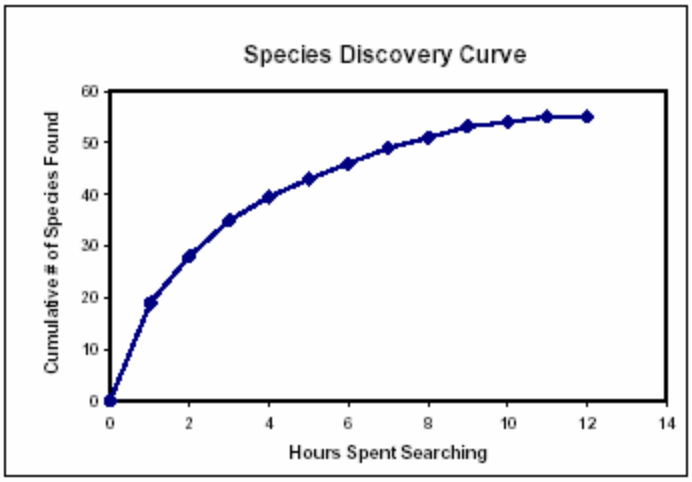
Computer Motile Population Lab

Information

Species Discovery Curve-



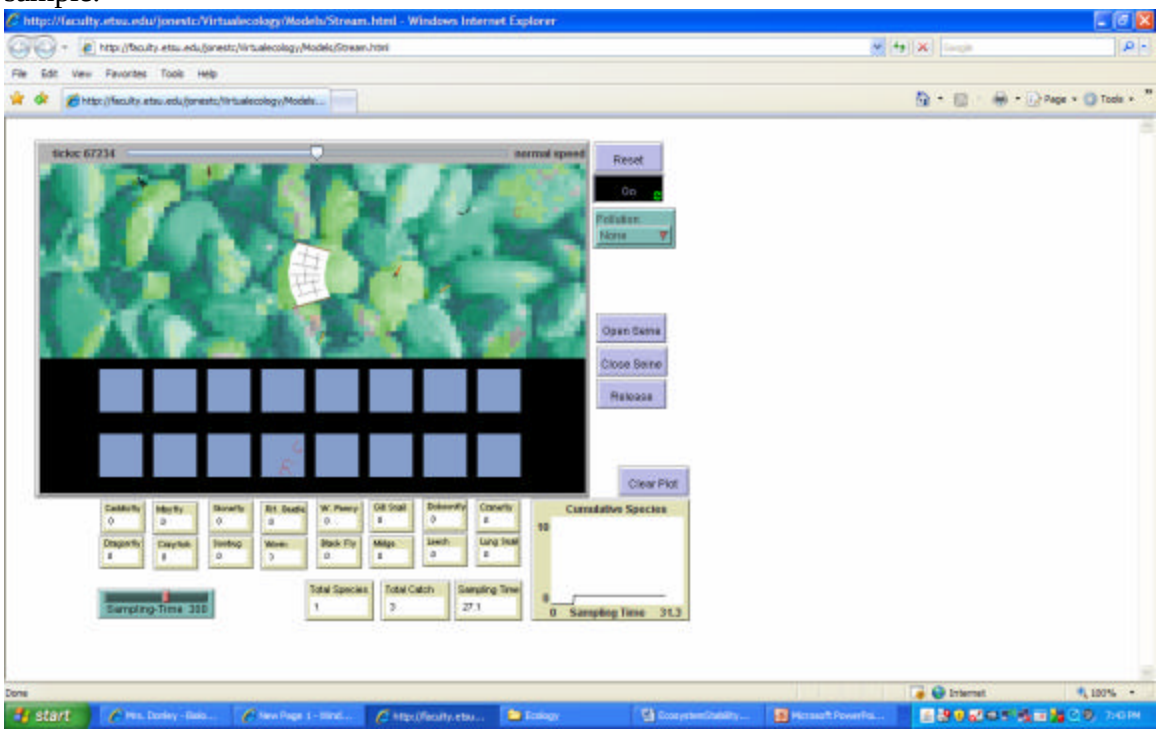
When sampling for biodiversity, how do you know when you have found all the species? You don't. However, you can get an idea of how many more you *could* find by plotting the cumulative number of species found against some standardized measure of sampling effort. The function will be a curve predicting the actual number of species present. The reason it is curved is it reflects the fact that, as species found accumulate, there is a diminishing probability that the next individual found will be a new species. The curve is also a function of that fact that the most common species are found first, and the rare species are more likely to be missed. From the species discovery curve you can estimate how much more effort it will take to find new species. It allows you to know when you have found most of the species…and decide when it is time to stop sampling.

Activity

Go to my webpage.
Locate and choose the Virtual Ecology Simulations Link.
Choose Biodiversity.
Choose Estimating Stream Biodiversity by clicking on the picture in the box with its name.

Change the 'Pollution' menu to none. Then set the 'Sample_Time' slider to300 seconds.

Click ‘Go’ and this will set the stream in motion.
Click ‘Open Seine’ to begin sampling. The plot will record the number of species in the sample.



Print screen your results and put into your word document.
Release all specimen.
Change the Pollution to Moderate.
Click “Open Seine” to begin sampling. The plot will record the number of species in the sample in the same plot as before.
Print screen your results and put into your word document.
Release all specimen.
Change the Pollution to Severe.
Click “Open Seine” to begin sampling. The plot will record the number of species in the sample in the same plot as before.
Print screen your results and put into your word document.

Print your word document and answer the following questions:

1. *Which species appear to be the most sensitive to pollution?*
2. *Which species are the least sensitive?*
3. *Observe the cumulative species to sampling time plot. Does it behave as predicted by the species discovery curve?*
4. *The simulation has only ten species, how do you think the variation in the plot would be affected if there were substantially more biodiversity in the stream?*
5. *Calculate the Simpson diversity for each stream (no pollution, moderate, severe.)—Show all work.*
6. *Describe the diversity of each stream based on the Simpson diversity results in question 5.*
7. *Which of these streams would be the most likely to be the most stable. Why?*