Balcones Canyonlands Preserve Karst Management
2009 Annual Report



Two adult *Texella reyesi* in Tooth Cave, Travis County. Photo by Mark Sanders

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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EXHIBIT A: KARST FAUNAL REPORTS: 33
CITY OF AUSTIN (21 REPORTS)
TRAVIS COUNTY (4 REPORTS)
ZARA ENVIRONMENTAL INC. (2 REPORTS)

EXHIBIT B: CRICKET COUNT DATA REPORTS: 50
CITY OF AUSTIN (4 CAVES)
TRAVIS COUNTY (10 CAVES)

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.

The Regional Permit requires protection of 35 endangered species caves and 27 additional caves that support SOC, for a total of 62 karst features (60 caves, 1 mine and 1 karst spring). Several of these karst features occur in clusters, identified in the Regional Permit as the Jollyville, McNeil, and Northwood cave clusters. Currently, 28,513 acres have been acquired for the Balcones Canyonlands Preserve (BCP). 45 of the 62 BCCP karst features have some form of formal protection within these preserve tracts, which include properties owned and managed by COA, TC, and BCCP partners, as well as private mitigation lands.

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

Tooth Cave pseudoscorpion	*Tartarocreagris texana*	Kretschmarr Cave mold beetle	*Texamaurops 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*		*Tartarocreagris reddelli*
	Cicurina cueva		*Tartarocreagris intermedia*
	Cicurina ellioti		*Tartarocreagris* N. S. 3
	Cicurina reddelli	**HARVESTMEN**	*Texella spinoperca*
	Cicurina reyesi	**GROUND BEETLES**	*Rhadine s. subterranea*
	Cicurina travisae		*Rhadine s. mitchelli*
	Cicurina wartoni		*Rhadine austinica*
	Neoleptoneta concinna	**ISOPODS**	*Caecidotea reddelli*
	Neoleptoneta devia		*Trichoniscinae* N. S.
	Eidmannella reclusa		*Miktoniscus* N. S.
MILLIPEDES	*Speodesmus* N. S.		

2.0 CAVE MANAGEMENT SUMMARY

This annual report covers the fiscal year 10/01/08-9/30/09 (FY2009) and is referred to in this document as "2009". In 2009, the BCCP partners continued efforts to determine and track the 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; ten protected on TC land 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 45 of the BCCP caves are "protected" in some way, with 17 "unprotected". 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 the 3 cave clusters required to be protected by the permit are threatened by potential development near the caves (Tables 1&2).

There were several new karst features acquired in 2009. The Lucas tract, located within the Cypress Creek macrosite, was acquired in 11/08 by TC and contains several important karst features, including New Comanche Trail cave. The GDF/Purcell Tract (from now on referred to as the Cuevas East tract) that surrounds Tooth and Root caves, part of the Four Points Cave Cluster, located within the Cypress Creek macrosite, was acquired in 12/08 by TC. These 2 cave entrances were already owned by TC but previously lacked adequate buffers around the caves. Note that additional buffers for the protection of Kretschmarr Cave and Root Cave were a mitigation requirement of the 10(a) permit issued to GDF/Purcell. The transfer of ownership of these buffers is pending to be transferred to TC prior to the development of adjacent areas allowed in the permit.

To assist with analyzing the adequacy of the current preserve design for each karst feature, including the amount of surface and subsurface habitat needed to support these ecosystems, the COA and TC have been working together to develop a comprehensive database for the 62 features and other features identified within the BCP since the regional permit was issued in

1996. The database also incorporates monitoring data and management issues for each karst feature. The karst database is discussed in more detail in Section 5.0.

Please note that a probable occurrence of *Rhadine persephone* has been added to Amber Cave based on visual observation during a 2009 faunal survey and is now reflected in Table 1.

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, 2008, and 2009 to show new species location information from James Reddell (2004, 2005), HNTB (2005), Cokendolpher (pers com, 2008), and Sanders (pers com, 2009) .

Cave Name	**Current Preserve Status**	**Karst Fauna Region**	**Tooth Cave Pseudoscorpion** *Tartarocreagris texana*	**ToothCave Spider** *Neoleptoneta myopica*	**Tooth Cave Ground Beetle** *Rhadine persephone*	**Kretschmarr Cave Mold Beetle** *Texamaurops reddelli*	**Bee Creek Cave Harvestman** *Texella reddelli*	**Bone Cave Harvestman** *Texella reyesi*
Amber Cave	BCP Jollyville/ TC	Jollyville Plateau	X 1996		P 2009***	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	BCP 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	BCP Schroeter Pk./COA	McNeil/Round Rock						X 1996
Fossil Garden Cave	Private	McNeil/Round Rock						X 1996
Gallifer Cave	BCP Jollyville/TC	Jollyville Plateau		P 1996	P 1996 X 2005			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 Cave Mold Beetle *Texamaurops reddelli*	Bee Creek Cave Harvestman *Texella reddelli*	Bone Cave Harvestman *Texella reyesi*
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 2008 (Cokendolpher)**				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	BCP Lake Travis/TC	Jollyville Plateau		X 1996				X 1996
No Rent 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 Cave Mold Beetle *Texamaurops reddelli*	Bee Creek Cave Harvestman *Texella reddelli*	Bone Cave Harvestman *Texella reyesi*
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 1996
Spider Cave	BCP Park West/COA	Jollyville Plateau			X 2004		X 2004 (Reddell)	P 1996 delete P 2004 (Reddell)
Stovepipe Cave	BCP Canyon Creek/ COA	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 longer thought to occur in this cave (personal communication Reddell 2004).
* 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.
** Cokendolpher (confirmation via email January 30, 2008) Confirmed that Jester Estates Cave is a new site for ***Tartarocreagris texana***
P 2009*** = Visual field verification by M. Sanders. Speciman not collected and thus not confirmed by species expert.

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. 2009 Ownership Status of the 62 BCCP 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	

Cave Name	ES or SOC	Current tract/owner. On BCP Land or private	Cave Cluster
Eluvial Cave	ES	BCP Private 10(a)	4 Points Cl. (Perot)
Flint Ridge Cave	SOC	Prop 2 Tabor tract /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 Cave	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 Cave.	ES	BCP Private 10(a)	4 Points Cl. (Perot)
Kretschmarr Cave	ES	BCP Jollyville/TC	4 Points Cl. (Parke)
Kretschmarr Double 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	

Cave Name	ES or SOC	Current tract/owner. On BCP Land or private	Cave Cluster
New Comanche Trail Cave	ES	BCP Lake Travis/TC	
No Rent Cave	ES	Private	McNeil Cl.
North Root Cave	ES	BCP Jollyville/TC	4 Points Cl (Parke)
Pennie's Cave	SOC	Private	
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 Cave	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 BCP 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 needed to support the karst ecosystem(USFWS 2001).

