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document Summary: Community Structure and Dynamics Dowland Aiello May 28, 2020

Overview: The Community as a Hierarchy

In order to better analyze the various actors involved in some process, one might find that grouping various actors involved at a certain geographical location or in respect to some inquiry can provide utility and make answering such an inquiry easier. In doing so, one must analyze the various populations or groups of interacting organisms of the same species, and, on a larger scale, the biological communities or groups of geographically proximate populations that one deems paramount to successfully addressing the matter of inquiry.

In addition to the above classifications, a researcher may choose to bear regards to the composition of a community –the feeding relationships, species, and number of populations within the community–, as well as the interactions between the populations, which each may differ in their importance and scope. Over longer periods of time, these interactions may manifest themselves in the study of community dynamics, which deals with the analysis of patterns in the populatiion makeup of a community.

Interactions in a Community

Among the members of a community, interspecific interactions can be classified according to their effects on the two populations involved. Interspecific competition, for example, is generally a mutually harmlful act, whereas mutualism (e.g., dichotomy of pollinators and flowers) is, in most cases, mutually beneficial. A third class of interspecific relations, by contrast, bears benefit to only one of the involved parties. Examples of such a relationship are:

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Predation: predator benefits, while the prey does not (+/-). Encourages adaptation in the prey population.

Herbivory: consumer benefits, while the plant or algae does not (+/-). Encourages development of defense mechanisms in plants (e.g., thorns and spines), as well as chemical defense toxins, while bringing about reactionary adaptations in consumers–coevolutioon.

Parasite-host interactions: parasite benefits, while the host does not (+/-). Can cause rapid and dramatic changes in community dynamics by systematically wiping out entire chains of interspecific interactions (e.g., attacking chestnut trees, upon which a great number oof populations rely for survival).