



# MDC Resource Science

## Counting Bats with Infrared Video

Science Notes



# Counting Bats with Infrared Video

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## Summary

A relatively inexpensive method is presented for recording bat emergences with Digital8® or mini-DV camcorders and near-infrared (NIR) lamps. The Missouri Department of Conservation developed a statistical sampling method, in which 40 percent of the video sequence is visually counted by one or two observers. This “MDC method” is described, in which a total estimate of the emergence is made with 95 percent confidence limits. A bat stopwatch counting method also is given. Some preliminary information is reported on a more expensive thermography method for counting bats, and comparisons are made with it and the traditional guano measurement method.

**Goal: To develop a reliable method to monitor Gray bat populations**

## Project Details:

- Current methods of bat colony estimates include measurements of guano deposits, area density estimates, direct counts and emergence counts
- Methods currently in use depend on observer’s experience level, can be biased, and are rarely reported with any measure of variance
- Proposed method uses a cluster sampling approach
- Since 2000 we recorded 48 flights at 22 Missouri caves

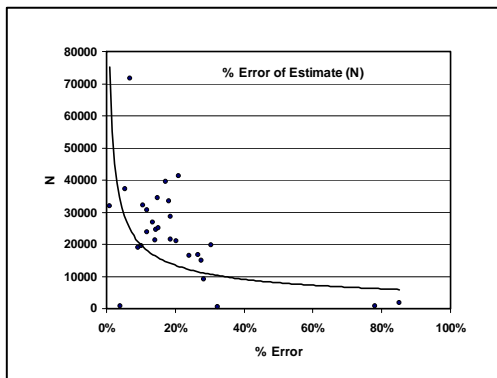


Fig. 1. The percent error of the estimate over 29 estimates, measured as the 95% confidence interval divided by the estimate (N).

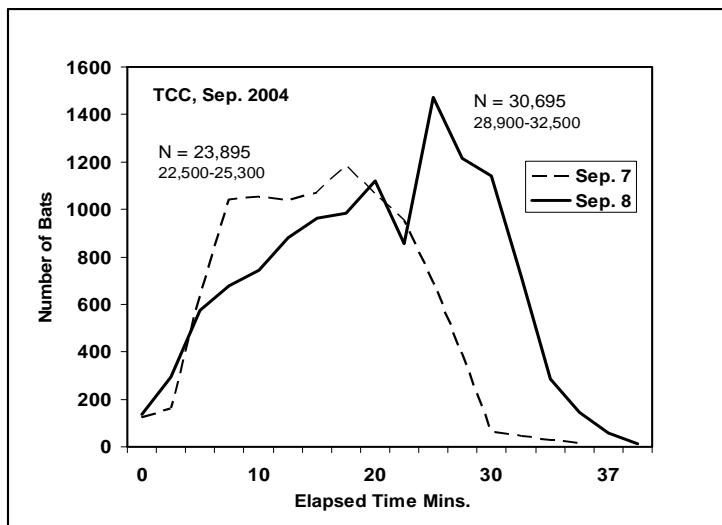


Fig.2. Comparison of two consecutive Gray bat emergences using the MDC Method, at Tumbling Creek Cave. During this transient period the emergences may differ significantly from night to night. The total estimates, N, are followed by the 95% confidence intervals.

Cave	MDC Method	Thermography Method	Guano Method
Smittle	16,418 ± 1,970	16,400	24,500
Mary Lawson	71,615 ± 2,408	49,010	35,400
Beck	736 ± 15 (1 entrance)	1,705 (2 entrances)	
Tumbling Creek	poor recording	31,985	

Table 1. Comparison of the MDC, Thermography and Guano methods at Gray bat emergences in Missouri, 2005. No guano was measured at Beck and Tumbling Creek Cave because of conditions.

**Management Findings:** The MDC method can be used to provide a statistically valid estimate of bat numbers for long-term survey and monitoring efforts.

<sup>1</sup>Full report available from  
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