A Practical Map-Analysis Tool for Detecting Dispersal Corridors

Corridors (pathways between different habitat patches) are important for maintaining migration among habitat patches as landscapes become fragmented for terrestrial animals and plants Currently, no analytical tools exist which can predict comprehensively where dispersal corridors are likely to exist in real-world landscape maps. The new Pathway Analysis Through Habitat (PATH) tool can predict the location of corridors of movement between patches of habitat within any map. The algorithm works by launching virtual entities called "walkers" from each patch of habitat in the map, simulating their travel as they journey through landcover types in the intervening matrix, and finally arrive at a different habitat "island." Each walker is imbued with a set of user-specified habitat preferences which make its walking behavior resemble that of a particular animal species. Because the tool operates in parallel on a supercomputer, large numbers of walkers are efficiently simulated. The importance of each habitat patch as a source (sending patch) or a sink (receiving patch) for a species is calculated. The source importance is calculated by dividing the number of successes by the total number of "walkers. The sink importance is calculated by dividing the the total number of successful "walkers" ending up at a patch by the total number of successful walkers. The source and the sink of a species is compared by calculating the ratio to compare the immigration and emigration rate of the species. The ratio is calculated by dividing the total number of successes by the total number of successful "walkers" ending up at a particular patch. The PATH tool can be used as a tool to evaluate prospective changes in the landscape before they are made. The PATH tool will also be useful in the design of preserves consisting of several habitat remnants.

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