Balcones Canyonlands Preserve Karst Management
2007 Annual Report

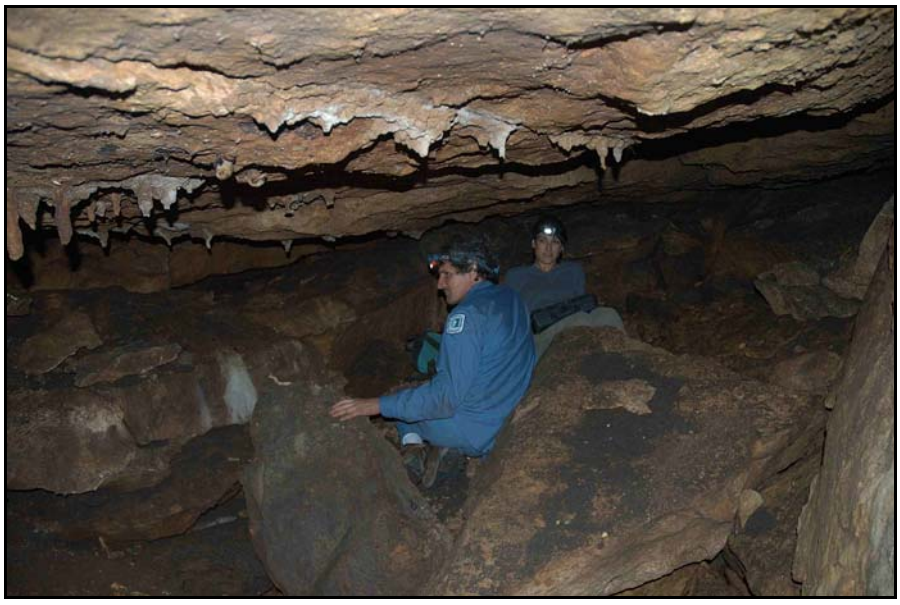

Photo: Inside Lamm Cave, Mark Sanders and Kathleen O'Connor

Travis County
Department of Transportation and Natural Resources
Natural Resources and Environmental Quality Division
and
City of Austin BCP – Austin Water Utility (AWU)

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1.0 REGIONAL PERMIT

There are six species of endangered karst invertebrates (ES) and 25 karst species of concern (SOC) covered by the Balcones Canyonlands Conservation Plan (BCCP), a regional 10(a)1(b) permit issued by the U.S. Fish and Wildlife Service (USFWS) to the City of Austin (COA) and Travis County (TC) in May 1996. If these 25 species of concern become listed as endangered in the future, no additional mitigation will be necessary to protect them, provided that all karst protection requirements, outlined in the BCCP, are fully implemented. Many of the species of concern (SOC) may actually be as endangered or even more so, than the currently listed species. The SOC have no protection under the Endangered Species Act of 1973 as amended. Therefore, the 27 SOC caves lack the federal protections given to the 35 endangered species caves. About 27,000 acres have currently been acquired for the Balcones Canyonlands Preserve (BCP) and most of the BCCP karst features are protected within these preserve tracts.

The Regional Permit requires protection of 35 endangered species caves and 27 additional caves that support SOC, but are not currently listed by the USFWS, for a total of 62 karst features (60 caves, 1 mine and 1 karst spring).

The six species of endangered karst invertebrates in Travis County are:

Tooth Cave pseudoscorpion:	*Tartarocreagris texana*	Kretschmar Cave mold beetle T	*examaurops reddelli*
Tooth Cave spider	*Neoleptoneta myopica*	Bee Creek Cave harvestman	*Texella reddelli*
Tooth Cave ground beetle	*Rhadine persephone*	Bone Cave harvestman	*Texella reyesi*

The 25 additional karst species of concern to be protected by the regional permit are:

FLATWORMS	*Sphalloplana mohri*	**PSEUDOSCORPIONS**	*Aphrastochthonius* N. S.
OSTRACODS	*Candona* sp. Nr. *Stagnalis*		*Tartarocreagris comanche*
SPIDERS	*Cicurina bandida* (#1)*		*Tartarocreagris reddelli*
	Cicurina cueva (#4)**		*Tartarocreagris intermedia (#2)*
	Cicurina ellioti (#5)		*Tartarocreagris* N. S. 3
	Cicurina reddelli (#3)	**HARVESTMEN**	*Texella spinoperca* (#2)
	Cicurina reyesi (#6)	**GROUND BEETLES**	*Rhadine s. subterranea*
	Cicurina travisae (#7)		*Rhadine s. mitchelli*
	Cicurina wartoni (#9)		*Rhadine austinica*
	Neoleptoneta concinna	**ISOPODS**	*Caecidotea reddelli*
	Neoleptoneta devia		*Trichoniscinae* N. S.
	Eidmannella reclusa		*Miktoniscus* N. S.
MILLIPEDES	*Speodesmus* N. S.		

*Numbers #1-9 correspond to species listing in the Final EIS-HCP, Section 2-66.

2.0 CAVE MANAGEMENT SUMMARY

This annual report covers the fiscal year 10/01/06-9/30/07 and is referred to in this document as "2007". In 2007, the Balcones Canyonlands Conservation Plan (BCCP) partners continued efforts to determine and track cave status of the 62 karst features covered by the BCCP 10(a) permit. The permit holders continued efforts to acquire, protect, and monitor the karst species in the caves included in the Permit.

The 62 BCCP caves are currently managed as follows: twenty-one caves protected as part of the BCP on COA land plus 1 additional private cave (Lamm cave) managed by the Austin Water Utility Dept.-BCP office; one protected on The Nature Conservancy (TNC) land; nine protected on Travis County (TC) land (all nine have the entrances protected) and one 10(a) private cave informally protected by TC (Talus Springs Cave); three caves are protected on Texas Cave Management Association (TCMA) land; a total of seven caves are protected as part of private Section 10(a) or Section 7 agreements with USFWS; and one cave is protected by a private landowner (Bandit Cave). A total of 44 of the BCCP caves are "protected" in some way, with 18 "unprotected", one of which has been destroyed (Pennie's Cave). Some "protected" caves only have protected entrances, but are threatened by surrounding development or planned development. With the exception of the Four Points: Northeast Cluster, which is protected by a private 10(a) agreement and some of the caves in the Four Points Northwest Cluster, all the caves in clusters to be protected by the permit are threatened by potential development near the caves (Tables 1&2).

Table 1. Endangered Karst Invertebrate Locations in Travis County, Texas. This table was originally in the BCCP permit in 1996 and was revised in 2005 to show new species location information from James Reddell (2004, 2005) and HNTB (2005).

Cave Name	Current Preserve Status	Karst Fauna Region	Tooth Cave Pseudoscorpion *Tartarocreagris texana*	ToothCave Spider *Neoleptoneta myopica*	Tooth Cave Ground Beetle *Rhadine persephone*	Kretschmarr C Mold Beetle *Texamaurops reddelli*	Bee Creek Cav Harvestman *Texella reddelli*	Bone Cave Harvestman *Texella reyesi*
Amber Cave	BCP Jollyville/ TC	Jollyville Plateau	X 1996			X 1996		
Bandit Cave	Private	Rollingwood					P 1996	
Beard Ranch Cave	BCP Ivanhoe/COA	Jollyville Plateau						X 1996
Bee Creek Cave	Private	Rollingwood					X 1996	
Beer Bottle Cave	Not required to be protected under BCCP	McNeil/Round Rock						X 1996
Broken Arrow Cave	BCP Lime Cr. Prs./COA	Cedar Park			X 1996			
Cave Y	Barton Creek Grblt/COA	Rollingwood					P 1996 delete P (Reddell 2004)	
Cold Cave	Private	McNeil/Round Rock						X 1996
Cotterell Cave	BCP Spicewood Spgs. Pk./COA	Central Austin						X 1996
Disbelievers Cave	BCP Private 10(a)	Jollyville			X 1996			
Eluvial Cave	BCP Private 10(a)	Jollyville						X 1996
Fossil Cave	Schroeter Pk./COA	McNeil/Round Rock						X 1996
Fossil Garden Cave	Private	McNeil/Round Rock						X 1996

Cave Name	Current Preserve Status	Karst Fauna Region	Tooth Cave Pseudoscorpion *Tartarocreagris texana*	ToothCave Spider *Neoleptoneta myopica*	Tooth Cave Ground Beetle *Rhadine persephone*	Kretschmarr C Mold Beetle *Texamaurops reddelli*	Bee Creek Cav Harvestman *Texella reddelli*	Bone Cave Harvestman *Texella reyesi*
Gallifer Cave	BCP Jollyville/TC	Jollyville Plateau		P 1996	P 1996 X 2005			X 1996
Hole-in-the-Road	Private	McNeil/Round Rock						X 1996
Japygid Cave	BCP Private 10(a)	Jollyville			X 1996	P 1996 X 2005		
Jest John Cave	BCP Forest Ridge/COA	Jollyville Plateau					X 1996	
Jester Estates Cave	BCP Forest Ridge/COA	Jollyville Plateau					X 1996	
Jollyville Plateau Cv.	BCP Private 10(a)	Jollyville			X 1996			X 1996
Kretschmarr Cave	BCP Jollyville/TC	Jollyville Plateau			X 1996	X 1996		
Kretschmarr Dble. Pit	BCP Jollyville/TC	Jollyville Plateau	P 1996 X 2005		P 1996 X 2005		P 1996	
Lamm Cave	Private Section 7	Jollyville Plateau			X 1996			
Little Bee Cr. Cave	BCP Ullrich WTP/COA	Rollingwood					X 1996	
McDonald Cave	BCP Jollyville/TC	Jollyville Plateau						X 1996
McNeil Bat Cave	Private	McNeil/Round Rock						X 1996
Millipede Cave	Not Protected under BCCP	McNeil/Round Rock						X 1996
M.W.A. Cave	BCP Private 10(a)	Jollyville	P 1996 X 2005		X 1996	P 1996 X 2005		X 1996
New Comanche Tr. Cave	Private	Jollyville Plateau		X 1996				X 1996

Cave Name	Current Preserve Status	Karst Fauna Region	Tooth Cave Pseudoscorpion *Tartarocreagris texana*	ToothCave Spider *Neoleptoneta myopica*	Tooth Cave Ground Beetle *Rhadine persephone*	Kretschmarr C Mold Beetle *Texamaurops reddelli*	Bee Creek Cav Harvestman *Texella reddelli*	Bone Cave Harvestman *Texella reyesi*
No Rent Cave	Private	McNeil/Round Rock						X 1996
North Root Cave	BCP Jollyville/TC	Jollyville Plateau			X 1996			
Puzzle Pits Cave	Not required to be protected under BCCP	Jollyville			X 1996			
Rolling Rock Cave	BCP Lime Cr. Prs./COA, Sec.10(a)	Cedar Park			X 1996			
Root Cave	BCP Jollyville/TC	Jollyville Plateau			X 1996 Tentative 2005			X
Spider Cave	BCP Park West/COA	Jollyville Plateau					X Reddell 2004	P 1996 delete P 2004 (Reddell)
Stovepipe Cave	Private Sec. 7	Jollyville Plateau	P 1996 delete P 2005 (Reddell) *	P 1996	X 1996	X 1996		P 1996
Tardus Hole	BCP Jollyville/TC	Jollyville Plateau			X 1996			
Tooth Cave	BCP Jollyville/TC	Jollyville Plateau	X 1996	X 1996	X 1996	X 1996		X 1996
Weldon Cave	Private	McNeil/Round Rock						X 1996
West Rim Cave	Not Protected under BCCP	Central Austin						X 1996

Sources: BCCP Permit 1996, Elliott 1992, USFWS 1994, Reddell 2004 and 2005, HNTB 2005
X 1996 = confirmed occurrence based on collected specimen, the designation in the 1996 BCCP permit
P 1996 = probable occurrence based on observation but not confirmed with collected specimen, the designation in 1996 BCCP permit
X 2005 = was listed as confirmed in the HNTB summary of James Reddell's data, 2005 report for USFWS
Tentative 2005 = was listed as tentative in the HNTB summary of Reddell's data, 2005 report for USFWS
Delete P = this species is no long thought to occur in this cave (personal communication Reddell 2004 or 2005).
* Reddell (pers com 2005) reported that *Tartarocreagris texana* does NOT occur in Stovepipe Cave. The species there is *Tartarocreagris altimana,* known only from that cave.

3.0 OWNERSHIP AND PROTECTION STATUS

The following table lists the status of the 62 caves/karst features listed in the BCCP permit with information on ownership, species status, cave cluster.

Table 2. 2007 Ownership Status of the BCCP 62 caves/karst features (35 with ES and 27 caves with SOC).

Cave Name	ES or SOC	Current tract/owner. On BCP Land or private	Cave Cluster
Adobe Springs Cave	SOC	BCP Lehmann/TNC	
Airman's Cave	SOC	BCP Barton Creek/COA	
Amber Cave	ES	BCP Jollyville/TC	4 Points Cl (Parke)
Armadillo Ranch Sink	SOC	Private	
Arrow Cave	SOC	BCP Slaughter Cr. Pk./COA	
Bandit Cave	ES	Private	
Beard Ranch Cave (Featherman's Cave)	ES	BCP Ivanhoe/COA	
Bee Creek Cave	ES	Private	
Blowing Sink Cave	SOC	BCP COA	
Broken Arrow Cave	ES	BCP Lime Crk Pres/COA	
Buda Boulder Spg.	SOC	BCP Shoal Creek Grblt./COA	
Cave X	SOC	Private/COA Protection Agreement	
Cave Y	SOC	BCP Barton Creek Grblt/COA	
Ceiling Slot Cave	SOC	Private	
Cold Cave	ES	Private	Northwood Cl.
Cotterell Cave	ES	BCP Stillhouse Hollow Preserve./COA	
Disbelievers Cave	ES	BCP Private 10(a)	4 Points Cl. (Perot)
District Park Cave	SOC	BCP D.Nickols Pk./COA	
Eluvial Cave	ES	BCP Private 10(a)	4 Points Cl. (Perot)

Cave Name	ES or SOC	Current tract/owner. On BCP Land or private	Cave Cluster
Flint Ridge Cave	SOC	Prop 2/COA	
Fossil Cave	ES	BCP Schroeter Pk./COA	
Fossil Garden Cave	ES	Private	McNeil Cl.
Gallifer Cave	ES	BCP Jollyville/TC	4 Points Cl (Parke)
Get Down Cave	SOC	Private/COA Protection Agreement with TCMA	
Goat Cave	SOC	BCP Goat Cave Karst Preserve/COA	
Hole-in-the-Road	ES	Private	Northwood Cl.
Ireland's Cave	SOC	Private Circle C	
Jack's Joint	SOC	Private	
Japygid Cave	ES	BCP Private 10(a)	4 Points Cl. (Perot)
Jest John Cave	ES	BCP Forest Ridge/COA	
Jester Estates Cave	ES	BCP Forest Ridge/COA	
Jollyville Plateau Cv.	ES	BCP Private 10(a)	4 Points Cl. (Perot)
Kretschmarr Cave	ES	BCP Jollyville/TC	4 Points Cl. (Parke)
Kretschmarr Dble. Pit	ES	BCP Jollyville/TC	4 Points Cl. (Parke)
Lamm Cave	ES	BCP Private Section 7	
Little Bee Cr. Cave	ES	BCP Ullrich WTP/COA	
Lost Gold Cave	SOC	Private	
Lost Oasis Cave	SOC	Private TCMA	
M.W.A. Cave	ES	BCP Private 10(a)	4 Points Cl. (Perot)
Maple Run Cave	SOC	BCP Goat Cave Karst Preserve/COA	
McDonald Cave	ES	BCP Jollyville/TC	
McNeil Bat Cave	ES	Private	McNeil Cl.
Midnight Cave	SOC	BCP Slaughter Cr. Pk./COA	
Moss Pit	SOC	Private	
New Comanche Tr. Cave	ES	Private	
No Rent Cave	ES	Private	McNeil Cl.

Cave Name	ES or SOC	Current tract/owner. On BCP Land or private	Cave Cluster
North Root Cave	ES	BCP Jollyville/TC	4 Points Cl (Parke)
Pennie's Cave	SOC	Private-Destroyed	
Pickle Pit	SOC	BCP Private Sec. 7	
Pipeline Cave	SOC	Private	
Rolling Rock Cave	ES	BCP Lime Cr. Prs./COA	
Root Cave	ES	BCP Jollyville/TC	4 Points Cl (Parke)
Slaughter Creek Cave	SOC	BCP Slaughter Cr.Pk./COA	
Spanish Wells	SOC	Private	
Spider Cave	ES	BCP Park West/COA	
Stark's North Mine	SOC	Private	
Stovepipe Cave	ES	BCP Canyon Creek/ COA	
Talus Springs Cave	SOC	Private/ 10(a) permit, TC checks entrance	
Tardus Hole	ES	BCP Jollyville/TC	4 Points Cl (Parke)
Tooth Cave	ES	BCP Jollyville/TC	4 Points Cl (Parke)
Weldon Cave	ES	Private	McNeil Cl.
Whirlpool Cave	SOC	Private TCMA	

Many caves on the Balcones Canyonlands Preserve (BCP) land have adequate buffer areas, as outlined in the *U.S. Fish and Wildlife Service Draft Recommendations for Karst Preserve Design, March, 2001*. However, some listed as "protected" under individual USFWS Section 10(a) or Section 7 permits, do not, including many caves that were considered "protected" under USFWS individual 10a permits in years past. The latest USFWS preserve design recommendations direct that the protected area surrounding the cave should be 59-89 acres in size to capture the majority of plant and animal community elements in viable numbers needed to support the karst ecosystem.

Travis County owns two small cave tracts that are currently not large enough to adequately protect the surrounding footprint and drainage areas. However, the county is currently in negotiations to acquire an additional 17 acres around these cave tracts. The COA has two Private Landowner Agreements to protect BCP caves but managing these agreements with the private owners has been challenging.

The following table lists caves that are currently gated, fenced and/or open to the public, and also their protection and monitoring status.

Table 3. 2007 Protection, monitoring and access status of the 62 BCP karst features.

Cave Name	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
Adobe Springs Cave		Protected on preserve		none
Airman's Cave		Protected on parkland	COA species and surface monitoring	open
Amber Cave	Gated, fenced	Protected on preserve (very close to road and sewer line)	TC bi-annual surface monitoring, quarterly cricket exit counts, quarterly end. species monitoring	none
Armadillo Ranch Sink		Private - Unknown		none
Arrow Cave	Gated	Protected in parkland .(There are nearby homes immediately south of the cave entrance).	COA bi-annual surface monitoring	none
Bandit Cave	Gated	Protected by private ecologically concerned landowner		none
Beard Ranch Cave		Protected on preserve	COA quarterly surface monitoring	none
Bee Creek Cave		Private- Unknown		none
Blowing Sink Cave	Gated [1]	Protected on preserve	COA bi-monthly surface monitoring	none
Broken Arrow Cave	Fenced (ranch fence)	Protected on preserve	COA quarterly surface monitoring	none
Buda Boulder Spg.		Protected in parkland (close proximity to a hike and bike trail)	COA annual surface monitoring	none
Cave X	Gated, fenced	Protected by landowner with 4.5 acre setback to protect cave footprint. Protected to some extent (not actively managed and the set back is inadequate).		None
Cave Y	Gated	Protected in parkland	COA quarterly surface monitoring	none
Ceiling Slot Cave		Private - Unknown		none
Cold Cave		Private - Unknown		none
Cotterell Cave	Fenced and gated	Protected in parkland. (There are nearby homes immediately east of the cave entrance)	COA quarterly species and surface monitoring; cricket exit count	none
Disbelievers Cave		Protected by 10a permit, hired ACI Consulting		none
District Park Cave	Gated after the 1st room.	Protected in parkland	COA quarterly species and surface monitoring; cricket exit count	1st room open, past the 1st room access by permit*
Eluvial Cave		Protected by 10a permit, hired ACI Consulting		None

Cave Name	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
Flint Ridge Cave	Gated	Protected on Water Quality Protection Land (drainage basin will be negatively impacted by the construction of a new highway).	COA quarterly species and surface monitoring; cricket exit count	none
Fossil Cave		Protected in parkland	Exact location of cave is unknown	None
Fossil Garden Cave		Private - Unknown	COA/ USFWS conducted one faunal survey last fiscal year)	none
Gallifer Cave	Gated, fenced	Protected on preserve	TC bi-annual surface monitoring, quarterly cricket exit counts, RIFA assessment, Spring end. species monitoring	none
Get Down Cave	Gated	Protected with Protection Agreement Inadequate setback from development.	TCMA species and surface monitoring	none
Goat Cave	Fenced	Protected on preserve	COA semiannual faunal surveys, monthly surface monitoring monitoring	access by permit*
Hole-in-the-Road		Private –Unknown. (very close to a major roadway)	COA/ USFWS conducted one faunal survey last fiscal year	none
Ireland's Cave	Fenced	Protected by landowner with 4.8 ac. Setback, watershed problems with golf course, setback inadequate	COA/ USFWS/ TCMA conducted one faunal survey last fiscal year	none
Jack's Joint		Private - Unknown		none
Japygid Cave		Protected by 10a permit, hired ACI Consulting		none
Jest John Cave		Protected on preserve	COA cricket exit count, bi-annual surface monitoring	none
Jester Estates Cave	Gated	Protected on preserve (3.2 acre preserve surrounded by homes).	COA annual species and quarterly surface monitoring	none
Jollyville Plateau Cv.	Gated [1]	Protected by 10a permit, hired ACI Consulting		none
Kretschmarr Cave	Gated, Fenced	Protected on preserve. Too close to roadway and in powerline ROW. Potential development land too close east and west.	TC bi-annual surface monitoring, quarterly cricket exit counts, RIFA assessment, Spring end. species monitoring	none
Kretschmarr Dble. Pit	Fenced	Protected on preserve	TC bi-annual surface monitoring, quarterly cricket exit counts, RIFA assessment, quarterly end. species monitoirng	none
Lamm Cave	Gated on 12//05, fenced in 2006	COA negotiated setback (approximately 150')	Zara Environmental, COA, Travis County conducted one faunal survey last fiscal year. Site will be monitored and treated for fire ants in the future.	none
Little Bee Cr. Cave	Gated	Protected by COA AWU Dept	Annual faunal survey and semi-annual surface monitoring	none
Lost Gold Cave	Gated	Private - Unknown, new owner, may be development near cave entrance		None

