INSTRUCTOR GUIDE
LESSON 15: WILDLIFE CONSERVATION

V. 2/2017

Basic Hunter Education 2014 Standards – Section 1
Objectives 5, 6, & 7

Instructor Notes	This lesson introduces the students to wildlife conservation, habitat and wildlife population dynamics. This lesson corresponds with Chapter 5 (pages 84-89) in the student manual. **Teaching Methods Used In This Lesson** • **Lecture** • **Discussion** This lesson includes the use of a PowerPoint show (See Addendum A). Review the PowerPoint ahead of time and familiarize yourself with the functionality of the presentation. Certain slides present all information at once, while others reveal pieces of information at a time. This is intended to allow the students to see topics or questions while still hiding the additional information from view. This allows the instructor to use questioning techniques throughout the lecture.
Time Suggested	40 Minutes
Materials Required	• Audio visual equipment (projector & screen)

	• Laptop w/ PowerPoint viewer
	• *2017 Wildlife Conservation Slideshow*

Station Set-up 10 minutes	1. Set up projector, screen, and laptop and open the PowerPoint show. 2. This opens the show to Slide #1 (the Title slide) that should be displayed.

Vocabulary Builder

> Note: Do not read the vocabulary to the students. These are terms commonly used during this lesson, and the definitions are for instructor reference only.

Additive mortality - When the standard regulated harvest adds to the annual mortality rate.

Balance – Stability in nature, where game populations do not exceed the capacity of the habitat to support their survival.

Biological surplus – The amount of animals in a given population that are "above" the carrying capacity.

Carrying capacity – The number of animals each habitat can support throughout the year.

Compensatory mortality – When the standard regulated harvest replaces mortality factors that otherwise would have reduced the annual population by a similar amount.

Conservation – The wise sustainable use of natural resources.

Edge effect – The changes in animal populations that occur at the boundary of two habitats. As the edge effect increases, the boundary habitat will allow for greater biodiversity.

Habitat – The natural environment of a plant or animal that consists of the arrangement of food, water, cover and space necessary to survive.

Limiting factors – Dynamics that control population growth.

Non-renewable resource – Natural resources that are not easily replenished.

Preservation – Protection of natural resources that does not include any direct use by people.

Renewable resource – Natural resources that can be used, managed, and replenished.

Succession – The natural, gradual change to habitat.

Wildlife management – The wise use and manipulation of renewable wildlife resources. It is a field of study based on science.

LESSON PLAN

PART A:

Focus Activity

1 minute

The purpose of the focus activity is to get everyone focused on the lesson. Ask: "Can anyone name the state agency that is responsible for wildlife management and conservation in Massachusetts?" (*The Massachusetts Division of Fisheries & Wildlife is responsible for the conservation including the restoration, protection and management of fish and wildlife resources*)

> Note: This lesson uses PowerPoint extensively as a teaching aid. This "click" icon (👆) is shown when the instructor should advance the PowerPoint. It is vital that you practice with the PowerPoint ahead of time so that you are familiar with the program and know how/when to navigate it properly. See Addendum A for a layout of the slides.

PART B:

Objectives

1 minute

👆 Slide #2 – State the learning objectives to the students. "At the end of this lesson, you will be able to:

- 👆 identify key components of wildlife habitat;
- 👆 describe how wildlife and habitat interact;
- 👆 and describe how carrying capacity, biological surplus, and limiting factors affect the size of a population."

PART C:

Teaching Method

35 minutes

Say: "Let's take a look at what we mean by wildlife conservation."

1. 👆 Slide #3 – Say: "The main idea behind conservation is that wildlife and habitat must be conserved for future generations. 👆 Conservation is known as the wise and

sustainable use of natural resources." Ask: "What does wise use mean?" Use questioning techniques to draw some answers from the students. Include the following:
- use serves a purpose
- use is regulated
- use prevents waste

2. 👆 Slide #4 – Discuss wildlife management: read the definition on the slide and discuss the **bold** words. Say:
- 👆 "wildlife management uses **science** to manage wildlife **populations** and their **habitats** to achieve a goal."
  - science – biologists study the interaction between living things and their environment
  - populations – managing populations is sustainable, managing individuals is not
  - habitat – the best way to manage a population is through managing its habitat

3. 👆 Slide #5 – Define habitat. Say: "We will start with understanding the importance of habitat. What is habitat?" Allow the students to respond before revealing the information on the slide. 👆 Say: "Habitat is a species' home address (i.e. the physical location where an animal lives)."

