

5. The following models represent all the interacting species in two different communities with some of the same species and feeding relationships. These models assume that both communities have the same initial biomass. The models can be used to understand the effects of human activities on the communities.

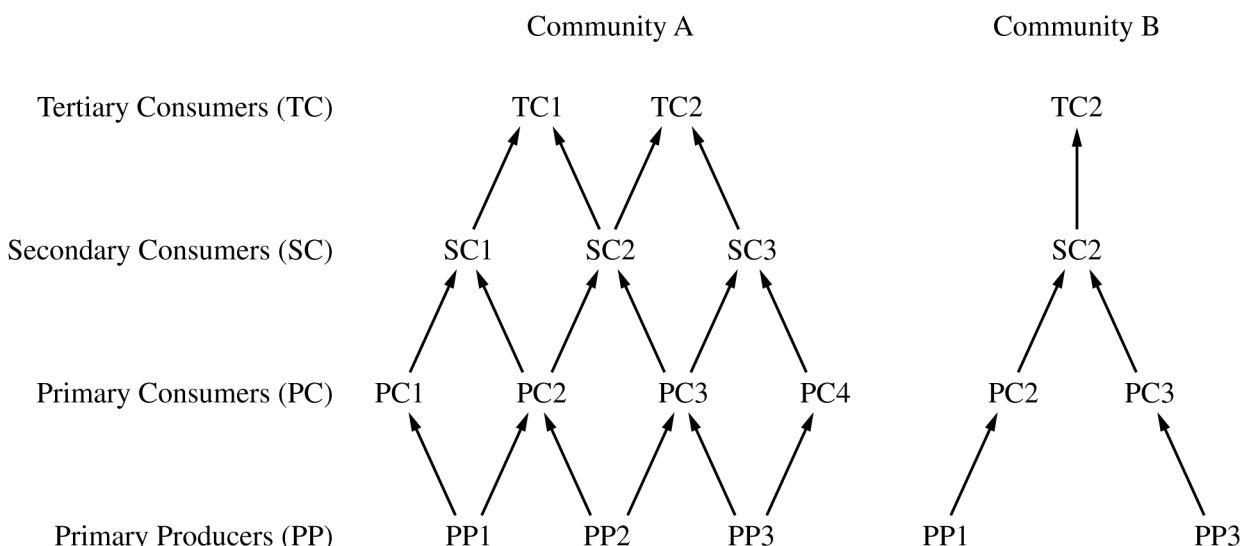


Figure 1. Models of two different communities with some of the same species

- Describe** a characteristic of a community that makes a species invasive in that community but not invasive in a different community.
- Explain** why removing species PP1 will have a greater effect on community B than on community A.
- An invasive species (INV) that eats individuals of species SC2 is introduced into community B. Using the template in the space provided for your response, for community B, indicate the feeding relationship for this invasive species by correctly placing **INV** to represent the invasive species and an **arrow** to represent the feeding relationship within community B.
- Explain** how human activities that add toxins to the soil could change a community with many species at each trophic level, such as community A, into a community with few species at each trophic level, such as community B.

Write your responses to this question only on the designated pages in the separate Free Response booklet.

Question 5: Analyze Model or Visual Representation of a Biological Concept or Process

4 points

The following models represent all the interacting species in two different communities with some of the same species and feeding relationships. These models assume that both communities have the same initial biomass. The models can be used to understand the effects of human activities on the communities.

