
APPLYING NEW RESEARCH METHODS TO INFORM MOUNTAIN LION HARVEST MANAGEMENT IN WESTERN MONTANA

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The lack of reliable methods to accurately estimate mountain lion abundance has made lion (*Puma concolor*) management one of the most contentious wildlife issues in western Montana over the last 20 years. Lion harvest prescriptions and hunting season structure varied widely during that period because social factors drove management decisions in the absence of objective population data. During winter 2012-2013, we used a DNA-based spatial capture-recapture (SCR) approach to estimate mountain lion abundance in hunting districts 250 and 270 in the southern Bitterroot Watershed of western Montana. Mountain lion hair, scat, and muscle samples were collected for genetic analysis to identify individuals. We developed extensions to standard SCR models to accommodate simultaneous sampling and harvest events and incorporate existing information regarding mountain lion habitat quality. We estimated the abundance of 85 (95% CI = 54, 141) independent mountain lions in hunting district 250 and 82 (95% CI = 51, 137) in hunting district 270. These results are 2 - 3 times higher than previously reported mountain lion abundance in this area and correspond to density estimates of 4.6 and 5.4 lions per 100 km². Because current harvest regulations in western Montana were developed under the assumption of lower population abundance, lion management objectives are unlikely to be met unless harvest prescriptions are adjusted to account for this new understanding of lion population status. More broadly, the analytic improvements in SCR methods will enhance the ability of wildlife managers to reliably and economically estimate abundance of harvested species.