4. Slide #5 (continued) – Identify and discuss the 4 primary components of habitat and why the proper arrangement of those 4 components is essential:
- 👆 food, water, cover, and space
- 👆 arrangement – the close proximity of the four components is key

5. 👆 Slide #6 – Discuss some examples of different habitat types. Say: "There are different types of habitat. Ask students to give some examples of different habitat types:

- river
- forest
- meadow

6. 👆 Slide #7 – Ask: "How does the quality of habitat affect wildlife reproduction and survival?"
   - 👆 better quality equals more resources
   - 👆 more resources equals more reproduction/survival
   - 👆 more resources equals less crowding, thus less spread of disease

7. 👆 Slide #8 – Discuss succession. 👆 Say: "Habitat is always changing through a process called succession. Succession is the natural gradual change in plant communities over time. 👆 It will progress through a fairly predictable set of stages. Grasslands will be replaced by shrubs. Shrubs will grow into young forest. Young forest will grow to mature forest. Each stage benefits different plant and wildlife species."

8. 👆 Slide #9 – Say: "Reproduction and survival are also affected by climate. Climate is the long term weather patterns (temperature and precipitation) of an area that influences the seasons." Ask: "How would climate affect wildlife reproduction and survival?" Discuss the following:
   - 👆 climate affects habitat - the vegetation changes as the climate changes; as the vegetation changes, so does the habitat
   - climate affects a species range - many species have evolved to tolerate a certain range of extremes; once exceeded the species can't survive

9. 👆 Slide #10 – Say: "Reproduction and survival are also affected by the reproductive potential of a species. Some species have lots of young annually where others have very

few. For example: 👆 through generational reproduction in suitable habitat, a single pair of deer can become 40 deer over a seven year period."

10. 👆 Slide #11 – Discuss carrying capacity. Say: "Carrying capacity is the amount of animals a habitat can support throughout the year. This amount is restricted by the quality of the habitat. The size of the population will grow when resources are abundant and decline when resources are scarce. To have a long term effect on the population, the quantity and quality of the habitat components must increase.   The loss or degradation of habitat is the primary threat to the survival of wildlife."

11. 👆 Slide #12 – Discuss limiting factors. Say: "Healthy populations fluctuate on an annual basis. It is common for a species to exceed carrying capacity until various influences slow or stop population growth. These are called limiting factors." Ask: "What limiting factors can influence the size of a population?" Use questioning techniques to engage students.
   - 👆 extreme weather events
   - competition
   - disease
   - predation

12. 👆 Slide #13 – Discuss biological surplus. Say: "When populations fluctuate annually, 👆 the amount of animals that are above the carrying capacity is called the biological surplus. It is common for a species to produce more animals each year than will survive to the next. 👆 When this happens, all extra or surplus animals will die due to disease, predation, or other factors. Most harvest seasons occur in the fall and winter when this surplus is available

and regulated hunting replaces the mortality factors that would otherwise reduce the population."

13. 👆 Slide #14 – Discuss hunting as a management tool. Say: "Hunting seasons can also be used as a management tool to decrease animal densities for species that cause damage. Biologists set goals and will use the regulated harvest to add to the annual mortality rate to decrease the population."

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PART E: **Student Summary** 3 minutes	👆 Slide #15 – Ask the students to recall the important topics that were covered in the lesson. It is important for students to be able to verbalize these points. Use questioning strategies to engage the students. • 👆 What are the 4 components that make up a habitat? • 👆 What is the definition of carrying capacity? • 👆 What is it called when a habitat changes through a natural gradual process? **END OF LESSON**

Addendum A ⓘ

POWERPOINT SLIDES FOR LESSON FIFTEEN
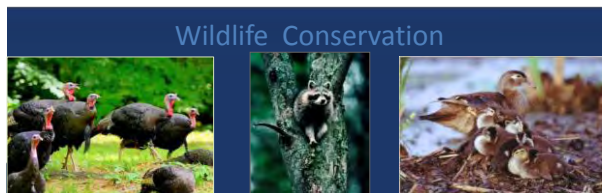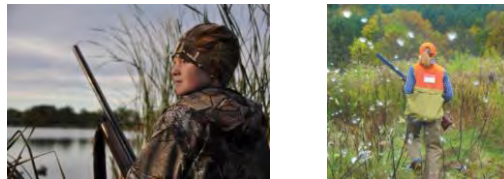
#1 -

Learning Objectives

You will be able to:
- identify key components of wildlife habitat;
- describe how wildlife and habitat interact;
- and describe how carrying capacity, biological surplus, and limiting factors affect the size of a population.

