Agenda

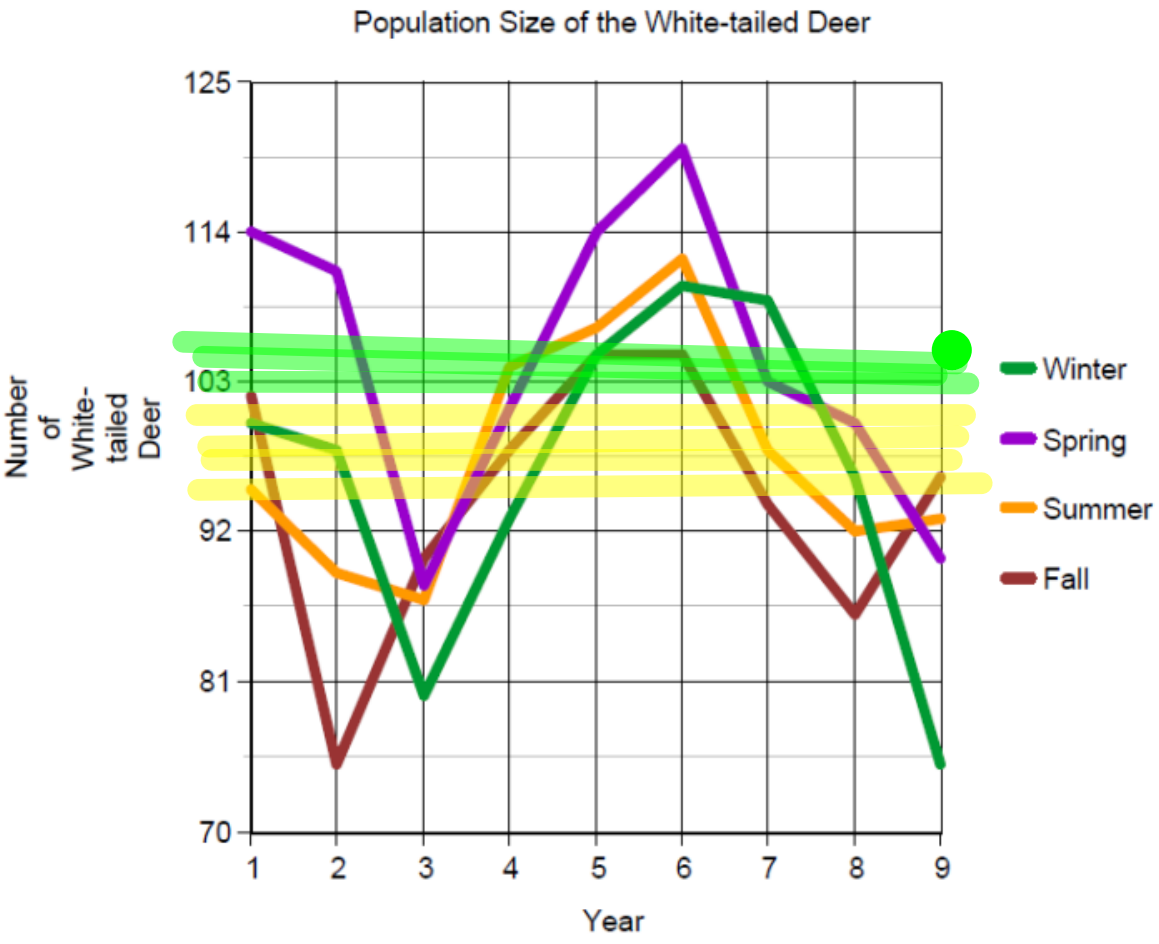
- Modeling Lions Debrief
- Population Distribution Notes
- Population Distribution Pratice

