



Cave Cricket Monitoring in Mammoth Cave National Park

Importance

The population structure and dynamics of *Ceuthophilus* spp. and *Hadenoeus* spp. may be significant to resource managers of government land holdings because in caves without large bat colonies these genera are typically the primary conduits for the regular input of organic matter into the subsurface habitat.

Cave crickets (*Hadenoeus subterraneus*) are important to cave food webs because they feed in the relatively productive surface habitat and transport nutrients, in the form of guano, into the subsurface habitat where productivity is nonexistent.

Cave cricket eggs and feces support subsurface communities that may include rare, sometimes endemic, obligate cave-dwelling invertebrates.

We use a monitoring method that, integrated with other monitoring protocols, will provide a long-term index of cricket population structure and dynamics through time and space.



Hadenoeus subterraneus. Photo by Rick Olson.

Preliminary Monitoring Objectives

1. Determine temporal changes in population structure (e.g., age class and sex ratio) and relative abundance of cave crickets in sets of developed and undeveloped caves across Mammoth Cave National Park (MACA).
2. Determine potential effects of active management decisions, e.g., alteration of cave entrances, on cave cricket ecology within actively managed caves. Specific study focus will include assessment of cave-entrance modification effects on cricket exit/entry patterns, management impact on population structure, and localized impacts on cricket use of ceiling roosts.

Management Applications

Correlating specific management actions with changes in cave cricket population parameters will enable ecologists to distinguish the effects of management practices on cave cricket populations from potential effects due to other, natural sources (e.g., seasonal changes in temperature). Thus, management decisions by MACA resource managers will be better informed.

Status and Trends

Cave cricket habitat use in Region Two of Frozen Niagara Cave in 2006 (Figure 1). The black lines are cave walls, the green line is the tourist trail, the orange lines show the approximate extent of the portion of the cave ceiling brightly illuminated by a large fluorescent light, and the dark green circle is a prominent cave formation. Red and blue dots depict cave cricket habitat use before and after the fluorescent light was removed, respectively. Note cave crickets did not roost in or around the brightly lighted area before the light was removed. These data are further supported by years of observation from multiple sources. Thus, the light's removal opened up new roosting habitat for the cave crickets. Subsequent guano deposition beneath the new roosts created new foraging habitat for obligate cave invertebrates dependent on such subsidies. All data were located from a fixed point (i.e., 0,0) in region two via distance and compass bearing.

Contact

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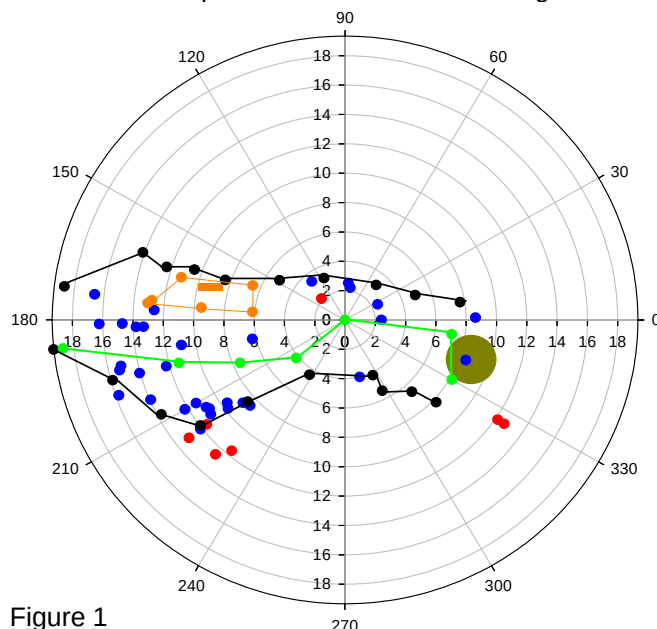


Figure 1