The following table (Table 3) lists caves that are currently gated, fenced and/or open to the public, and also their protection and monitoring status.

Table 3. 2009 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	Occasional surface and species monitoring by COA	none
Airman's Cave	Gate has been Breached by vandals	Protected on parkland	COA species and surface monitoring	Open to sign, beyond requires permit, however there's no gate it's voluntary**
Amber Cave	Gated, fenced	Protected on preserve (very close to road and sewer line)	TC bi-annual surface monitoring, quarterly cricket exit counts, RIFA assessment,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 species and surface monitoring	none
Bandit Cave	Gated	Protected by private ecologically concerned landowner		none
Beard Ranch Cave		Protected on preserve	COA quarterly surface monitoring plus annual faunal survey	none
Bee Creek Cave		Private- Unknown		none
Blowing Sink Cave	Gated	Protected on preserve	COA bi-monthly surface and annual species monitoring	none
Broken Arrow Cave	Tract is fenced (8' game fence)	Protected on preserve	COA quarterly surface and Annual species 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).	Occasional species and surface monitoring by COA	1 day/ year COA guided access to first room to educate children
Cave Y	Gated	Protected in parkland	COA quarterly surface and annual species monitoring	none

Cave Name	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
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; quarterly cricket exit counts	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; quarterly cricket exit counts	1st room open, past the 1st room protected by gate, access by permit*
Eluvial Cave		Protected by 10a permit, hired ACI Consulting		none
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; quarterly cricket exit counts, Watershed Protection and Development Review Dept.(WPDRD) monitors quantity and quality at surface	none
Fossil Cave	Access to features on site are protected by large rocks	Protected in parkland	Exact location of cave is unknown	None
Fossil Garden Cave		Private - Unknown		none
Gallifer Cave	Gated, fenced	Protected on preserve	TC bi-annual surface monitoring, quarterly cricket exit counts, RIFA assessment	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 annual faunal survey, monthly surface monitoring	access by permit*
Hole-in-the-Road		Private –Unknown. (very close to a major roadway)		none

Cave Name	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
Ireland's Cave	Fenced	Protected by landowner with 4.8 ac. setback, watershed problems with golf course, setback inadequate		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 and fenced	Protected on preserve (3.2 acre preserve surrounded by homes).	COA annual species and quarterly surface monitoring	none
Jollyville Plateau Cave	Gated [1]	Protected by 10a permit, hired ACI Consulting		none
Kretschmarr Cave	Gated, Fenced	Protected on preserve. Close to roadway and in powerline ROW.	TC bi-annual surface monitoring, quarterly cricket exit counts, RIFA assessment	none
Kretschmarr Dble. Pit	Fenced	Protected on preserve	TC bi-annual surface monitoring, annual cricket exit counts, RIFA assessment, quarterly end. species monitoring	none
Lamm Cave	Gated and fenced	COA negotiated setback (approximately 150')	Occasional surface and species monitoring by COA	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
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*

Cave Name	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
McDonald Cave		Protected on preserve	TC bi-annual surface monitoring, annual cricket exit counts, 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 quarterly surface and annual species monitoring	access by permit*
Moss Pit		Private - Unknown		none
New Comanche Tr. Cave		Protected on preserve	TC bi-annual surface monitoring, RIFA assessment	none
No Rent Cave		Private - Unknown		none
North Root Cave		Protected on preserve	TC bi-annual surface monitoring, annual cricket exit counts, RIFA assessment.	none
Pennie's Cave		Land owner closed entrance with fill Material. WPDRD are potentially negotiating a setback including possible excavation of entrance		none
Pickle Pit	Gated	Private- Unknown		none
Pipeline Cave	Metal frame [1]	WPDRD have negotiated a small setback from future platted development		none
Rolling Rock Cave	tract is fenced with a 8' game fence	Protected on preserve	COA quarterly surface and Annual species monitoring	none
Root Cave		Protected on preserve	TC bi-annual surface monitoring, annual cricket exit counts, RIFA assessment	none
Slaughter Creek Cave	Gated	Protected on parkland. (There are nearby homes immediately south of the cave entrance)	COA quarterly surface and annual species monitoring	none
Spanish Wells		Private- Unknown		none

Cave Name	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
Spider Cave	Fenced (ranch fence)	Protected on preserve	COA quarterly species and surface monitoring; quarterly cricket exit counts	none
Stark's North Mine		Private - Unknown		none
Stovepipe Cave	Fenced (ranch Fence) preserve boundary	Protected on preserve	COA annual faunal and quarterly surface monitoring	none
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, Annual cricket exit counts, RIFA assessment	none
Tooth Cave	Gated	Protected on preserve	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**

[1] Needs gate repairs/improved gate

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

** Controlled Access - Private cave owners control the access

*** Access by Permit- Permit may be issued by TCMA

4.0 ACCESS AND EDUCATION

In 2009, the total number of visitors in COA BCP caves for educational/recreational/rescue training that were issued access permits was 214: District Park Cave **(COA 15),** Maple Run Cave **(COA 92)**, Goat Cave **(COA 73)**, Midnight Cave **(COA 10)**,and Flint Ridge Cave **(COA 24)**. See Table 3 for access and gating status of all of the BCCP caves.

The COA's Watershed Protection & Development Review Department (WPDRD) conducts cave education through Earth Camp (a fifth grade water quality program), Clean Creek Camp (a summer parent/child water quality program) and Hydrofiles (a high school water quality program).

Earth Camp involves a week long day camp available to Title I Austin Independent School District (AISD) schools where students learn in the field about watersheds, the Edwards Aquifer, caves, and cave biota through cave tours on the Wildflower Center and interactions with professional biologists and hydrogeologists. Earth Camp is coordinated by Susan Wall, a former classroom (certified) teacher with an MS in science education. In 2009 , Earth Camp guided 1,300 students into Wildflower cave (not a BCP cave). Additionally, every fifth-grader in AISD is offered aquifer education through an Earth School hands-on classroom presentation.

In summer 2009, Parent/Child Clean Creek Camp brought 30 students and parents into Wildflower Cave . Clean Creek Camp is a partnership between the WPDRD and Keep Austin Beautiful. Activities focus on watersheds, the Edwards Aquifer and citizen actions that improve water quality. Clean Creek Camp is offered in summer to parents and their children ages 9-12.

Hydrofiles reaches aquatic science and environmental science classes with a hands-on inquiry based investigation of Austin's water resources. Local field studies involve monitoring local creeks and caving into the Edwards Aquifer. Students learn about hydrogeology and cave biology through cave tours. Sara Heilman coordinates the high school cave education and holds an MS in environmental science.

