

Who Set the Moose Loose?

Case Study: Species Interaction, Food Webs & Ecosystems

CQ#1: Riparian habitats are:

What was Paul's primary question for research? How did research this question?

Hypothesis: What do you think Paul will find are the aspects of the ecosystem that most strongly affect the diversity of bird species found there?

Explain Why:

Food Web: Using the following list of species and your knowledge of food webs, create a food web for the riparian area where Paul is working.

Remember: Lines/arrows connecting organisms in a food web point **toward** the organism that gains the energy in the interaction.

For example, if a person eats an apple- the line and arrow will be drawn FROM the apple toward the person because the energy is transferred from the apple to the person who ate it.

Hint: It is usually easier to start with producers and make connections from there.

Moose
Mule Deer
Beavers
Songbirds
Grasses
Insects
Coyotes
Willows
Aspen
Rabbits
Hawks

* Coyotes, Hawks

CQ #3: At what **trophic level** (**trophic level = feeding level**) are songbirds?

CQ #4: What other organisms *share a trophic level* with songbirds?

CQ#5: The one kind of feeding relationship NOT illustrated in the food web is...

Define the following:

Carnivory

Herbivory

Omnivory

Cannibalism

Define a **functional food web**:

What does this **functional food web** tell us about factors that may influence SONGBIRD populations? *Discuss with your neighbor.*

CQ#6: What does this FUNCTIONAL food web suggest about other organisms that may influence SONGBIRD population growth?

Define the following theories:

1: Top-down control of productivity

2: “The Earth is Green”

3: Trophic Cascade

4: Bottom-Up control of productivity

CQ#7: Look at your food web diagram. If bottom-up control explains the size of songbird populations in Paul’s riparian habitats, *which graph* best illustrates the critical population interactions?

CQ#8. Look at your food web diagram. If top-down factors control songbird populations, increasing which population do you predict would result in reduced songbird populations?

Paul’s Data: The summary data didn’t reflect differences Paul thought existed between his sites, so he looked more closely at his first year data. What conclusions about species interactions can you draw from this data?

CQ#9. The summary data didn’t reflect differences Paul thought existed between his sites, so he looked more closely at his first year data. What conclusions about trophic effects can you draw from these data?

CQ#10: If moose affect willows, what impact on songbirds might be expected if moose populations increase? Look at your food web diagram.

Some interactions between organisms in a biological community are not feeding relationships. Look at Paul's data & the food web – what are some possible non-feeding relationships in this community?

CQ#11: Paul thinks the moose-willow feeding interaction may affect the songbird populations. What non-feeding relationship in this community likely provides a mechanism by which moose affect songbird populations?

Paul thinks the moose-willow feeding interaction may affect the songbird populations. **What might explain the difference in moose populations inside and outside the park?**

CQ#12: Shortly after Paul's first year of research, the first wolves were reintroduced to Yellowstone NP. How do you predict wolf reintroduction will affect songbird abundances?