SNC1D
CHAPTER 2: POPULATIONS & SUSTAINABLE ECOSYSTEMS

2.2: INTERACTIONS AMONG SPECIES

All organisms interact with other species in multiple ways, and these **interactions** along with **limiting factors** restrict populations to particular places, roles, and sizes in the ecosystems they occupy.

A Species' Ecological Niche

Niche, in ecology, involves all of the interactions of a species with the other members of its community, including **competition**, **predation**, **parasitism**, and **mutualism**. A variety of abiotic factors, such as soil type and climate, also define a species' niche. Each of the various species that make up a community occupies its own ecological niche. Informally, a niche is considered the "job" or "role" that a species performs within nature.

Types of Species Interaction (see Table 1.1 on page 10)

1. **PREDATION *(page 58)*** occurs when predators feed on other individuals, usually the young and weak, of another species. These interactions are extremely important to ecosystems because they limit the size of prey populations, for example deer.

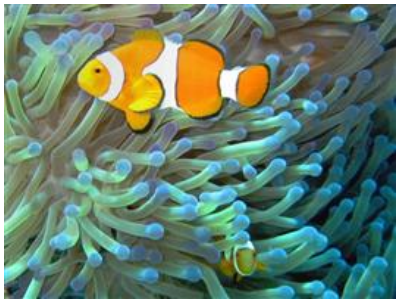
2. **COMPETITION *(page 60)*** occurs when two or more individuals, from the same or different species, require the same resource. For example, a coyote and a vulture compete for the same food source or two plants compete for nutrients in the soil.

Two red deer in competition for a female mate.

3. **SYMBIOSIS *(page 62)*** is the interaction between members of two different species that live together in a close association. The following are two types of symbiosis:

    - **PARASITSM *(page 62)*** occurs when one species benefits from an interaction and another is harmed. However, unlike predators, parasites typically do not kill their host.

    - **MUTUALISM *(page 63)*** occurs as a cooperative relationship between two species in which both species may benefit. For example, the strain of *E. coli* bacteria in your intestines produces vitamin K, while your body provides a home for the bacteria.



As Nemo's father explained, the clownfish gets protection and housing from an anemone, while the anemone receives leftover food scraps from the clownfish.

Predation & Population Size **(Read Page 58)**

Compare ***Bottom-Up Population Regulation*** with ***Top-Down Population Regulation***:

Use an example in your comparison.

Check Your Understanding

1. What is an ecological niche?

2. What factors influence the populations of moose and wolves on Isle Royale?

3. What would be the advantage of studying an island ecosystem in which the only large herbivore was the moose and the only large predator was the wolf? What would be the disadvantage?

4. List the biotic niche factors, the abiotic niche factors, and the ecological services of the big brown bat in Figure 2.9 on page 56

Biotic Niche Factors	Abiotic Niche Factors	Ecological Services

5. Give one example of each type of species' interaction. [Use examples that are different from those mentioned in the notes.]

   a) predation

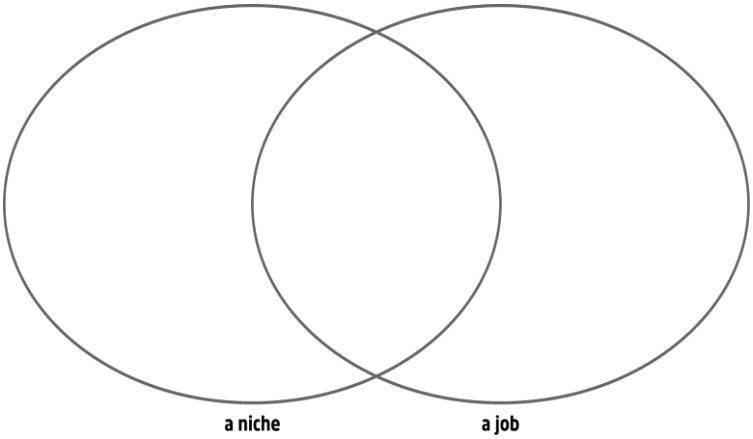
   b) competition

   c) symbiosis

Section 2.2 Review

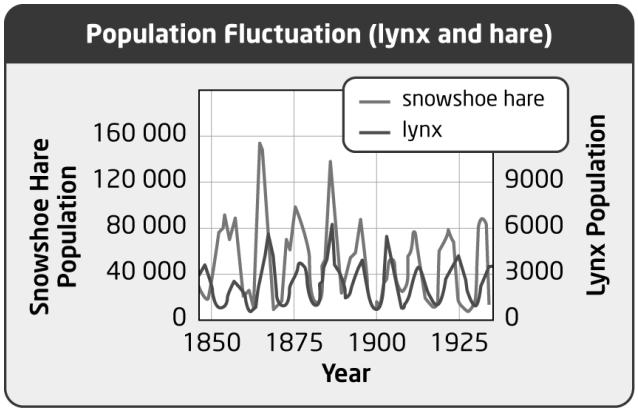
1. Complete this Venn diagram. Use these words and your own.

includes daily activities
includes living area
provides services
earns money



2. If the resources and energy in an ecosystem decrease, the size of a plant or animal's niche could _____ (increase/decrease). There would be _____ (more/fewer) of the plant or animal in the area.

3. Look at this graph. See Figure 2.11 on page 58.



Complete each sentence.

The population of _____ increased, then the population of _____ increases.
This is an example of _____ predation because _____
_____

4. Plants that live in a bog get some nutrients from the soil. They also get some nutrients by consuming _____. They need to do this because _____

5. Two types of organisms that help add nutrients to ecosystems are _____ and _____.

6. This photograph shows two osprey.

Female osprey are bigger than males and eat different kinds of food. Complete this sentence. Use these terms:

carrying capacity competition

This would increase _____ because it would decrease _____

7. Describe the symbiotic relationship between corals and algae. What causes the colour loss associated with bleaching?