May 9-7:42 AM

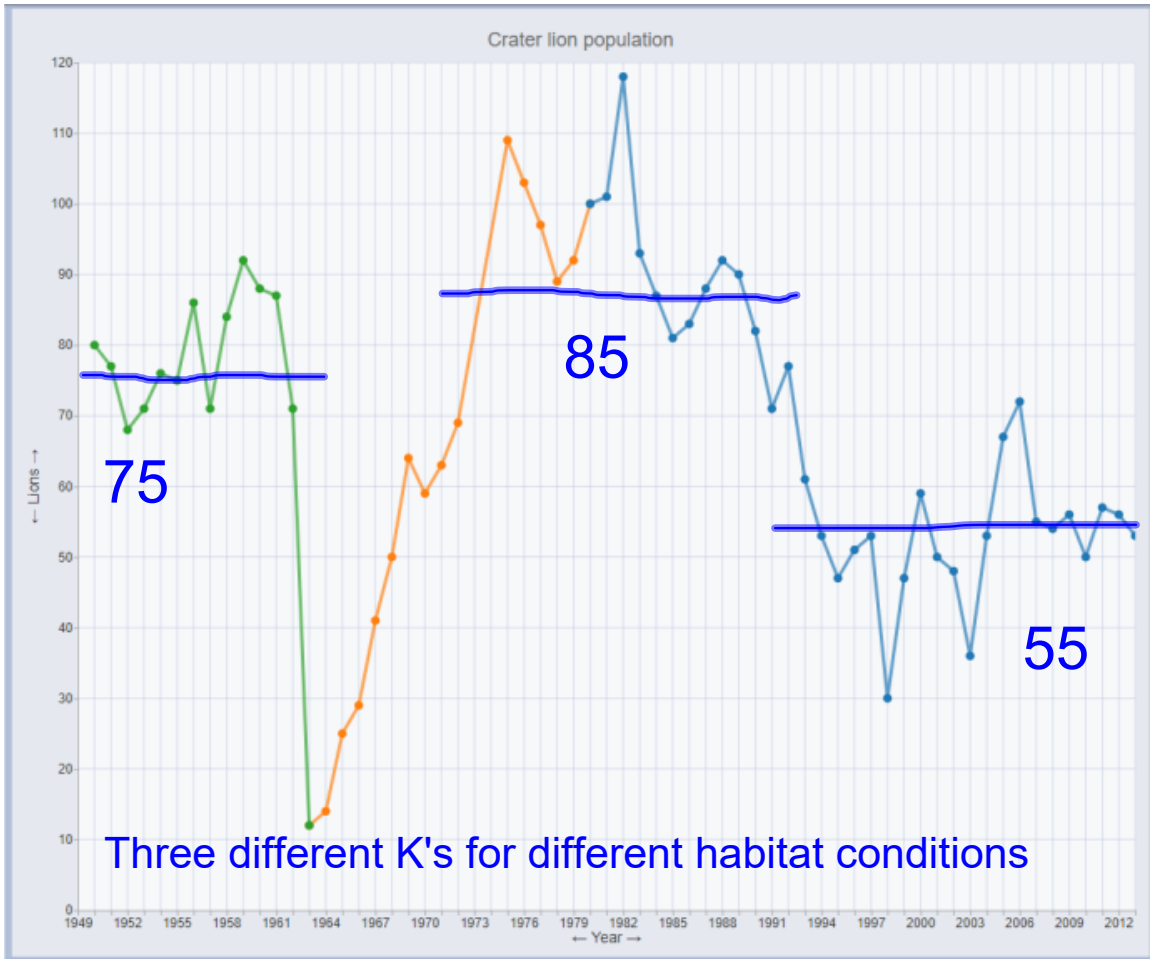
What is the Carrying Capacity of the Deer Population?

Large range for all seasons.

