Movement-Based Parturition Detection Methods for Elk Neonate Captures - A Case Study

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Accurate estimates of neonate survival and mortality rates can provide valuable information to effectively manage ungulate populations. To obtain these estimates, researchers often need to capture neonates, which can be challenging. Typically, researchers capture neonates opportunistically or by deploying vaginally implanted transmitters (VITs) in pregnant females, but these methods are not always effective or feasible. Female ungulates display distinct movement behaviors around parturition, which have been used to identify birth events and locate neonates for capture. To improve efficiency of detecting parturition events and capturing neonates to estimate elk (Cervus canadensis) calf survival in northwest Montana, we developed a movement-based parturition detection workflow. We used a threshold-based approach with four movement metrics (home range size, residence time, velocity, and displacement) to identify potential birth events from collared female elk. We created an automated workflow in R that calculated movement metrics and displayed recent GPS data and combined this workflow with a structured search process to locate elk neonates in the field. Using this movement-based detection method, we detected and captured 41 neonate elk in 2024 and 40 in 2025. Although imperfect, this method of detecting birth events from collared females' movement behavior was more effective in our study area than opportunistic or VIT-based methods. We believe this method could be widely applicable to other neonate ungulate capture efforts and recommend its use as an alternative or addition to existing methods.