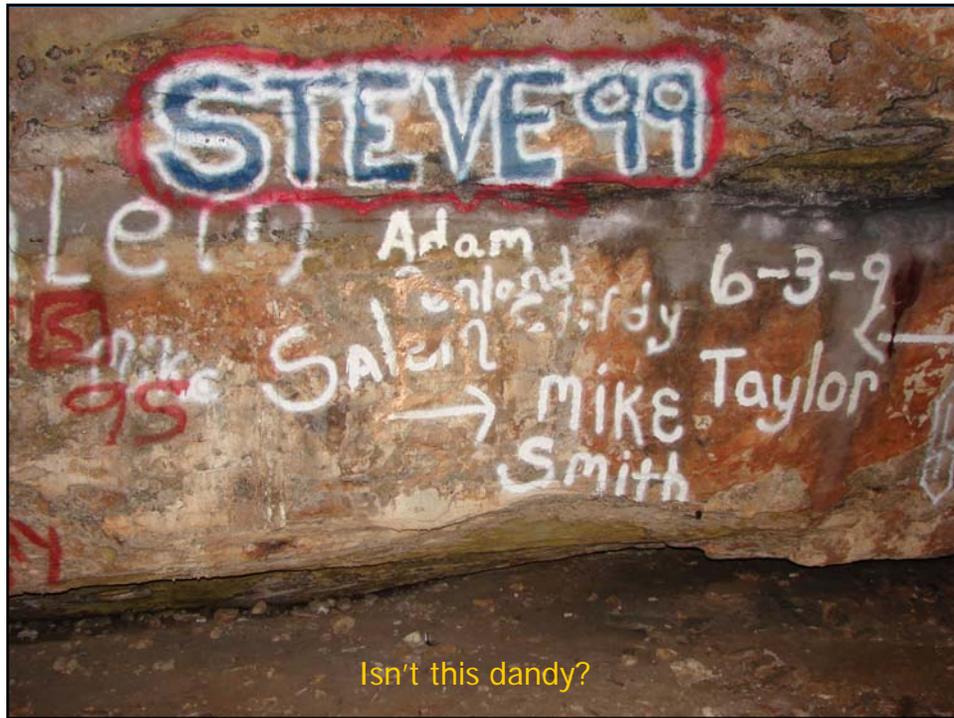


## Cave/Karst Monitoring

### Concern

- How much use and impact is too much?
- How do we document use?
- Resources protected? Then we recreate.



### Irreplaceable resources

<p>Geological</p>	<p>Archeology</p>
<p>Biology</p>	<p>Paleontology</p>

## Archeology/Paleontology

- Document location, material, and delineate if necessary
- Leave contents alone, photograph, mark area if possibility of damage, report material to archeologist ASAP
- Cave may need to be gated and managed dependent on resource

## Water

- Spot sampling
- Flow
- Data Loggers
- Dye studies
- Hydrolab
- POCIS/SPMD- environmental contaminants

Consider seasonal fluctuations, and in cave site variation.

## Biology

- Micro then Macro- impacts to micro change macro
- Seasonal considerations
- Target species considerations- bats vs. bugs
- Data Loggers
- Hand pick vs. bait trap

## Human disturbance

- Brush entrance clean
- Periodic visits- staff or volunteers
- Data loggers- light
- Cave register- documents legal/illegal
- Photos- photo point and entrance
- Pressure plates
- Cave stewards

## Development/Agriculture

### Over caves or recharge zones

- Aerial photos- agencies/organizations may have area/project specific overlays
- Geologic maps
- Satellite
- County plats
- Ground truth
- Review and comment on permitted activities

## Limits of Acceptable Change/Visitor Experience and Resource Protection

- Developed for Wilderness Areas and Parks
- Defines amount of environmental change measured as indicators
- Defines limits of acceptable change (LAC)
- As change approaches determined limit, management actions are implemented

## Visual Impact Evaluation System (VIES)

- Easy to use form of LAC
- Can be conducted by anyone
- Objective- relies on observations
- Provides a record of resource monitoring

## VIES Steps

- Identify indicators (1)
- Create impact scales (2)
- Determine LAC (3)
- Conduct monitoring (4)

## Identify Indicators (1)

- Easily observed
- Relates to human impact
- Examples may include trash, graffiti, impacted speleothems, critters, altered passages

## Impact Scales (2)

- Scale indicates how much change the indicator is being impacted or altered
- Should be easily understood and observed
- Examples may include level 0= no trash, level 1=limited trash, level 2= trash present, level 3= trash impacts view