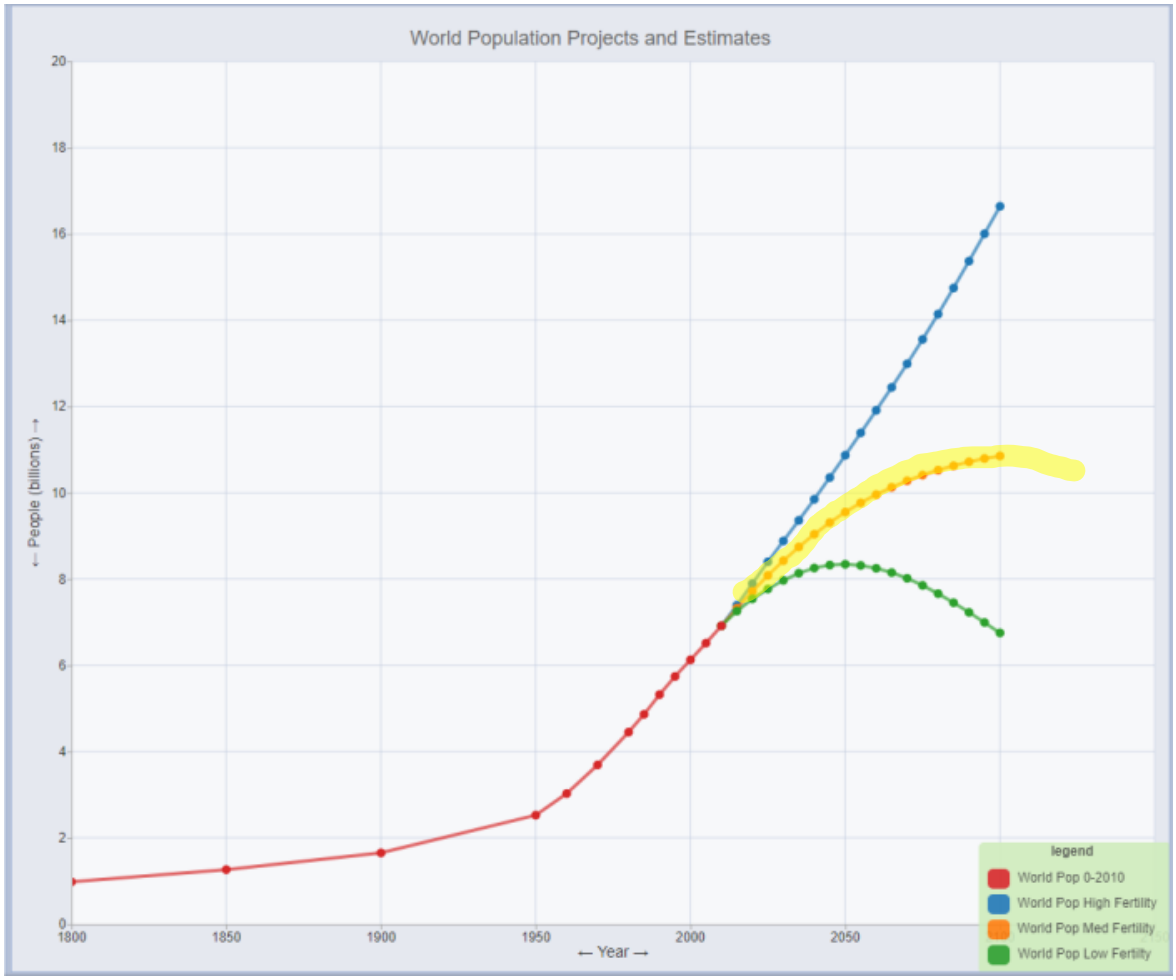
If Spring only than = 103 - 108



Apr 17-7:40 PM



Apr 19-10:14 AM



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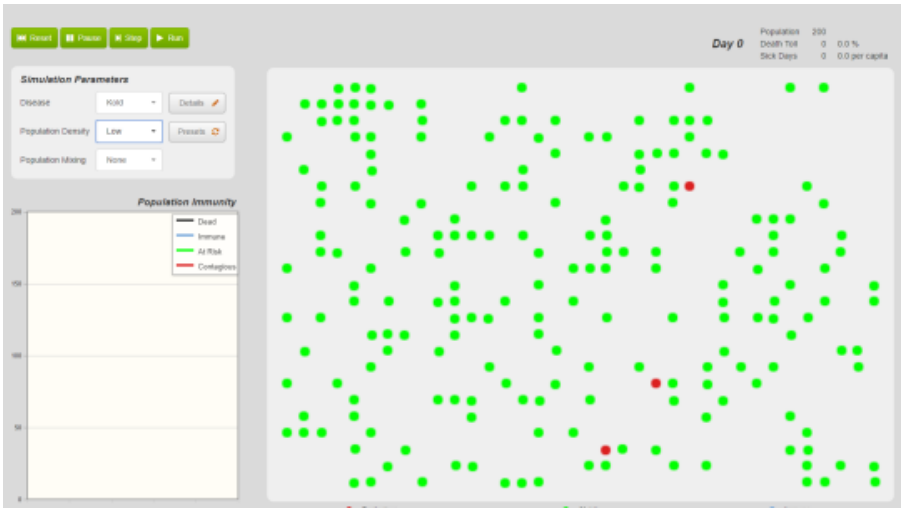
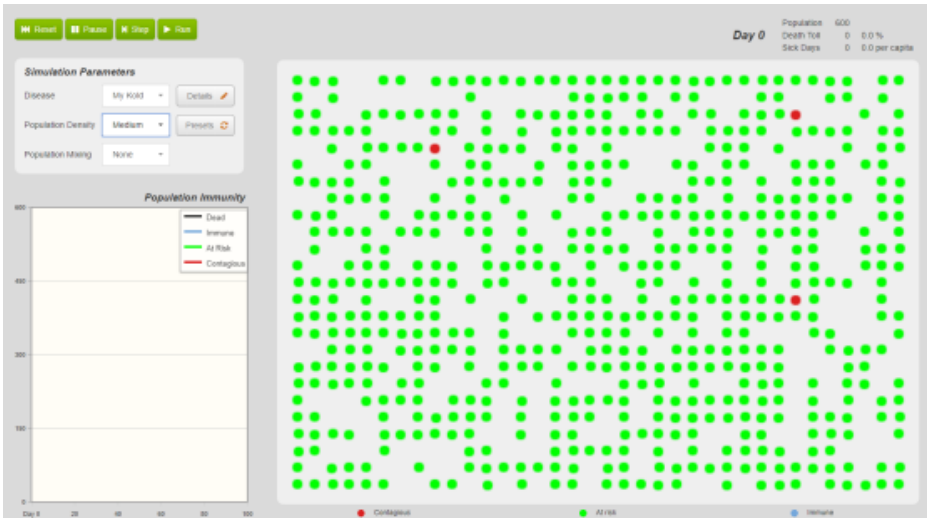
Stop the Spread

