Ben-Gurion University of the Negev
Jacob Blaustein Institutes for Desert Research
The Swiss Institute for Dryland Environmental and Energy Research
Mitrani Department of Desert Ecology

Seminar

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MDDE

Tuesday, June 19, 2017, 12:00

Seminar Room, Old Administration Building

This is Jorge's Ph.D. summary seminar and refreshments will be served at 11:40.

The Generalized Ideal Distribution

There is an ample body of research on habitat selection theory, especially on the ideal free distribution model. This model allows researchers to predict the distribution of one species of forager across patches if they can infer animal's fitness and how it is affected by other animals and the environment. The construction of this model is simple: the optimal distribution is the one that equalizes fitness gain between patches. This model has been expanded to handle more complicated situations, such as multiple species, unequal competitors, presence of parasites, individual state (hunger levels) and even speed of food consumption in relation to standing crops. All these models, although expanding from the same base are not immediately related. They used widely different methods from algebraic solutions, passing through game-theory, up to dynamic programming. In my thesis my main objective is to create a new standard model, that combines the predictions of these previous models in a single general model. For that I used linear algebra as the framework, and this approach showed promising results. The current model can represent twelve different expansions (multiple species, unequal competition, parasitism, individual state, differences in search efficiency, despotism, effect of environmental factors, omnivory and extraneous birth and death). We also compared our predictions with previous famous prediction in ideal free distribution (input matching rule, interference competition, leapfrog effect, ideal despotic distribution and marginal value theorem) and found our model to be consistent with all.