The WPDRD produces cave posters and a companion aquifer brochure which are distributed through other agencies and at public events. On September 16 and October 28, 2009, WPDRD offered two identical field trips on aquifer recharge and cave ecosystems that targeted regulatory staff who protect cave resources. The field trips were designed to help

regulators evaluate environmental assessments with the most current information so that adequate protection is provided. The trips occurred on the Tabor Water-Quality Protection Land tract and were led by Nico Hauwert and Scott Hiers (WPDRD) and Heather Beatty (Texas Commission on Environmental Quality), and had guest speakers including Dr. Jean Krejca and Peter Sprouse of Zara Environmental, Brian Cowan of UT Geological Sciences, and Mark Sanders of COA BCP. The 36 attendants observed various recharge features types across the Tabor tract and learned about current research on recharge and soil infiltration, and cave ecosystem surface interaction. Twenty-four people entered Flint Ridge Cave. The proposed State Highway 45 would negatively impact Flint Ridge Cave , the proposed route would be constructed directly over the rear portion of the cave containing the largest cave drip. An identical field trip will be offered Feb 18, 2010 for the USFWS Karst Conservation Initiative group.

COA receives more requests for cave-associated educational experiences than can be supplied, largely due to a lack of developed and accessible cave resources. This year, Regents School requested from WPDRD educational tours of Cave X. WPDRD has provided these tours in previous years, but was unable to sufficiently address concerns about potential roundworm transmission from raccoon scat to the school's level of comfort, despite cleaning the entrance room of raccoon scat. Two visits (3/24 and 3/26/09) were made and approximately 20 gallons of raccoon scat were removed. CO2 levels in the cave ranged from 1.06% to 2.09%. CO2 levels dropped to 0.2% following ventilation for 10 minutes with a portable, battery-operated fan. It is hoped that cave resources can eventually be developed for public education that are safe, easily accessible, and sufficiently long for a cave immersion experience.

COA shared a BCP booth with TC at the annual "Cave Day Festival" held at the Village of Western Oaks Karst Preserve in October 2008. The BCP was able to educate large numbers of citizens about the BCP and its role in protecting the unique biology of karst ecosystems.

TC and COA presented a poster entitled "Management of Endangered Karst Invertebrates on the Balcones Canyonlands Preserve, Austin, Texas" at the 15th International Congress of Speleology held in Kerrville, Texas in July 2009. The poster focused on karst management, biological monitoring, and threats to karst communities at BCP karst features.

5.0 MANAGEMENT COORDINATION AND OVERSIGHT

COA and TC determined that there was a need to create a master database on BCP karst faunal monitoring and management with the ability to analyze this data to determine current status and compliance with the regional permit and determine future needs of the listed species. In 2009, Rob Clayton with WPDRD developed the Karst Database that will house all faunal survey data from BCCP caves and provide much of the information needed for this karst analysis. This database is now in use for all BCP partners to enter survey data, and all available data has been entered to date. Though the intent is for this database to be a "shared" information source for all the BCP partners, there are still confidentiality challenges on how to establish this. This database will focus on compliance and contribution to recovery.

6.0 BIOLOGICAL MONITORING

City of Austin

During 2009, COA BCP staff performed species surveys of the following BCCP caves: Airman's cave, Arrow cave, Blowing Sink, Broken arrow cave, Cave Y, Cotterell cave (quarterly), District Park cave (quarterly), Flintridge cave (quarterly), Goat cave, Jest John cave, Jester Estates cave, Little Bee Creek cave, Maple Run cave, Midnight cave, Rolling Rock cave, Slaughter Creek cave, Spider cave (quarterly), and Stovepipe cave. In addition, COA BCP staff surveyed Dunvegan, Seibert Sink, and Testudo Tube. While these three caves are not listed on the BCCP permit, Dunvegan and Seibert Sink have species of concern, and Testudo Tube has endangered species. The results of these surveys are presented in EXHIBIT A.

Zara Environmental Inc. staff conducted faunal surveys of Beard Ranch cave. In addition, they surveyed Pond Party Pit, which is not listed on the BCCP permit but is an endangered species cave. The survey data are presented in EXHIBIT A.

COA, with the help of volunteers, conducted quarterly cave cricket exit counts at: Cotterell, District Park, Flintridge, and Spider caves (EXHIBIT B).

COA re-issued a Scientific Research permit to Dr. Jay Banner (University of Texas at Austin) and two of his graduate students, Brian Cowan and Michael Osborne, regarding the temporal and spatial variations of carbon dioxide levels found in central Texas caves. Blowing Sink, Seibert Sink, Maple Run Cave, District Park cave, and Cave Y were the COA

BCP caves monitored for this study. Preliminary results show that CO^2 levels in the local area vary seasonally, with peak levels in late August to early October and lower concentrations in December through late March (Cowan and Banner 2009; APPENDIX Q).

COA issued a Scientific Research permit to Joel Ledford (doctoral student at the University of California Berkeley). His research will reevaluate the species limits for the spider genus *Neoleptoneta* using a combination of molecular, morphological, and geological data. The molecular component of this work requires fresh specimens collected from sites within the BCP. No work was conducted during 2009.

Sofia Angelo (M.S. Candidate Conservation Biology Affiliation & Department: Antioch University New England, Environmental Studies Dept.) completed a study funded by Bat Conservation International of the roost site requirements of the cave myotis bat (*Myotis velifer*). The study included measuring humidity, temperature, vegetation characteristics surrounding the cave entrance, proximity of the cave to permanent water sources, and evidence of disturbance by comparing caves (including BCP permit caves) that are currently occupied by *M. velifer* and those that are not. This study provides a baseline information that can aid in cave management as well as future studies identifying possible reasons for the decline of *Myotis velifer* (Angelo, 2009, APPENDIX Q).

COA contracted with Weston Solutions, Inc., which in turn subcontracted with Zara Environmental, Inc. for biological survey work within the BCP. The objective of the project is to update the scientific knowledge base of karst invertebrates and the species data contained in *The Caves of the Balcones Canyonlands Conservation Plan, Travis County, 1997* in accordance with the Karst Species Management Plan contained in the BCCP Permit. The project will focus on endangered species identification and mapping in caves and karst features managed under the BCCP, with particular emphasis on *Neoleptoneta myopica*, *Tartarocreagris texana*, and *Texamaurops reddelli*. The updates generated during this effort are intended to increase knowledge about the occurrence and distribution of these endangered karst invertebrates, and to assess the recovery of these fauna as part of a status review of Travis County karst species.