## Determine LAC (3)

- Determine the maximum level of change that is acceptable for each cave  
"standard" (ie: trash)
- Often no change is the preference!
- Example: the indicator is trash; and level 2 is acceptable for Billy Bob cave due to no other competing resource values

## Conduct Monitoring (4)

- Use previous monitoring reports for comparison
- Establish permanent monitoring points
- Document with photos and various methods

## VIIES Summary

- Provides for an easy, objective monitoring method
- A tool to help manage cave/karst resources

<b>CAVE VISUAL IMPACT EVALUATION WORKSHEET</b>					
Cave Name _____		Date _____			
Montior Point _____		In-Cave Location _____			
Indicator	Degree of Impact Criteria (A)				
	0	1	2	3	4
Trash at Entrance	None	Few small items	Several small, few medium items	Several medium, few large items	Established dump or toxic materials
Litter in Cave	None	1-2 items out of sight	Up to 5 items in sight	Presence of litter impacts cave in-cave setting	Highly noticeable, impacting cave
Graffiti (not historic writing before 1940)	None	Present but not noticeable Less than 25% of visible surfaces covered	Less than 25% of visible surfaces covered	25-50% of visible surfaces covered	Greater than 50% or highly intrusive
Trails	None	Few footprints, not immediately noticeable	Trail visible but not distracting	Well used, obvious trail	Marked trail, heavily used (soil compacted) impact trail, multiple trails
Speleothem Damage	None	Some formations slightly discolored or chipped	Moderate discoloration or small formations broken	Highly discolored, some large formations broken	Majority of formations destroyed
Passage/Entrance Modification	None	Slight modification, not readily apparent	Obviously either opened or filled in	Passage is twice original size or half filled in	Passage completely filled in and/or new passage exists
Water Quality/Levels	Pristine	Slightly muddy or clouded	Muddy water or tracked-in silt on pool bottom	Pool filling in or drop in level, anaerobic bacteria present	Completely silted in or polluted
Other					

# CRYSTAL RIVER CAVE

Sharp County, AR  
AACS #SH5501

Maybe more widely referred to as CAVE CITY CAVE, Crystal River Cave is mostly known for the motor court motel that has encircled its entrance since 1992. Legends about the cave itself abound, including a purported Osage Indian massacre and subsequent burial of the Osage chief beneath a large boulder within the cave mouth, and the tale of a previous owner exploring a mile downstream via boat before running out of rope.

The level of the river fluctuates, and its current water table prevents verification of additional chambers beyond the many without divers. The water is quite clear, with visible boulders and what appears to be a snake boat at the bottom. While several people are reported to have lost their lives in the river over the years, no current could be detected.

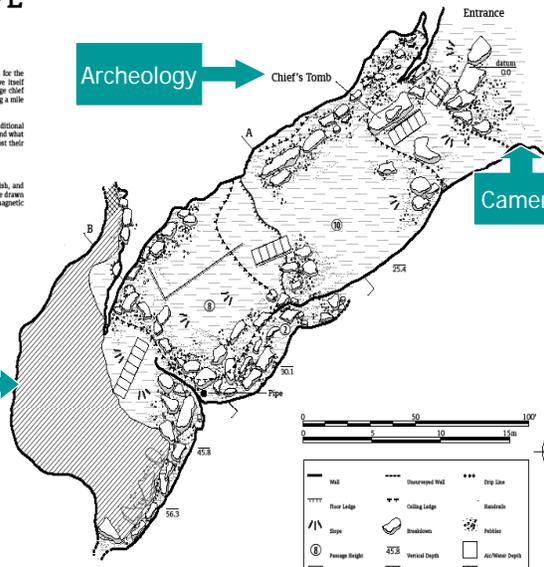
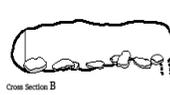
Surveyed November 11, 2004 by Dwayne Agin, Bryan Sigronelli, Ed Corley, Mark English, and Dave Kingweert. Suzette & Shergian Tape. Cartography by Jeff Bartlett. Cross sections are drawn to scale. Map units expressed in feet. All Azimuth readings corrected to true north, magnetic North omitted for clarity. declination is +1.21° as of November 2004.

Total surveyed length: 276 feet. Total surveyed depth: 56 feet.

Archeology

Camera

Biology  
WQ



—	Wall	----	Overlapped Wall	•••	Drip Line
TTTT	Floor Ledge	—•—	Outing Ledge	—•—	Handholds
∩	Slope	○	Breakdown	○	Pool
⊙	Passage Height	⊙	Vertical Depth	□	Air/Water Depth
□	Windfall	▨	Water	▩	Sump