eating insects off of the backs of wildlife.

   E. ***Mutualism*** occurs when a relationship benefits both species involved. An example would be bees spreading pollen from flowers to pollinate other flowers, while using some of the pollen to produce honey.

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid describing the relationships between animals and plants or other animals. Chapter 17 in Environmental Science and Technology text is recommended. Use TM: C5–5A to aid in discussion on this topic.

Objective 2: Describe population density and the population curve.

Anticipated Problem: What are population density and the population curve?

II. A key factor that must be considered when managing wildlife populations is the population of the wildlife species. All the animals within an area make up its ***population.*** The population density, which is characterized by the population curve, is critical to managing wildlife populations.

A. The ***population density*** is a measure of how many of an organism are present in a given area. The ***birth rate*** (the number of new organisms added to a population over a give time) and the ***death rate*** (the number of organisms that die within a given period of time) influence the population density.

B. The population of a species varies through the year depending on births and deaths. The ***population curve*** represents the changes that occur in a wildlife population over a year. The population is highest just after the time of year when the young are born. It gradually reduces due to deaths caused by hunting, predation, and starvation. The animals that make it through the year breed, and the cycle starts again.

C. It is also important to know that different populations respond differently to changes in habitat, weather, etc. Some populations will rapidly grow or shrink, while others slowly respond. This is called ***population response***.

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid in describing population density and the population curve. Chapter 7 in Wildlife Management Science and Technology, 2nd ed. text is recommended. Use TM: C5–5C to aid in discussion on this topic.

Objective 3: Identify problems associated with managing wildlife.

Anticipated Problem: What are some problems that may be faced when managing wildlife?

III. When man undertakes the responsibility of managing wildlife, numerous problems may arise. These problems usually deal with managing the habitat, as the habitat is usually the limiting factor in managing wildlife. So, these problems must be dealt with for the wildlife to flourish. Some problems include:

A. Loss of natural vegetation that causes a reduction of the food supply and habitat. This loss can be caused by man (fire, construction, etc.) or by nature (fire, weather related events, or overpopulation).

B. Wetlands are drained, thus reducing the available habitat for species that live in those areas. Man often causes this loss.

C. Polluted waters not only cause problems for aquatic plants and animals, it also reduces the available drinking water for wildlife.

D. Polluted air also poses a problem. Not only is it harmful for wildlife to breathe, it also can cause acid rain, which damages or kills vegetation.

E. In extreme pollution cases, radioactive material may be dumped. This radioactive material may cause ***mutations*** (abnormalities in the wildlife) or ***sterility*** (the inability to reproduce).

F. Occasionally, animals are killed by motor vehicles (such as cars, ATVs, or trains). Often, predatory wildlife is killed to protect domestic livestock.

G. Domestic livestock can also adversely affect wildlife by transmitting diseases to them. Wildlife often is not able to fight these diseases.

H. Another form of pollution involves pesticides used by farmers and homeowners. Applying these pesticides incorrectly can cause adverse affects to the wildlife in the area. Far too often, farmers are blamed for polluting the environment with pesticides.

I. Mankind can also adversely affect wildlife by introducing non native species of plants or animals. Non native plants can overtake a habitat and push out the plants that wildlife use for food and shelter. Non native animals can affect the food chain by competing for food and space.

There are many techniques that can be used to assist students in mastering this material. Students need text material to aid in identifying problems associated with managing wildlife. Chapter 7 in Wildlife Management Science and Technology, 2nd ed. text is recommended. Use TM: C5–5D to aid in discussion on this topic.

Review/Summary. Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Questions at end of chapter in the textbook may also be used in the review/summary.

Application. Several opportunities for application are listed in the "Exploring" section at the end of Chapter 7 in the *Wildlife Management Science and Technology*, 2nd ed. text.

Evaluation.

Answers to Sample Test:

Part One: Matching

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

Part Two: Completion

1. diseases
2. Radioactive
3. population
4. mutualism
5. birth rate

6. population curve
7. pesticides

Part Three: Short Answer

1. By competing for food and water.
2. With a parasitic relationship, the host is damaged.

Sample Test Name _____

Test

Lesson C5–5: Managing Wildlife Populations

Part One: Matching

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

a. Commensalism
b. Competition
c. Parasite
d. Population Density
e. Predation
f. Species Richness
g. Sterility

_____ 1. The inability to reproduce.

_____ 2. A measure of how many of an organism are present in a given area.

_____ 3. One species hunts and eats another.

_____ 4. The habitat is managed to promote all species of wildlife.

_____ 5. A species lives on or in a host without causing any harm.

_____ 6. Animals compete for the same food or water.

_____ 7. Lives in or on a host species and damages the host.

Part Two: Completion

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

1. Domestic livestock can harm wildlife by introducing _____ that the wildlife can't fight.
2. _____ material can cause mutation or sterility in wildlife.
3. All the animals in an area make up its _____.
4. When both species benefit from a relationship, it is called _____.
5. The _____ _____ causes the population to increase.
6. The _____ _____ shows how wildlife populations vary throughout the year.
7. Farmers are often blamed for polluting the environment with _____.