Cave Name	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
Lost Oasis Cave	Gated and Fenced	Protected by TCMA	TCMA species and surface monitoring	controlled access**
M.W.A. Cave		Protected by 10a permit, hired ACI Consulting		
Maple Run Cave	Gated	Protected on preserve	Annual faunal survey and Monthly surface monitoring	access by permit*
McDonald Cave		Protected on preserve	TC bi-annual surface monitoring, quarterly cricket exit RIFA assessment, quarterly end. species monitoring	None
McNeil Bat Cave		Private – Unknown (close proximity to high school)		none
Midnight Cave	Fenced	Protected on parkland (close proximity to soccer fields)	COA monthly surface monitoring	access by permit*
Moss Pit		Private - Unknown		none
New Comanche Tr. Cave		Private	TC is negotiating to acquire. Faunal survey conducted, via Landowner permission, by COA and TC staff.	none
No Rent Cave		Private - Unknown		none
North Root Cave		Protected on preserve but area too small. Potentially threatened with surrounding development.	TC bi-annual surface monitoring, quarterly cricket exit counts, RIFA assessment. Spring end. species monitoring	none
Pennie's Cave		Destroyed (cave filled in)		none
Pickle Pit	Gated	Private- Unknown		none
Pipeline Cave	Metal frame [1]	Private - Unknown		none
Rolling Rock Cave	Fenced (ranch fence)	Protected on preserve	COA quarterly surface monitoring	none
Root Cave		Protected on preserve but area too small. Potentially threatened with surrounding development.	TC bi-annual surface monitoring, quarterly cricket exit counts, RIFA assessment, Spring end. species monitoring	none
Slaughter Creek Cave	Gated	Protected on parkland. (There are nearby homes immediately south of the cave entrance)	COA quarterly surface monitoring	none
Spanish Wells		Private- Unknown		none
Spider Cave	Fenced (ranch fence)	Protected on preserve	COA quarterly species and surface monitoring; cricket exit count	none
Stark's North Mine		Private Unknown, recently sold		none
Stovepipe Cave	Fenced (ranch Fence) preserve boundary	On COA preserve	COA bi-annual faunal and quarterly surface monitoring	None

Cave Name	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
Talus Springs Cave	Gated	Protected by Homeowners Association and TC, only has 50' setback from houses and is probably effected by uphill development.	TC bi-annual surface monitoring,	none
Tardus Hole	Fenced	Protected on preserve	TC bi-annual surface monitoring, quarterly cricket exit counts, RIFA assessment, Spring end. species monitoring	none
Tooth Cave	Gated	Protected on preserve but area too small. Potentially threatened with surrounding development.	TC bi-annual surface monitoring, quarterly cricket exit counts, RIFA assessment, quarterly end. species monitoring	none
Weldon Cave		Private - Unknown		None
Whirlpool Cave	Gated	Protected by TCMA	TCMA species and surface monitoring	controlled access**

* Access by Permit - Permit may be issued by COA – Austin Water Utility or PARD staff.

** Controlled Access - Private cave owners control the access [1] Needs gate repairs/improved gate

4.0 ACCESS AND EDUCATION

In the fiscal year 10/01/06-9/30/07, the total number of visitors in the City of Austin's BCCP caves for educational/recreational/rescue training that were issued access permits were: District Park Cave (COA 15 & TCMA 13), Maple Run Cave (TCMA 56 & COA 0), Midnight Cave (TCMA 3), Goat Cave (TCMA 29 & COA 30) and Get Down Cave (See Table 3 for access and gating status of all of the BCCP caves).

TCMA Summary

Midnight Cave: 3 trips conducted to checked air quality and take photos.

Historically the air is of good quality as long as Slaughter Creek is running. When the creek quits running air quality diminishes. All gathered data from the monitoring site has been sent to Nico Hauwert with the City of Austin Watershed Protection and Development Review Dept.

District Park: The gate/lock access problems still exist. One trip was unable to open the lock after accessing the cave entrance room. It is recommended that the current gate be removed and relocated to just inside the cave entrance at an area where the passage is narrow and accessibility limited. It is thought that this would eliminate the most serious access problems that of having to dig out the gate after heavy rain events and the problems of lock maintenance.

Goat Cave: Students worked on vertical practice, TCMA was on hand to educated regarding biological monitoring areas and need for care when visiting the cave and avoid damaging species.
Maple Run: 2007 visits were primarily by cave grotto members. One near incident took place when a non experienced individual misrepresented his abilities and experience and was temporarily stuck in the cave. Local UT grotto members were called in to assist in his safe exiting of the cave. No 'official' rescue was necessary and COA staff was informed.

The TCMA has embarked on a mission to further educate the general Austin area public regarding the importance and sensitivity of our karst and aquifer. To reach that goal, in 2007, nearly 1000 citizens had an opportunity to experience a cave visit and were educated about cave biology and the aquifer. Groups include scouts, numerous elementary schools, various public and private high schools, university students, and adults. It has been observed that education of the public has lead to an increased awareness, more conscientious, responsible behaviour and decision making regaarding lawn care practices, water usage, and interest about Austin's karst and water.

5.0 MANAGEMENT COORDINATION AND OVERSIGHT

The City of Austin, Travis County and TCMA have continued to work together to standardize karst monitoring and reporting procedures.

6.0 BIOLOGICAL MONITORING

City of Austin

The City of Austin's BCCP staff performed species surveys for Airman's cave, Barker Ranch cave #1, Cotterell cave, District Park cave, Flintridge cave, Goat cave, Jester Estates cave, Little Bee Creek cave, Maple Run cave, Spider cave (note: Barker Ranch cave #1 is not listed on the BCCP permit, however, it does contain species of concern).
The City of Austin, with the help of volunteers, conducted cave cricket exit counts at: Cotterell, District Park, Flintridge, Jester Estates, and Spider caves.
Volunteers along with BCP staff also helped remove trash and excavate Hoskin's Hole (COA WQPL cave) with species of concern.
A new cave (Pond Party Pit) was discovered by volunteers, excavated to allow for access, mapped the interior, and collected one pseudoscorpion which was sent to James Cokendolpher for species identification.
Through site selection for the proposed new Water treatment plant the City of Austin contractor discovered 2 new *Rhadine persephone* sites on upper bull creek. These features were bait trapped.

The City of Austin issued a Scientific/Research permit to Dr Jay Banner (UT at Austin). Dr Banner will be monitoring CO2 levels in area caves, attempting to determine why levels fluctuate during the year.
Zara Environmental LLC along with the Division of Biodiversity and Ecological Entomology, Illinois Natural History Survey, and the Isotope Geochemistry laboratory, Illinois State Geological Survey completed their section 6 grant study "Examining possible foraging differences in urban and rural cave cricket populations: Carbon and nitrogen isotope ratios as indicators of trophic level". Several caves in the Austin and San Antonio area were used in this study including caves on the BCCP permit (Blowing Sink, Lost Oasis, and Slaughter Creek caves). The authors hope to have this study published soon.

Nico Hauwert with the COA-WPDRD continued his study on the surface catchment area of Flintridge cave. This study will help determine the potential negative impacts associated with the construction of proposed state Highway 45 South.

Travis County

Travis County's BCCP staff, accompanied by permitted karst biologist Pierre Paquin, conducted a spring 2007 faunal surveys in all nine Travis county-owned BCP caves with federally listed species: Amber cave, Gallifer cave, Kretschmarr cave, Kretschmarr Double Pit cave, McDonald cave, North Root cave, Root cave, Tardus Hole cave, and Tooth cave. Additionally, Two Trunks cave, known from previous data to contain *Rhadine persephone*, was surveyed as well. Two new records for *Texamaurops reddelli* were observed and confirmed from Gallifer cave and Tardus Hole cave. Four of the nine Travis County caves were assigned for quarterly monitoring. These are: Amber cave, McDonald cave, Kretschmarr Double Pit cave and Tooth cave. Faunal surveys in these four caves, with newly permitted Travis County biologists, were conducted in late August/early September 2007. Caves were also delineated into zones that will be used indefinitely for subsequent faunal surveys. In addition to aforementioned caves, the privately owned BCCP listed cave, New Comanche Trail cave, was surveyed for listed invertebrates in mid-Summmer 2007 by COA and TC staff. Geode cave, located on the same private property, was also surveyed. Table 4 summarizes all listed species found by cave and by year. See Attachment B for results from all BCP-listed cave faunal surveys.

Table 4. Listed karst invertebrates found in Travis County managed caves by year.

Cave Name	2005	2007
Amber Cave	No listed species observed	No listed species observed
Gallifer Cave	*N. myopica* *T. reyesi* **T. reddelli* *R.. persephone*	*N. myopica* *T. reyesi* **T. reddelli* *R.. persephone*
Kretschmarr Cave	No listed species observed	*T. reddelli*
Kretschmarr Dbl. Pit	No survey done	*T. texana* *T. reyesi*
McDonald Cave	*T. reyesi*	*T. reyesi*
North Root Cave	No survey done	*Neoleptoneta. species*-to be determined
Root Cave	No survey done	No listed species observed
Tardus Hole Cave	No survey done	**T. reddelli*
Tooth Cave	*T. reyesi* *T. reddelli*	*N. myopica* *T. reyesi* *T. reddelli* *R.. persephone*

**new record*

In 2007, Travis County did both surface monitoring and cricket exit counts at McDonald, Amber, Tooth, Root, North Root, Gallifer, Kretschmarr, Kretschmarr Double Pit, and Tardus Hole. Suface monitoring was also conducted at Two Trunks Cave (not listed on the BCCP permit), as well as all other Travis County-owned karst features, including several sinks, caves and pits. Table 6 provides a summary of all data from cricket counts conducted at Travis County BCCP caves. Red-imported fireants (*Solenopsis invicta*) were encountered in some of the caves during surveys. These included Amber cave, McDonald cave and Gallifer cave.

The Texas Cave Management Association

The Texas Cave Management Association (TCMA) performed species surveys in Whirlpool, Get Down, and Lost Oasis Caves (Attachment A). TCMA continues to provide valuable volunteer support activities to the BCCP and Central Texas cave protection efforts. They assisted with monitoring of access to City of Austin sensitive caves, participated in negotiations with developers to manage caves under City of Austin cave management agreements, visited caves on private land

to assess potential threats, and assisted both BCCP partners in assessment and protection of BCP caves. The BCCP partners greatly appreciate the dedication and hard work of this group.

It has become evident over the past 4 years of monitoring that caves located in urban areas have been experiencing significant negative changes due to the presence of raccoons. The urban caves such as Get Down, Live Oak, Lost Oasis, Electo Mag and others have become the residence of the 'neighborhood' maurading raccoons. The raccoons use the caves during the daylight hours as their dens and at night emerge to feed at back porch pet food dishes, trash cans, etc. This increase in suburban neighborhoods is fairly recent and has caused a tremendous decrease in the numbers of typical cave invertebrates that have been historically observed. This raises the issue of the effect of too much scat and energy input in to the caves, which in turn attracts more aggressive invertebrates, who then move further into the cave, into areas not usually inhabited by these more aggressive species, causing a dramatic decrease in the numbers of typical karst species normally observed. The long term affects of this change are unknown at this time. At Get Down Cave in particular, the decrease in typical cave critters has been so dramatic that TCMA has, with permission, filled in the previously mandated gate 'animal entrances' with concrete and rocks to exclude the raccoons. This has not been completely successful. There was partial success in 2005, but it was found that the raccoon juveniles were still inhabiting the cave. In 2006 additional efforts were put toward 'total' exclusion of raccoons and we hope for the best and a return to normal of the cave/karst invertebrates. In 2007 extreme efforts were incorporated to exclude raccoons from the caves at the Village of Western Oaks Karst Preserve.

It is the TCMA's recommendation to the COA and Travis County BCP, and The Karst Sub-Committee of the Scientific Advisory Committee that the BCP urban caves be monitored for presence of raccoons and that measures be taken if excessive raccoon's are present to exclude them from access to the caves. These measures would include observation for scat, locating and blocking all raccoon accessible entrances, removal of the majority of the scat and re-monitoring to see if indeed the exclusion has been successful.

**Raccoon Statement

The visitations of raccoons to BCP caves has been encouraged because they brought energy into the cave that was thought to be an important for the health of the cave animals, including the BCP protected species. Unfortunately, while the droppings of one or two raccoons might provide useful energy inputs that benefit the protected species, the use of the cave by large numbers of raccoons has turned several caves into raccoon latrines, and the accumulation of large amounts of skat has overwhelmed the cave ecosystem.

The population of raccoons in urban areas has greatly expanded, due to the increased availability of food, and many of these animals are using caves as a convenient den. In Get Down Cave this increased usage resulted in fresh deposits of skat that over large areas were approximately two to three deposits per square meter. This means that an area 2 by 3 meters would have 12 to 18 piles of skat. Moving through the cave is difficult, and the air blowing from the entrance has a strong odor of feces. The ecology of the cave was totally changed 2006. None of the species of concern, the more highly cave adapted animals, were present in the high skat areas. Large numbers of Rove beetles and isopods of the family Porcellionidae had replaced the more cave-adapted species.

In 2007 efforts to install wire over the existing cave gates proved at first futile as the raccoons immediately ripped the wire off of the gate. We responded with improved wiring and additional cemented rocks, as well as wiring over the lock access port. By the end of 2007 we began to see that exclusion was working, the amount of scat was decreased and we found in our monitoring a cave adapted millipede, *Speodesmus lg,* the first cave adapted millipede we observed in over a year.

In addition to managing the karst features required in the BCCP permit, BCCP Partners are also voluntarily managing other karst features located on preserve land, such as Testudo Tube (COA) and several non-BCCP karst features

7.0 RECOMMENDATIONS

Access to the 18 privately owned and unprotected BCP-listed caves, in order to assess current faunal assemblages, should be attempted by managing partners. Additionally, there may be a need to substitute some of these privately owned caves listed on the BCCP permit (ex. Pennie's Cave) for non-listed caves that may be more appropriate and are known to have listed species. For example, Two Trunks Cave is located on TC preserve property and, although not listed in the BCCP permit, is a known locale for the listed invertebrate *Rhadine persephone.*

Additonally, a one-day symposium or workshop highlighting the latest research in RIFA control and most effective management techniques has been proposed and should occur in this fiscal year. Native versus non-native ant identification would also be beneficial.

The compilation of a karst invertebrate field guide has been discussed in the past and should be further explored.

Finally, it is recommended that a master database be created to house all faunal survey data from BCCP listed caves. Travis County, as one the permit holders and managing partners, has volunteer ed to help create and manage this database.

8.0 KARST MANAGEMENT ACTIVITIES

The BCP Land Management Plan outlined planned activities concerning the 62 BCCP karst features. Table 5 below includes a summary of activities completed in 2007.

Table 5. 2007 BCCP Karst Management Activities.
Adobe Springs Cave The Nature Conservancy The last cave faunal survey was conducted in 1999. The entrance to the cave continues to be undisturbed and is protected on the Lehmann Preserve tract.
Airman's Cave City of Austin 1. Completed annual cave faunal survey(See Attachment) 2. COA BCP cotinued to work with local caving volunteers to help monitor and "police"this cave. 3. BCP staff have noticed a slight increase in litter and graffiti. BCP staff contacted TCMA and the local UT grotto requesting help in monitoring this situation. 4. UT grotto members have volunteered to help the City install an informational sign inside the cave along with registries which will help monitor actual traffic inside the cave. BCP staff and volunteers continue to explore ideas to help protect the cave, species within, and the public. BCP staff and volunteers continue to explore ideas to help protect the cave, species within, and the public. 5. Permitted UT grad student to conduct CO2 monitoring research project.
Amber Cave Travis County 1.Conducted quarterly cricket exit surveys. 2. Did trash cleanup and did frequent surface inspections with no signs of vandalism to the cave entrance or in the cave. 3. Maintained fencing and signage to protect this area from unauthorized access and dumping. 4. Inspected for RIFA. 5. Conducted Spring and Fall cave faunal surveys (see Attachment)
Armadillo Ranch Sink Private
Arrow Cave City of Austin 1. Quarterly site inspections were conducted. City staff continue to deal with ongoing dumping problems from the adjacent neighborhood. 2. The site was also inspected for RIFA infestations. On all visits fire ant mounds were observed in close proximity of the cave entrance, however, ants did not appear to be entering the cave. 3. City of Austin BCP staff sought bids for the drafting of an interior map for Arrow cave and the nearby sinkholes. The contract was awarded and the map was completed.
Bandit Cave Private

Table 5. 2007 BCCP Karst Management Activities.
Beard Ranch Cave (Featherman's Cave), City of Austin 1. The cave was inspected quarterly. 2. No evidence of vandalism was noted. 3. No red imported fire ants were found. A healthy population of native fire ants was found in close proximity to the cave. 4. City of Austin BCP staff sought bids for the drafting of an interior map for Beard Ranch cave. The contract was awarded and the map was completed.
Bee Creek Cave Private
Blowing Sink Cave City of Austin 1. This site was inspected 6 times and no signs of vandalism were found in the cave or to the cave entrance. 2. The site was treated twice for fire ants with boiling water. 3. Local cave volunteers and the City of Austin continued to work on the stabilization project using reinforced concrete to stabilize passageways within the cave. 4. COA BCP staff on site inspection reported Texas Gas Service's construction of a new gas line along the northern portion of the existing "Kinder Morgan" line was in violation of their permit. Texas Gas Service was operating outside of their easement and had damaged several protected live oaks. COA BCP and Pard staff meet with Texas Gas Service representatives and worked out a mitigation plan. 5. COA BCP staff deployed more salamander bait traps. 6. Researchers conducted an isotope study at this cave to help determine differences between rural and urban cave cricket foraging distances around selected caves. 7. Permitted UT grad student to conduct CO2 monitoring research project.
Broken Arrow Cave City of Austin 1. This cave was inspected quarterly with no sign of human visitation or vandalism. 2. A small amount of fire ant activity was found near the cave entrance but not activity was observed in the entrance.
Buda Boulder Spring City of Austin 1. BCP staff visited the site twice and noted no real negative impacts to the spring. Old abandoned transient camps were found nearby. 2. WPDRD staff has taken water quality samples at this spring, most recently on 1/7/99. The chemistry looks fairly typical for an urban setting according to David Johns, (WSPD geologist).
Cave X Private 1. The City of Austin entered into a Private Landowner Agreement "Cave X, Management and Monitoring Plan, Covenants and Restrictions, (see attachment)", with the property owners (Regent's School) in Oct. 1999. The agreement sets aside a 4.5 acre area to protect the cave footprint. The USFWS was involved in the discussions on protection. 2. The cave entrance is gated and also has a fence for added protection. 3. There are still concerns about the implementation of Private Landowner Agreement that does

Table 5. 2007 BCCP Karst Management Activities.
not seem to be working yet. This site has had quite a lot of new development in close proximity of the cave. With the potential listing of *Cicurina cueva*, Regents expressed interest in a "Candidate Conservation Agreement". COA, Travis County, Regents, Horizon, and USFWS met regarding what measures would be needed to fulfill this. One suggestion was that Regents should start to implement the "Cave X Management and Monitoring Plan.
Cave Y City of Austin 1. 4 site visits were conducted to this cave with no signs of vandalism. 2. No red imported fire ant activity was observed at or near the cave entrance, however, there were fire ant mounds within a 150' radius of the cave. 3. Permitted UT grad student to conduct CO2 monitoring research project.
Ceiling Slot Cave Private
Cold Cave Private
Disbelievers Cave Private 10a Permit: PRT-808694
District Park Cave City of Austin 1.BCP staff conducted two cave faunal surveys (See attachments). 2. BCP staff and volunteers conducted 2 cave cricket exit counts (see attachments) 3. Conducted site surveys quarterly. No red imported fire ants were noted in the cave. 4. Permitted access to this cave was allowed. 5. BCP staff removed trash from the un-gated portion of the cave. 6. Permitted UT grad student CO2 monitoring research project. 7. COA BCP staff removed flood debris washed into the cave to allow for access into the interior of the cave. TCMA 1. 2005 a tree fell in and over the rock gabion enclosure around the cave, BCP and PARD staff were notified and no removal has taken place as of Jan. 2008. Local park trash and the fallen tree are the primary issues other than the gate/lock situation, see #2 below. 2. TCMA spent some months routinely working on the frozen lock and was able to get the cave back open. TCMA recommends re-gating the cave at the actual entrance to avoid the typical problem of flooding the current gate and lock, rendering the lock in-operable.
Eluvial Cave Private 10a Permit: PRT-808694
Flint Ridge Cave City of Austin 1. BCP staff conducted 6 site visits and noted no signs of illegal trespass and no fire ant activity inside the cave, however fire ant mounds were noted within a 150 foot radius of the cave entrance. 2. TCMA initiated a drip study to help determine % of recharge occurring overland. 3. BCP staff treated numerous RIFA mounds with boiling water. 4. BCP staff conducted two cave faunal surveys (see attachments). 5. BCP staff and volunteers conducted 2 cave cricket exit counts (see attachments). 6. Nico Hauwert with the COA WPDRD continued his study on the surface catchment area of

