

Respiring cells were detected by staining cells on-site with a respiratory dye, ([2-(p-iodophenyl)-3-(p-nitrophenyl)-5-phenyltetrazolium chloride]); INT). This chemical is taken up and reduced by actively respiring cells, and is seen as a distinct red crystal within the cell using bright-field microscopy. Killed controls and previously live samples were stained with a 0.1% acridine orange solution in the laboratory. Respiring cell counts for CR examined in site one (EA survey) indicate 1.6×10^7 cells per cm^3 of material representing 30% of total cells. Cell densities in punk rock were more varied. Respiring cell counts for punk rock examined from site one ranged from 1×10^6 to 8.6×10^6 cells per cm^3 of material representing 15-29% of total cells. The highest counts were found in site two (Sanctuary) with 2×10^7 actively respiring cells per cm^3 of material. The presence of actively respiring cells in the punk rock supports the hypothesis that microorganisms are interacting with limestone walls.

+ EYES WIDE OPEN: THE "EYELESS" CAVE FISH OF TRINIDAD IS NOT BLIND
Aldemaro Romero & Joel E. Creswell, *Environmental Studies Program and Department of Biology, Macalester College, 1600 Grand Ave., St. Paul, MN 55105, romero@macalester.edu*

Since being described in 1926, *Caecorhamdia urichi* (Pimelodidae) consistently has been listed as a blind cave representative of the ichthyofauna of Trinidad, West Indies. Our field and laboratory studies strongly suggest that members of this fish population not only have eyes, but also tapetum lucidum and display strong photophobic responses. Morphological variations in eye development and pigmentation could be the result of either an incipient process of troglomorphy (hypogean adaptation) or introgressive hybridization. We believe that this cave "species" is not a valid species at all but rather a deme of *Rhamdia quelen*. We also propose that the presence of tapetum lucidum in this fish is the result of convergent evolution.

COMMUNICATIONS & ELECTRONICS SESSION

A DIGITAL CAVE RADIO USING PSK31

Ray Cole, 3410 Austin Ct., Alexandria, VA 22310, K4GAA@arrl.net

Digital communication in caves using the amateur radio PSK31 mode can be used to achieve greater range than voice radios without having to learn Morse code. It's easy to build PSK31 cave radio transmitters that are efficient using switching techniques, and the circuitry required for both transmitting and receiving is minimal since the more complex signal processing is performed in a small laptop computer.

THE USE OF RADIOLOCATION AND GPS TO ENHANCE MAPPING ACCURACY AT WAKULLA SPRINGS

Brian L. Pease, 567 Fire St., Oakdale, CT 06370, bpease@99main.com

During the winter of 1998/99, Low Frequency Radiolocation gear was used extensively during the Wakulla II expedition to create a 3D Wall map of Wakulla Springs, a Florida State Park. Earlier work had resulted in a mostly line map of much of the Spring. Divers deployed submersible Beacons at intervals through the passages, leaving a marker at each site for later use by the Wall Mapping Team. My job was to locate the point on the surface precisely above each Beacon and provide UTM grid coordinates to the Computer Team.

Great care was used in calibrating the Radiolocation equipment; by divers in leveling the Beacon loops; and by myself in locating each point, resulting in an estimated total "Ground Zero" location error of <1 m.

For planning purposes, a handheld GPS with Coast Guard differential corrections and averaging gave the UTM coordinates with 4 meters expected accuracy.

Midway thru the expedition Trimble Navigation Ltd loaned us a phase differential GPS system with 1 cm accuracy. Conventional surveying with a Leica Total Station was used where multipath would not allow a fix with the Trimble gear. Eventually, every surface point was located to centimeter accuracy.

The average error of the simple Coast Guard DGPS setup for 38 surface points was actually 3.8 meters.

CONSERVATION, MANAGEMENT, AND CAVE RESTORATION

INTERSTATE 66: PROPOSED ALTERNATIVES IN SOUTHERN KENTUCKY AND KARST IMPACTS

Lee Florea, 9265 Hwy 1675 Somerset, KY 42501, mr_chaos@hotmail.com

In May of 1999, the Kentucky Transportation Cabinet (KTC) unveiled possible routes for the section of I-66 between London and Somerset, KY. Of the alternatives presented, the most environmentally damaging route was chosen as the preferred alternative. KICK 66 formed as an umbrella organization dedicated to preserving quality of life and environment in the region affected by these proposed corridors. Since the formation of KICK 66, the KTC has retracted their preferred alternative and are reassessing ten alternate corridors. They are also considering modifications to existing Hwy 80.

The proposed route between London and Somerset contains the rugged lands of the Cumberland Escarpment in the Daniel Boone National Forest. The National Forest contains undeveloped woodlands and gorges along Rockcastle River and Buck Creek. The region is highly karstified with a healthy biodiversity. Alternative corridors chosen by the KTC are deficient for reasons including but not limited to:

- Corridors dissect undeveloped land both inside and outside of the National Forest.
- Alternatives cross the Rockcastle River, listed as a Kentucky Wild and Scenic River.
- Alternatives fail to use existing road grades.
- Flanking lands are sensitive to environmental change and contain many protected and threatened species.
- Corridors cross karst topography endangering the integrity of the highway.
- Alternatives do not alleviate traffic volumes into the Lake Cumberland region.

KICK 66 opposes any alternative that would create a new highway corridor through the region. Our position is supported by scientific evidence and backed by local opinion.

KENTUCKY SPELEOLOGICAL SURVEY: FROM CONCEPT TO FOUNDATION

Lee Florea, 9265 Hwy 1675 Somerset, KY 42501, mr_chaos@hotmail.com

Development has greatly impacted karst areas and karst biota in Kentucky. Establishing a speleological survey is an important step toward proper planning and zoning in karst regions, implementation of best management practices for karst, and advancing knowledge about karst through well-informed research.

Computer technology will allow the Kentucky Speleological Survey to be developed and managed efficiently. Appropriate accessibility will be an essential component. Government, community, and conservation needs must all be considered. Therefore, provisions will be made for release of certain types of data to the public and government agencies to help prevent karst damage and human casualties. Public education must be a priority. Data contained in a speleological survey must be accessible to help educate landowners and to forward the benefits of karst science. At the same time, sensitive data must be reserved from the public.

To date, four Kentucky Speleological Survey organizational meetings have been held in Lexington. Individuals representing several regional organizations have attended and expressed their views. Resolutions have been reached. A ratifiable draft of the Articles of Incorporation has been produced with a complete draft of the bylaws under review.

CONSEQUENCES OF PUBLICITY: ARE THERE UNINTENDED CONSEQUENCES OF MASS CAVING PUBLICITY FOR CAVE CONSERVATION AND MANAGEMENT?

John Ganter, 1408 Valencia Dr NE, Albuquerque NM 87110, ganter@etrademail.com & Bill Storage, San Francisco CA

Publicity about caving has benefits as well as unintended consequences. Publicity can influence the public to appreciate caves, support protection, and encourage responsible and safe caving. But there is also some evidence of negative consequences; specifically an increase in "naïve novice" accidents, persistent over-trafficking, and vandalism in technically difficult caves. There may be analogous developments in mountain biking and "outlaw" rock climbing.