

## 2.2: Meadow Simulation Worksheet

**Introduction:** The Meadow Simulation allows you to set the initial mass of organic matter in grass, rabbits, and foxes and observe the changes in the organic mass of the populations over a 100-year period.

**Directions:** Go to the following website:

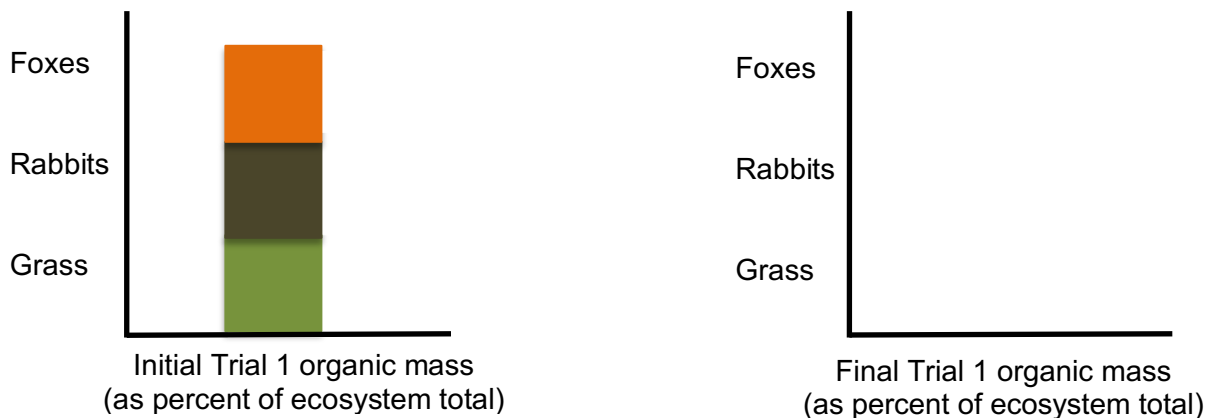
<https://carbontime.bsccs.org/sites/default/files/simulations/eco-simulation/index.html>

Set the initial mass for each population by dragging the sliders or typing in the boxes. Note that the maximum initial organic mass for each population is 1000 kg. Click the start arrow in the top right corner of the screen to run the simulation. On the simulation screen, use the buttons on the stopwatch at the bottom to pause the simulation (middle button), move ahead one year (right button), or to start a new run (left button).

1. **Trial 1** – Set the following initial conditions, run the simulation, and complete the table below. (Note: After a run you can click on the graph to make a line appear. Drag the line to the year that you want to record the data for, and it will appear in the data table below the graph).

	t = 0	t ~ 50	t = 99
<b>Foxes organic mass</b>	500 kg		
<b>Rabbits organic mass</b>	500 kg		
<b>Grass organic mass</b>	500 kg		

2. Below is a organic mass diagram representing the initial conditions for trial 1. Sketch the final organic mass diagram for trial 1 (Notes: you can always get back to the lab book that records the data for each run by clicking the left button of the stopwatch to start a new run).



3. Why do you think that the organic mass diagram changed the way that it did in trial 1? Explain your reasoning.

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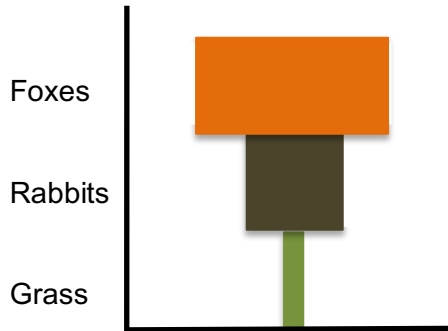


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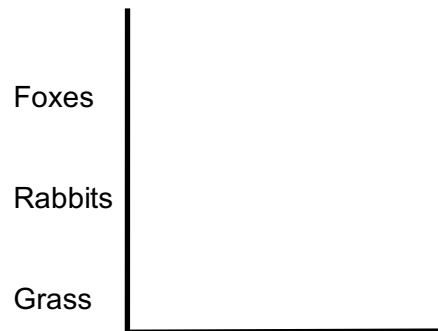
4. **Trial 2** – Set the following initial conditions, run the simulation, and complete the table.

	t = 0	t ~ 50	t = 99
<b>Foxes organic mass</b>	1000 kg		
<b>Rabbits organic mass</b>	500 kg		
<b>Grass organic mass</b>	100 kg		

5. Sketch the final organic mass diagram for Trial 2.



Initial Trial 2 organic mass  
(as percent of ecosystem total)



Final Trial 2 organic mass  
(as percent of ecosystem total)

6. Why do you think that the organic mass diagram changed the way that it did in trial 2? Explain your reasoning.

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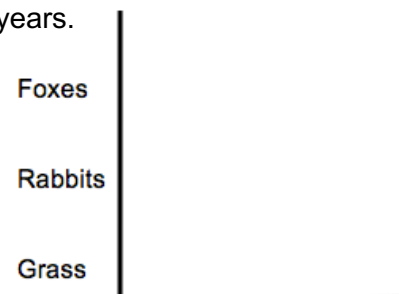
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7. Use the simulation to determine the maximum organic mass of foxes that the meadow ecosystem can support. Record your data for the initial final organic mass for each population in the table below. Attach another sheet of paper for additional trials if necessary.

	Trial 1 Initial	Trial 1 Final	Trial 2 Initial	Trial 2 Final	Trial 3 Initial	Trial 3 Final	Trial 4 Initial	Trial 4 Final
Foxes								
Rabbits								
Grass								

8. Record the data and draw the organic mass diagram for the conditions that resulted in the highest organic mass in the fox population at the end of 100 years.

	Initial	Final
<b>Foxes organic mass</b>		
<b>Rabbits organic mass</b>		
<b>Grass organic mass</b>		



Final organic mass  
(as percent of ecosystem total)