

A COMPARISON OF NON-INVASIVE GENETIC AND TRADITIONAL APPROACHES TO ESTIMATING ANIMAL ABUNDANCE

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Non-invasive genetic population estimation, in which capture-mark-recapture (CMR) statistics are applied to individual genotypes obtained from hair or fecal samples, has gained interest among wildlife managers and researchers as a promising alternative to traditional live-trapping methods when working with rare and elusive species. This study explored another potential advantage of non-invasive genetic population estimation—surveying relatively common and trappable species occurring in difficult-to-access areas. We evaluated efficacy of non-invasive genetic sampling for CMR estimation of snowshoe hare (*Lepus americanus*) densities in the remote backcountry of Glacier National Park, Montana. We tested various combinations of pellet collection methods, plot numbers and sizes, sampling duration, and baits to maximize sample sizes (number of pellets collected for genotyping) and minimize time, labor, and costs in the field. At five study sites in Glacier National Park, we estimated hare abundance using this optimized non-invasive genetic approach as well as traditional live-trapping and pellet index methods. We present findings from this field study and a simulation-based cost-benefit analysis of abundance estimation using traditional live-trapping vs. non-invasive pellet sampling.