Table 5. 2007 BCCP Karst Management Activities.
Flintridge cave. COA BCP staff contracted professional surveyors to delineate the Flint Ridge basin boundaries north of Flint Ridge cave. 7. COA BCP staff continued to meet with LCRA regarding their proposal to route a new power line within the drainage area of Flintridge cave, staff urged LCRA to staff within TXDOT ROW.
Fossil Cave City of Austin 1. The site was inspected quarterly and there was no new signs of vandalism 2. No red imported fire ant activity was observed at the suspected cave entrance, however, mounds were found within a 150' radius of the cave. 3. BCP staff monitored trail work to make sure no karst features were negatively impacted. 4. Invasive non-native vegetation was removed from the park.
Fossil Garden Cave Private
Gallifer Cave Travis County 1. Did surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Maintained fencing and signage to protect this area from unauthorized access and dumping. 3. Inspected for RIFA. 4. Conducted quarterly cricket exit surveys 5. Conducted Spring cave faunal survey (see Attachment)
Get Down Cave TCMA 1.The cave has been visited by TCMA monitoring staff numerous times in the past year to observe and mitigate (with concrete and rocks) for the influx of raccoons and the problems resulting from the influx. (See Biological Monitoring) 2.The entrance room of the cave is visited by local citizens, one day per year, for the annual Cave Day Festival, held the last weekend of Oct. For the 2007 cave day event we had an attendance of about 1500 people, approximately 500 people visited the entrance room. Prior to cave day, TCMA staff removed the accumulated raccoon scat just from the entrance room. 3. The gate area was observed for further raccoon access and additional holes were 'plugged'. Hardware clothe wire and wire cable was used to secure additional wiring over original gate, to prevent raccoon access completely. 4. TCMA as defacto managers/owners, provide routine preserve maintenance, check for RIFA/treat w/boiling water, empty the 2 mutt mitt trash cans. The kiosk signage is updated and replaced with cooperation of the BEACD education department and printing support of the COA Watershed Protection Dept. Sandy Maldonado, graphics dept. in preparation for the 6th Annual Cave Day event. 5. Support of preserve cleanups, with the help of various scout groups, and Magellon (Longhorn Pipeline) staff volunteers and a few very helpful VWO neighbors.
Goat Cave Karst Preserve City of Austin 1. Completed annual faunal survey (see attachment) 2. COA BCP staff treated RIFA biannually with boiling water. 3. With the help of volunteer stewards, conducted weekly site inspections, removed trash from preserve area and reported on anything out of the ordinary. 4. Allowed permitted access to this cave.

Table 5. 2007 BCCP Karst Management Activities.
5. COA BCP and PARD staff repaired vandalized fence. 6. No bats observed. There seems to be a consistent concern regarding the lack of bat populations in this and in other local Austin caves, such as Barker Bat and County Line Bat caves. These caves have historically had bat activity. Possible explanations for some historic bat colony locations is encroaching urbanization and changes in land usage. 7. UT fire ant lab researchers did a preliminary study to see if the RIFA boiling water mound treatment is successful or not. Preliminary results showed a slight increase in native ant diversity in areas that were treated with boiling water versus the control.
Hole-in-the-Road Cave Private
Ireland's Cave Private 1. A new subdivision; Somerset Estates, is being constructed around the cave. 2. City of Austin Watershed Protection and Development Review Department obtained 4. 819 acres critical environmental feature setback surrounding the cave. About 99% of the cave's natural catchment area is preserved. The entire 4.819 acres setback will be fenced with a combination of 6-ft wood and wrought fencing. Currently the cave entrance is blocked with large rocks. 3. More info is needed on who will manage the cave; need to ask about possible landowner agreement with BCP.
Jack's Joint Cave Private
Japygid Cave Private 10a Permit: PRT-808694
Jest John Cave City of Austin 1. Conducted 2 site visits found and no signs of vandalism or human visitation. 2. No red imported fire ants were present at the cave entrance, however, there were mounds within a 150' radius of the cave entrance.
Jester Estates Cave City of Austin 1. BCP staff conducted 6 site visits and on several occasions removed new illegally dumped trash. 2. BCP staff continue to meet with neighbors regarding why these activities must end. 3. The site was treated three times for fire ants with boiling water. 4. City of Austin BCP staff sought bids for the drafting of an interior map for Jester Estates cave. The contract was awarded and the map was completed. 5. BCP staff conducted one cave faunal survey (see attachment) 6. UT fire ant lab researchers did a preliminary study to see if the RIFA boiling water mound treatment is successful or not. Preliminary results showed a slight increase in native ant diversity in areas that were treated with boiling water versus the control.
Jollyville Plateau Cave Private 10a Permit: PRT-808694
Kretschmarr Cave Travis County 1.Did surface inspections with no signs of vandalism to the cave entrance or in the cave. 2.Inspected for RIFA. 3.Conducted quarterly cricket exit surveys.

Table 5. 2007 BCCP Karst Management Activities.
4. Conducted Spring cave faunal survey (see Attachment).
Kretschmarr Double Pit Travis County 1. Did surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Inspected for RIFA. 3. Conducted quarterly cricket exit surveys. 4. Conducted Spring and Fall cave faunal surveys (see Attachment).
Lamm Cave Section 7 Permit 2-15-93-F-075 (see USFWS files) 1. The City of Austin negotiated protective measures for this cave including a Land Management Plan for this cave. The cave has a setback size of approximately 4.13 acres. The radius of the setback varies from a minimum of 123 feet south of the cave to a maximum of 340 feet north of the cave. 2. The cave was gated and the preserve area was fenced following COA WPDRD and BCP staff recommendations and design. Once the cave gate was completed, BCP staff reviewed work, requested additional measures and eventually signed off on the completed gate. 3. No application of fertilizers, pesticides or herbicides will be allowed in the CEF area. 4. COA staff will continue to work with the property owner to make sure all aspects of the cave management agreement are carried out.
Little Bee Creek Cave City of Austin 1. BCP staff conducted 2 site visits. 2. BCP staff conducted a cave faunal survey. (See attachment).
Lost Gold Cave Private TCMA Contacted by HCC late 2006 regarding possible mitigation and purchase of cave, current owner negotiations may be possible in 2007 2007 TCMA contacted by owner, we're still attempting to get owner to turn cave over to TCMA. Owner is still attempting to get a variance to be able to build on the 1.6ac. setback lot. The COA has assured us that the setbacks are non-negotiable and that the cave and tract are protected.
Lost Oasis Cave TCMA 1. Bailey MS classroom visits to the cave to observe cave life and the recharge zone in 2007. Plans to repair the fence and install a new gate are on TCMA agenda for FY 2008.
Maple Run Cave City of Austin 1. BCP staff conducted one cave faunal survey (See attachment). 2. Conducted 6 site visits, found no sign of unpermitted access, and on occasion, removed trash from the entrance. 3. Permitted UT grad student CO2 monitoring research project. 4. Permitted access to this cave is allowed. 5. Site was treated twice for RIFA with boiling water. 6. During a UT Grotto permitted access trip an individual had difficulty exiting the cave and AFD rescue crew was called, however, local caving volunteers helped the individual before AFD

Table 5. 2007 BCCP Karst Management Activities.
arrived on the scene. After this event the access policy for this cave was modified to make it more stringent to prevent this type of incident in the future. 7. UT fire ant lab researchers did a preliminary study to see if the RIFA boiling water mound treatment is successful or not. Preliminary results showed a slight increase in native ant diversity in areas that were treated with boiling water versus the control.
McDonald Cave Travis County 1. Did surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Inspected for RIFA. 3. Conducted quarterly cricket exit surveys. 4. Conducted Spring and Fall cave faunal surveys (See Attachment).
McNeil Bat Cave Private 1.TCMA attempted to observe any bat flights from a remote location at the RR HS and did not sight any emergence from the cave locality. 2. Landowner relations are in need of improvement in order to gain any access to the cave or implement any types of protection measures. 3. No new activity of access attempts were made in 2005.
M.W.A. Cave Private 10a Permit: PRT-808694 (see FWS files for status)
Moss Pit Cave Private
New Comanche Trail Cave Private
No Rent Cave Private
North Root Cave Travis County 1. Did surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Inspected for RIFA. 3. Conducted quarterly cricket exit surveys. Conducted Spring cave faunal survey (See attachment).
Pennie's Cave Private 1. The entrance is filled with rock, gravel and graded over and the cave may be lost. City Watershed Protection staff sent recommendations on protective buffers and requested a site meeting with BCP cave folks on the Pennies Cave property (Roe tract) but the meeting request was denied by the owner or developer. Nothing has been submitted for the development of that project.
Pickle Pit Cave Section 7 Permit 2-15-93-F-075 (see USFWS files)
Pipeline Cave Private

Table 5. 2007 BCCP Karst Management Activities.
TCMA had a meeting with the Stratus Development Group and has been assured that the cave will be set aside and that the previously planned large commercial development on that tract will likely be scaled down to accommodate the cave. 2004-2005 no changes observed. There is a need to establish a sufficient setback for the cave with the Stratus group, TCMA will look into it 2006. No information for 2007. Development does not appear to be in forward motion near the cave at this time.
Rolling Rock Cave City of Austin 1. This cave was inspected quarterly, and no sign of human visitation or vandalism was found. 2. Was inspected for red imported fire ants, none were present at or near the cave entrance, but did find several species of native ants. RIFA mounds were found within a 150' radius of the cave entrance.
Root Cave Travis County 1. Did frequent surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Inspected for RIFA. 3. Conducted quarterly cricket exit surveys. 4. Conducted Spring cave faunal survey (see Attachment).
Slaughter Creek Cave City of Austin 1.Quarterly site inspections were conducted. 2. The entrance was inspected to make sure that no human access had occurred. 3. The site was also inspected for RIFA infestations. On all visits fire ant mounds were found in close proximity of the cave entrance. On at least one occasion staff noticed RIFA entering the cave. 4. City of Austin BCP staff sought bids for the drafting of an interior map for Slaughter Creek cave. The contract was awarded and the map was completed. 5. Researchers conducted an isotope study at this cave to help determine differences between rural and urban cave cricket foraging distances around selected caves.
Spanish Wells Cave Private (location unknown)
Spider Cave City of Austin 1. 4 site visits were conducted, and no sign of human access, or vandalism was found. 2. RIFA was treated with boiling water. 4.Conducted two cave faunal surveys (see attachments). 5. BCP staff with the help of volunteers conducted 2 cave cricket exit counts. (see attachments). 5. City of Austin BCP staff sought bids for the drafting of an interior map for Spider cave. The contract was awarded and the map was completed.
Stark's North Mine Private 1. TCMA reports that they visited the mine and it appears undisturbed. TCMA was contacted about sewer line construction in the vicinity, and the engineer of the project was advised of the sensitivity of this locality. 2. TCMA reports the tract of land where the cave is has been put on the market. It is unknown at

Table 5. 2007 BCCP Karst Management Activities.
this time if the land has sold and what the status of the cave will be after the new owner takes possession. 3. City of Austin accurately GPS the cave position. Trash was visible inside the cave passage. 4. The neighbor immediately downhill from the cave has contacted TCMA re; protection of the cave and the impending erosion issues. No action taken.
Stovepipe Cave 1. City of AustinCOA recently took over ownership of this cave and preserve. 2. BCP staff conducted quarterly site inspections of the entrance. 3. BCP staff repaired perimeter fence. 4. Staff conducted one cave faunal survey. (see attachment).
Talus Springs Cave Private 1.The USFWS 10a permit PRT 815447 mitigation requirement intended this cave to go to Travis County, however, the cave is located on private land just outside of the mitigation area. Travis County has continued requesting that the homeowners association donate the land to Travis County; Coordinated management with them. 2. Did surface inspections with no signs of vandalism to the cave entrance or in the cave.
Tardus Hole Cave (Kretschmarr Fluted Sink) Travis County 1. Did surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Conducted quarterly cricket exit surveys. 3. Conducted Spring cave faunal survey.
Tooth Cave Travis County 1.Did surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Inspected for RIFA. 3.Conducted quarterly cricket exit surveys. 4.Conducted Spring and Fall cave faunal survey.
Whirlpool Cave TCMA 1. Conducted a biological survey in December 2007. 2. Controlled and monitored public access. 3. Education usage of the cave continues to be very regular and high as compared to the other Austin area caves. The main groups utilizing the cave are The Austin Nature Center, The University of Texas, Baylor University, Texas A&M, and various outdoor groups from around central Texas. This cave has tremendous potential as an educational resource and receives in excess of 1000 visits annually and observations indicate that visitor impact to be minimal. 4.TCMA granted permission to the US Geological Survey for the installation of a groundwater monitoring well at the Whirlpool Preserve site, 2006. 5.. Worked with COA-Water Utility on the ACCP finish up. There were several items not finished which led to considerable trespassing by off road vehicles. The preserve has been somewhat secured to prevent unauthorized access and the area will be re-vegetated in the spring of 2007. 2007 several lingering re-vegetation issues and site remediation issues were outstanding and have now been resolved. 6. The cave is heavily utilized for karst and aquifer education by both the COA Earth Camp

Table 5. 2007 BCCP Karst Management Activities.

program thru Watershed Protection Dept., the BSEACD, and the University of Texas. Additionally TCMA Austin educators have opened up visits to Austin citizens in order to further educate neighbors and the general public as to the importance and sensitivity of the Austin karst, its critters and the aquifer. As part of that education, individuals have joined TCMA on biological monitoring activities.

7. Preserve and cave cleanups are on-going as the area is typically used as a local dumpsite for construction trash and the Latta Branch of Williamson Creek, runs thru the preserve, which leaves lots of garbage and trash post rain events. Prior to buildout of the VWO neighborhood, it would take at least a 2 inch rain to cause the creek to run. Since that buildout, it now only takes approximately $1/10^{th}$ of an inch, this is due to the great increase of impervious cover. The water quality is unknown but thought to not be of sufficient quality to allow or encourage recharge to the cave. 2007 TCMA personnel have contacted Gary Franklin, LCRA regarding costs of water monitoring at the site. Water quality testing requests will be brought before the TCMA board for approval for FY 2008.

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ATTACHMENT A
TCMA REPORT

Texas Cave Management Association (TCMA)
December 2007

Submitted by: Julie Jenkins and Bill Russell, TCMA

WHIRLPOOL CAVE

Whirlpool Cave is utilized by large numbers of visitors from Austin and the surrounding area, The cave's primarily use is for educational/recreational activities including aquifer and karst education made available to the general population. Other uses include Austin Fire Department and Travis County EMS safety and rescue training, science monitoring for the TCMA and BCP, caver training by local Texas cave grottos, and various recreational groups. The cave is typically visited on a weekly basis by one or more organizations. In the fall new cavers receive training and experience in Whirlpool. Groups using the cave stay to the well-worn path and seldom if ever stray from the established route. Visits may take as little as an hour or last for several hours, depending on the educational needs, age and background of the group touring the cave. Whirlpool received 940 registered visitors in 2006-2007. Only one biological survey was conducted in 2007. No info has been provided from USGS regarding monitoring of the well installed in 2005.

LOST OASIS CAVE

Historically, Lost Oasis, a small cave has been monitored for its biology and has had little interest from local cavers, except for monitoring and the occasional school group visit, there has been little access.
There was still some evidence of raccoon scat in the cave. It appears that one or two small holes have opened to the surface allowing entry into the cave for small animals. We have put rocks on top of both holes. Our observance is that where caves are very near residential development the occurrence of raccoons and increased scat has become a problem or at least an issue for the cave species.

Field work for a study by Zara was completed in 2006-7, and laboratory analysis and write-up are underway. A final report was to be submitted to TPWD in December, 2007 and should be available to interested parties and TCMA.

The BSEACD staff has given several presentations to Bailey MS, which is located across the street from the cave. TCMA and the district are in the process of finalizing a partnership with the school for hands-on aquifer and karst education. This program will be in concert with the COA Watershed Protection Dept, and Keep Austin Beautiful Clean Creek Project.

GET DOWN CAVE

The annual Western Oaks Cave Day date event is now held on October· There was more visitation this year than previously (numbers exceeded 400 visitors to the entrance room of the cave- only). USFWS has been consulted re: access one day per year, entrance room only; the response is that this is not an endangered species cave, yet protection of the SOC's is of importance. As the access does not in any way affect the SOC, who dwell deep in the dark zone, some 30 feet down and nearly 100 feet in the cave, this one day annual event access will continue and monitoring efforts will be included to determine if adverse affect to the SOC's is observed.

Outstanding issues of the year regarding the karst preserve are still ownership of the preserve and ownership/responsibility for the wet pond. These remain unresolved at the time of this report and presented somewhat of a stumbling block to the preserve management as no funds were available and although a management plan has been drafted, it has yet to be approved.

One survey was performed this year, most remarkably it should be noted that during our surveys we discovered an over abundance of raccoon scat and that the highly cave adapted species had apparently been displaced by less adapted and more aggressive species, like rove beetles. It has been noted that there are distinct issues with raccoons in the cave, which is demonstrated both thru the increase in the scat and the decaying raccoon carcasses found.

We believe that the increased numbers in the raccoons is due to the intense urbanization of the area, which greatly increases the availability of food (dog food outside etc.). The animal access was blocked at various times during the year, yet the raccoons managed to locate additional methods of entry. In October of 2005 a more robust blockage was put in place. The cave entrance will be surveyed numerous times in 2006 to study the effectiveness of the raccoon anti-access measures. Frequently raccoon access has been regarded as necessary to maintain the energy for the cave environment however lately there have been several instances in which the abundance of raccoon scat has over powered the cave eco system resulting in the displacement of cave adapted animals by less adapted species. 2007 additional wiring and cementing to exclude the raccoons was installed and we are finally seeing the slow return of cave adapted species to the cave. One *Speodesmus lg.* was sighted this year.

ATTACHMENT B
KARST FAUNAL REPORTS

TRAVIS COUNTY:

Name: K. O'Connor, P. Paquin, M. Sanders	**Date: 6-Apr-07**
Agency: Travis County	**No. of pages: 1 of 2**

Location: Amber Cave GPS coordinates (NAD 1983) E 609786 N 3365429 Section: 1 and 2

Time Started: (see below) Time ended: _____ scientific permit # TE819451-1

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 18.8 Outside: 17.2 Humidity Inside: 100% Outside: 46%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: 1.76" of rain; Avg. temp: 17.2 C -22.7 C
Organic matter encountered in survey area: 1 raccoon scat pile observed in Zone 2

FAUNAL SURVEY-Zone 1 and 2

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Zone 1: (12:23 PM-12:33 PM)			
Earthworms: *Haplotaxida*	2		
Surface millipedes	4		
Collembola	2		
Cicurina varians	2		
Syrrhophus marnocki	1		
Zone 2: (11:31 AM- 12:16 PM)			
Snails: *Helicodiscus eigenmanni*	6		
**Cicurina sp.*	5		
Cambala speobia	68		
Surface millipedes	85		~ 50 on raccoon scat
Campodeid dipluran	2		
Springtails: Collembola	12		
Ceuthophilus cunicularis	6		
Ceuthophilus juveniles	16		
Ceuthophilus nymphs	3		
Ant: hymenoptera undetermined	1		

Name: K. O'Connor, P. Paquin, M. Sanders **Date: 6-Apr-07**
Agency: Travis County **No. of pages: 2 of 2**

Location: Amber Cave GPS coordinates (NAD 1983) E 609786 N 3365429 Section: 3
Time Started: 11:40 AM Time ended: 12:32 PM scientific permit # TE819451-1

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 18.8 C Outside: 17.2 C Humidity Inside: 100% Outside: 46%
Humidity was measured with a Psychrodyne analog psychrometer.