Flint Ridge Cave is included on a federal permit held by the COA and TC for the preservation of karst species of concern. State Highway 45 is proposed to cross the Tabor Tract within 150 feet of Flint Ridge Cave entrance, will overlie the largest cave drip, and bisect the surface catchment to Flint Ridge. Existing reports and presentations by TxDOT have reflected that Flint Ridge Cave has a small catchment of only 0.75 acres, that recharge

entering the cave likely would not recharge the aquifer, that soils on the site are relatively impermeable for transmitting rainfall to the subsurface, and that the largest drip in Flint Ridge Cave is fed by Bear Creek rather than rainfall infiltrated through overlying soils. However, these results are unlikely given casual inspection of shallow drips and formations in the caves on the sites all indicate soil infiltration and the well-defined channels and flood debris to Flint Ridge Cave point to a large catchment. These initial inspections suggest that detailed information about recharge and infiltration are necessary to protect this cave. Furthermore, the findings from these investigations can be applied across the BCP permit area.

Flow to Flint Ridge Cave has been continuously measured since July 2004. Water-quality of the surface runoff, through grab samples and automatic samplers have been infrequently collected since 1997. Data collected prior to 2008 was used by Hauwert (2009; http://drop.io/NHdissertation) to measured average discrete runoff to Flint Ridge Cave (as 3% discrete recharge from rainfall) and water quality data was used to measure diffuse recharge through chloride balance. In 2007 three sets of soil traces were conducted over three rain events near Barker Ranch #1 Cave by UT graduate student Brian Cowan and COA hydrogeologist Nico Hauwert. By comparing surface runoff quality at Flint Ridge Sinkhole with the breakthrough of naturally occurring constituents at Barker Ranch #1 Cave Drip, we seek to measure the attenuation of natural levels of various constituents. However, an additional soil trace was required to complete the analysis, and in 2008, rain became very infrequent and the cave drips eventually dried up. We hope to regain funding and complete the final series of soil traces in early 2010. In summer 2008, the flow station at Flint Ridge sinkhole was improved by replacing the rotting weir walls and placing a flume in place of a weir at drainage 3. The flow data is now received real-time by the COA WPD Water-Quality Management hydrologists led by Roger Glick and runoff quality is periodically sampled using permanent automatic samplers. Aquifer-wide tracing was conducted on the Tabor tract in 2007 in order to test the hypotheses (1) presented in the 1989 TxDOT EIS report that rainfall on the site would not recharge the aquifer but would discharge from seeps and springs along Bear Creek and (2) that the Drip Pit in Flint Ridge Cave is lower than Bear Creek and therefore must be fed by Bear Creek. All four traces (2 on the Tabor tract) arrived at Barton Springs between 2 to 3 days and tracers poured in Bear Creek was not detected in the Flint Ridge Drip Pit. Geophysical surveys were completed as part of a fieldclass in Fall 2008 to examine the effectiveness of various geophysical tools to locate known caves and survey portions of the site for possible caves. A report of the geophysical surveys has not been prepared.

Over the last year (Oct 2008-Sept 2009) due to lack of rainfall, no new activity in soil tracing, groundwater tracing, or runoff measurement occurred. The upper level cave drips in Flint Ridge dried within this period. The Tabor site was used for education of regulatory staff from various agencies on September 16 and October 28, 2009. Many of the agencies involved (including City of Austin, Texas Commission on Environmental Quality, Travis County, US Fish and Wildlife, Lower Colorado River Authority, Barton Springs/Edwards Aquifer Conservation District) play important roles in protecting Flint Ridge Cave. During the two trips, 43 attendants toured the Tabor tract and 24 of these toured the inside of Flint Ridge Cave. The field trips focused on recharge but included a component on cave invertebrate ecosystems, taught by cave biologists Dr. Jean Krejca and Mark Sanders.

Travis County

TC's BCP staff conducted quarterly monitoring on the following four pre-selected caves: Amber cave, McDonald cave, Kretschmarr Double Pit cave and Tooth cave. Faunal surveys in these four caves, with permitted TC biologists, were conducted in late Fall 2008, and Winter, Spring, and Summer 2009 (EXHIBIT A). Of special note during 2009 faunal surveys was the observation of one *Rhadine persephone* by BCP staff in Amber Cave in Spring 2009 (Table 4). Occurence of this listed endangered species represents a possible new record for this cave and is not listed in the BCCP EIS-HCP and BCCP 10a Permit. However, the *R. persephone* specimen was not collected and therefore this locale has not yet been confirmed by a species expert .

Annual faunal surveys have been rescheduled for the Fall season, and will be conducted in Fall 2009 (FY 2010) in all ten TC-owned BCCP caves with federally listed species: Amber cave, Gallifer cave, Kretschmarr cave, Kretschmarr Double Pit cave, McDonald cave, New Comanche Trail cave, North Root cave, Root cave, Tardus Hole, and Tooth cave.

In 2009, TC conducted quarterly cave cricket exit counts at Amber Cave, Gallifer Cave, Kretschmarr Cave, and Tooth Cave. TC staff also conducted annual cave cricket exit counts in August/September 2009 at McDonald Cave, Root Cave, North Root Cave, Kretschmarr Double Pit, Tardus Hole, and Geode Cave (EXHIBIT B).

In addition to managing the karst features required in the BCCP permit, TC is also voluntarily managing other karst features located on BCP land, including Geode Cave, Two Trunks Cave, Cactus Pit, Brew Pot Cave and karst features F11 and F12.

Table 4. Listed Endangered Species karst invertebrates found in TC managed caves by fiscal year.

Cave Name	2005	2007	2008	2009
Amber Cave	No listed species observed	No listed species observed	*T.reddelli* *T. texana*	**R. persephone* *T. reddelli*
Gallifer Cave	*N. myopica* *T. reyesi* **T. reddelli* *R. persephone*	*N. myopica* *T. reyesi* *T. reddelli* *R. persephone*	*N. myopica* *T. reyesi* *T. reddelli* *R. persephone*	No survey done
Kretschmarr Cave	No listed species observed	*T. reddelli*	No listed species observed	No survey done
Kretschmarr Double Pit	No survey done	*T. texana* *T. reyesi*	No listed species observed	*T. texana*
McDonald Cave	*T. reyesi*	*T. reyesi*	*T. reyesi*	*T. reyesi*
New Comanche Trail Cave	Not yet owned by TC	Not yet owned by TC	Not yet owned by TC	No survey done
North Root Cave	No survey done	*Neoleptoneta. sp.* - to be determined	No listed species observed	No survey done
Root Cave	No survey done	No listed species observed	No listed species observed	No survey done
Tardus Hole Cave	No survey done	**T. reddelli*	No listed species observed	No survey done
Tooth Cave	*T. reyesi* *T. reddelli*	*N. myopica* *T. reyesi* *T. reddelli* *R.. persephone*	*N. myopica* *T. reyesi* *R. persephone*	*N. myopica* *T. reyesi* *T. reddelli* *T. texana*

** new record (not previously observed in this location and not listed in BCCP EIS-HCP and 10a Permit)*

In 2009, TC issued a scientific research permit to Pierre Paquin, a senior scientist at SWCA Environmental Consultants, to determine if Leptonetidae spiders could be found outside the cave habitat, and if so, to identify those Leptonetidae to species level. Specimens were collected at Tooth Cave in November 2008, and used for morphological study using Scanning Electronic Microscopy (SEMs) and for DNA sequencing. Both methods resulted in determining that the species occurring on the surface of Tooth Cave is *Neoleptoneta devia*, a species which previously was treated as a troglobite endemic to McDonald Cave (Paquin pers com 2009; APPENDIX Q).