Part Three: Short Answer

Instructions. Provide information to answer the following questions.

1. How can non native species affect wildlife?

3. What is the difference between commensalism and parasitism?

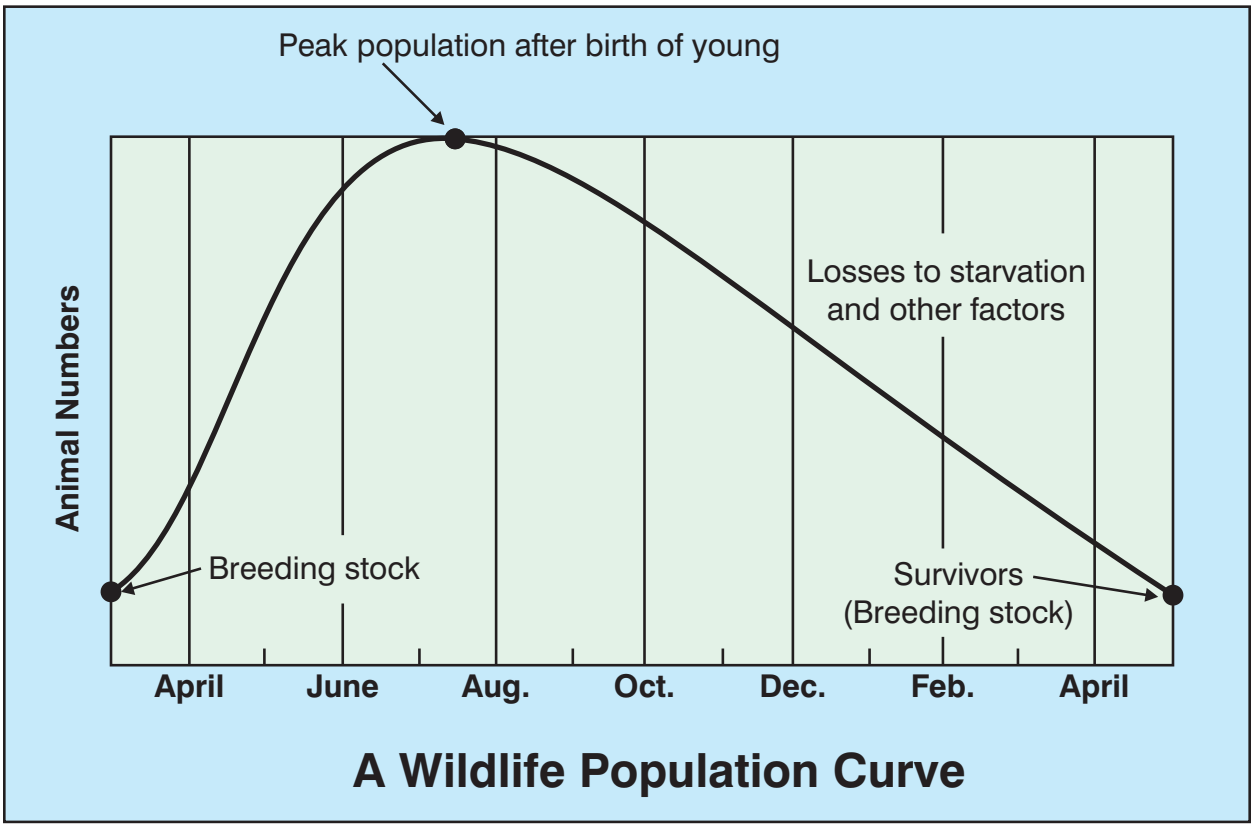
TM: C5–5A

ANIMAL & PLANT RELATIONSHIPS

- **Competition - Species compete for food and water**
- **Parasitism - A species lives on or in another and damages the host species**
- **Commensalism - A species lives on or in another and the host species is not damaged**
- **Predation - One species eats another**
- **Mutualism - Two species benefit from each other**

TM: C5–5B

WILDLIFE POPULATION CURVE



A Wildlife Population Curve

TM: C5–5C

PROBLEMS IN MANAGING WILDLIFE

- Loss of natural vegetation
- Wetlands are drained
- Water Pollution
- Air Pollution
- Radioactive Materials
- Wildlife being killed
- Diseases from domestic livestock
- Pesticides
- Nonnative Species