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**Project Number: SUU-40**

**Park/NPS Unit: Zion National Park**

**Title of Project: Establish Ecoregional Baseline Bat Data at Cedar Breaks, Bryce Canyon and Zion National Park Units**

**Administered through the:**  Colorado Plateau Cooperative Ecosystem Studies Unit Cooperative Agreement Number H1200-09-0005

**CESU Partner (pick from drop down list):** Southern Utah University

**Project Contacts**

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**Amount Funded: $9,990**

**NPS Account Numbers (amounts in parentheses): 1242-CECP-RYY ($10,000)**

**Fund Source (e.g., ONPS, FLREA, CRPP, CESU, etc.): CPCESU Base**

[x] NPS Funding

[ ]  Is this funded using a reimbursable account number? If yes, IMR contracting needs a copy of the Interagency Agreement.

**Project Dates:**

**Start Date: June 30, 2012**

**Any Other Product Milestone Dates you need to include:** (full dates can go in with the project description) Initial planning meeting will take place

**End Date:** (please make end date the last day of the month if possible) June 30, 2014

**PROJECT ABSTRACT:**

Bats make up a significant portion of mammalian biodiversity (Nowak 1994), and are economically important as consumers of insect pests (Whitaker 1995). Due to their mobility and their dependence on both riparian areas and surrounding uplands, bat response to habitat alteration is a useful ecological indicator on a broad scale. A large proportion of bat species are sensitive and in decline. In addition to direct effects, bat populations are threatened by the indirect effects of climate change, including emerging or re-emerging disease and changes in habitat or prey availability. The recent rapid spread of White Nose Syndrome (WNS) demonstrates the sensitivity of already small and declining populations to new threats such as emerging disease.

Lack of information about bats may lead to unintentional mismanagement of, and/or lack of proactive management actions for, sensitive bat species. Sporadic opportunistic mistnetting efforts at ZION and BRCA have confirmed the presence of some bat species, but habitat use and seasonal distribution of the confirmed Species of Concern remain unknown. CEBR bat data collection has been limited to the NCPN Inventory and Monitoring Program’s initial inventory efforts. Data on specific microhabitat use and metapopulation dynamics are critical to developing management plans for the preservation of bat populations.

Utah’s only known nursery colony of Big Free-tailed Bats is at Zion (George Oliver, Utah Division of Wildlife Resources and Utah Bat Working Group biologist, personal communication 2007). Location of the nursery roost is unknown, and cyclic disease has been detected in this species at Zion but not diagnosed, although rabies, Western Equine Encephalitis and West Nile Virus have been ruled out.

This study will collect baseline data on bat temporal and geographical habitat use, species richness and relative abundance in multiple life zones at all three park units with a combination of auditory surveys and mistnetting capture and release of live bats. Some bat species are more easily identified in the hand than by sound, and other species are more easily detected by sound than captured in a mistnet. Bats released after handling can be recorded to verify presence of and frequency signatures of species that are difficult to discern by sound alone. Ectoparasites found during bat handling will be collected and sent to the NPS Wildlife Health team for analysis. If a die-off of big free-tailed bats occurs during the study, specimens will be sent to the NPS Wildlife Health team in Ft. Collins for analysis. Auditory surveys will use Sonobat detectors, proven technology which provides for more efficient data management and analysis than Anabat technology.

The baseline data collected in this study is needed for predicting, detecting, measuring, modeling and counteracting future alterations in population health, size and robustness due to large-scale management actions and climactic changes. The multi-park reach of this study is advantageous because most bat species don’t exhibit strong site fidelity. The location of a population fluctuates with annual conditions, especially food availability. The smaller the geographic scope of the study, the higher likelihood that apparent changes in bat population size in future sampling may not accurately reflect true changes. For example, future sampling in a small area may find fewer of one species not because the population has decreased, but because the population has moved to a different physical location. This study will include multiple sampling sites in multiple vegetation communities and life zones across all three park units, in order to mitigate this potential problem. The data collection methods of this study are in accord with those currently employed at Grand Staircase Escalante National Monument, Dixie National Forest, Arizona Strip BLM and Pipe Spring National Monument, thus analysis and conclusions can be made on a regional scale.

The methods for this project will be reviewed and approved by an IACUC before capture or handling of live bats takes place. All safety requirements in ZION’s Job Hazard Analysis for bat capture/handling will be met. All personnel handling bats will receive the entire pre-exposure rabies series of immunizations before handling any bats. NPS recommendations to reduce the chance of White Nose Syndrome (WNS) transmission will be followed.

A public event at CEBR will include a demonstration of mist netting and an interpretive program about bats, as part of a concentrated 24-hour citizen science and education effort during the summer of 2012.