Simpson's Index of Diversity

In ecology, this index is used to quantify the biodiversity of a habitat.

Biodiversity: _____

Habitat: _____

It takes into account the number of species and the relative abundance of each species.

Species Richness: _____

Species Evenness: _____

EX: Lets say you have 2 plots with the following species of salamanders:

Salamanders	Number of individuals ***n***	Number of individuals ***n***
Species	**Plot 1**	**Plot 2**
Tiger	30	20
Southern Red back	34	7
Seal	36	73
Total *N*	100	100

Which plot has the greater species richness? _____

Which plot has the greater species evenness? _____

Now let's think about using a measurement that takes into account species richness and evenness. This measurement is called: **Simpson's Index of Diversity (SID).**

The formula is: ***SID = 1 – D***

where ***D*** is a measure of diversity, computed as follows:

$$D = \frac{n_1(n_1 - 1) + n_2(n_2 - 1) + n_3(n_3 - 1) + \ldots n_k(n_k - 1)}{N(N - 1)}$$

In this formula, n_1 is the count of the first species, n_2 is the count of the second species, and so on to your last count; and *N* is the total number of organisms of all species counted. The value of *D* ranges between 0 and 1.

Then remember that ***SID*** is equal to ***1–D*** or ***1–Diversity***:

So let's try an example using the data from Plot 1 above.

First let's calculate the numerator:

30(30-1)+34(34-1)+36(36-1) = 870+ 1,122+ 1,260 =3,252

Now let's do the denominator:

N= 30+34+36=100 so N (N-1)= 100(100-1) = 9,900

Now let's finish by dividing the numerator by the denominator:

3,252/9,900 = 0.328 = D

***REMEMBER SID= 1–D so your answer is 1–0.328 =0.67**

The higher the *SID*, the more diverse your sample is!!! Or we can say there is a higher probability of sampling two different species in a plot.

Now let's compare the diversity of Plot 2 to the diversity of Plot 1. Calculate Plot 2 *SID* on your own!

First calculate the numerator:

Now calculate the denominator:

Now divide the numerator by the denominator:

And remember SID = 1–D:

Congrats!!! Which plot is more diverse based on your calculations??