FAUNAL SURVEY- Zone 3

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Snails: *Helicodiscus eigenmanni*	1		
**Cicurina sp.*	9	Under rocks	2 blind individuals (*C. travisae)* collected by P. Paquin
**Eidmannella reclusa*	2	Under rocks	1 collected by P. Paquin
Rove beetles: Staphylinidae	1		
* *Speodesmus bicornourus*	2	Under rocks	1 collected by P. Paquin
Cambala speobia	44		1 collected by P. Paquin
Surface millipede	12		
* *Rhadine sp*	3	Under rocks	*Rhadine subterranea?*
Springtails: Collembola	73		
Ceuthophilus cunicularis	10		
Ceuthophilus juveniles	48		
Ceuthophilus nymphs	33		

(*) signifies species of concern (☼) signifies endangered species

Name: K. O'Connor, Paul Fushille **Date: 12-Sept-07**
Agency: Travis County **No. of pages: 1 of 3**

Location: Amber Cave GPS coordinates (NAD 1983) E 609786 N 3365429
Section No. 1 (twilight zone)
Time Started: 0256 PM Time ended: 0306 PM scientific permit # TE819451-1
Surface area observations: Strong sewage smell noted outside of cave entrance vicinity.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 24.3 C Outside: 27.6 Humidity Inside: 94% Outside: 66%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: 1.62" of rain on 11-Sept-07
Organic matter encountered in survey area: 1 raccoon scat pile present

FAUNAL SURVEY-Zone 1

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Achaearanea porteri	2		
Cambala speobia	1		
Class Symphyla	4		
Surface millipedes: *Oxidus gracilis*	9		
Ceuthophilus secretus	16		
Fungus gnats larvae-Mycetophilidae	2		
Solenopsis invicta	9		
Procyon lotor	1		Scat pile

(*) signifies species of concern (☼) signifies endangered species

Name: K. O'Connor , Paul Fushille	**Date:12-Sept-07**
Agency: Travis County	**No. of pages: 2 of 3**

Location: Amber Cave GPS coordinates (NAD 1983) E 609786 N 3365429 Section No. 2
Time Started: 0229 PM Time ended: 0252 PM scientific permit # TE819451-1
Surface area observations: Strong sewage smell noted outside of cave entrance vicinity.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 23.6 C Outside: 27.6 Humidity Inside: 94% Outside: 66%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: 1.62" of rain on 11-Sept-07
Organic matter encountered in survey area: N/A

FAUNAL SURVEY-Zone 2

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Helicodiscus eigenmanni	4		
Unid chilipod	1		Collected and stored for future identification
Cicurina varians	16		
**Cicurina travisae*	2		
Class Symphyla	3		
Cambala speobia	105		
Surface millipede: *Oxidus gracilis*	49		
Springtails: Collembola	430		
Rove beetles: Staphylinidae	8		
Crickets*: Ceuthophilus secretus*	281		
Ceuthophilus ***juveniles***	25		
Fungus gnats -Mycetophilidae	1		
Solenopsis invicta	40		

(*) signifies species of concern (☼) signifies endangered species

Name: K. O'Connor	**Date: 12-Sept-07**
Agency: Travis County	**No. of pages: 3**

Location: Amber Cave GPS coordinates (NAD 1983) E 609786 N 3365429 Section No. 3
Time Started: 0208 PM Time ended: 0225 PM scientific permit #TE819451-1
Surface area observations: Strong sewage smell noted outside of cave entrance vicinity.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 24.0 C Outside: 27.6 Humidity Inside: 100% Outside: 66%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: 1.62" of rain on 11-Sept-07
Organic matter encountered in survey area: N/A

FAUNAL SURVEY- Zone 3

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Helicodiscus eigenmanni	6		
Araneae: unid individual	1		Collected and stored for future identification
Cicurina varians	2		
* *Speodesmus sp*.	6		
Cambala speobia	56		
Surface millipede: *Orthomorpha gracilis*	20		
Springtails: Collembola	~550		
Crickets*: Ceuthophilus secretus*	15		
Ceuthophilus ***juveniles***	1		
Fungus gnats -Mycetophilidae	2		
Mosquitos: Culcidae	2		

(*) signifies species of concern (☼) signifies endangered species

Name: K. O'Connor, P. Paquin	**Date: 10-Apr-07**
Agency: Travis County	**No. of pages: 1 of 3**

Location: Gallifer Cave GPS coordinates (NAD 1983) E 609978 N 3364400
Zone No. 1-3
Time Started: 1005 AM Time ended: 1021 scientific permit # TE819451-1

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☒ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 17.2 C Outside: 20 C Humidity Inside: 100% Outside: 76%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: 1.04 "of rain; Temp. close to freezing on 4-7-07 and 4-8-07 (daily avg: 5.5 C – 6.6 C)

FAUNAL SURVEY- Zones 1-3

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Zone 1 & 2 (1005 AM- 1021 AM)			
Snails: *Gastropoda*	1		
**Cicurina sp.*	4		
Ceuthophilus secretus	2		
Zone 3 (1022 AM- 1052 AM)			
Snails: *Helicodiscus eigenmanni*	1		
**Cicurina sp.*	23	Under rock	
✡ *Neoleptoneta myopica*	17	In web under rock	
✡ *Texella reyesi*	11	Under rock	
✡ *Rhadine persephone*	1	Under rock	
Cambala speobia	9		
Scutigeridae	1		
Symphylans: *Symphyla* undetermined	2		
Isopods: Triconiscidae	1		
Assasin bugs: Reduviidae	2		
Springtails: Collembola	~250		
Ticks: Acarina undetermined	1		
Parasitic wasp: hymenoptera undetermined	1		
Crickets*: Ceuthophilus secretus*	1		
Ceuthophilus cunicularis	7		
Ceuthophilus nymphs	2		

Name: K. O'Connor, P. Paquin	**Date: 10-Apr-07**
Agency: Travis County	**No. of pages: 2 of 3**

Location: Gallifer Cave GPS coordinates (NAD 1983) E 609978 N 3364400
Zone No. 4
Time Started: 1048 AM Time ended: 11:25 AM scientific permit # TE819451-1

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☒ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 17.2 C Outside: 20 C Humidity Inside: 100% Outside: 76%
Humidity was measured with a Psychrodyne analog psychrometer.

FAUNAL SURVEY- Zone 4

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Snails: *Helicodiscus eigenmanni*	2		
Carabidae: *Tachys. sp.*	1		
**Cicurina sp.*	16		
Cicurina varians	2		
**Eidmannella reclusa*	2		
☼ *Neoleptoneta myopica*	3	Under rock	3 collected by P. Paquin
☼ *Texella reyesi*	3	Under rock	2 collected by P. Paquin
☼ *Rhadine persephone*	3	Under rock	1 collected by P. Paquin
☼ *Texamaurops reddelli*	1	Under rock	Collected by P. Paquin
Cambala speobia	4		1 collected by P. Paquin
Symphylans: *Symphyla* undetermined	7		
Japygidae**:** Japygid undetermine*d*	1		Collected by P. Paquin
Springtails: Collembola	~400		
Isopods: Triconiscidae	5		
Crickets*: Ceuthophilus secretus*	2		
Ceuthophilus cunicularis	13		
Ceuthophilus juveniles	4		
Ceuthophilus nymphs	5		

(*) signifies species of concern (☼) signifies endangered species

Name: K. O'Connor, P. Paquin	**Date: 10-Apr-07**
Agency: Travis County	**No. of pages: 3 of 3**

Location: Gallifer Cave GPS coordinates (NAD 1983) E 609978 N 3364400
Zone No. 5
Time Started: 11:25 AM Time ended: 12:41 PM scientific permit # TE819451-1

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☒ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 17.2 C Outside: 20 C Humidity Inside: 100% Outside: 76%
Humidity was measured with a Psychrodyne analog psychrometer.

FAUNAL SURVEY- Zone 5

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Snails: *Helicodiscus eigenmanni*	1		
Scorpions: *Pseudouroctanus reddelli*	1		
**Cicurina sp.*	6		
**Cicurina elliotti*	2		Collected by P. Paquin (Paquin recorded them as *C. bandida*)
**Eidmannella reclusa*	1		
☼*Neoleptoneta myopica*	10	Under rocks	10 collected by P. Paquin
☼ *Texella reyesi*	3	Under rocks	1 collected by P. Paquin
Carabidae: Analine beetle	1		Collected by P. Paquin
Batrisodes uncicornis (?)	1		Collected by P. Paquin
Cambala speobia	1		
Symphylans: *Symphyla* undetermined	1		
Rove Beetles: Staphylinidae	5		
Springtails: Collembola	~480		
Crickets*: Ceuthophilus secretus*	1		
Ceuthophilus cunicularis	7		
Ceuthophilus juveniles	1		
Ceuthophilus nymphs	1		
Fungus gnat larve:Mycetophilidae	1		
Tick: Acarina undetermined	1		
Flea:Siphonaptera undetermined	1		

(*) signifies species of concern (☼) signifies endangered species

Name: K. O'Connor, P. Fushille, P. Paquin	**Date: 3-Apr-07**
Agency: Travis County	**No. of pages: 1**

Location: Kretschmarr Cave GPS coordinates (NAD 1983) E 610227 N 364914
Section No.1 -3 (Drop Zone) Scientific permit # TE819451-1
Time Started: (see below) Time ended: (see below)

Survey area: ☐ *Solenopsis invicta* If so, ☒ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 21.2 C Outside: 20.5 C Humidity Inside: 100% Outside: 90%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: Close to 2" in rain; Avg. temp: 17.2 C- 22.7 C

FAUNAL SURVEY- Zones 1-3

Species Zone 1: (4:00 PM- 4:10 PM)	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Ceuthophilus cunicularis	3		
Surface beetle: Lucanidae	1		
Zone 2: (4:11- 4:35)			
**Cicurina sp.*	12		1 blind sp. (*C. travisae)* collected by Pierre Paquin
☼ *Texamaurops reddelli*	2	Under rock	2 collected by P. Paquin
Tachys ferrugineus	2		
Cambala speobia	3		1 collected by P. Paquin
Springtails: Collembola	~345		
Campodeid dipluran	1		
Zone 3: (4:40- 5:02)			
**Cicurina sp.*	6	Under rock	2 blind (*C. travisae*) collected by Pierre Paquin
**Eidmanella reclusa*	3	Under rock	1 collected by P. Paquin
Speodesmus bicornourus	1		collected by P. Paquin
Springtails: Collembola	57		

(*) signifies species of concern (☼) signifies endangered species

Name: K. O'Connor, P. Paquin	**Date: 3-Apr-07**
Agency: Travis County	**No. of pages: 1 of 2**

Location: Kretschmarr Double Pit Cave GPS coordinates (NAD 1983) E 609882 N3365369
Section No. 1 of 2 (Drop Zone) Scientific permit # TE819451-1
Time Started: 0844 AM Time ended: 0915 AM

Survey area: ☐ *Solenopsis invicta* if so, ☒ Heavy infestation ☐ Moderate ☐ Light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 16.1 C Outside: 15 C
Humidity Inside: 100% Outside: 94%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: Rained 1.76" previous week; Avg temp 17.2-22.7 C
Organic matter encountered in survey area: none

FAUNAL SURVEY- Zone 1

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Helicodiscus eigenmanni	1		
Achaearanea porteri	1		
**Cicurina* sp.	7		4 blind spp. collected by Pierre Paquin
Cambala speobia	1		
Springtails: Collembola	~145		
☼ ***Texella reyesi***	2	Under rock	2 collected by P. Paquin
☼ ***Tartarocreagris texana***	1	On cave shelf	collected by P. Paquin

(*) signifies species of concern (☼) signifies endangered species

Name: K. O'Connor, P. Paquin	**Date: 3-Apr-07**
Agency: Travis County	**No. of pages: 2 of 2**

Location: Kretschmarr Double Pit Cave GPS coordinates (NAD 1983) E 609882 N 3365369
Section No.2 of 2 Scientific permit #TE819451-1
Time Started: 0920 AM Time ended: 0950 AM

Survey area: ☐ *Solenopsis invicta* If so, ☒ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 21.2 C Outside: 20.5 C
Humidity Inside: 100% Outside: 90%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: Rained 1.76" previous week; Avg temp 17.2-22.7 C
Organic matter encountered in survey area: none

FAUNAL SURVEY- Zone 2

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Gastropoda: *Helicodiscus eigenmanni*	1		
**Eidmanella reclusa*	1		collected by P. Paquin
**Cicurina sp.*	1		
Cicurina varians	1		collected by P. Paquin
✡ ***Rhadine persephone***	1	Under rock	collected by P. Paquin
✡***Tartarocreagris texana.***	1	On cave shelf	Feeding on a cricket nymph
Speodesmus sp.	1		
Fleas: Siphonaptera undetermined	3		

(*) signifies species of concern (✡) signifies endangered species

Name: K. O'Connor, P. Fushille	**Date:23-Aug-07**
Agency: Travis County	**No. of pages: 1**

Location: Kretschmarr Double Pit GPS coordinates (NAD 1983) E 609882 N 3365369
Section No. 1 and 2
Time Started: (see below) Time ended: (see below) scientific permit # TE819451-1

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 32.4 Outside: 22.3 Humidity Inside: 84% Outside: 64%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: 0.14" on 21-Aug-07 and 0.36" on 22-Aug-07; ~ 1" on the 16th and 17th combined.
Organic matter encountered in survey area: N/A

FAUNAL SURVEY- Zone 1 and 2

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Zone 1 (0540 PM-0557 PM)			
Snails: *Helicodiscus eigenmanni*	11		
**Cicurina sp.*	3		
Eidmannella sp.	2		
☼ *Texella reyesi*	1	Under rock	
Cambala speobia	20		
Springtails: Collembola	150		
Crickets*: Ceuthophilus secretus*	33		
Ceuthophilus juveniles	1		
Ceuthophilus nymphs	1		
Moth: Lepidoptera undetermined	1		
Zone 2 (0600 PM-0611 PM)			
Snails: *Helicodiscus eigenmanni*	4		
**Cicurina sp.*	1		
Cambala speobia	22		
Springtails: Collembola	45		
Crickets*: Ceuthophilus secretus*	43		
Ceuthophilus nymphs	3		
Mosquitos: Culcidae undetermined	65		

(*) signifies species of concern (☼) signifies endangered species

***Zone 3 not surveyed**

Name: Kathleen O'Connor, Paul Fushille, P. Paquin **Date: 3-Apr-07**
Agency: Travis County **No. of pages:1 of 6**

Location: McDonald Cave GPS coordinates (NAD 1983) E 609429 N 3367852
Zone No.1 of 6
Time Started:_____ Time ended: _____Scientific permit # TE819451-1
Surface area observations: _____

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐graffiti

Temperature Inside: 17.7 C Outside: 25 C Humidity Inside: 90% Outside: 74%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: Rained 1.76" previous week; Avg Temp-17.2-22.7 C
Organic matter encountered in survey area: N/A

FAUNAL SURVEY-Zone 1

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Gastropoda: *Helicodiscus eigenmanni*	1		
Springtails: Collembola	~40		
Ceuthophilus nymphs	1		
Acarina undetermined	1		

(*) signifies species of concern (☼) signifies endangered species

Name: Kathleen O'Connor, Paul Fushille, P. Paquin **Date: 3-Apr-07**
Agency: Travis County **No. of pages:2 of 6**

Location: McDonald Cave GPS coordinates (NAD 1983) E 609429 N 3367852
Section No. 2 of 6
Time Started:_____ Time ended: _____Scientific permit # TE819451-1
Surface area observations: _____

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐graffiti

Temperature Inside: 17.7 C Outside: 25C Humidity Inside: 100% Outside: 74%
Humidity was measured with a Psychrodyne analog psychrometer.

FAUNAL SURVEY- Zone 2

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Gastropoda: *Helicodiscus eigenmanni*	1		
**Cicurina sp.*	16		2 blind spp. (*C. travisae)* collected by P. Paquin
**Neoleptoneta devia*	10		4 collected by P. Paquin
Pseudouroctanus reddelli	1		
* *Speodesmus bicornourus*	1		
Cambala speobia	5		
Springtails: Collembola	~400		
Ceuthophilus cunicularis	1		
C. cunicularis juvenile	1		
Ceuthophilus nymphs	5		
Reduviidae: *Triatoma*	2		

(*) signifies species of concern (☼) signifies endangered species

Name: Kathleen O'Connor, Paul Fushille, P. Paquin Date: 3-Apr-07
Agency: Travis County No. of pages: 3 of 6

Location: McDonald Cave GPS coordinates (NAD 1983) E 609429 N 3367852
Zone No. 3 of 6
Time Started: Time ended: Scientific permit # TE819451-1
Surface area observations: _____

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 17.7 C Outside: 25 C Humidity Inside: 100% Outside: 74%
Humidity was measured with a Psychrodyne analog psychrometer.

FAUNAL SURVEY- Zone 3

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Pseudouroctanus reddelli	1		
**Neoleptoneta devia*	4		3 collected by P. Paquin
**Cicurina travisae*	2		
Springtails: Collembola	~100		
Cambala speobia	3		
Speodesmus bicornourus	1		
Ceuthophilus nymphs	2		
Moth; Lepidoptera undetermined	1		

(*) signifies species of concern (☼) signifies endangered species

Name: Kathleen O'Connor, Paul Fushille, P. Paquin Date: 3-Apr-07
Agency: Travis County No. of pages: 4 of 6

Location: McDonald Cave GPS coordinates (NAD 1983) E 609429 N 3367852
Section No. 4 of 6
Time Started:_____ Time ended: _____Scientific permit # TE819451-1
Surface area observations: _____

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐graffiti

Temperature Inside: 18.8 C Outside: 25 C Humidity Inside: 100% Outside: 74%
Humidity was measured with a Psychrodyne analog psychrometer.

FAUNAL SURVEY- Zone 4

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
**Cicurina sp.*	5		3 collected by P. Paquin
**Neoleptoneta devia*	3		3 collected by P. Paquin
Pseudouroctanus reddelli	1		
Speodesmus bicornourus	1		Collected by P. Paquin
Cambala speobia	1		
Springtails: Collembola	~200		
Ceuthophilus cunicularis	1		
Ceuthophilus nymphs	1		
Gnat: Diptera undetermined	1		
Reduviidae: *Triatoma gerstaeckeri*	1		

(*) signifies species of concern (☼) signifies endangered species

Name: Kathleen O'Connor, Paul Fushille, P. Paquin	**Date: 3-Apr-07**
Agency: Travis County	**No. of pages:5 of 6**

Location: McDonald Cave GPS coordinates (NAD 1983) E 609429 N 3367852
Section No.5of 6
Time Started:_____ Time ended: _____Scientific permit # TE819451-1
Surface area observations: _____

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐graffiti

Temperature Inside: 18.8 C Outside: 25 C Humidity Inside: 100% Outside: 74%
Humidity was measured with a Psychrodyne analog psychrometer.

FAUNAL SURVEY-Zone 5

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
**Cicurina sp.*	9		3 blind spp. (*C. travisae)* collected by Pierre Paquin
**Eidmanella reclusa*	1		collected by P. Paquin
Pseudouroctanus reddelli	1		
✡ ***Texella reyesi***	3	Under rocks	
**Tartarocreagris sp.*	1		Collected by P. Paquin
Staphylinidae	5		
Thysanurans: *Texoreddellia texensis*	2		1 collected by P. Paquin
Speodesmus bicornourus	6		
Springtails: Collembola	~150		
Ants: Hymenoptera undetermined	13		

(*) signifies species of concern (✡) signifies endangered species

Name: Kathleen O'Connor, Paul Fushille, P. Paquin **Date: 3-Apr-07**
Agency: Travis County **No. of pages:6 of 6**

Location: McDonald Cave GPS coordinates (NAD 1983) E 609429 N 3367852
Section No. 6 of 6
Time Started:____ Time ended: _____Scientific permit # TE819451-1

Surface area observations: _____
Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐graffiti

Temperature Inside: 18.8 C Outside: 25 C Humidity Inside: 100% Outside: 74%
Humidity was measured with a Psychrodyne analog psychrometer.

