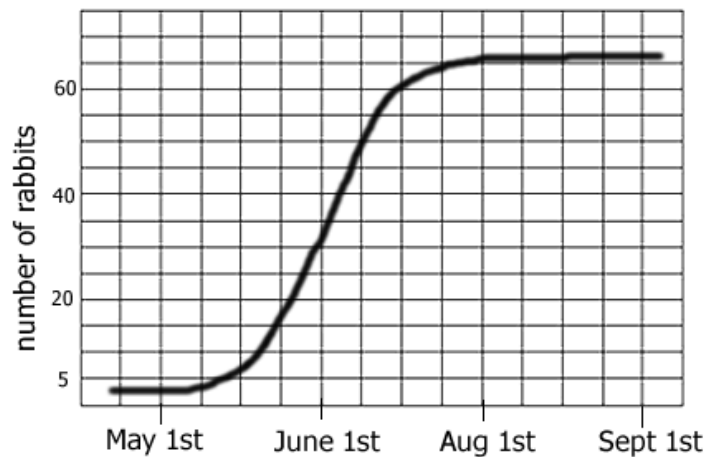


## 11-4 What are limiting factors?

**Limiting Factors** Certain conditions in the environment limit how much a population can grow. These conditions are called **limiting factors**. Suppose a type of plant needs a lot of water to survive. In an area with little rainfall, only a few of these plants might be able to survive. In an area with little rainfall, only a few of these plants might be able to survive. The amount of water is a limiting factor for the plant. Other limiting factors of plants are the amount of sunlight and the type of soil. Animals also are limited by conditions in the environment. Limiting factors of animals include temperature, water, food supply, and shelter.



**Black-footed ferrets live in a burrow.**



**This graph is used to show carrying capacity**

**Plants as Limiting Factors** The number of green plants in a community is a limiting factor of the animals in a community. Suppose many green plants in a meadow died. Some of the mice that eat plants would starve. With fewer mice to eat, some of the owls also would starve. Even though owls do not eat plants, the number of owls is affected by the number of plants. The size of animal populations are limited by the sizes of plant populations.

**Carry Capacity** The largest population that can be supported by an area is the area's **carrying capacity**. An area has different carrying capacities for different populations. When a population becomes too large, some of its members must move or they will die from lack of resources. The spread of organisms from one area to another is called dispersal. Look at the graph above (right). It shows the growth of a population as it approaches the carrying capacity. The actual growth pattern of a population may not always follow this model. In nature, growth rates and carrying capacity change as the environment changes.

**Range** The area where a kind of population lives is called its **range**. The size of an organism's range is determined by its limiting factors. For example, American black bears can eat a large variety of foods, including berries, nuts, and small mammals. As a result, their range is large. American black bears can be found across much of the United States. Giant pandas eat only bamboo. The range for the giant panda is very small. Pandas are only found in forested areas of China.

# 11-4 What are limiting factors?

## Lesson Review

Write *true* if the statement is true. If the statement is false, change the underlined term to make the statement true.

- \_\_\_\_\_ 1. The largest population size that can be supported by the available resources of an area is its limiting factor.
- \_\_\_\_\_ 2. The conditions in an environment that put limits on the size a population can grow to are limiting factors.
- \_\_\_\_\_ 3. The size of all other populations that can live in an area is determined by the size of the animal populations.
- \_\_\_\_\_ 4. The amount of sunlight an area receives is a limiting factor for plants.
- \_\_\_\_\_ 5. The size of an organism's range is determined by the limiting factors of the area.
- \_\_\_\_\_ 6. Organisms that eat only a few kinds of food have a larger range than organisms that eat many kinds of food.
- \_\_\_\_\_ 7. The area where a type of plant or animal is found living is the carrying capacity of the organism.
- \_\_\_\_\_ 8. Limiting factors for animals include temperature, water, food supply, and shelter.

## Skill Challenge

**Skills:** *classifying, identifying*

Decide whether each limiting factor listed below directly affects plants or animals or both. Complete the table by placing check marks in the correct columns.

LIMITING FACTORS		
Factor	Affects Plants	Affects Animals
1. Amount of water		
2. Amount of sunlight		
3. Amount of food		
4. Type of soil		
5. Proper temperature		
6. Shelter		
7. Animals in area		
8. Plants in area		

## CHECKING CONCEPTS

1. A limiting factor of plants is the amount of \_\_\_\_\_.
2. The sizes of animal populations are limited by the \_\_\_\_\_ populations.
3. Carrying capacity is the \_\_\_\_\_ size of a population that can be supported by an area.
4. The area where a type of plant or animal population is found is its \_\_\_\_\_.
5. The \_\_\_\_\_ of a range is determined by an organism's limiting factors.