Bat Use, Human Visitation, and Environmental Attributes of Cave Hibernacula in Montana

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Across the eastern United States, caves historically supported large aggregations of overwintering bats. In contrast, few large aggregations have been observed within caves in Montana. To collect comprehensive information on cave use by bats and inform White Nose Syndrome surveillance, we inventoried caves to estimate numbers of hibernating bats, assessed the microclimate within hibernacula, monitored activity of bats using acoustic detectors, and quantified visitation by people using trail cameras. In collaboration with recreational cavers, state, and federal biologists we conducted over 300 structured and incidental surveys at 99 caves. Only 6 caves had counts exceeding 100 individuals, and our largest hibernacula had approximately 1,700 bats. The mean annual temperature and humidity across 16 caves averaged 5.0°C and 100% RH. At the 6 largest hibernacula, we established year round baselines of bat acoustic activity and quantify visitation by people. We found that both the number of people entering caves and bat activity within caves peaked in summer. During the winter, visitation appears largely dependent on accessibility of the cave and all monitored caves had low levels of bat activity. Caves in Montana appear to support relatively few aggregations of overwintering bats. Although we have visited most known caves in the state, the number of hibernating individuals we observed is likely orders of magnitude less than the total number we presume overwinter in-state. Future projects should explore the use of cracks, crevices, talus, and badlands to identify other important hibernacula.