FAUNAL SURVEY- Zone 6

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Gastropoda: *Helicodiscus eigenmanni*			
**Cicurina sp.*	12		
**Eidmanella reclusa*	8		3 collected by Pierre Paquin
✡ *Texella reyesi*	1	Undr rock	
Staphylinidae	13		
Thysanurans: *Texoreddellia texensis*	2		
Speodesmus bicornourus	12		
Cambala speobia			
Springtails: Collembola			
Ceuthophilus cunicularis	6		
C. cunicularis juveniles	5		
Ceuthophilus nymphs	17		
Gnat: Diptera undetermined			
Reduviidae: *Triatoma gerstaeckeri*			

(*) signifies species of concern (✡) signifies endangered species

Name: Kathleen O'Connor, Paul Fushille **Date:9-Aug-07**
Agency: Travis County **No. of pages: 1 of 2**

Location: McDonald Cave GPS coordinates (NAD 1983) E 609429 N 367852
Section No. 1 and 2
Time Started: (see below) Time ended: (see below) Scientific permit # TE81945-1

Temperature Inside: 21.6 C Outside: 27.7 Humidity Inside: 90% Outside: 80%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: Rained 0.03" on 3-Aug; only day of precipitation pre-survey.
Organic matter encountered in survey area: _____
Surface area moisture conditions: Dry

FAUNAL SURVEY- Zone 1 and 2

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Zone 1: (0955 -1002 AM)			
Achaearanea porteri	2		
Cicurina varians	6		
Springtails: Collembola	~500		
Ceuthophilus secretus	1		
Cricket nymphs	3		
Unid Lepidoptera- Moth	2		
Fungus gnat: Mycetophilidae	1		
Mosquitos: Culcidae undetermined	20		
Solenopsis invicta	3		
Eleutherodactylus marnockii	1		
Zone 2: (1150 AM- 1220 PM)			
Helicodiscus eigenmanni	1		
Springtails: Collembola	>500		
***Neoleptoneta devia*	3		
**Cicurina travisae*	3		
Cambala speobia	13		
Ceuthophilus cunicularis	1		
C. secretus	15		
Ceuthophilus juveniles	10		
Ceuthophilus nymphs	52		
Rove beetle: Staphylinidae	3		
Fungus gnat larvae: Mycetophilidae	2		
Mosquitos: Culcidae	~50		
Eleutherodactylus marnockii	1		

(*) signifies species of concern (☼) signifies endangered species

Name: Kathleen O'Connor, Paul Fushille **Date: 9-Aug-07**
Agency: Travis County **No. of pages: 2 of 2**

Location: McDonald Cave GPS coordinates (NAD 1983) E 609429 N 367852
Section No. 3 and 4
Time Started: (see below) Time ended: (see below) Scientific permit # TE81945-1

Temperature Inside: 21.1 C Outside: 27.7 Humidity Inside: 100% Outside: 80%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: Rained 0.03" on 3-Aug; only day of precipitation pre-survey.
Organic matter encountered in survey area: _____
Surface area moisture conditions: Dry

FAUNAL SURVEY- Zone 3 and 4

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Zone 3: (1121 -1148 AM)			
Cicurina sp.	13		
Cicurina varians	2		
***Neoleptoneta devia*	3		1 collected
***Eidmanella reclusa*	1		Carrying egg sac
Texoreddellia texensis	3		
Cambala speobia	1		
Speodesmus bicornourus	25		
Collembola	>500		
✡ ***Texella reyesi***	3	Under rocks	
Ceuthophilus secretus	3		
C. cunicularis	1		
Ceuthophilus nymphs	16		
Mosquitos: Culcidae	25		
Fungus Gnat larvae: Mycetophilidae	3		
Zone 4: (1045 - 1111 AM)			
Springtails: Collembola	~500		
**Cicurina travisae*	13		
**Eidmanella reclusa*	4		1 young specimen collected
Speodesmus bicornourus	2		
Class Symphyla	1		
✡ ***Texella reyesi***	3	Under rocks	
Ceuthophilus juveniles	5		
Ceuthophilus nymphs	4		
Mosquitos: Culcidae	~100		
Eleutherodactylus marnockii	1		

Name: K. O'Connor, P. Paquin	**Date: 5-Apr-07**
Agency: Travis County	**No. of pages: 1**

Location: North Root Cave GPS coordinates (NAD 1983) E 610172 N 3364457
Zone: 1 Scientific permit # TE819451-1
Time Started: 1220 PM Time ended: 1255 PM

Surface area observations: leaf litter prevalent
Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 19.4 C Outside: 20 C Humidity Inside: 90% Outside: 42%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: Rain 1.76" previous week; Avg temp- 17.2-22.7 C
Organic matter encountered in survey area: n/a

FAUNAL SURVEY- Zone 1

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Snails: *Helicodiscus eigenmanni*	3		
**Cicurina sp.*	5		2 collected by Pierre Paquin
**Neoleptoneta sp.*	1		Collected by Pierre Paquin- species currently being studied for id. purposes
Cambala speobia	8		
Scutigeridae	1		
Springtails: Collembola	51		
Ceuthophilus cunicularis	2		
Syrrhophus marnockii	1		

(*) signifies species of concern (☼) signifies endangered species

Name: K. O'Connor, P. Paquin	**Date:5-Apr-07**
Agency: Travis County	**No. of pages: 1**

Location: Root Cave GPS coordinates (NAD 1983) E 610173 N 334463
Zone: 1 Time Started: 11:40 Time ended: 12:15 scientific permit # TE819451-1

Surface area observations: leaf litter prevalent

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 16.1 C Outside: 20 C Humidity Inside: 84%
Outside: 42%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: Rain 1.76" previous week; Avg temp- 17.2-22.7 C
Organic matter encountered in survey area: n/a

FAUNAL SURVEY-Zone 1

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Snails: *Gastropoda*	4		
Scorpions: *Pseudouroctanus reddelli*	1		
Harvestman- *Leiobunum townsendii*	2		
Surface spider-*Achaearanea porteri*	10		2 collected by P. Paquin
Cicurina varians	1		
**Cicurina travisae*	1		collected by P. Paquin
Cambala speobia	15		1 collected by P. Paquin
Scutigeridae	1		
Springtails: Collembola	5		
Ceuthophilus cunicularis	2		
Ceuthophilus juveniles	13		
Ceuthophilus nymphs	3		
Eleutherodactylus marnockii	1		

(*) signifies species of concern (☼) signifies endangered species

Name: K. O'Connor, P. Paquin	**Date: 6-Apr-07**
Agency: Travis County	**No. of pages: 1 of 3**

Location: Tardus Hole GPS coordinates (NAD 1983) E 609917 N 3365344
Section No. 1 and 2
Time Started: 1031 AM Time ended: 1103 AM scientific permit #TE819451-1

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☒ light

Temperature Inside: 16.1 C Outside: 15.5 C Humidity Inside: 100% Outside: 58%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: 1.76" rain previous week; Avg. temp- 17.2-22.7 C
Organic matter encountered in survey area: N/A

FAUNAL SURVEY-Zone 1

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Zone 1:			
Surface spider: Araneae undetermined	1		
Achaearanea porteri	1		
✡ ***Texamaurops reddelli***	1	Under rocks	collected by P. Paquin
Springtails: Collembola	4		
Zone 2:			
Helicodiscus eigenmanni	3		
Achaearanea porteri	1		
Eidmanella pallida	4		2 collected by P. Paquin
Cicurina varians	1		collected by P. Paquin
* *Cicurina sp.*	3		2 blind sp. collected by P. Paquin
✡ ***Texamaurops reddelli***	1	Under rocks	collected by P. Paquin: **NEW LOCALE RECORD**
Speodesmus bicornourus	1		
Collembola	8		
Reduviidae genus and species	1		
Staphylinidae	4		
Ceuthophilus juvenile	5		
Mosquito: Culcidae undetermined	1		

(*) signifies species of concern (✡) signifies endangered species

Name: K. O'Connor, Pierre Paquin	**Date: 5-Apr-07**
Agency: Travis County	**No. of pages: 2 of 3**

Location: Tooth Cave GPS coordinates (NAD 1983) E 610160 N 3364233
Zone: 1 of 3
Time Started: 0231 PM Time ended: 0300 scientific permit # TE819451-1
Surface area observations: leaf litter prevalent

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 20 Outside: 20 C Humidity Inside: 85% Outside: 42%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: 1.76" of rain in previous week; Avg. temp- 17.2-22.7 C
Organic matter encountered in survey area: n/a

FAUNAL SURVEY- Zone 1

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Helicodiscus eigenmanni	3		
Cicurina varians	11		
✡ ***Neoleptoneta myopica***	1	Under rocks	Collected by P. Paquin
✡ ***Texella reyesi***	2	Under rocks	
Cambala speobia	3		
Class Symphyla	3		
Springtails: Collembola	~80		
Ceuthophilus cunicularis	1		
Ceuthophilus cunicularis juveniles	2		
Mycetophilidae-Fungus gnat larvae	2		
Bufo valliceps	1		Removed from cave

(*) signifies species of concern (✡) signifies endangered species

Name: K. O'Connor , Pierre Paquin	**Date: 5-Apr-07**
Agency: Travis County	**No. of pages: 3 of 3**

Location: Tooth Cave GPS coordinates (NAD 1983) E 610160 N 3364233
Zone: 2of 3
Time Started: 0150 PM Time ended: 0230 scientific permit # TE819451-1

Surface area observations: leaf litter prevalent
Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 20 Outside: 20 C Humidity Inside: 85% Outside: 42%
Humidity was measured with a Psychrodyne analog psychrometer.
Organic matter encountered in survey area: n/a

FAUNAL SURVEY- Zone 2

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Earthworm: Haplotaxida	3		
Helicodiscus eigenmanni	2		
Scorpions: *Psuedouroctanus reddelli*	5		
Cicurina varians	1		
**Cicurina sp.*	17		
✡ *Neoleptoneta myopica*	11	Dry areas under rocks	8 collected by Pierre Paquin
✡ *Texella reyesi*	10	Mainly Under rocks	
✡ *Rhadine persephone*	1	Under rocks	
Cambala speobia	2		
Class Symphyla	4		
Springtails: Collembola	~350		
Collembola (sminthurans)	1		
Thysanurans	1		
Ceuthophilus secretus	1		
Ceuthophilus secretus juveniles	2		
Ceuthophilus cunicularis	1		
Ceuthophilus cunicularis juveniles	6		
Cricket nymphs	3		
Mycetophilidae-Fungus gnat larvae	2		

Name: K. O'Connor , Pierre Paquin	**Date: 5-Apr-07**
Agency: Travis County	**No. of pages: 3 of 3**

Location: Tooth Cave GPS coordinates (NAD 1983) E 610160 N 3364233
Zone: 3 of 3
Time Started: 0231 PM Time ended: 0300 scientific permit # TE819451-1

Surface area observations: leaf litter prevalent
Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 20 Outside: 20 C Humidity Inside: 85% Outside: 42%
Humidity was measured with a Psychrodyne analog psychrometer.
Organic matter encountered in survey area: n/a

FAUNAL SURVEY- Zone 3

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Snails: *Gastropoda*			
Helicodiscus eigenmanni	2		
Scorpions: *Pseudouroctanus reddelli*	1		
Araneae: undetermined surface spider	1		
**Cicurina sp.*	23		2 blind species (*C. travisae)* collected by P. Paquin
Cicurina varians	1		
**Eidmannella reclusa*	6		2 collected by P. Paquin
✡ *Neoleptoneta myopica*	20	Under rocks	7 collected by P. Paquin
✡ *Texella reyesi*	17	Under rocks	4 collected by P. Paquin
✡ ***Texamaurops reddelli***	1	Under rocks	Collected by P. Paquin
Cambala speobia	1		Collected by P. Paquin
Speodesmus bicornourus	1		Collected by P. Paquin
Texoreddellia texensis	1		
Class Symphyla			
Springtails: Collembola			Number undetermined
Ceuthophilus cunicularis adult	2		
Ceuthophilus cunicularis juveniles	5		
Ceuthophilus secretus adult	1		
Ceuthophilus secretus juveniles	3		
C. nymphs	1		

(*) signifies species of concern (✡) signifies endangered species

Name: K. O'Connor, P. Fushille, R. Barlow **Date: 21-Aug-07**
Agency: Travis County **No. of pages: 1 of 3**

Location: Tooth Cave GPS coordinates (NAD 1983) E 610160 N 3364233 Zone No. 1
Time Started: 10:00 AM Time ended: 10:34 AM scientific permit # TE819451-1

Surface area observations: _____
Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 22.7 C Outside: 26.1 C Humidity Inside: 95% Outside: 87%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: 1" of rain on combined days of 16-Aug and 17-Aug
Organic matter encountered in survey area: N/A Surface area moisture conditions: dry

FAUNAL SURVEY- Zone 1

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Snails: *Helicodiscus eigenmanni*	6		
Earthworms: Haplotaxida			
Scorpions: *Pseudouroctanus reddelli*	2		
**Cicurina travisae*	3		
Cicurina varians	8		
✡ ***Texella reyesi***	5	Under rocks	
✡ ***Neoleptoneta myopica***	2	Under rocks	
* *Speodesmus bicornourus*	2		
Cambala speobia	5		
Millipede: Siphonophora	1		
Rove Beetles: Staphylinidae	1		
Springtails: Collembola	~480		
Class Symphyla	1		
Crickets*: Ceuthophilus secretus*	3		
Ceuthophilus cunicularis	3		
Ceuthophilus juveniles	3		
Ceuthophilus nymphs	2		
Fungus gnat larvae: Mycetophilidae	2		
Eleutherodactylus marnockii	1		

(*) signifies species of concern (✡) signifies endangered species

Name: K. O'Connor, P. Fushille, R. Barlow **Date: 21-Aug-07**
Agency: Travis County **No. of pages: 2 of 3**

Location: Tooth Cave GPS coordinates (NAD 1983) E 610160 N 3364233 Zone No: 2
Time Started: 10:35 Time ended: 11:20 AM scientific permit # TE819451-1

Surface area observations: _____
Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 21.6 C Outside: 26.1 C Humidity Inside: 95% Outside: 87%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: 1" of rain on combined days of 16-Aug and 17-Aug

FAUNAL SURVEY-Zone 2

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Snails: *Helicodiscus eigenmanni*	7		
Scorpions: *Pseudouroctanus reddelli*	1		
**Cicurina travisae*	4		
Cicurina varians	1		
Cicurina sp.	4		
✡ ***Texella reyesi***	9	Under rocks	
✡ ***Neoleptoneta myopica***	3	Under rocks	
Speodesmus bicornourus	2		
Cambala speobia	14		
Millipede: Siphonophora	1		
Rove Beetles: Staphylinidae	2		
Springtails: Collembola	>550		
Dipluran: Japygidae	1		
Crickets: *Ceuthophilus secretus*	214		
Ceuthophilus cunicularis	4		
Ceuthophilus juveniles	30		
Ceuthophilus nymphs	10		
Mosquitos: Culcidae	1		
RIFA: *Solenopsis invicta*	31		
Fungus gnat: Mycetophilidae	1		
Fungus gnat larvae: Mycetophilidae	2		
Eleutherodactylus marnockii	1		
Plethodon albagula	1		
Bufo valliceps	1		

(*) signifies species of concern (✡) signifies endangered species

Name: K. O'Connor, P. Fushille, R. Barlow	**Date: 21-Aug-07**
Agency: Travis County	**No. of pages: 3 of 3**

Location: Tooth Cave GPS coordinates (NAD 1983) E 610160 N 3364233 Zone No. 3
Time Started: 11:25 AM Time ended: 12:05 PM scientific permit # TE819451-1

Surface area observations: _____
Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☒ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 21.6 C Outside: 26.1 C Humidity Inside: 100% Outside: 87%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: 1" of rain on combined days of 16-Aug and 17-Aug
Organic matter encountered in survey area: _____
Surface area moisture conditions: dry

FAUNAL SURVEY-Zone 3

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Snails: *Helicodiscus eigenmanni*	22		
Earthworms: Haplotaxida	3		
Scorpions: *Pseudouroctanus reddelli*	1		
**Cicurina travisae*	7		
Cicurina varians	2		
**Cicurina sp.*	12		
***Eidmanella reclusa*	3		
Araneae: Unid. spider	1		Collected and stored for future identification
✡ ***Texella reyesi***	24		
✡ ***Neoleptoneta myopica***	9		
* *Speodesmus bicornourus*	4		
Cambala speobia	19		
Millipede: Siphonophora	2		Photo taken
Rove Beetles: Staphylinidae	1		
Surface beetle: Carabidae	1		
Springtails: Collembola	No count		
Crickets: *Ceuthophilus secretus*	142		
Ceuthophilus cunicularis	1		
Ceuthophilus juveniles	4		
Ceuthophilus nymphs	24		
Mosquitos: Culcidae	45		
Fungus gnat: Mycetophilidae	16		
Unid. Larvae	1		

(*) signifies species of concern (✡) signifies endangered species

CITY OF AUSTIN:

Name: Mark Sanders, Kathleen O'Connor	COA and Travis County
Date: 3/29/07	No. of pages: 3

Location: Airman's cave GPS coordinates (NAD 1983) _____ Section No. 1
Time Started: 17:20 Time ended: 17:33 Scientific permit # TE798920-0
Surface area observations: (gate condition, fire ants, vandalism) small amount of trash, which we removed.

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☒ Vandalism If so, ☒ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 69 F Outside: NA Humidity Inside: 83.45% Outside: NA
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: (freeze, over 100 F, draught, flood)
Organic matter encountered in survey area: a dead raccoon was observed just outside of survey area
Surface area moisture conditions: (dry, dripping, pools) relatively dry

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Cicurina varians	1		
**Cicurina sp* (blind)			
Eidmannella sp.	19		
Acarina (tick)	1		
* *Speodesmus sp*.			
Surface roach			
Springtails: Collembola			
Ceuthophilus secretus	4		
Ceuthophilus nymphs	7		
Ceuthophilus cunicularis	7		
mosquitoes			
Diptera (blow fly)	1		
Plethodon albagula			
Pipistrellus subflavus	1		

(*) signifies species of concern (☼) signifies endangered species

Kathleen and I were accompanied by 2 volunteers, Mike Sisson and Tone Garot, part of the reason we were accessing the cave was to assess visitor impacts and methods to educate the public on ways to minimize damage to the cave. We looked at areas to install an interior do's and don'ts caving etiquette sign and other potential ways to educate the public.

Name: Mark Sanders, Kathleen O'Connor	COA and Travis County
Date: 3/29/07	No. of pages: 3

Location: Airman's cave GPS coordinates (NAD 1983) _____ Section No. 2

Time Started: 18:00 Time ended: 18:14 Scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism) small amount of trash, which we removed

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☒ Vandalism If so, ☒ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 67.5 F Outside: NA Humidity Inside: 93.82% Outside: NA
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: (freeze, over 100 F, draught, flood)
Organic matter encountered in survey area:
Surface area moisture conditions: (dry, dripping, pools) relatively dry

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Cicurina varians			
**Cicurina sp* (blind)	1		
Eidmannella sp	9		
Acarina (tick)			
* *Speodesmus sp*.			
Surface millipede			
Rhadine austinica			Observed one individual between sections 2 and 3
Surface roach			
Springtails: Collembola	3		
Ceuthophilus secretus			
Ceuthophilus nymphs	4		
Ceuthophilus cunicularis	5		
mosquitoes			
Diptera (blow fly)			
Plethodon albagula			
Pipistrellus subflavus			

(*) signifies species of concern (☼) signifies endangered species

We removed 3 batteries and one pee bottle, yet another reason for going forward with educating the public.

Name: Mark Sanders, Kathleen O'Connor	COA and Travis County
Date: 3/29/07	No. of pages: 3

Location: Airman's cave GPS coordinates (NAD 1983) _____ Section No. 3

Time Started: 19:00 Time ended: 19:13 Scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism)

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 70F Outside: NA Humidity Inside: 94.73% Outside: NA
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood)_____
Organic matter encountered in survey area: _____
Surface area moisture conditions: (dry, dripping, pools) relatively dry _____

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Cicurina varians			
**Cicurina sp* (blind)	1	Under rock	3 were observed just outside of survey area
Eidmannella sp			3 were observed at the nearby "aggie art gallery"
Acarina (tick)			
* *Speodesmus sp*.	1	On floor	7 were observed at the nearby "Aggie art gallery"
Surface millipede			
Rhadine austinica			Observed one individual between sections 2 and 3
Surface roach			
Springtails: Collembola			
Ceuthophilus secretus			
Ceuthophilus nymphs	1		
Ceuthophilus cunicularis			
mosquitoes			
Diptera (blow fly)			
Plethodon albagula			
Perimyotis subflavus			

(*) signifies species of concern (☼) signifies endangered species

Name: Mark Sanders	Agency: COA
Date: 3/1/07	No. of pages: 1

Location: Cotterell cave GPS coordinates (NAD 1983) _____ Section No. Cursory survey of the entire cave

Time Started: 18:39 Time ended: 20:00 Scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) no problems noted

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ fence ☐ graffiti

Temperature Inside: 63.5 F Outside: 63.5 F @ 6:30pm Humidity Inside: 92.3% Outside: 41.75%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, drought, flood) fairly wet Spring with flooding
Organic matter encountered in survey area: rotting wood/leaf litter, damp soil.
Surface area moisture conditions: (dry, dripping, pools) most areas were damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Gastropoda: snail	3		
Pseudouroctonus reddelli	3		
Pseudoscoropion	1	Under rock	Blind, and I photographed it
**Cicurina sp.*	30	Under rocks	Most individuals were too small to determine if they were blind, so we lumped them together
✡ ***Texella reyesi***	3	Under rocks	
**Speodesmus sp*	3		
Cambala speobia	*3*		
Ceuthophilus nymphs	30		
Collembola	40		
Diptera: fungus gnats	2		
Texoreddellia texensis	1		
Plethodon albagula	5		

(*) signifies species of concern (✡) signifies endangered species

Due to recent trespass issues with the perimeter fence cut on several occasions the City installed a flat angle iron gate to prevent trespass and vandalism to the cave. The gate is of the (BLM bat gate/mine) style.

The primary reason for access was to see if pseudoscorpions fluoresced under black light, and other frequencies. Piers Hendrie (volunteer) had a proposal to see if any cave fauna fluoresced other than scorpions. We noticed that an adult cave cricket fluoresced on the ventral side, however, no other cave fauna including a pseudoscorpion fluoresced, Piers used several different wave lengths of industrial grade UV light for this test.

