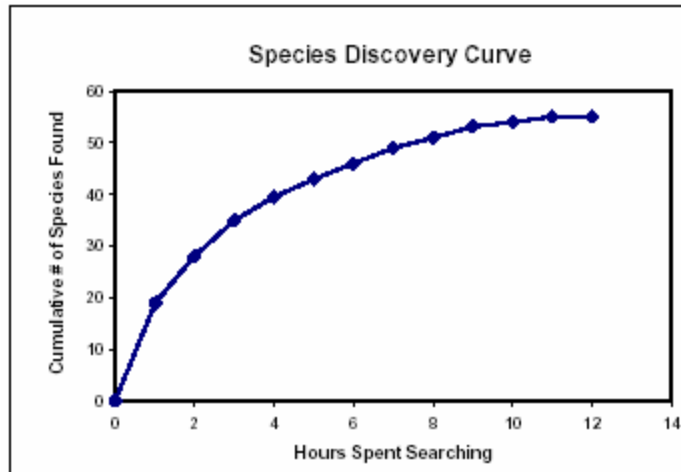


## Computer Motile Population Lab

### 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.

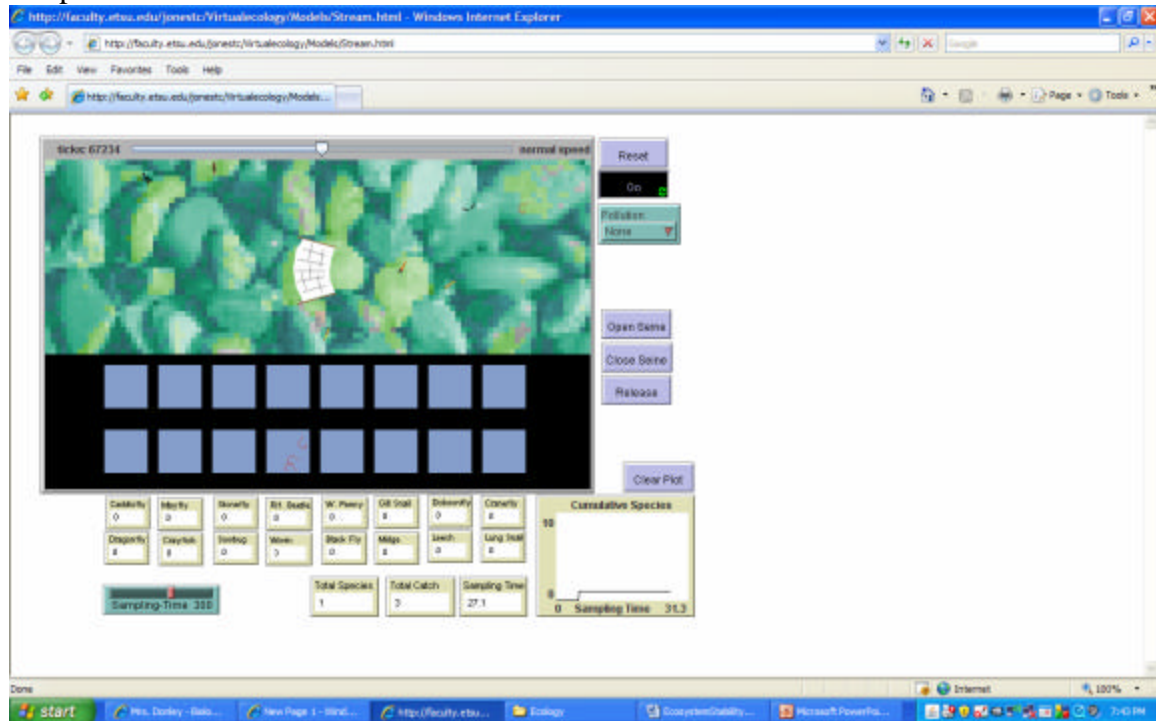
Choose Estimating Stream Biodiversity by clicking on the picture in the box with its name.

The screenshot shows a web browser window displaying the "VIRTUAL ECOLOGY" website. The main heading is "VIRTUAL ECOLOGY" with the subtitle "An Inquiry-Based Learning Environment". Below this, there is a "Biodiversity" section. On the left, there is a "Model Categories" list with "Biodiversity" highlighted. In the main content area, there are two simulation options: "Island Biogeography" and "Estimating Stream Diversity". The "Estimating Stream Diversity" option is circled in red. The description for "Estimating Stream Diversity" reads: "This simple model simulates seining a stream for animal life. Several species of invertebrates wash down the stream, and when the seine is open they may get caught and separated into buckets. Counts of individual species, total species and individuals are given to allow calculation of various diversity indices. This model displays the species 'discovery to effort' curve."

Change the 'Pollution' menu to none. Then set the 'Sample\_Time' slider to 300 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. Which of these streams would be the most likely to be the most stable. Why?