Disease Lab Link

Low Density



High Density



Apr 19-10:28 AM

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Apr 19-9:43 AM

3B Ecology: Population Density & Distribution

Population density is the number of individuals that live in a defined area.

- Population density is a measurement of :

  is a measurement of the number of individuals living in a defined space.

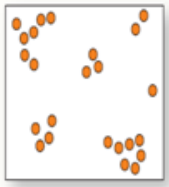
- Scientists can calculate population density.

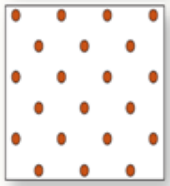
$$\frac{\text{\# of individuals}}{\text{area (units}^2\text{)}} = \text{population density}$$

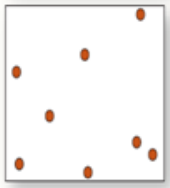
Geographic dispersion:

- Population dispersion refers to : how a population is spread in an area.

Label each type of dispersion next to the picture

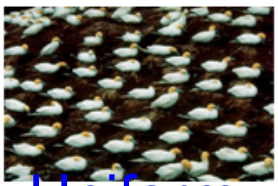






Identify each type of dispersion shown

Random

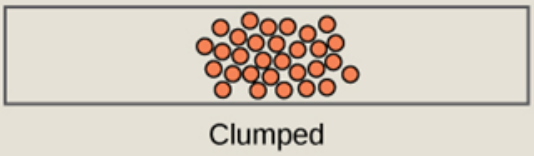


Uniform

Clumped

Clumped

clustered together, creating patches with many individuals and some patches with no



Clumped

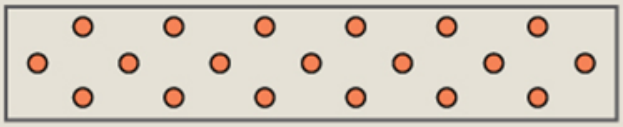
- school of fish
- herds/flocks
- packs/pride
- colonies
- social groups
- protection from pred
- resource availability