Name: Mark Sanders, Kathleen O'Connor, Pierre Paquin
Agency: COA and Travis County
Date: 4/12/07 No. of pages: 1

Location: Cotterell cave GPS coordinates (NAD 1983) __ Section No. Drop zone
Started: 20:40 Time ended: 20:58 Scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) no problems noted

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ fence ☐ graffiti

Temperature Inside: 67 F Outside: 73 F @ 8pm Humidity Inside: 83% Outside: 69.85%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: (freeze, over 100 F, drought, flood) _fairly wet Spring with flooding

Organic matter encountered in survey area: __rotting wood/leaf litter, damp soil._____
Surface area moisture conditions: (dry, dripping, pools) _most areas were damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Gastropoda: snail	3		
Haplotaxida (Earthworm)	2		
Pseudouroctonus reddelli	1		
**Cicurina ellioti.*	1	Under rocks	
Eidmanella	1		
Ceuthophilus nymphs	6		
Ceuthophilus cunicularis	1		
Collembola	4		
Rhadine sp	1		
Plethodon albagula	14		

(*) signifies species of concern (✡) signifies endangered species

Name: Mark Sanders, Kathleen O'Connor, Pierre Paquin	Date: 4/12/07
Agency: COA and Travis County	No. of pages: 1

Location: Cotterell cave GPS coordinates (NAD 1983) _____ Section No. Zone 2 (the rest of the cave) Started: 20:56 Time ended: 21:56
Scientific permit # TE798920-0
Surface area observations: (gate condition, fire ants, vandalism) no problems noted

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ fence ☐ graffiti

Temperature Inside: 64.5 F Outside: 73 F @ 8pm Humidity Inside: 89.82% Outside: 69.85%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: (freeze, over 100 F, drought, flood) fairly wet Spring with flooding

Organic matter encountered in survey area: rotting wood/leaf litter, damp soil.
Surface area moisture conditions: (dry, dripping, pools) most areas were damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Gastropoda: *Helicodiscus sp*	5		
Gastropoda: snail	1		
Haplotaxida (Earthworm)	2		
Diptera pupae	1		
Diptera: fungus gnat	7		1 larvae was observed
Hemiptera: leaf hopper	1		
Pseudouroctonus reddelli	2		
☼***Texella reyesi***	5	Under rocks	
**Cicurina sp.*	30	Under rocks	Many of these were blind, however, several immatures were observed, too small to determine if they were eyed. Pierre collected 2 adult male *C. ellioti*
Eidmanella sp	1		
Agyneta llanoensis	14		
Anapistula sp	1		Adult male, Pierre collected for species ID
**Speodesmus sp*	13		Pierre collected 1 individual
Cambala sp	2		
Ceuthophilus secretus	11		
Ceuthophilus subadults	27		
Ceuthophilus nymphs	39		
Collembola	10		
Syrrhophus marnockii	1		

(*) signifies species of concern (☼) signifies endangered species

Name: Mark Sanders, Kelly Nesvacil	Agency: COA
Date: 8/10/07	No. of pages: 3

Location: Cotterell cave GPS coordinates (NAD 1983) _____ Section No. Drop zone Started: 12:57 Time ended: 13:15 Scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) no problems noted

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ fence ☐ graffiti

Temperature Inside: NA Outside: 90.5 F @ 12:47pm Humidity Inside: NA Outside: 69.85%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, drought, flood) cool wet summer with several flood events during the late Spring
Organic matter encountered in survey area: rotting wood/leaf litter, damp soil.
Surface area moisture conditions: (dry, dripping, pools most areas were damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Diptera: fungus gnat	1		
Haplotaxida (Earthworm)	1		
Pseudoscorpion	1	Under rock	Tiny individual
Cicurina varians.	2		
**Cicurina ellioti*	2	Under rocks	
Eidmanella sp	1		
Araneae: surface spider	1		
Leiobunum townsendii	~30		
Collembola	7		
Syrrhophus marnockii	2		
Bufo nebulifer	1		
Plethodon albagula	1		

(*) signifies species of concern (☼) signifies endangered species

Name: Mark Sanders, Kelly Nesvacil	Agency: COA
Date: 8/10/07	No. of pages: 3

Location: Cotterell cave GPS coordinates (NAD 1983) _____ Section No. Zone 2 Start time: 13:21 Time ended: 13:50 Scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) no problems noted

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ fence ☐ graffiti

Temperature Inside: 70 F Outside: 90.5 F @ 12:47 Humidity Inside: 91.71% Outside: 63.9%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, drought, flood) fairly wet Spring with flooding
Organic matter encountered in survey area: rotting wood/leaf litter, damp soil.
Surface area moisture conditions: (dry, dripping, pools); most areas were damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Gastropoda: *Helicodiscus sp*	2		
Pseudouroctonus reddelli	1		
☼*Texella reyesi*	7	Under rocks	
Cicurina varians	10		
**Cicurina ellioti*	6	Under rocks	
Cicurina sp	8		Undetermined if eyed or blind
Eidmanella	1		
**Speodesmus sp*	2		Pierre collected 1 individual
Ceuthophilus secretus	2		
Ceuthophilus subadults	50		
Ceuthophilus nymphs	41		
Collembola	14		

(*) signifies species of concern (☼) signifies endangered species

Name: Mark Sanders, Kelly Nesvacil	Agency: COA
Date: 8/10/07	No. of pages: 3

Location: Cotterell cave GPS coordinates (NAD 1983) _____ Section No. zone 3 Started: 13:55 Time ended: 14:25 Scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) no problems noted

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ fence ☐ graffiti

Temperature Inside: 70 F Outside: 90.5 F @ 12:47 Humidity Inside: 91.71% Outside: 63.9%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, drought, flood) fairly wet Spring with flooding
Organic matter encountered in survey area: rotting wood/leaf litter, damp soil.
Surface area moisture conditions: (dry, dripping, pools) most areas were damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Diptera: fungus gnat	1		
☼***Texella reyesi***	4	Under rocks	
Cicurina varians	5		
**Cicurina ellioti*	3	Under rocks	
**Speodesmus sp*	1		Pierre collected 1 individual
Troglobitic centipede	1		
Ceuthophilus secretus	2		
Ceuthophilus subadults	15		
Ceuthophilus nymphs	10		
Collembola	12		

(*) signifies species of concern (☼) signifies endangered species

Name: Mark Sanders and Kathleen O'Connor Agency: COA & Travis County
Date: 6/8/07 No. of pages: 2

Location: District Park Cave GPS coordinates (NAD 1983) ____ Section No. 1 (aquifer room)

Time Started: 17:40 Time ended: 18:00 Scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism)

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 70 F Outside: 81.25 F @ 16:45 Humidity Inside: 85.96% Outside: 84.79%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: (freeze, over 100 F, draught, flood) heavy rains with recent flooding

Organic matter encountered in survey area: old raccoon scat, leaves and woody debris .
Surface area moisture conditions: (dry, dripping, pools) dry

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Helicodiscus sp	2		
Cicurina varians	1		
**Cicurina sp* blind	7	Under rocks	
* *Speodesmus sp*.	6		
Cambala speobia	43		
Reduviidae: assassin bug	1		
Springtails: Collembola	12		
Crickets*: Ceuthophilus secretus*	79		
Ceuthophilus subadults	19		
Ceuthophilus cunicularis	5		
Ceuthophilus nymphs	14		
Tipulidae: cranefly	1		
Siphonaptera: flea	15		

(*) signifies species of concern (☼) signifies endangered species

Due to recent flooding the passageway to the aquifer room was blocked with debris and soil so in order to access that area we removed the debris.

CO2 levels were taken with a Telaire CO2 meter; the reading was 1.05% (quite high).

Name: Mark Sanders and Kathleen O'Connor Agency: COA & Travis County
Date: 6/8/07 No. of pages: 2

Location: District Park Cave GPS coordinates (NAD 1983) ____ Section No. 1 (aquifer room)

Time Started: 18:25 Time ended: 18:45 Scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism)

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 70 F Outside: 81.25 F @ 16:45 Humidity Inside: 85.96% Outside: 84.79%
Humidity was measured with a Psychrodyne analog psychrometer.
Weather conditions during the past week: (freeze, over 100 F, draught, flood) heavy rains with recent flooding

Organic matter encountered in survey area: old raccoon scat, leaves and woody debris
Surface area moisture conditions: (dry, dripping, pools) dry

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
**Cicurina* blind sp	5	Under rocks	
**Texella mulaiki*	1	Under rock	
* *Speodesmus sp*.	1	On floor	
Cambala speobia	1		
Diptera: fungus gnat	1		

(*) signifies species of concern (☼) signifies endangered species

CO2 levels were taken with a Telaire CO2 meter; the reading was 1.52% (quite high).

Name: Mark Sanders and John Chenoweth	Agency: COA
Date: 8/8/07	No. of pages: 2

Location: District Park Cave GPS coordinates (NAD 1983) _____
Section No. 1 (aquifer room)
Time Started: 15:00 Time ended: 15:25 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism)

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 72.5 F Outside: 85.6 F @ 14:46 Humidity Inside: 89.72% Outside: 74.85%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood) cooler wetter summer than usual
Organic matter encountered in survey area: old raccoon scat, leaves and woody debris
Surface area moisture conditions: (dry, dripping, pools) dry

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Isopods **Trichoniscidae sp*	2		
Cicurina varians	4		One was observed eating a silverfish
**Cicurina sp* blind	3	Under rocks	
* *Speodesmus sp*.	2		
Cambala speobia	18		
Coleoptera: surface beetle	1		
Springtails: Collembola	15		
Crickets*: Ceuthophilus secretus*	120		
Ceuthophilus subadults	10		
Ceuthophilus nymphs	22		
Siphonaptera: flea	12		
Diptera: fungus gnat	4		

(*) signifies species of concern (☼) signifies endangered species

Access to the aquifer room was blocked by debris deposited by flooding events earlier in the year, we removed the flood debris to allow passage.

CO2 levels were taken with a Telaire CO2 meter; the reading was 1.54% (quite high).

Name: Mark Sanders and John Chenoweth	Agency: COA
Date: 8/8/07	No. of pages: 2

Location: District Park Cave GPS coordinates (NAD 1983) _____
Section No. 1 (aquifer room)
Time Started: 15:37 Time ended: 15:55 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism)

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 72.5 F Outside: 85.6 F @ 14:46 Humidity Inside: 89.72% Outside: 74.85%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood) cooler wetter summer than usual
Organic matter encountered in survey area: old raccoon scat, leaves and woody debris
Surface area moisture conditions: (dry, dripping, pools) dry

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Coleoptera: beetle	2		Small red beetles
**Cicurina sp* blind	7	Under rocks	
** Neoleptoneta sp*.	1	Under rock	
Springtails: Collembola	1		
Siphonaptera: flea	10		
Diptera: fungus gnat	2		

(*) signifies species of concern (☼) signifies endangered species

Name: Mark Sanders and Kathleen O'Connor	Date: 6/08/07
Agency: COA	No. of ages: 3

Location: Flintridge cave Section No. 1 (formation pit)
Time Started: 10:45 Time ended: 11:30 Scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism) flood debris blocked access

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 68.6 F Outside: 81@ 10:14 Humidity Inside: 94.65% Outside: 85.73%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood) cave was flooded several times earlier in the Spring
Organic matter encountered in survey area: leaf litter, rotting wood
Surface area moisture conditions: (dry, dripping, pools) small pool, other areas were damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Eidmanella sp???	1		Collected for species ID
Cambala speobia	1		
Troglobitic centipede	1		Collected for species ID
Texoreddellia texensis	1		
Japygidae	2		juveniles
Collembola: *Pseudosinella sp*	3		
Ceuthophilus nymphs	4		
Diptera: Fungus gnats	9		3 were larvae
Diptera: fly	2		

(*) signifies species of concern (☼) signifies endangered species

The purpose of this visit was to set up 3 permanent transects for cave faunal surveys. The "formation pit" is relatively close to the surface, dimensions are: 5.5 meters X 3.8 meters.

CO2 levels were taken with a Telaire CO2 meter, the reading was 784ppm.

Name: Mark Sanders and Kathleen O'Connor	Date: 6/08/07
Agency: COA	No. of pages: 3

Location: Flintridge cave Section No. 2 (breakdown room)

Time Started: 12:10 Time ended: 12:56 Scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism) flood debris blocked access

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 70.2 F Outside: 81@ 10:14 Humidity Inside: 94.29% Outside: 85.73%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood) cave was flooded several times earlier in the Spring

Organic matter encountered in survey area: leaf litter, rotting wood with white fungus
Surface area moisture conditions: (dry, dripping, pools) small pool, other areas were damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
**Cicurina cueva*	2		Under rocks
Cambala speobia	1		
**Texella mulaiki*	4		Under rock
Staphylinidae: rove beetle	6		juveniles
**Speodesmus sp*	4		
Collembola: *Pseudosinella sp*	17		
Ceuthophilus cunicularis	2		
Ceuthophilus nymphs	3		
Diptera: Fungus gnats	3		
Plethodon albagula	1		Photographed

(*) signifies species of concern (☼) signifies endangered species

The purpose of this visit was to set up 3 permanent transects for cave faunal surveys. The "breakdown room" survey area starts are a big boulder in the middle of the cave passage and ends at rock ledge drop off, dimensions are: 6 meters X 6 meters.

CO2 levels were taken with a Telaire CO2 meter, the reading was 1584ppm.

Name: Mark Sanders and Kathleen O'Connor	Date: 6/08/07
Agency: COA	No. of pages: 3

Location: Flintridge cave Section No. 3 (below D-Day room/ back end of cheese and chocolate)
Time Started: 13:45 Time ended: 14:32 scientific permit #TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism)flood debris blocked access
Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐graffiti

Temperature Inside: 71 F Outside: 81@ 10:14 Humidity Inside: 94.81% Outside: 85.73%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood) cave was flooded several times earlier in the Spring
Organic matter encountered in survey area: lots of leaf litter, rotting wood with white fungus
Surface area moisture conditions: (dry, dripping, pools) small pool, other areas were damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
**Cicurina cueva*	10		Under rocks
Anapistula sp	1		Not certain on genus ID
Coleoptera: surface beetle	1		
Staphylinidae: rove beetle	18		8 were juveniles
Hemiptera: true bug	1		
**Speodesmus sp*	29		
Cambala speobia	1		
Collembola: *Pseudosinella sp*	~175		Possible 2 different species
Diptera: Fungus gnats	5		

(*) signifies species of concern (☼) signifies endangered species

The purpose of this visit was to set up 3 permanent transects for cave faunal surveys. The "D-Day room/ back end of cheese and chocolate" is located near the end of the cave.
We noticed a large amount of leaf litter and woody debris in the survey area.

CO2 levels were taken with a Telaire CO2 meter, the reading was 2695ppm.

Name: Mark Sanders and John Chenoweth	Date: 8/08/07
Agency: COA	No. of pages: 3

Location: Flintridge cave Section No. 1 (formation pit)

Time Started: 10:35 Time ended: 11:00 Scientific permit #TE798920-0

Surface area observations: (gate condition, fire ants, vandalism) looked good

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 75 F Outside: 84.25@ 10:15 Humidity Inside: 83.65% Outside: 74.31%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood) cave was flooded several times earlier in the Spring
Organic matter encountered in survey area: leaf litter, rotting wood
Surface area moisture conditions: (dry, dripping, pools) damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Cicurina sp	2		
**Speodesmus sp*	1		
Staphylinidae: rove beetle	7		5 were juveniles
Collembola: *Pseudosinella sp*	2		
Ceuthophilus secretus	2		
Ceuthophilus nymphs	5		
Diptera: Fungus gnats	7		
Hymenoptera: *Pheidole sp*	1		
Gastrophryne sp	1		

(*) signifies species of concern (☼) signifies endangered species

.

Name: Mark Sanders and John Chenoweth	Date: 8/08/07
Agency: COA	No. of pages: 3

Location: Flintridge cave Section No. 2 (breakdown room)
Time Started: 11:19 Time ended: 11:45 Scientific permit # TE798920-0
Surface area observations: (gate condition, fire ants, vandalism)

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 71.9F Outside: 84.25@ 10:15 Humidity Inside: 91.67% Outside: 74.31%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood) cave was flooded several times earlier in the Spring
Organic matter encountered in survey area: leaf litter, rotting wood with white fungus
Surface area moisture conditions: (dry, dripping, pools) damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
**Cicurina cueva*	3		Under rocks
Eidmanella sp	1		
Cambala speobia			One dead individual
Staphylinidae: rove beetle	4		
Coleoptera: surface beetles	3		Tiny black
**Speodesmus sp*	7		
Ceuthophilus nymphs	3		
Diptera: Fungus gnats	3		
Hymemoptera: *Pheidole sp*	1		

(*) signifies species of concern (☼) signifies endangered species

CO 2 levels were somewhat high, measured at 7000ppm by a Telaire CO 2 meter.

Name: Mark Sanders and John Chenoweth	Date: 8/08/07
Agency: COA	No. of pages: 3

Location: Flintridge cave Section No. 3 (below D-Day room/ back end of cheese and chocolate)

Time Started: 12:11 Time ended: 12:30 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism)

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 71.9F Outside: 84.25@ 10:15 Humidity Inside: 94.41 % Outside: 74.31%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood) cave was flooded several times earlier in the Spring
Organic matter encountered in survey area: large amounts of leaf litter, rotting wood with white fungus
Surface area moisture conditions: (dry, dripping, pools) damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
spider	1		Tiny (collected for ID)
Cambala speobia			
Staphylinidae: rove beetle	12		2 larvae
Coleoptera: surface beetles	1		Black color
Coleoptera: surface beetles	1		Gold color
**Speodesmus sp*	43		
Diptera: Fungus gnats	2		

(*) signifies species of concern (✡) signifies endangered species

CO 2 levels were somewhat high, measured at 1.18%, (somewhat high) by a Telaire CO 2 meter.

Name: Mark Sanders, John Chenoweth	Agency: COA
Date: 3/23/07	No. of pages: 2

Location: Goat cave GPS coordinates (NAD 1983) _____ Section No. 1 (landing zone)

Time Started: 15:12 Time ended: 15:31 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) no problems noted.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☒ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 66 F Outside: 72.1 @ 2pm Humidity Inside: 94.95% Outside: 86.99%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood) _____
Organic matter encountered in survey area: small amount of: dirt, leaf litter, wood debris
Surface area moisture conditions: (dry, dripping, pools) damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Snails: Gastropoda			
Earthworms: Haplotaxida	5		
Isopods: Oniscoidea			
Pseudouroctonus reddelli			
Rove beetle: Staphylinidae	2		
Collembola			
Ceuthophilus sp. B			
Ceuthophilus cunicularis			
Ceuthophilus nymphs	5		
Fungus gnats: Diptera	1		
Surface millipede	3		
Plethodon albagula	22		
Virginia striatula	1		
Bufo nebulifer	5		

(*) signifies species of concern (✡) signifies endangered species

We removed old trash that was exposed after heavy rains eroded away a portion of the landing zone.

Name: Mark Sanders, John Chenoweth	Agency: COA
Date: 3/23/07	No. of pages: 2

Location: Goat cave GPS coordinates (NAD 1983) _____ Section No. 1 (landing zone)
Time Started: 15:44 Time ended: 16:05 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) no problems noted.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☒ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 66 F Outside: 72.1 @ 2pm Humidity Inside: 94.95% Outside: 86.99%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood) _____
Organic matter encountered in survey area: small amount of: dirt, leaf litter, wood debris
Surface area moisture conditions: (dry, dripping, pools) damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Snails: Gastropoda			
Earthworms: Haplotaxida			
Isopods: Oniscoidea			
Pseudouroctonus reddelli	3		
Rove beetle: Staphylinidae			
Collembola			
Ceuthophilus sp. B	5		
Ceuthophilus cunicularis			
Ceuthophilus nymphs	5		
Fungus gnats: Diptera			

(*) signifies species of concern (☼) signifies endangered species

Name: Mark Sanders, Kelly Nesvacil, and Kathleen O'Connor	Date: 4/26/07
Agency: COA	No. of pages: 3

Location: Jester Estates Cave GPS coordinates (NAD 1983) __ Section No. Zone 1

Time Started: 15:30 Time ended: 15:45 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) No problems observed.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 71.5 F Outside: 81.5 F @ 15:07 Humidity Inside: 86.26% Outside: 50.76%
Humidity was measured with a Psychrodyne analog psychrometer, Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, flood) wet Spring, with recent flooding.
Organic matter encountered in survey area: old wood debris, primarily damp clay.
Surface area moisture conditions: (dry, dripping, pools) damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Helicodiscus sp	5		
Cicurina varians	2		
Achareanea porteri	3		1 was collected for positive ID
Araneae	1		Collected for species ID
Acarina: mite	1		Tiny, orange in color
Acarina: tick	1		
Tachys sp	1		Collected for species ID
Springtails: Collembola	1		
Ceuthophilus nymphs	44		
Diptera *sp*	1		
Fungus gnat lavae	2		

(*) signifies species of concern (☼) signifies endangered species

Kathleen and Kelly surveyed zone 1 and 2 while Mark surveyed zone 3.

Name: Mark Sanders, Kelly Nesvacil, and Kathleen O'Connor	Date: 4/26/07
Agency: COA	No. of pages: 3

Location: Jester Estates Cave GPS coordinates (NAD 1983) __ Section No. Zone 2

Time Started: 15:55 Time ended: 16:20 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) No problems observed.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 71.5 F Outside: 81.5 F @ 15:07 Humidity Inside: 86.26% Outside: 50.76%
Humidity was measured with a Psychrodyne analog psychrometer, Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, flood) wet Spring, with recent flooding.
Organic matter encountered in survey area: __old wood debris, primarily damp clay._____
Surface area moisture conditions: (dry, dripping, pools) damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Helicodiscus sp	150		Mostly empty shells
Ceuthophilus secretus	1		
Ceuthophilus subadults	1		
Ceuthophilus nymphs	2		
Diptera sp			
Fungus gnat lavae			

(*) signifies species of concern (☼) signifies endangered species

Kathleen and Kelly surveyed zone 1 and 2 while Mark surveyed zone 3.

