Strip Adaptive Cluster Sampling with Application to Cave Crickets

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Adaptive cluster sampling (ACS) is a strategy for sampling rare populations and can provide more precise estimates for population means and totals than other designs such as simple random sampling (SRS). Adaptive sampling responds in real-time to conditions on the ground and allows sampling effort to increase where clusters of observations of interest occur. This is a case study involving cave crickets in Mammoth Cave National. We used strip ACS, a 2-stage extension to standard ACS designs, to estimate population sizes of these rare endemics and considered both the practical and statistical performance of these approaches relative to SRS. We demonstrate its practical implementation and briefly discuss issues such as plot set-up and data management, computation of population estimators and confidence intervals.