7.0 RECOMMENDATIONS

COA and TC should attempt to contact the owners of each privately-owned BCCP cave in order to assess current faunal assemblages and negotiate protection of these caves. The precise location of some of these privately owned caves is currently unknown, so therefore, the COA and TC should attempt to locate these caves in order to make a meaningful assessment. Additionally, there may be a need to substitute some of the privately owned caves listed on the BCCP permit for caves known to have listed species that have been found on COA, TC, or other BCCP partner lands since the permit was issued. During FY2010, COA and TC will continue evaluating the adequacy of protection of all of the 62 BCCP caves. If protection is not possible for one or more BCCP caves, USFWS will be consulted to evaluate whether any caves could potentially serve as a replacement.

Research needs, as indentified by the Recovery Plan for Endangered Karst Invertebrates in Travis and Williamson Counties, Texas (USFWS 1994), should be re-examined. Seasonal species richness and abundance should also be analyzed in order to determine trends in populations within the listed caves. Analyses of all faunal and cave cricket data to date would also be beneficial.

COA and TC should also synchronize faunal survey and cricket count methodology and timing, which will facilitate the ability to accurately compare BCCP cave data for seasonal trends in species richness and abundance.

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 2009.

Table 5. 2009 BCCP Karst Management Activities.
Adobe Springs Cave The Nature Conservancy
Airman's Cave City of Austin 1. Completed annual cave faunal survey (See EXHIBIT A). 2. There was yet another call for rescuing "lost spelunkers", however, this time the "lost" individuals were able to find their way out. 3. Worked with Austin Parks and Recreation and TCMA on putting together new signs for the cave. TCMA installed the signs. The first sign installed in the first room is a "caving etiquette" sign basically stating common sense rules to minimize damage to the cave and themselves. The second sign installed past the "newly" installed chain gate notifying visitors that access to this part of the cave requires a permit issued by

Table 5. 2009 BCCP Karst Management Activities.
TCMA. 4. TCMA installed a new chain gate at crucifixion rock (~1000' inside the cave), unfortunately soon after someone was able to breach the new gate. TCMA installed a new, stronger chain gate and lock but unfortunately it was breached once again. If this type of vandalism continues, it may be necessary to install a more traditional gate at the entrance of the cave. 5. The UT Spelological Society takes beginner cavers into this cave, teaching beginners the proper caving etiquette to safely access caves with minimal impacts. The UT grotto have met quite a few interested people on the way to the cave, and told them about the UT Grotto, many of which seemed interested, but none of them have actually showed up to a meeting. Last November, one of the guides witnessed a couple of boys crushing a tri-coloured bat with a rock. They also report the "usual" trash (water bottles, food wrappers, string, and candles which they remove from the cave.
Amber Cave Travis County 1. Conducted quarterly cricket exit surveys. (See EXHIBIT B). 2 .Performed 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 site for RIFA. 5. Conducted quarterly cave faunal surveys (see EXHIBIT A).
Armadillo Ranch Sink Private
Arrow Cave City of Austin 1. Completed annual cave faunal survey (See EXHIBIT A). 2. Conducted quarterly site inspections. City staff continue to deal with ongoing dumping problems from the adjacent neighborhood. 3. Inspected site for RIFA infestations. On all visits though fire ants were observed within close proximity of the cave (but not inside the cave). RIFA mounds were dormant due to the drought so no treatment was warranted.
Bandit Cave Private
Beard Ranch Cave (Featherman's Cave), City of Austin 1. Conducted quarterly site inspections. 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. Zara Environmental Inc. conducted one cave faunal survey as part of a contract with the City of Austin (an attempt to get a better understanding of the true distribution of our listed karst invertebrates) (See EXHIBIT A).
Bee Creek Cave 1. COA WPDRD and BCP staff took an accurate GPS location and briefly accessed the cave to determine the current status of the cave. No signs of vandalism or trespass were noted. It was important to determine an accurate gps location for this cave in order to accurately assess the level of protection defined by multiple parameters assessed through GIS. 2. WPDRD staff initiated contact with the property owner requesting access to the cave for assessment and cave faunal survey and access was unfortunately denied.
Blowing Sink Cave City of Austin 1. Inspected monthly and no signs of vandalism were found in the cave or to the cave entrance. 2. Inspected site for RIFA infestations. On all visits though fire ants were observed within close proximity of

Table 5. 2009 BCCP Karst Management Activities.
the cave (but not inside the cave). RIFA mounds were dormant due to the drought so no treatment was warranted. 3. Completed annual cave faunal survey (See EXHIBIT A). 4. Continued work on the "stabilization project", work is nearly completed, all by volunteer labor. 5. Deployed more salamander bait traps. 6. A section 6 grant was awarded to Paul Chippindale, Andy Gluesenkamp, and Nate Bendik to conduct molecular work with salamanders found in blowing sink and other sites: "To examine the status of newly discovered salamander populations in the Barton Springs Segment of the Edwards Aquifer using mitochondrial and nuclear DNA sequences, microsatellite markers, and allozymes and assess their relationships to the federally protected species *Eurycea sosorum* and *E. nana* over two years. 7. Permitted UT grad student to conduct CO2 monitoring research project. 8. Reviewed and commented on plan to expand Davis Ln, make certain that any negative impacts to the preserve be minimized.
Broken Arrow Cave City of Austin 1. Inspected quarterly with no sign of human visitation or vandalism. 2. Inspected site for RIFA infestations. On all visits though fire ants were observed within close proximity of the cave (but not inside the cave). RIFA mounds were dormant due to the drought so no treatment was warranted. 3. Completed annual cave faunal survey (See EXHIBIT A).
Buda Boulder Spring City of Austin 1. Visited the site twice and noted no new negative impacts to the spring.
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. This year, Reagents School requested from WPD educational tours for Cave X, as provided in the previous years, but we were unable to sufficiently address concerns about potential roundworm transmission from raccoon scat to the school's level of comfort, despite cleaning the entrance room of raccoon scat. It is hoped that cave resources can eventually be developed for public education that are safe, easily accessible, and sufficiently long for a cave immersion experience. 4. Regents staff conduct periodic surface inspections of the cave including gate and lock maintenance. 5. The City of Austin's WPDRD and BCP staff reviewed Regents School's proposal to "thin vegetation" within the setback area. After researching their proposal the work was approved since it was in compliance with FWS guidelines (GCWA bird clearance) and their karst management plan.
Cave Y City of Austin 1. Visited this cave 6 times and noticed no signs of vandalism to the cave or cave gate. 2. Inspected site for RIFA infestations. On all visits though fire ants were observed within close proximity of the cave (but not inside the cave). RIFA mounds were dormant due to the drought so no treatment was warranted. 3. Completed annual cave faunal survey(See EXHIBIT A). 4. Permitted UT grad student to conduct CO2 monitoring research project.
Ceiling Slot Cave Private
Cold Cave 1. TC is currently exploring the possibility of ownership and management of this 8 acre tract.