Apr 20-3:27 PM

Uniform

Evenly

- plants in high density
- Territorial



Uniform

Apr 20-3:27 PM

Random

individuals are arranged without any apparent

Random

- angler fish
- sharks
- large predators
- solitary organisms
- flowers

Apr 20-3:27 PM

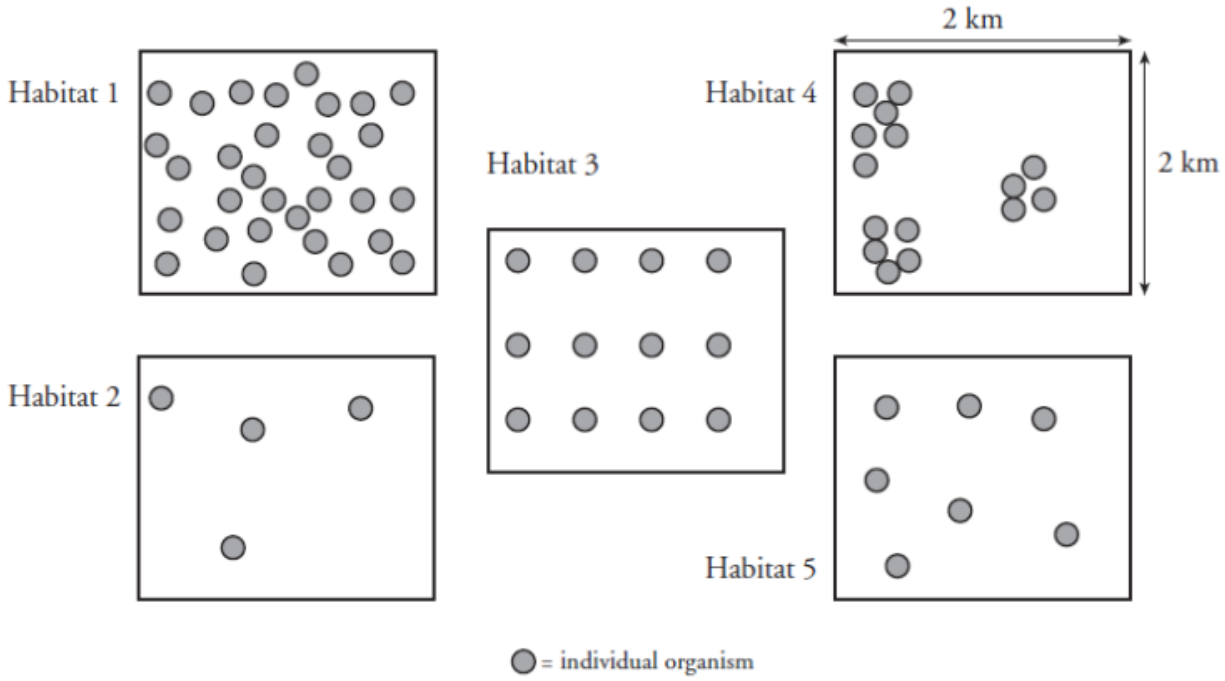
Population Distribution

How does population distribution affect the environment?

Why?

Alaska contains over 127 million acres of untouched forest land. It is the largest state in the United States, yet with a population of nearly 700,000 people it has the same total population as Austin, Texas. New Jersey is one of the smallest states and home to a population of nearly 9 million, but almost 1.8 million of its 4.4 million total land acres are untouched natural woodland. What are the reasons for the ways populations organize themselves, and what effect does this organization have on the environment?

Model 1 – Population Density and Distribution



1. Refer to Model 1.
   a. What do the dots in the diagrams represent?

   b. What do the boxes in the diagrams represent?

2. Calculate the area of a single habitat.

   $A = l \times w \quad A = 2 \times 2 = 4 km^2$

3. Consider the arrangements of the dots in Model 1.
   a. Describe the arrangements of the dots in habitat 3.

b. Describe the arrangement of the dots in habitat 4.

4. Fill in the table below by counting the number of individuals in each habitat in Model 1 and then calculate the area available per individual.

Habitat No.	Area (km^2)	No. of Individuals	No. of Individuals/Unit area (Density)
1	4		
2	4		
3	4		
4	4		
5	4		

