Insight from Four Years of Structured Acoustic Monitoring of Bat Species

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In 2020, a partnership of state and federal entities initiated annual surveys of bats across thestate using acoustic detector-recorders, primarily to assess the impacts of the fungal disease White-Nose Syndrome (WNS). Through 2024 this effort has resulted in the collection of 4,173,501 bat calls from 1,879 sites. Analyses of these data provide insight into the status of many of Montana's species at both the state and federal level. Spotted Bat (*Euderma maculatum*) was once considered among the rarest mammal species in North America. Recordings have confirmed the species' rarity, however, the species is more widely distributed and recorded near potential roost types that differ from typical large cliff roosts. Hoary Bat (*Lasiurus cinereus*) is vulnerable to collisions at wind turbines and analysis of these data demonstrate declining occupancy within Montana. Little Brown Myotis are vulnerable to WNS and have suffered catastrophic declines across central and eastern regions of North America. Occupancy for the species has remained stable across Montana, but roost and capture data support widespread declines in abundance. Previous analysis of acoustic data infer WNS impacts on the number of calls recorded per night on acoustic detectors across *Myotis* species. Acoustic monitoring data collected within the state have been submitted to the North AmericanBat Monitoring Program and are being used in ongoing assessments of WNS and wind-energy impacts at the continental scale, ensuring Montana's representation in national efforts to understand and mitigate these threats.