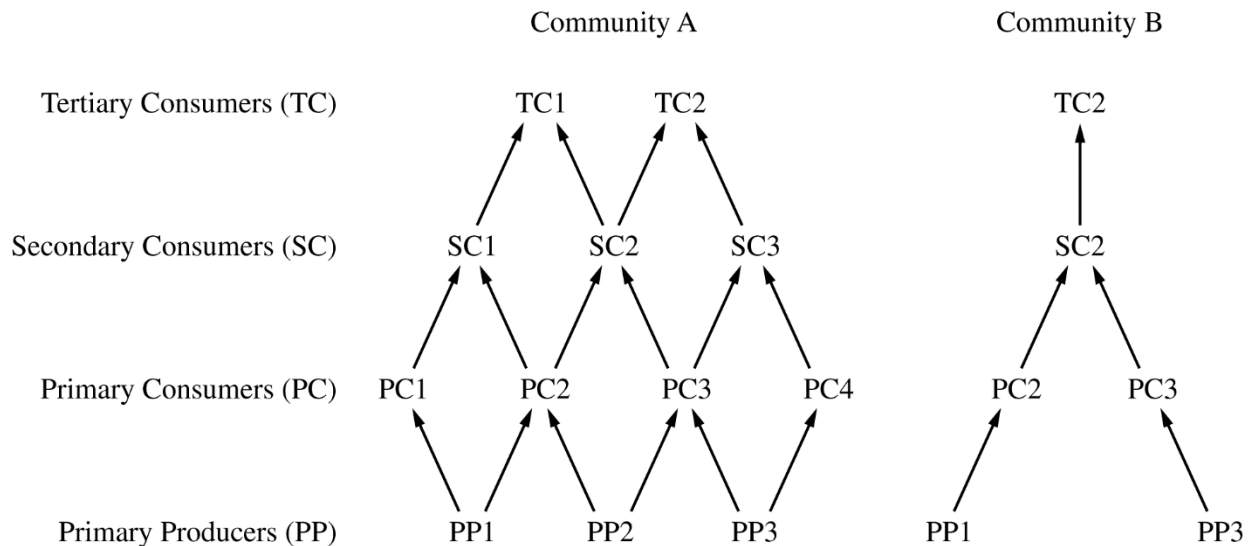
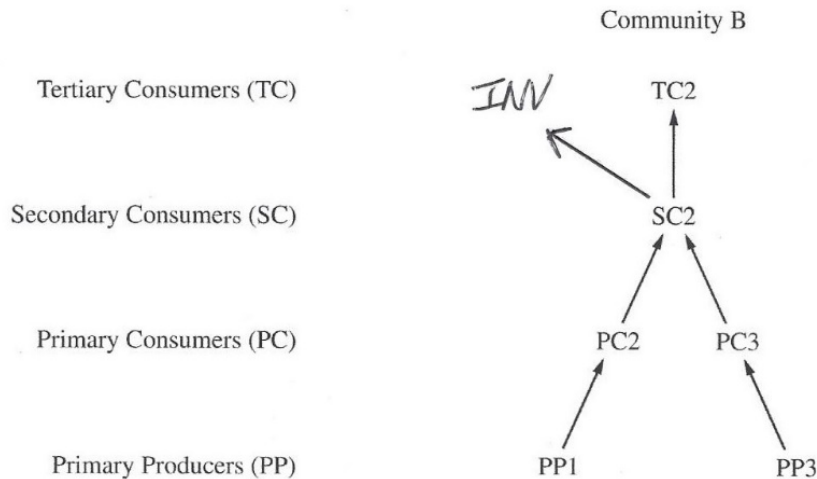


Figure 1. Models of two different communities with some of the same species

- (a) **Describe** a characteristic of a community that makes a species invasive in that community but not invasive in a different community. **1 point**
- Accept one of the following:
- There are no/reduced numbers of natural predators of the species in the community where it is invasive.
 - There are no/reduced numbers of competitors of the species in the community where it is invasive.
 - There are no/reduced numbers of diseases to which the species is susceptible in the community where it is invasive.
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- (b) **Explain** why removing species PP1 will have a greater effect on community B than on community A. **1 point**
- Accept one of the following:
- In community B, there will be decreases in PC2, SC2, and TC2 / PC2, SC2, and PC3. In community A, PC2 has alternative food sources.
 - With fewer/less diverse primary producers (and primary consumers), there are fewer paths for energy to move through the community.
 - With fewer species/fewer feeding interactions/less diversity, community B will be less resilient to future environmental change.

- (c) An invasive species (INV) that eats individuals of species SC2 is introduced into community B. Using the template in the space provided for your response, for community B, indicate the feeding relationship for this invasive species by correctly placing **INV** to represent the invasive species and **an arrow** to represent the feeding relationship within community B.
- INV should be added in a position that is horizontally aligned with TC2. An arrow should point from SC2 to INV.



- (d) **Explain** how human activities that add toxins to the soil could change a community with many species at each trophic level, such as community A, into a community with few species at each trophic level, such as community B.
- Accept one of the following:
- The activities could eliminate primary producers, which reduces species diversity at higher trophic levels.
 - The activities could cause biomagnification of the toxins, reducing species diversity at higher trophic levels.

Total for question 5 4 points