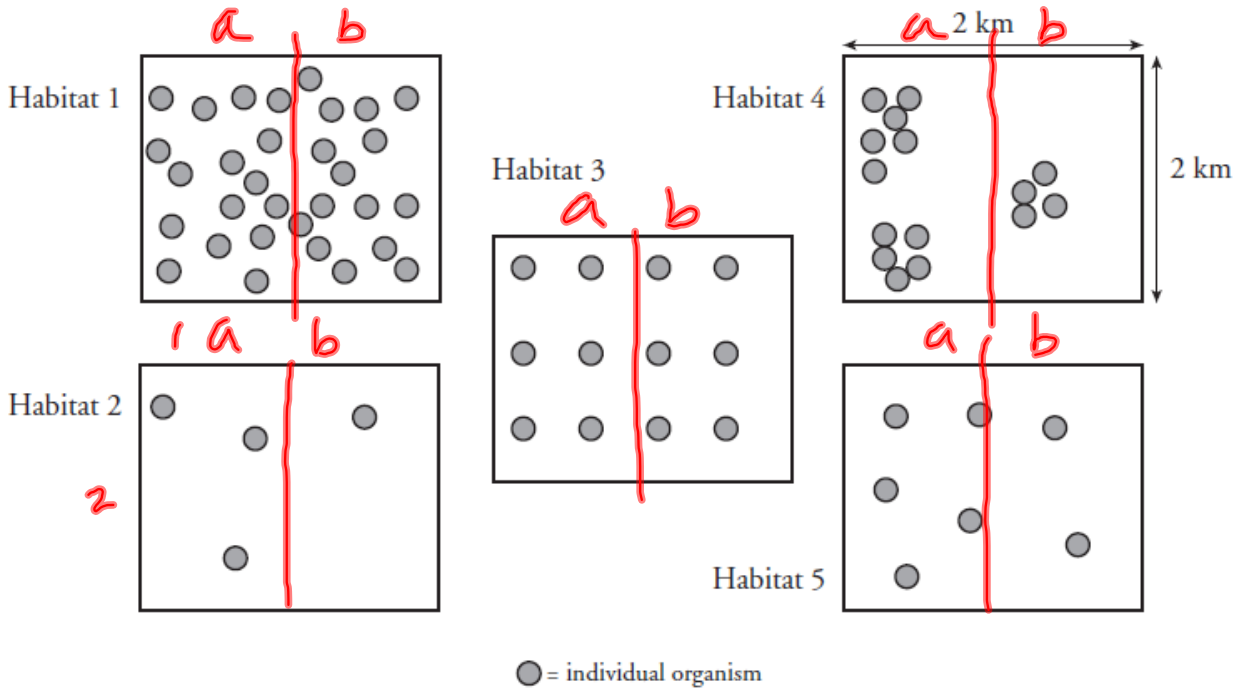
5. Refer to the completed table above.

a. Which habitat shows a high **population density**?

b. Which habitat shows the lowest population density?

Apr 18-10:32 AM

Model 1 – Population Density and Distribution



6. Draw a vertical line through the middle of each of the boxes in model 1. Label the left side "a" and the right side "b" on each box. Complete the table below for each half of each habitat.

Habitat No.		Area (km²)	No. of Individuals	No. of Individuals/Unit area (Density)
1	a			
	b			
2	a			
	b			
3	a			
	b			
4	a			
	b			
5	a			
	b			

7. For which of the habitats in Model 1 is population density very similar between sides a and b?

8. For which of the habitats in Model 1 is the population density quite different between sides a and b?

9. Label each of the diagrams on Model 1 using the terms clumped (clustered), random, and uniform (even) to describe the **population distribution** within the boxes.

10. Compare and contrast the terms population density and population distribution.

11. Assuming the population size stays constant, propose at least two factors that might cause a population to shift from a low density habitat to a high density habitat?

12. Animals such as lions or wolves often show clumped distribution. Give a reason why this would be advantageous for these animals.

13. Other than social reasons, list any other factors that may lead to clumped distribution patterns in populations.

14. For each of the organisms listed below state the type of population distribution and population density of their habitat. Give a reason for each answer.

Organism	Distribution	Density	Reason
Tigers			
Bison			
Ants			
Dandelions			
Apple trees in an orchard			

Apr 18-10:33 AM

Model 2 – Factors Affecting Density

Factor	Density Dependent	Density Independent
Food supply	X	
Rainfall		X
Flood		X
Parasites	X	
Acidity		X
Disease	X	
Drought		X
Competition	X	
Predation	X	

15. Refer to Model 2.

    a. Which factors are dependent on the population density?

    b. Describe how the food supply would be affected by the population density.

    c. Describe how the levels or spread of disease would be affected by population density.

16. What do all the density-independent factors have in common?

17. In your own words, define **density dependent** and **density independent** by completing the sentences below.

    Density-dependent factors are

    Density-independent factors are

18. Density-independent factors and density-dependent factors may be interrelated. For example, a lack of rainfall that causes a drought will impact the food supply in a habitat. Propose another pairing of a density-independent factor and density-dependent factor that might occur.

Attachments

3B Population Ecology.ppt