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Pros and Cons of Using Grasshopper Mark-Recapture for Investigating Populations

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Abstract

Mark-recapture of grasshoppers and/or crickets is a common method to provide a hands-on experience for students learning about populations in ecology or natural history. I have utilized this method in general ecology and field biology classes for the past 5 years and have observed students experiencing pitfalls as well as great learning experiences. I plan to continue utilizing this technique, with modification, in the future. The equipment you need to conduct mark-recapture and to estimate the population is minimal. The students must mark and recapture within the same defined area. I have the students make 10-m squares in different old-field habitats and delineate them with flagging material. The size can be larger, but that will require more searching time. Students collect grasshoppers, mark them (we use White Out ™ correction fluid), and place them in a bucket (so they don't get trampled). The marked grasshoppers are released after the student work is done. At a later date, the students recollect the grasshoppers, note the proportion marked, and some remove them from the sampling area while others replace them as they are caught. We utilize the Peterson mark-recapture method, which has several assumptions, e.g., the population is closed and marks do not affect catch-ability. Controlling for the assumptions within a classroom environment is difficult; however, securing a large enough population of grasshoppers often provides greater challenges. Since different species and families of grasshoppers functionally occupy similar niches within a habitat, we have grouped them into "grasshoppers" to create a larger population. Alternatively, one may increase the sampling area to sample a large enough population of one species but this is very problematic as there is seldom enough time available during class to thoroughly survey the area. While using this modification estimates the number occupying the niche, not a population, it provides a functional understanding of populations and their regulation.