Name: Mark Sanders, Kelly Nesvacil, and Kathleen O'Connor	Date: 4/26/07
Agency: COA	No. of pages: 1

Location: Jester Estates Cave GPS coordinates (NAD 1983) __ Section No. Zone 3

Time Started: 15:40 Time ended: 16:30 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) No problems observed.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 71.5 F Outside: 81.5 F @ 15:07 Humidity Inside: 86.26% Outside: 50.76%
Humidity was measured with a Psychrodyne analog psychrometer, Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, flood) wet Spring, with recent flooding.
Organic matter encountered in survey area: __old wood debris, primarily damp clay._____
Surface area moisture conditions: (dry, dripping, pools) damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Helicodiscus sp	5		
**Cicurina sp* blind	6	Under rocks	
**Neoleptoneta*	5	Under rock, in ledges	
*Pseudoscorpion "blind"	1	Under rock	Collected for species ID
Tachys sp	3		
Ceuthophilus cunicularis	3		
Ceuthophilus subadults	6		
Ceuthophilus nymphs	8		
Fungus gnat lavae			

(*) signifies species of concern (☼) signifies endangered species

Kathleen and Kelly surveyed zone 1 and 2 while Mark surveyed zone 3. Zone 3 is the lowest level, somewhat difficult to access, tight squeeze.

Name: Mark Sanders	Agency: COA-AWU
Date: 5/03/07	No. of pages: 2

Location: Little Bee Creek cave Section No. 1 (entry level)

Time Started: 14:06 Time ended: 14:29 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism) recently gated

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: NA Outside: 73.8 F @ 14:00 Humidity Inside: NA Outside: 86.61%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood) above average rainfall, recent flooding
Organic matter encountered in survey area: small amount of wood debris
Surface area moisture conditions: (dry, dripping, pools) dry

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Spiders: **Cicurina sp*			
Eidmannella sp	7		
Leiobunum townsendii			
Surface millipede	1		
Cambala speobia			
* *Speodesmus sp*.			
* *Rhadine austinica*			
Reduviidae: Assassin bug			
Texoreddellia texensis			
Springtails: Collembola	5		
Crickets*: Ceuthophilus secretus*			
Diptera: (fungus gnat)	12		
Diptera: (mosquitoes)	5		
Soft Bodied ticks: *Ornithodors turicata*	1		Known to carry "relapsing fever" virus

(*) signifies species of concern (☼) signifies endangered species

Name: Mark Sanders	Agency: COA-AWU
Date: 5/03/07	No. of pages: 2

Location: Little Bee Creek cave Section No. 2 (upper level)

Time Started: 14:33 Time ended: 15:00 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism) recently gated

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 71F Outside: 73.8 F @ 14:00 Humidity Inside: 90.65% Outside: 86.61%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood) above average rainfall, recent flooding
Organic matter encountered in survey area: small amount of wood debris
Surface area moisture conditions: (dry, dripping, pools) dry

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
*Cicurina sp			
Eidmannella sp	2		
Leiobunum townsendii			
Cambala speobia	17		
* *Speodesmus sp*.			
* *Rhadine austinica*			
Reduviidae: Assassin bug			
Texoreddellia texensis			
Springtails: Collembola			
Crickets*: Ceuthophilus secretus*	5		
Ceuthophilus subadults	8		
Ceuthophilus nymphs	4		
Diptera: (fungus gnat)	4		
Diptera: (mosquitoes)	3		
Ornithodors turicata			

(*) signifies species of concern (☼) signifies endangered species

.

Name: Mark Sanders and Pierre Paquin	Agency: COA
Date: 11/4/06	No. of pages: 2

Location: Maple Run cave Section No. Survey station 1
Time Started: 14:25 Time ended: 14:45 Scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism) old broken glass and metal fragments which I removed

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 70 F Outside: 71.5 F @ 14:09 Humidity Inside: 95.22% Outside: 86.23%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood)
Organic matter encountered in survey area: nothing
Surface area moisture conditions: (dry, dripping, pools) mostly damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Scorpions: *Vaejovis reddelli*	1		
**Cicurina sp*	8	Under rocks	One adult male collected by Pierre
Texella mulaiki	2	Under rocks	
Cambala speobia	1		Collected by Pierre
Ceuthophilus nymphs	1		
Fungus gnat	1		
Plethodon alabagula			

(*) signifies species of concern (✡) signifies endangered species

CO2 reading for this area was .95%, meter used was a Telaire CO2 meter.

Name: Mark Sanders and Pierre Paquin	Agency: COA
Date: 11/4/06	No. of pages: 2

Location: Maple Run cave Section No. Survey station 2
Time Started: 15:12 Time ended: 16:00 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism) old broken glass and metal fragments which I removed

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 71.5 F Outside: 71.5 F @ 14:09 Humidity Inside: 95.31% Outside: 86.23%
Humidity was measured with a Psychrodyne analog psychrometer.

Weather conditions during the past week: (freeze, over 100 F, draught, flood)
Organic matter encountered in survey area: mammal scat with blue fungus growing on it.
Surface area moisture conditions: (dry, dripping, pools) mostly damp

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
**Cicurina sp* (blind)	3	Under rocks	
Anapistula sp	5	In webs	4 collected by Pierre for isotope study/ species ID work
**Texella mulaiki*	3	Under rocks	1 was observed just outside of survey area
Texoreddellia texensis	8		
**Speodesmus sp*	1		Also 1 was observed just outside of survey area
Cambala speobia	5		
Ceuthophilus nymphs	3		
Collembola	6		
Fungus gnat	1		
Lepidoptera: moth	1		

(*) signifies species of concern (☼) signifies endangered species

CO2 reading for this area was 1.44% (high), meter used was a Telaire CO2 meter.

The primary purpose of this visit was to collect *Anapistula sp.* Pierre was studying this spider with the intent of determining whether or not this species is indeed a non-predatory spider (consuming only fungal spores from their webs). The purpose was to collect individuals, take them to a lab and assess their trophic ranking through isotopic analyses. In order to compare with a known predator and scavenger, Pierre collected a *Cicurina* spider and a scavenging millipede.

Name: Mark Sanders, Kelly Nesvacil, and Kathleen O'Connor	Date: 4/26/07
Agency: COA	No. of pages: 3

Location: Spider cave GPS coordinates (NAD 1983) ___ Section No. 1 (drop zone)

Time Started: 12:44 Time ended: 13:18 Scientific permit #TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) No problems observed.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: NA Outside: 67.5 F @ 12:30 Humidity Inside: NA Outside: 65.39%
Humidity was measured with a Psychrodyne analog psychrometer. Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, flood) wetter than ususal with recent floods.
Organic matter encountered in survey area: rotting wood/leaf litter, soil.
Surface area moisture conditions: (dry, dripping, pools) slightly damp.

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Gastropoda: snails	2		
Earthworms: Haplotaxida	1		
Cicurina varians	3		
?? unidentified invertebrate larvae	3		
Springtails: Collembola	15		
Ceuthophilus sp. B			
Ceuthophilus nymphs			
Fungus gnats			
Lepidoptera: cave moth			
Diptera: mosquito			
Plethodon albagula			

(*) signifies species of concern (☼) signifies endangered species

Kelly surveyed this area.

Name: Mark Sanders, Kelly Nesvacil, and Kathleen O'Connor	Date: 4/26/07
Agency: COA	No of pages: 3

Location: Spider cave GPS coordinates (NAD 1983) ___ Section No. 2

Time Started: 12:44 Time ended: 13:30 scientific permit #TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) No problems observed.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: NA Outside: 67.5 F @ 12:30 Humidity Inside: NA Outside: 65.39%
Humidity was measured with a Psychrodyne analog psychrometer. Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, flood) wetter than ususal with recent floods.
Organic matter encountered in survey area: rotting wood/leaf litter, soil.
Surface area moisture conditions: (dry, dripping, pools) slightly damp.

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Heliocodiscus sp	1		
Pseudouroctonus reddelli	2		
Cicurina varians	3		
Cicurina sp	5		Uncertain if these individuals were eyed or eyeless
**Cicurina sp* (eyeless)	4		
Eidmannella sp	1		Collected for species ID
Cambala speobia	4		
☼*Rhadine sp*	1		Uncertain if this was persephone or subterranea
Isopod (surface)	1		
Ceuthophilus subadults	2		
Texoreddellia texensis	1		
Lepidoptera: cave moth			
Diptera: mosquito			
Plethodon albagula			

(*) signifies species of concern (☼) signifies endangered species

Kathleen surveyed this area.

Name: Mark Sanders, Kelly Nesvacil, and Kathleen O'Connor	Date: 4/26/07
Agency: COA	No. of pages: 3

Location: Spider cave GPS coordinates (NAD 1983) ___ Section No. 3

Time Started: 12:44 Time ended: 13:30 scientific permit #TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) No problems observed.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: NA Outside: 67.5 F @ 12:30 Humidity Inside: NA Outside: 65.39%
Humidity was measured with a Psychrodyne analog psychrometer. Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, flood) wetter than usual with recent floods.
Organic matter encountered in survey area: rotting wood/leaf litter, soil.
Surface area moisture conditions: (dry, dripping, pools) slightly damp.

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
**Cicurina sp* (eyeless)	6	Under rocks	
Eidmannella sp			
☼ *Texella reddelli*	1	Under a rock	
☼*Rhadine persephone*	2	Under rocks	
**Speodesmus sp*	1		
Cambala speobia	8		
Ceuthophilus subadults	4		
Collembola	8		
Lepidoptera: cave moth			
Fungus gnat	2		
Plethodon albagula			

(*) signifies species of concern (☼) signifies endangered species

Mark surveyed this area.

Name: Mark Sanders, Kelly Nesvacil	Date: 8/10/07
Agency: COA	No. of pages: 3

Location: Spider cave GPS coordinates (NAD 1983) ____ Section No. 1 (drop zone)

Time Started: 9:30 Time ended: 9:40 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism)No problems observed.

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐graffiti

Temperature Inside: NA Outside: 78 F @ 9:28 Humidity Inside: NA Outside: 87.3%
Humidity was measured with a Psychrodyne analog psychrometer. Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, flood) cooler, wetter than usual summer.
Organic matter encountered in survey area: lots of rotting wood/leaf litter, soil.
Surface area moisture conditions: (dry, dripping, pools) slightly damp.

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Gastropoda: snails			
Earthworms: Haplotaxida			
Cicurina varians	2		
Leiobunum townsendii	~1000		
Cambala speobia	1		
Springtails: Collembola	30		
Ceuthophilus secretus	15		
Ceuthophilus nymphs			
Fungus gnats			
Lepidoptera: cave moth	1		
Diptera: mosquito			
Syrrhophus marnockii	1		

(*) signifies species of concern (☼) signifies endangered species

Name: Mark Sanders, Kelly Nesvacil	Date: 8/10/07
Agency: COA	No of pages: 3

Location: Spider cave GPS coordinates (NAD 1983) _____ Section No. 2

Time Started: 10:16 Time ended: 10:52 scientific permit #TE798920-0

Surface area observations: (gate condition, fire ants, vandalism)No problems observed.

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐graffiti

Temperature Inside: NA Outside: 78 F @ 9:28 Humidity Inside: NA Outside: 87.3%
Humidity was measured with a Psychrodyne analog psychrometer. Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, flood) cooler and wetter than ususal summer
Organic matter encountered in survey area: loose soil, small amount of cricket guano.
Surface area moisture conditions: (dry, dripping, pools) dry

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Staphylinidae	2		
Coleoptera: surface beetle	1		
Cicurina varians	12		
Cicurina sp	12		Uncertain if these individuals were eyed or eyeless
**Cicurina sp* (eyeless)	2	Under rocks	
Eidmannella sp	2		Both were adult females with egg sacs, collected one for species ID
Cambala speobia	4		
☼*Texella reddelli*	5		Under rocks
Ceuthophilus secretus	1		
Ceuthophilus nymphs	12		
Collembola	~200		
Texoreddellia texensis	1		
Lepidoptera: cave moth	1		
Diptera: mosquito	~500		
Fungus gnat	3		One was a larvae

(*) signifies species of concern (☼) signifies endangered species

Name: Mark Sanders, Kelly Nesvacil	Date: 8/10/07
Agency: COA	No of pages: 3

Location: Spider cave GPS coordinates (NAD 1983) _____ Section No. 3

Time Started: 9:43 Time ended: 10:15 scientific permit # TE798920-0

Surface area observations :(gate condition, fire ants, vandalism)No problems observed.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐graffiti

Temperature Inside: 73.3F Outside: 78 F @ 9:28 Humidity Inside: 91.84% Outside: 87.3%
Humidity was measured with a Psychrodyne analog psychrometer. Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, flood) cooler and wetter than ususal summer
Organic matter encountered in survey area: loose soil, small amount of cricket and mice guano.
Surface area moisture conditions: (dry, dripping, pools) dry

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Heliocodiscus sp	1		
isopod	2		Collected one for species ID
Cicurina sp	5		Uncertain if these individuals were eyed or eyeless
**Cicurina sp* (eyeless)	3	Under rocks	
Eidmannella sp			
Cambala speobia	4		
☼*Texella reddelli*	2	Under rocks	
Ceuthophilus secretus	1		
Ceuthophilus subadult	1		
Collembola	40		
Diptera: mosquito	~200		

(*) signifies species of concern (☼) signifies endangered species

Name: Mark Sanders, Kathleen O'Connor, Cyndee Watson Date: 8/10/07
Agency: COA No. of pages: 1

Location: Stovepipe cave GPS coordinates (NAD 1983) __ Section No. Entire cave
Time Started: 9:00 Time ended: 10:00 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism)No problems observed.

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐graffiti

Temperature Inside: 70.5F Outside: 74.5 F @ 8:30 Humidity Inside: 90.62% Outside: 88%
Humidity was measured with a Psychrodyne analog psychrometer. Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, flood) recent heavy rains
Organic matter encountered in survey area: __damp soil, and cricket guano.
Surface area moisture conditions: (dry, dripping, pools) very damp, lots of water entered the cave

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Heliocodiscus sp	1		
Leiobunum townsendii	~3000		Mostly in the entrance shaft, as we entered some exited due to the disturbance
**Cicurina sp* (eyeless)	1	Under rocks	Collected for species ID
Neoleptoneta sp	6	Under rocks and in crevices in webs	Photographed one, collected 3 for species ID, this is a probable but unconfirmed site for the listed myopica.
*Pseudoscorpion (blind)	2		Photographed one individual, this cave has 2 species (2 Genera) of troglobitic pseudoscorpions, one of which is endangered.
Cambala speobia	62		
**Speodesmus sp*	16		
☼***Texella sp***	3	Under rocks	Species id is probable for reyesi
☼ ***Texamaurops reddelli***	2	Under rocks	Collected both for species ID
Ceuthophilus secretus	~100		
Ceuthophilus nymphs	18		
Ceuthophilus cunicularis	4		
Collembola	~500		
Fungus gnats	~50		

(*) signifies species of concern (☼) signifies endangered species

Name: Mark Sanders, John Chenoweth, and Kathleen O'Connor	Date: 3/23/07
Agency: COA	No. of pages: 3

Location: Barker Ranch cave #1 GPS coordinates _____ Section No. 1(twilight zone)
Time Started: 10:33 Time ended: 10:57 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism) fire ants observed near entrance

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: NA Outside: 71.8 F @ 10:14 Humidity Inside: NA Outside: 85.84%
Humidity was measured with a Psychrodyne analog psychrometer. Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, flood)_____
Organic matter encountered in survey area: small amount of leaf litter, and wood debris
Surface area moisture conditions: (dry, dripping, pools) dry

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Cicurina varians	13		
Eidmannella sp	2		
Araneae: Surface spider	1		
Pseudouroctonus reddelli	1		
Coleoptera: surface beetle	1		
Collembola	32		
Ceuthophilus nymphs	2		
Plethodon albagula	6		

(*) signifies species of concern (☼) signifies endangered species

This cave is located very near the soon to be built south extension of SH 45.

Name: Mark Sanders, John Chenoweth, and Kathleen O'Connor	Date: 3/23/07
Agency: COA	No. of pages: 3

Location: Barker Ranch cave #1 GPS coordinates _ Section No. 2 (wet areas in twilight zone)
Time Started: 11:00 Time ended: 11:14 scientific permit #TE798920-0

Surface area observations: (gate condition, fire ants, and vandalism) no problems noted

Survey area: ☐ *Solenopsis invicta* if so, ☐ heavy infestation ☐ moderate ☐ light
☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: NA Outside: 71.8 F @ 10:14 Humidity Inside: NA Outside: 85.84%
Humidity was measured with a Psychrodyne analog psychrometer. Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, floods) _____
Organic matter encountered in survey area: small amount of leaf litter, and wood debris
Surface area moisture conditions: (dry, dripping, pools) damp to wet

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Ciciurina varians	4		
Haplotaxida: earthworm	3		
Centipede (surface)	1		
Pseudouroctonus reddelli	1		
**Speodesmus sp*	1		
Collembola	11		
Ceuthophilus nymphs	5		
Plethodon albagula	1		

(*) signifies species of concern (☼) signifies endangered species

WPDRD staff is conducting a drip study/ dye trace study; there are catchment devices to measure the volume of water dripping into the cave.

Name: Mark Sanders, John Chenoweth, and Kathleen O'Connor	Date: 3/23/07
Agency: COA	No. of pages: 3

Location: Barker Ranch cave #1 GPS coordinates _____ Section No. 3 (lower level)

Time Started: 11:25 Time ended: 11:55 scientific permit # TE798920-0

Surface area observations: (gate condition, fire ants, vandalism) no problems noted

Survey area: ☐ *Solenopsis invicta* If so, ☐ heavy infestation ☐ moderate ☐ light

☐ Vandalism If so, ☐ trash ☐ speleothems ☐ gate ☐ graffiti

Temperature Inside: 58.5F Outside: 71.8 F @ 10:14 Humidity Inside: 88.8% Outside: 85.84%
Humidity was measured with a Psychrodyne analog psychrometer. Barometric pressure was measured with a watch mounted barometer (Time model Helix).

Weather conditions during the past week: (freeze, over 100 F, draught, flood)_____
Organic matter encountered in survey area: loose soil
Surface area moisture conditions: (dry, dripping, pools) dry, cool

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Lepidoptera: caterpillar	1		
Araneae: surface spider	1		
Acarina: mite	1		
Pseudouroctonus reddelli			
☼*Rhadine persephone*	3		
**Speodesmus sp*	3		
Collembola	21		
Ceuthophilus subadults	11		
Myotis velifer	6		Since the ceiling was low, the bats were quite agitated, we exited the cave to minimize disturbance.

(*) signifies species of concern (☼) signifies endangered species

Name: K. O'Connor, Mark Sanders	Date: 18-Jul-07
Agency: Travis County/ COA	No. of pages: 1

Location: New Comanche Trail Cave GPS coordinates (NAD 1983) _____
Section No. 1 of 1

Time Started: 1047 AM Time ended: 1120 PM

Scientific permit # TE819451-1

FAUNAL SURVEY

Species	No. seen	Microhabitat for troglobites	Comments (if specimen was collected state where it was sent to)
Harvestmen: *Leiobunum townsendii*	~2000		
Eidmanella sp.	1		Collected and given to Zara Environmental for identification
Cicurina varians	26		Collected 2 and stored
Lycosidae: Wolf Spider	1		
Cambala speobia	4		
Surface millipede- *Oxidus gracilis?*	9		
Springtails: Collembola	35		
Crickets*: Ceuthophilus secretus*	332		
Ceuthophilus juvis	2		
Ceuthophilus nymphs	5		
Fungus gnats	3		
Diptera: Mosquito	1050		

TCMA:

TEXAS CAVE MANAGEMENT ASSOCIATION

Surveyor(s): __Bill Russell, Julie Jenkins_____ Date: Dec. 1, 2007
SurfaceTemperature:_70F__SurfaceHumidity:Low Weather Conditions: partly sunny
Cave: _**GET DOWN CAVE** Survey Section:_A.
Time Stated: _11:00a.m._____ Time Ended:_11:32am_____
Solenopsis invicta (fire ant) Infestation: NO__x_ YES___ Heavy Moderate Light
Vandalism: NO _x__ YES___ Gate Broken Speleothems Grafitti
Cave Temperature: 70°F (C)Cave Humidity: Normal Air Flow: In x Out

FAUNAL SURVEY

SPECIES	COUNT	OBSERVATIONS
Spiders: Circurina blind		
Cicurina 'eyed'	4	
Undetermined:	2	In web against wall, on floor no web
Harvestman: L. townsendii		
*Texella mulaiki		
Millipedes: Cambala speobia		
*Speodesmus sp. "small"		
*Speodesmus sp. "large"		
Cave Crickets: Ceuthophilus sp. B		
Ceuthophilus secretus	3	
Ceuthophilus cunicularis		
undetermined nymphs	many	on floor
Springtails: Collembola sp		
Silverfish: Texoreddellia tex.		
Beetles: Coleoptera sp		
Rove beetles		
*Rhadine austinica		
Flies: Diptera		
Scorpion: Pseudouroctonus reddelli		
Snails: Gastropoda		
Salamander: Plethodon albagula		
Cliff Chirping Frog: Syrrhophus marnocki		
Rattlesnakes: Crotalus atrox		
Isopods: (Porcellionidae-terrestrial)	4	On scat
Gnats:		
Moths:		

- Comments: Noted that almost all scat was 'old', none new noted.