Table 5. 2009 BCCP Karst Management Activities.
Cotterell Cave City of Austin 1. Conducted quarterly site inspections, and found no RIFA at or near the cave. 2. RIFA were treated with boiling water, most of the ants were located at the parking lot, approximately 300 feet from the cave. 3. Conducted 3 cave faunal surveys and 3 cricket exit counts (See EXHIBIT A and B).
Disbelievers Cave Private 10a Permit: PRT-808694
District Park Cave City of Austin 1.BCP staff conducted three cave faunal surveys (See EXHIBIT A). 2. BCP staff and volunteers conducted 3 cave cricket exit counts (See EXHIBIT B). 3. Conducted site surveys quarterly, other than trash at the entrance no new major problems noted.. 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. (See Appendices for reference to this study) 7. Inspected site for RIFA infestations. On all visits though fire ants were observed within close proximity of the cave (but not inside the cave). RIFA mounds were dormant due to the drought so no treatment was warranted.
Eluvial Cave Private 10a Permit: PRT-808694
Flint Ridge Cave City of Austin 1. Conducted 6 site visits and noted no signs of illegal trespass. 2. TCMA initiated a study to help examine the recharge source for drips that may play an important function for cave ecosystem. In Sept 2006, UT Geological Sciences (Brian Cowan) installed new drip monitoring equipment and continued to maintain the monitoring with /WPDRD/TCMA support until July 2007. Brian installed a drip monitoring station for the Balcony Room in 2007. Several research trips were made in 2009 for this study. 3. Inspected site for RIFA infestations. On all visits, fire ants were observed within close proximity of the cave (including a few just inside the cave entrance). RIFA mounds were dormant due to the drought so no treatment was warranted. 4. Conducted three cave faunal surveys (See EXHIBIT A). Staff noted RIFA just inside the cave entrance. 5. BCP staff and volunteers conducted 3 cave cricket exit counts (See EXHIBIT B). 6. Nico Hauwert with the COA WPDRD passed his monitoring work onto Roger Glick (storm water monitoring specialist at WPDRD) on the surface catchment area of Flint Ridge cave. In 2009, the flow station was upgraded as described in the appendices. 7. Nico Hauwert (WPDRD hydrogeologist) led a field trip to the site regarding how to determine the level of sensitivity and needed protection for karst features, targeted audience was regulators. Part of the field trip included access to Flintridge cave.
Fossil Cave City of Austin 1. Inspected quarterly and there was no new signs of vandalism 2. Inspected for RIFA infestations. On all visits though fire ants were observed within close proximity of the "suspected" cave (but not inside the cave). RIFA mounds were dormant due to the drought so no treatment was warranted.

Table 5. 2009 BCCP Karst Management Activities.
Fossil Garden Cave Private 1. COA WPDRD and BCP staff took an accurate GPS location and briefly accessed the cave to determine the current status of the cave. No signs of vandalism or trespass were noted. It was important to determine an accurate gps location for this cave in order to accurately assess the level of protection defined by multiple parameters assessed through GIS.
Gallifer Cave Travis County 1. Performed 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 site for RIFA. 4. Conducted quarterly cricket exit surveys (See EXHIBIT B).
Get Down Cave TCMA 1. The annual Village of Western Oaks Karst Day was held in October 2008, providing a great opportunity to educate the public about the importance of karst ecosystems.
Goat Cave Karst Preserve City of Austin 1. Completed annual faunal survey (See EXHIBIT A). 2. Treated RIFA annually with boiling water. 3. With the help of volunteer stewards, conducted twice monthly site inspections, removed trash from preserve area and reported on anything out of the ordinary. 4. Allowed permitted access to this cave. 5. Replaced vandalized lock to gate and repaired vandalized gate and removed gang graffiti from informational signs. 6. Investigated illegal cutting of trees including a large live oak, staff addressed the damage and attempted to minimize the potential spread of oak wilt. 7. 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. 8. Reviewed and commented on plan to expand Davis Ln, make certain that any negative impacts to the preserve be minimized.
Hole-in-the-Road Cave Private 1. TCMA staff took an accurate GPS location. It was important to determine an accurate GPS location for this cave in order to accurately assess the level of protection defined by multiple parameters assessed through City of Austin's karst GIS database.
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

Table 5. 2009 BCCP Karst Management Activities.
Jest John Cave City of Austin 1. Conducted 2 site visits found and no signs of vandalism or human visitation. 2. Inspected site for RIFA infestations. On all visits though fire ants were observed within close proximity of the cave (including a few just inside the cave entrance). RIFA mounds were dormant due to the drought so no treatment was warranted. Also due to access issues, treatment would be impractical. 3. Conducted one cave faunal survey. (See EXHIBIT A).
Jester Estates Cave City of Austin 1. BCP staff conducted 6 site visits and noted fewer signs of illegally dumped brush and trash from neighbors. 2. Investigated a massive pool leak from an adjacent property owner and reported the incident to the City of Austin's Spill Response Team. Met with the property owner and determined that the leak had been fixed. The entire eastern half of the preserve was saturated, many trees including Ashe juniper and live oaks appeared to have been severely stressed by this ongoing leak, however, to date, only a few smaller junipers have died from this incident. The saturated area did reach the cave entrance, however, it is currently unknown what negative impacts that may have had to the cave fauna. Since, the leak was repaired by the homeowner; no action was taken with this individual. 3. Treated site twice for fire ants with boiling water. 4. Conducted one cave faunal survey (See EXHIBIT A).
Jollyville Plateau Cave Private 10a Permit: PRT-808694
Kretschmarr Cave Travis County 1.Performed surface inspections with no signs of vandalism to the cave entrance or in the cave. 2.Inspected site for RIFA. 3.Conducted quarterly cricket exit surveys (See EXHIBIT B).
Kretschmarr Double Pit Travis County 1. Performed surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Inspected site for RIFA. 3. Conducted annual cricket exit survey (See EXHIBIT B). 4. Conducted quarterly cave faunal surveys (See EXHIBIT A).
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. Conducted 2 site visits. 2. Conducted one cave faunal survey (See EXHIBIT A).
Lost Gold Cave Private

