

Time 1, 2, 3 Flora Survey Data

Data Set Name: t123flora

Unit of observation: site

Number of observations: 265

Number of variables: 16

Unique identifier: id

Response rate: Time 1, 100%; Time 2, 97.36%; Time 3, 97.74 %

Data Format: sas for windows

Sample: *

Observation length: 128

File structure: rectangular

Data collection: January 1996 – April 1997, December 1999 – March 2000, December 2006 – April 2007

Date of last edits: 8/11/09

Related publications:

*Barber, Jennifer S., Ganesh P. Shivakoti, William G. Axinn, and Kishor Gajurel. 1997. "Sampling Strategies for Rural Settings: A Detailed Example from Chitwan Valley Family Study, Nepal." Nepal Population Journal 6(5):193-203.

Note: Seven plots were flooded in Time 2 and one was recovered in Time 3

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ID	Site ID [A0101-CL145]	265
PLOTTYPE	Plot Type 1 Forest A 62 2 Forest B 34 3 Forest C 21 4 Grassland B 10 5 Common land 138	
FX	Universal transverse mercator X coordinate [221625.16-249683.78]	265
FY	Universal transverse mercator Y coordinate [3048343.86-3065850.13]	265
DENSITY1	Plant density in Time 1 [3.48-2893.8]	265
DENSITY2	Plant density in Time 2 [3.1-2510] . No response	258 7
DENSITY3	Plant density in Time 3 [4.95-1463.33] . No response	259 6
RICHNESS1	Number of species present in a specific area in Time 1 [1-30]	265
RICHNESS2	Number of species present in a specific area in Time 2 [2-47] . No response	258 7
RICHNESS3	Number of species present in a specific area in Time 3 [1-38] . No response	259 6
SHANNON1	Shannon Weiner Diversity Index Time 1 [0-2.735]	265
SHANNON2	Shannon Weiner Diversity Index Time 2	

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	[0.044-2.981]	258
	. No response	7
SHANNON3	Shannon Weiner Diversity Index Time 3	
	[0-3.206]	259
	. No response	6
SIMPSON1	Simpson's Equitability Index Time 1	
	[-0.14-1]	265
SIMPSON2	Simpson's Equitability Index Time 2	
	[-0.229-0.989]	258
	. No response	7
SIMPSON3	Simpson's Equitability Index Time 3	
	[0.02-1]	259
	. No response	6

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Shannon Wiener Diversity Index

Shannon diversity index (H') is commonly used index to characterize species diversity and to measure the biodiversity in a community or specific areas. It accounts both abundance and evenness of the species present in a community or areas (Lloyd and Ghelardi 1964, Grunewald and Schubert 2007). The Shannon-Wiener diversity index (Shannon and Wiener 1963) was calculated from the species number using formulae given by Magurran (Magurran 1988).

$$H' = - \sum_{i=1}^s p_i \ln p_i \text{ ----- (1)}$$

Where,

S - The number of species

p_i - The relative abundance of each species, calculated as the proportion of individuals of a given species to the total number of individuals in the community (n_i/N). Here, n_i is number of individuals in each species and N is the total number of individuals.

Simpson's Index of Diversity

Simpson's Index calculates the probability that two organisms sampled from a community, which belongs to different species (higher the abundance of individuals across species, the higher the probability of these species sampled to be belonged to different) (Simpson 1949). Simpson's Index value ranges from 0 to 1, with 1 representing perfect evenness (all species present in equal numbers).

The formula for Simpson's Index is,

$$D = \frac{\sum_{i=1}^S n_i(n_i - 1)}{N(N - 1)} \text{ ----- (2)}$$

Where N is the total number of organisms and n_i ($i=1, \dots, S$) is the number of organisms of a species.

Plant density

It is a simple measure of plant of all species present in a specific area. Total number of plants in a Unit area is plant density. It is usually measured in 1 square meter.

Species richness

Species richness is the total number of species present in a specific area irrespective of their numbers. If there is single plant or number of plant of a species, it counts as a single species. But in plant density, total number of any plant species counts.

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Plot type

It is a variable that has been created to further analysis of herbaceous plant, shrubs and tree so it would be helpful to split data for three categories. In forest data, collection we used three different plot sizes which is also shown in data set under variable "Plot size". It is just an adhoc variable.

- 1= Forest A (A0xxx, A1xxx)
- 2= Forest B (B0xxx, B1xxx)
- 3= Forest C (C0xxx)
- 4= Grass Land B (BGxxxx)
- 5= Common Land (CLxxx)

References

- Grunewald, R. and H. Schubert. 2007. The definition of a new plant diversity index "H'dune" for assessing human damage on coastal dunes--Derived from the Shannon index of entropy H'. *Ecological Indicators* 7:1-21.
- Lloyd, M. and R. J. Ghelardi. 1964. A table for calculating the 'equitability' component of species diversity. *Journal of Animal Ecology* 33:217-225.
- Margurran, A. E. 1988. *Ecological diversity and its measurement*. Princeton University Press. NJ.
- Shannon, C. E. and W. Wiener. 1963. *The Mathematical Theories of Communities*. University of Illinois Press, Urbana, Illinois.
- Simpson, E. M. 1949. Measurement of diversity. *Nature* 163: 688.