TEXAS CAVE MANAGEMENT ASSOCIATION

Surveyor(s): __Bill Russell, Julie Jenkins_____ Date: Dec. 1, 2007
SurfaceTemperature:_70F__SurfaceHumidity:Low Weather Conditions: partly sunny
Cave: _**GET DOWN CAVE** Survey Section:_B. South end of Canon del Blanco Vista
Time Stated: _11:40a.m._____ Time Ended:_12:15pm_____
Solenopsis invicta (fire ant) Infestation: NO__x_ YES___ Heavy Moderate Light
Vandalism: NO _x__ YES___ Gate Broken Speleothems Grafitti
Cave Temperature: 70°F (C)Cave Humidity: Normal Air Flow: In x Out

FAUNAL SURVEY

SPECIES	COUNT	OBSERVATIONS
Spiders: Circurina blind		
Cicurina 'eyed'	5	
Harvestman: L. townsendii		
*Texella mulaiki		
Millipedes: Cambala speobia		
*Speodesmus sp. "small"		
*Speodesmus sp. "large"	1	On ceiling
Cave Crickets: Ceuthophilus sp. B		
Ceuthophilus secretus	4	
Ceuthophilus cunicularis		
Ceuthophilus nymphs	25	on floor in areas B & C
Springtails: Collembola sp	6	on old scat
Silverfish: Texoreddellia tex.		
Beetles: Coleoptera sp		
Rove beetles	6	Old scat
*Rhadine austinica		
Flies: Diptera		
Scorpion: Pseudouroctonus reddelli		
Snails: Gastropoda		
Salamander: Plethodon albagula		
Cliff Chirping Frog: Syrrhophus marnocki		
Rattlesnakes: Crotalus atrox		
Isopods: (Porcellionidae-terristerial)	3	On scat, in canyon area
Gnats:	2	
Moths:	1	small

- Comments: Noted that almost all scat was 'old', none new noted.

- Faunal Area B is damp, as it was in 2006, during drought. There are active drips and areas of wet flowstone in the Formation Gallery a few meters further into the cave. During the day the air blows strongly out of the cave and this air passes through the Formation Gallery before it crosses Faunal Area B, thus the humidity is likely close to 100% in Faunal Area B.

- We are encouraged by the appearance of 1 *Speodesmus lg.* and are hopeful that with the installation of our 'anti' raccoon gate protection measures and the decrease in scat levels, the normal cave species will begin to recover.

TEXAS CAVE MANAGEMENT ASSOCIATION

Surveyor(s): __B. Russell, J. Jenkins____Date: ___Dec. 1, 2007_____
Surface Temperature:_lo 70's_ Surface Humidity:lo Weather Conditions:_partly sunny
Cave: ____**LOST OASIS**____ Survey Section:___entire cave_
Time Stated: __1:30 p.m_____ Time Ended:___2:15 pm_____
Solenopsis invicta (fire ant) Infestation: NO__x__YES___ Heavy Moderate Light
Vandalism: NO_x___ YES___ Gate Broken Speleothems Grafitti
Cave Temperature: ___70_____°F (C) Cave Humidity: _lo_cave is dry°F (C)
Air Flow: In X Out

SPECIES	COUNT	OBSERVATIONS
Spiders: Circurina blind	2	
Cicurina 'eyed'	2	
Harvestman: L. townsendii		
*Texella mulaiki		
Millipedes: Cambala speobia	17	
*Speodesmus sp. "small"		
*Speodesmus sp. "large"	14	Some under rocks, others on floor
Cave Crickets: Ceuthophilus sp. B		
Ceuthophilus secretus	74	Adults
Ceuthophilus cunicularis	8	
Ceuthophilus nymphs	Many 24+	24 at entrance
Springtails: Collembola sp	Many 10+	
Silverfish: Texoreddellia tex.	1	
Beetles: Coleoptera sp		
Rove beetles		
*Rhadine austinica		
Flies: Diptera		
Scorpion: Pseudouroctonus reddelli		
Snails: Gastropoda		
Salamander: Plethodon albagula		
Cliff Chirping Frog: Syrrhophus marnocki		
Rattlesnakes: Crotalus atrox		
Isopods: (Porcellionidae-terristerial)	1	Small
Gnats:		
Moths:		

- Drought affected this cave in 2006 and in 2007 we had a wet year, thus we've seen more species.
- The Zara Environmental and the Illonois Natural History Survey study was completed in 2007, shortly thereafter results should be available to TCMA.

TEXAS CAVE MANAGEMENT ASSOCIATION

Surveyor(s): __Julie Jenkins_____ Date: Dec. 1, 2007
SurfaceTemperature:_70F__SurfaceHumidity:Low_ Weather Conditions: partly cloudy-sunny
Cave: _**WHIRLPOOL CAVE** Survey Section:_B. edge of TC Room
Time Started: _3:30 p.m. Time Ended:_ 4:30p.m__
Solenopsis invicta (fire ant) Infestation: NO__x_ YES___ Heavy Moderate Light
Vandalism: NO _x__ YES___ Gate Broken Speleothems Grafitti
Cave Temperature: 70°F (C)Cave Humidity: Normal Air Flow: In x Out

FAUNAL SURVEY

SPECIES	COUNT	OBSERVATIONS
Spiders: Circurina blind		
non-Cicurina blind on floor		
Harvestman: L. townsendii		
*Texella mulaiki		
Millipedes: Cambala speobia		
*Speodesmus sp. "small"		
*Speodesmus sp. "large"		
Cave Crickets: Ceuthophilus sp. B		
Ceuthophilus secretus		
Ceuthophilus cunicularis		
Ceuthophilus nymphs		
Springtails: Collembola sp		
Silverfish: Texoreddellia tex.		
Beetles: Coleoptera sp		
Rove beetles		
*Rhadine austinica		
Flies: Diptera		
Scorpion: V. reddelli		
Snails: Gastropoda		
Salamander: Plethodon albagula	3-2-20	Adults-juveniles-babies
Cliff Chirping Frog: Syrrhophus marnocki		
Rattlesnakes: Crotakus atrox		
Isopods: Trichoniscidae		

Although 2007 was a wet year as compared to 2006, only 1 survey was performed. Survey area A was not included as NO species were observed at the time of the survey. The cave appears very dry despite the increased surface moisture and this is in part due to the strong dry winter air. Typically WP is been a much drier cave than some of the other caves monitored in the area.

A surprising number of Plethodons at the entrance, apparently there was a recent new hatching.

ATTACHMENT C
CRICKET COUNT DATA

TRAVIS COUNTY:

TABLE 6. Cricket exit count data from all surveys done on Travis County BCP caves containing federally listed species (N= nymphs, J= juveniles, A=adult, T= total individuals).

	Aug/Sept 2006				March 2007				Jul/Aug 2007				Oct/Nov 2007			
Cave Name	**N:**	**J:**	**A:**	**T:**	**N:**	**J:**	**A:**	**T:**	**N:**	**J:**	**A:**	**T:**	**N:**	**J:**	**A:**	**T:**
Amber Cave	107	87	40	**234**	122	40	1	**163**	148	74	133	**355**	51	56	136	**243**
Gallifer Cave	90	59	64	**213**	22	55	8	**85**	5	19	127	**151**	11	11	26	**48**
Kretschmarr Cave	8	9	26	**43**	184	149	6	**339**	2	15	150	**167**	1	1	19	**21**
Kretschmarr Double Pit Cave	25	16	2	**43**	13	2	4	**19**	3	10	5	**18**	2	1	2	**5**
McDonald Cave	0	6	3	**9**	17	9	3	**29**	4	0	6	**10**	0	0	0	**0**
North Root Cave	103	21	14	**138**	42	138	3	**91**	4	5	25	**34**	5	8	**4**	**17**
Root Cave	10	0	2	**12**	27	12	7	**81**	5	15	11	**31**	16	9	**7**	**32**
Tardus Hole Cave	28	5	71	**104**	6	104	1	**9**	1	1	12	**14**	0	1	**0**	**1**
Tooth Cave	42	68	197	**307**	144	307	8	**236**	10	23	78	**111**	35	14	**94**	**143***

*Tooth Cave cricket count on 8-Nov-07 was conducted from inside the cave.

CITY OF AUSTIN:

CRICKET EXIT COUNT DATA FORM – ZARA ENVIRONMENTAL LLC

Cave name _Cotterell cave__ Date _5/4/07__ Observer _J. & C Barrett__ barometric pressure (beg/end)_29.58 _28.90_
Observation start time _20:10_ Time of first cricket exit _20.41_ Observation end time _22:41____
% cloud cover _NA_ Start temp C (dry/wet bulb) _75.6/68.7F_ End temp C (dry/wet bulb) _73.8/72.8F other weather notes 5/2 area had 3" of rain_

Time block: use even 10 min intervals eg. 2010-2020	*Ceuthophilus* nymphs *up to 5 mm*	*Ceuthophilus* subadults *5-12 mm*	*C. secretus* adults *over 12 mm*	*C*. sp. B adults	Notes (eg: crickets mate, eat, are eaten, re-enter cave, interact with other fauna including RIFA, other taxa enter/exit cave, obstructions to view of exodus, photos taken, weather change, etc.)
Start: 2041					**This was our second cricket exit count and we did not have this data sheet, all #'s were lumped together**
					Leiobunum townsendii exited throughout the night in small but steady #'s
					Observed 3 large wolf spiders exiting the cave, and several *Syrrhophus marnockii* exiting the cave
					Ground around the cave entrance was very damp.
					Vegetation and the cave gate made visibility somewhat difficult
End: 22:41	**Total: 772**	**Total: 128**	**Total: 37**		**As stated above, this survey was done prior to using this data sheet.**

CRICKET EXIT COUNT DATA FORM – ZARA ENVIRONMENTAL LLC

Cave name _Cotterell cave__ Date _8/29/07__ Observer _J. & C Barrett__ barometric pressure (beg/end)_29.15 _29.15_
Observation start time _20:13_ Time of first cricket exit _20.44_ Observation end time _22:14____
% cloud cover _100%_ Start temp C (dry/wet bulb) _77.5/75F__ End temp C (dry/wet bulb) _75/73F_ other weather notes_light rain____

Time block: use even 10 min intervals eg. 2010-2020	*Ceuthophilus* nymphs *up to 5 mm*	*Ceuthophilus* subadults *5-12 mm*	*C. secretus* adults *over 12 mm*	*C*. sp. B adults	Notes (eg: crickets mate, eat, are eaten, re-enter cave, interact with other fauna including RIFA, other taxa enter/exit cave, obstructions to view of exodus, photos taken, weather change, etc.)
2013-2023	0	0	0	0	Throughout the night *Syrrhophus marnockii* exited the cave.
2023-2033	0	0	0	0	At 2119 it stopped raining
2033-2043	0	0	0	0	
2043-2053	6	4	0	0	
2053-2103	24	4	0	0	
2103-2113	51	7	0	0	
2113-2123	67	10	0	0	
2123-2133	84	7	0	0	
2133-2143	58	1	0	0	
2143-2153	37	1	0	0	
2153-2203	34	2	0	0	
2203-2213	19	1	0	0	
Total	**380**	**37**	0	0	

CRICKET EXIT COUNT DATA FORM – ZARA ENVIRONMENTAL LLC

Cave name __District Park cave__ Date _5/3/07_ Observer _D Dietz, Enora Fant__ barometric pressure (beg/end)_29.0 _29.0_
Observation start time _20:10 Time of first cricket exit _20:27_ Observation end time _22:27
% cloud cover _NA___ Start temp C (dry/wet bulb) _74/72F__ End temp C (dry/wet bulb) _71/70F_ other weather notes_____

Time block: use even 10 min intervals eg. 2010-2020	*Ceuthophilus* nymphs *up to 5 mm*	*Ceuthophilus* subadults *5-12 mm*	*C. secretus* adults *over 12 mm*	*C*. sp. B adults	Notes (eg: crickets mate, eat, are eaten, re-enter cave, interact with other fauna including RIFA, other taxa enter/exit cave, obstructions to view of exodus, photos taken, weather change, etc.)
Start: 2027					**This was our first cricket exit count and we did not have this data sheet, all #'s were lumped together and we were only using 2 categories (nymphs/ adults)**
					~ 200 *Leiobunum townsendii* started to exit in mass starting at 2015
					We heard a *Syrrhophus marnockii* chirping but did not see it.
					Starting at 2032-2048 Mark Sanders observed 105 nymphs and 21 adult crickets exiting the adjacent Lotus cave
End: 22:27	**Total: 869**		**Total: 394**		**As I stated before this was done without this data sheet, the exit times were lumped together**

CRICKET EXIT COUNT DATA FORM – ZARA ENVIRONMENTAL LLC

Cave name __District Park cave__ Date _9/27/07_ Observer _M Sanders, R Norwood__ barometric pressure (beg/end)_29.2 _29.2_
Observation start time _19:30 Time of first cricket exit _19:47_ Observation end time _21:30___
% cloud cover _0%___ Start temp C (dry/wet bulb) _80.5/75.5__ End temp C (dry/wet bulb) _77.5/73.5_ other weather notes_ rained in North Austin_

Time block: use even 10 min intervals eg. 2010-2020	*Ceuthophilus* nymphs *up to 5 mm*	*Ceuthophilus* subadults *5-12 mm*	*C. secretus* adults *over 12 mm*	*C*. sp. B adults	Notes (eg: crickets mate, eat, are eaten, re-enter cave, interact with other fauna including RIFA, other taxa enter/exit cave, obstructions to view of exodus, photos taken, weather change, etc.)
1930-1940	0	0	0	0	A few harvestman are exiting
1940-1950	0	2	5	0	
1950-2000	9	2	4	0	
2000-2010	5	6	6	0	
2010-2020	3	7	16	0	
2020-2030	5	8	8	0	
2030-2040	2	8	7	0	
2040-2050	1	5	6	0	
2050-2100	2	4	0	0	
2100-2110	0	1	3	0	
2110-2120	0	2	2	0	
2120-2130	1	1	0	0	
Total	**28**	**46**	**57**		

CRICKET EXIT COUNT DATA FORM – ZARA ENVIRONMENTAL LLC

Cave name _Flintridge_____ Date _5/07/07__ Observer _Krista McDermid and Charlie Nettles barometric pressure (beg/end)_29.25_29.30
Observation start time _20:48_ Time of first cricket exit _20:48_ Observation end time _22:48____
% cloud cover _100%_____ Start temp C (dry/wet bulb) _74/71.25__ End temp C (dry/wet bulb) _70.25/68.5_
other weather notes_humid_

Time block: use even 10 min intervals eg. 2010-2020	*Ceuthophilus* nymphs *up to 5 mm*	*Ceuthophilus* subadults *5-12 mm*	*C. secretus* adults *over 12 mm*	*C*. sp. B adults	Notes (eg: crickets mate, eat, are eaten, re-enter cave, interact with other fauna including RIFA, other taxa enter/exit cave, obstructions to view of exodus, photos taken, weather change, etc.)
2048-2058	1	3		3	Harvestman started to emerge prior to our arrival
2058-2108	25	11		4	
2108-2118	36	16		7	
2118-2128	36	15		4	RIFA observed attacking a mite
2128-2138	38	29	3	6	
2138-2148	21	16	3	3	
2148-2158	11	7	2	1	
2158-2208	35	13	3	2	
2208-2218	8	7		2	
2218-2228	18	5	2	2	
2228-2238	10	2		2	
2238-2248	19		2	1	
Total	**258**	**124**	**15**	**37**	

CRICKET EXIT COUNT DATA FORM – ZARA ENVIRONMENTAL LLC

Cave name _Flintridge_____ Date _8/07/07__ Observer _Krista McDermid and Charlie Nettles barometric pressure (beg/end)_____ _____
Observation start time _20:40_ Time of first cricket exit _21:25_ Observation end time _22:40____
% cloud cover _0%_____ Start temp C (dry/wet bulb) _88/79__ End temp C (dry/wet bulb) _81/72_ other weather notes_humid_____

Time block: use even 10 min intervals eg. 2010-2020	*Ceuthophilus* nymphs *up to 5 mm*	*Ceuthophilus* subadults *5-12 mm*	*C. secretus* adults *over 12 mm*	*C*. sp. B adults	Notes (eg: crickets mate, eat, are eaten, re-enter cave, interact with other fauna including RIFA, other taxa enter/exit cave, obstructions to view of exodus, photos taken, weather change, etc.)
2040-2050					Harvestman exodus 2031, surface cricket exited also
2051-2100					
2100-2110					
2110-2120					
2120-2130	5	2			Black surface cricket at entrance
2130-2140	7	4	1		
2140-2150	6	5	1		
2150-2200	9	9	4	1	Mosquitoes are diminishing
2200-2210	6	5	4		Harvestman never left, still hanging around entrance
2210-2220	6	5	1		Very few harvestman left
2220-2230	1	1	3		
2230-2240	4	2	2		
Total	**44**	**33**	**16**	**1**	

CRICKET EXIT COUNT DATA FORM – ZARA ENVIRONMENTAL LLC

Cave name _Jester Estates cave_ Date _11/13/06__ Observer _M Sanders, K Nesvacil__barometric pressure (beg/end)_NA__ _NA_
Observation start time _17:35__ Time of first cricket exit _18:11_ Observation end time _20:11__
% cloud cover _NA__ Start temp C (dry/wet bulb) _65/57F__ End temp C (dry/wet bulb) _63.5/56.5F_ other weather notes_____

Time block: use even 10 min intervals eg. 2010-2020	*Ceuthophilus* nymphs *up to 5 mm*	*Ceuthophilus* subadults *5-12 mm*	*C. secretus* adults *over 12 mm*	*C*. sp. B adults	Notes (eg: crickets mate, eat, are eaten, re-enter cave, interact with other fauna including RIFA, other taxa enter/exit cave, obstructions to view of exodus, photos taken, weather change, etc.)
Start: 1811					**I was using the old protocol, so therefore the all #'s were lumped together and at this time I was only using 2 categories (adults/ nymphs).**
					Noticed several spiders exiting the cave.
					Several mosquitoes were buzzing around.
End: 2011	**Total: 172**		**Total: 28**		**As stated above, this was done prior to using this data sheet, so only 2 categories were used**

CRICKET EXIT COUNT DATA FORM – ZARA ENVIRONMENTAL LLC

Cave name _spider cave_____ Date _5/22/07____ Observer _J Lipinski, Sefi Follosco___barometric pressure (beg/end)_28.85 _28.95_
Observation start time _20:00_ Time of first cricket exit _20:55_ Observation end time _22:55___
% cloud cover __100%_ Start temp C (dry/wet bulb) _75.25/73_ End temp C (dry/wet bulb) _72.8/71.5_ other weather notes_storm the previous night

Time block: use even 10 min intervals eg. 2010-2020	*Ceuthophilus* nymphs *up to 5 mm*	*Ceuthophilus* subadults *5-12 mm*	*C. secretus* adults *over 12 mm*	*C*. sp. B adults	Notes (eg: crickets mate, eat, are eaten, re-enter cave, interact with other fauna including RIFA, other taxa enter/exit cave, obstructions to view of exodus, photos taken, weather change, etc.)
2055-2105	11	1	0		Noticed several *Leiobunum townsendii* exiting a little after 20:00, and one *Syrrhophus marnockii*
2105-2115	1	0	1		Light rain
2115-2125	5	3	17		More *Leiobunum townsendii* exiting
2125-2135	7	2	18		Light rain, one surface millipede exiting the cave
2135-2145	7	7	3		Light rain
2145-2155	6	3	8		
2155-2205	3	0	8		
2205-2215	2	1	4		
2215-2225	3	4	6		Noticed *C secretus* climbing on a small juniper
2225-2235	1	0	7		*Peromyscus sp* started to exit, but went back in
2235-2245	0	1	2		
2245-2255	0	2	4		
Total	**46**	**24**	**78**		

CRICKET EXIT COUNT DATA FORM – ZARA ENVIRONMENTAL LLC

Cave name _Spider cave__ Date _9/19/07 Observer _M Sanders, J Lipinski_ barometric pressure (beg/end) _28.95 _28.95_
Observation start time _19:30_ Time of first cricket exit _19:59_ Observation end time _21:50_
% cloud cover _0%___ Start temp C (dry/wet bulb) _82/74__ End temp C (dry/wet bulb) _7805/74_ other weather notes_____

Time block: use even 10 min intervals eg. 2010-2020	*Ceuthophilus* nymphs *up to 5 mm*	*Ceuthophilus* subadults *5-12 mm*	*C. secretus* adults *over 12 mm*	*C*. sp. B adults	Notes (eg: crickets mate, eat, are eaten, re-enter cave, interact with other fauna including RIFA, other taxa enter/exit cave, obstructions to view of exodus, photos taken, weather change, etc.)
1950-2000	3	0	0		Large #'s of *Leiobunum townsendii* are already exiting as we arrived
2000-2010	1	1	10		*C secretus* are enormous, one *Syrrhophus marnockii* exited.
2010-2020	0	1	8		2 adult *C secretus* entered the cave.
2020-2030	2	1	4		Several male *C secretus* were observed actively following females attempting to mate
2030-2040	2	1	9		
2040-2050	0	0	11		
2050-2100	0	0	9		
2100-2110	0	0	9		
2110-2120	0	0	7		
2120-2130	0	0	8		
2130-2140	0	0	1		
2140-2150	0	0	5		2 large *C secretus* were observed mating
Total	**8**	**4**	**81**		