Table 5. 2009 BCCP Karst Management Activities.
Maple Run Cave City of Austin 1. Conducted one cave faunal survey (See EXHIBIT A). 2. With the help of volunteer stewards, conducted bi-monthly site inspections, removed trash from preserve area and reported on anything out of the ordinary. 3. Permitted UT grad student CO2 monitoring research project. (See Appendices for reference to this study) 4. Permitted access to this cave is allowed. 5. Treated site for RIFA with boiling water.
McDonald Cave Travis County 1. Performed surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Inspected site for RIFA. 3. Conducted annual cricket exit surveys (See EXHIBIT B). 4. Conducted quarterly cave faunal surveys (See EXHIBIT A).
McNeil Bat Cave Private 1. COA WPDRD staff took an accurate GPS location and briefly accessed the cave to determine the current status of the cave. No signs of vandalism or trespass were noted. It was important to determine an accurate gps location for this cave in order to accurately assess the level of protection defined by multiple parameters assessed through GIS.
Midnight Cave City of Austin 1. Conducted quarterly site inspections. 2. Conducted one cave faunal survey (See EXHIBIT A). 3. Inspected site for RIFA infestations. On all visits though fire ants were observed within close proximity of the cave (including a few just inside the cave entrance). RIFA mounds were dormant due to the drought so no treatment was warranted.
M.W.A. Cave Private 10a Permit: PRT-808694 (see FWS files for status)
Moss Pit Cave Private
New Comanche Trail Cave Travis County 1. Performed surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Inspected site for RIFA.
No Rent Cave Private
North Root Cave Travis County 1. 1. Perfomed surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. 2. Inspected site for RIFA. 3. 3. Conducted annual cricket exit survey (See EXHIBIT B).
Pennie's Cave Private 1 The entrance has been GPS located and dug-out to a depth of about five feet in 2008. 2. A new development plan is seeking approval for the site containing the cave. 3.The site plan calls for the cave entrance to be gated and boulders placed around the cave at the edge of a 300-ft buffer. 4.Additional excavation is needed to completely uncover the entrance and open the passage into cave, WPDRD is working with the land owner to protect the cave and re-establish the cave habitat.

Table 5. 2009 BCCP Karst Management Activities.
Pickle Pit Cave Section 7 Permit 2-15-93-F-075 (see USFWS files)
Pipeline Cave Private 1. A 2004 agreement between COA and Stratus set aside a fenced buffer around Pipeline cave that varies from 100 feet to the east and up to 300 feet west of the cave and an additional setback of 300 feet to the north and west; 150 ft to east and south for the adjacent feature known as Confusion Sink. 2. Met on site with Parks and Rec staff and SWCA consultants and had multiple email correspondence with these parties regarding a proposed new water line and trail that would be built in close proximity to the cave. Due to the potential for damage to this cave BCP and WPDRD staff recommended an alternative route that was accepted by the applicant and has been approved. WPDRD staff will monitor progress once construction starts to make certain all rules are followed and to minimize negative impacts to the cave.
Rolling Rock Cave City of Austin 1. Inspected quarterly, and no sign of human visitation or vandalism was found. 2. Inspected site for RIFA infestations. On all visits though fire ants were observed within close proximity of the cave (including a few just inside the cave entrance). RIFA mounds were dormant due to the drought so no treatment was warranted. 3. Conducted one cave faunal survey. (See EXHIBIT A).
Root Cave Travis County 1. Performed surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Inspected site for RIFA. 3. Conducted annual cricket exit survey (See EXHIBIT B).
Slaughter Creek Cave City of Austin 1. Conducted quarterly site inspections. City staff continue to deal with ongoing dumping problems from the adjacent neighborhood. BCP staff took GPS coordinates, photos and presented a report to Austin Parks and Recreation officials on the need to take action against these offenders. 2. Conducted one cave faunal survey. (See EXHIBIT A) 3. The entrance was inspected to make sure that no human access had occurred. 4. The site was also inspected for RIFA infestations. On all visits fire ants were observed within close proximity of the cave (including a few just inside the cave entrance). RIFA mounds were dormant due to the drought so no treatment was warranted. 5. Met on site with Parks and Rec staff and SWCA consultants and had multiple email correspondence with these parties regarding a proposed new water line and trail that would be built in close proximity to the cave. Due to the potential for damage to this cave BCP and WPDRD staff recommended an alternative route that was accepted by the applicant and has been approved. BCP and WPDRD staff will monitor progress once construction starts to make certain all rules are followed and to minimize negative impacts to the cave.
Spanish Wells Cave Private (location unknown)
Spider Cave City of Austin 1. Conducted four site visits, and no sign of human access or vandalism was found. 2. Inspected site for RIFA infestations. On all visits fire ants were observed within close proximity of the cave (including a few just inside the cave entrance). RIFA mounds were dormant due to the drought so no treatment was warranted. 3.Conducted three cave faunal surveys (See EXHIBIT A). 4. BCP staff with the help of volunteers conducted 3 cave cricket exit counts. (See EXHIBIT B).

Table 5. 2009 BCCP Karst Management Activities.
Stark's North Mine Private
Stovepipe Cave 1. Conducted 6 site inspections, and continued to remove old trash from the preserve. 2. Repaired perimeter fence. 3. Treated site for RIFA with boiling water. 4. Conducted one cave faunal survey (See EXHIBIT A).
Talus Springs Cave Private 1.The USFWS 10a permit PRT 815447 mitigation requirement intended this cave to go to TC, however, the cave is located on private land just outside of the mitigation area. TC has continued requesting that the homeowners association donate the land to TC; Coordinated management with them. 2. Performed surface inspections with no signs of vandalism to the cave entrance or in the cave.
Tardus Hole Cave (Kretschmarr Fluted Sink) Travis County 1. Performed surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Conducted annual cricket exit survey (See EXHIBIT B).
Tooth Cave Travis County 1. Performed surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Inspected site for RIFA. 3. Conducted quarterly cricket exit surveys (See EXHIBIT B). 4. Conducted quarterly cave faunal surveys (See EXHIBIT A). 5. BCP staff accompanied Pierre Paquin for surface collection of Leptonetidae spiders.
Whirlpool Cave TCMA

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EXHIBIT A:

KARST FAUNAL REPORTS
CITY OF AUSTIN (21 REPORTS)
TRAVIS COUNTY (4 REPORTS)
ZARA ENVIRONMENTAL INC. (2 REPORTS)

EXHIBIT A Symbols Key:

Red Bold** = Endangered species
Black Bold* = Species of Concern
[1] Non-BCCP cave