#2 -

Wildlife Management

Wildlife Management uses **science** to manage wildlife **populations** and their **habitats** to achieve a goal.

#3 -

Wildlife Management

Wildlife Management uses **science** to manage wildlife **populations** and their **habitats** to achieve a goal.

#4 -

Habitat

Habitat is a species' home address.

Food

Water

Arrangement

Cover

Space

#5 -

Habitat Types

#6 -

Wildlife Reproduction and Survival affected by <u>Habitat</u>

• better quality equals more resources

• more resources equals more reproduction and survival

• more resources also equals less crowding, thus less spread of disease

#7 - MASS**WILDLIFE**

Habitat is always changing

<u>Succession</u> is the natural gradual change of plant communities over time.
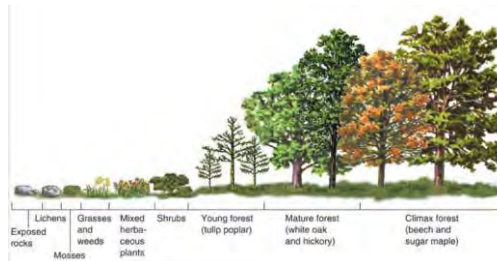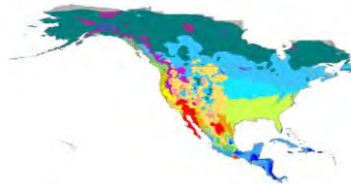

#8 - MASS**WILDLIFE**

Wildlife Reproduction and Survival affected by <u>Climate</u>

• climate affects habitat
• climate affects species ranges

#9 - MASS**WILDLIFE**

Wildlife Reproduction and Survival affected by <u>Reproductive Potential</u>

#10 -

Carrying Capacity

Carrying Capacity is the amount of animals within a population that a given habitat can support throughout the year.
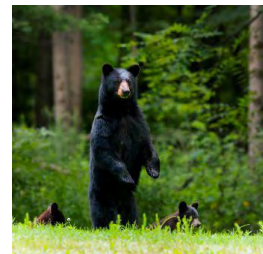

#11 -

Limiting Factors

Limiting Factors are influences that slow or stop population growth.

- extreme weather events
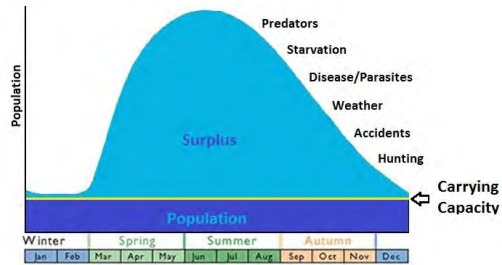- predation
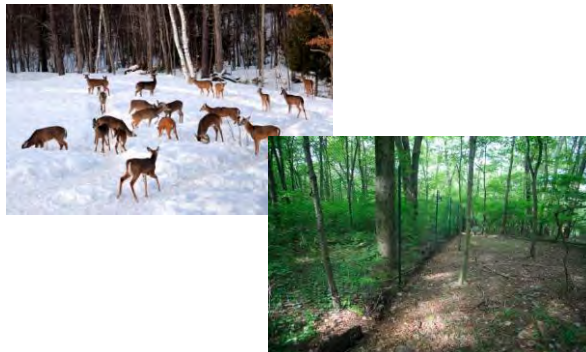- disease
- competition

#12 -

A Year in the Life of a Wildlife Species

Biological Surplus is the amount of animals in a given population that are "above" the carrying capacity.

#13 -

Hunting as a Management Tool

#14 -

Summary

- What are the four components of habitat?

- What is the definition of carrying capacity?

- What is it called when a habitat changes through a natural gradual process?

#15 -

<u>**Addendum B**</u>

FREQUENTLY ASKED QUESTIONS

1. What happens if the population gets below carrying

capacity?

The carrying capacity of a habitat will change as the quality of the habitat changes. Given a habitat that has not undergone any substantial change in quality, a population that dips below the carrying capacity should rebound and begin increasing again due to there now being more resources than the population requires.