Observers:
BR = Bill Reiner
JC = John Chenowith
KMD = Krista McDermid
KN = Kelly Nesvacil
KOC = Kathleen O'Connor
KT = Kevin Thuesen
MS = Mark Sanders
NH = Nico Hauwert
PF = Paul Fushille
PS = Peter Sprouse
RB = Rachel Barlow
SZ = Saj Zappitello
TB = Todd Bayless

Airman's Cave (COA) (#4308)	Faunal Survey Dates (FY 09) 11/24/2008
Observers	MS, RB
Humidity (%)	90-98
Temperature (deg C)	18-21
Total Time spent (mins)	172
Ceuthophilus	49
Ceuthophilus cunicularis	2
Cicurina	1
Collembola	6
Culicidae	38
Lepidoptera	1
Centruroides	1
Cicurina bandida*	10
Cicurina varians	6
Diplopoda	1
Eidmannella	3
Eidmannella pallida	6
Mycetophilidae	11
Plethodon albagula	2
Solenopsis invicta	None
Speodesmus bicornourus	3
Tartarocreagris	1
Texoreddellia texensis	1

Amber Cave (Travis County) (#4324)	Faunal Survey Dates (FY 09)			
	11/12/2008	1/21/2009	5/4/2009	9/3/2009
Observers	KOC, RB	KOC, MS	KOC, MS, TB	TB, MS
Humidity (%)	95-100	100	97	94-100
Temperature (deg C)	23	19-20	22	23-25
Total time spent (mins)	72	87	77	91
Acari			1	
Achaearanea porteri	3			5
Araneae		1	2	100
Cambala speobia	24	28	22	94
Ceuthophilus cunicularis	4			
Ceuthophilus cunicularis Subadult	2	1		
Ceuthophilus Nymph	2	12	10	7
Ceuthophilus secretus	53	21		48
Ceuthophilus secretus Nymph		1		9
Ceuthophilus secretus Subadult	5	7		2
Ceuthophilus SP B		8	4	
Ceuthophilus Subadult		7	2	3
Cicurina	2	6	2	
Cicurina travisae*	20	24	22	17
Cicurina varians	10		7	4
Coleoptera	2	2		
Collembola	32	48	98	138
Culicidae	1		1	
Diptera (Midge/Fly)	2		1	3
Eidmannella		3	6	
Eidmannella reclusa*	6			
Eleutherodactylus marnockii			4	1
Formicidae		17		
Gastropoda	26			
Haplotaxida			2	
Helicodiscus eigenmanni		17	14	4
Leiobunum townsendii			3	
Mycetophilidae			3	1
Oxidus gracilis			1	
Plethodon albagula	14	1		
Pseudouroctonus reddelli		1		1
Rhadine persephone			1	
Rhadine sp.		1		
Scutigera	1			
Solenopsis invicta	None	None	None	None
Speodesmus*		25	23	87
Speodesmus bicornourus	11			
Staphylinidae	2	2	1	1
Symphylan	3	2		1
Tartarocreagris		3	1	
Tartarocreagris reddelli*	1			
Texamaurops reddelli*	1			

Arrow Cave (City of Austin) (#4311)	Faunal Survey Dates (FY 09)
	2/6/2009
Observers	KOC, MS
Humidity (%)	92-98
Temperature (deg C)	18-19
Total time spent (mins)	84
Araneae	45
Cambala speobia	5
Ceuthophilus cunicularis	3
Ceuthophilus cunicularis Subadult	1
Ceuthophilus Nymph	~55
Ceuthophilus SP B	12
Ceuthophilus Subadult	~250
Cicurina	5
Cicurina bandida*	1
Cicurina varians	22
Collembola	1
Helicodiscus eigenmanni	4
Mycetophilidae	~50
Oniscidea	~200
Solenopsis invicta	None
Staphylinidae	1

Beard Ranch Cave[1] (Zara Environmental) (#4295)	Faunal Survey Dates (FY 09)
	8/31/2009
Observers	PS, SZ, KMD, KOC
Humidity (%)	50
Temperature (deg C)	25
Total time spent (mins)	1
Araneae	3
Cambala speobia	1
Ceuthophilus secretus	~1
Chilopoda	1
Cicurina varians	5
Collembola	2
Diptera (Midge/Fly)	1
Eleutherodactylus marnockii	1
Formicidae	1
Leiobunum townsendii	~1
Lepidoptera	1
Texella reyesi	1

Blowing Sink Cave (City of Austin) (#4313)	Faunal Survey Dates (FY 09)	
	10/9/2008	8/30/2009
Observers	MS, KOC	MS
Total time spent (mins)	930	240
Cambala speobia	4	
Ceuthophilus cunicularis Subadult	3	
Ceuthophilus Nymph	23	10
Ceuthophilus secretus	1	12
Ceuthophilus Subadult		12
Cicurina bandida*	10	6
Collembola	~500	
Plethodon albagula	3	
Solenopsis invicta	None	None
Speodesmus*	12	~25
Stygobromus	~30	~25

Broken Arrow Cave (City of Austin) (#4296)	Faunal Survey Dates (FY 09) 1/27/2009
Observers	KN, MS
Humidity (%)	98
Temperature (deg C)	17
Total time spent (mins)	74
Agyneta llanoensis	53
Blattodea (Blattaria)	1
Cambala speobia	93
Ceuthophilus cunicularis	1
Ceuthophilus Nymph	13
Ceuthophilus SP B	10
Ceuthophilus Subadult	15
Cicurina blind	7
Collembola	~126
Diplopoda	1
Haplotaxida	3
Mycetophilidae	8
Oniscidea	1
Solenopsis invicta	None
Speodesmus*	15

Cave Y (City of Austin) (#4315)	Faunal Survey Dates (FY 09) 1/26/2009
Observers	MS, BR
Total time spent (mins)	110
Humidity (%)	95
Temperature (deg C)	16
Achaearanea porteri	12
Centruroides	1
Ceuthophilus cunicularis	3
Ceuthophilus Nymph	7
Ceuthophilus SP B	10
Ceuthophilus Subadult	14
Cicurina	2
Cicurina bandida*	2
Cicurina varians	12
Collembola	2
Lepidoptera	1
Mycetophilidae	7
Pseudouroctonus reddelli	1
Reduviidae	2
Solenopsis invicta	None
Speodesmus*	4

Cotterell Cave (City of Austin) (#4297)	Faunal Survey Dates (FY 09)		
	1/27/2009	4/22/2009	8/21/2009
Observers	KN, MS	MS, KN, RB	KN, MS
Humidity (%)	98	93-94	91-97
Temperature (deg C)	14-16	19	21-22
Total time spent (mins)	195	266	165
Araneae			2
Armadillidiidae			6
Bufo nebulifer		1	1
Cambala speobia	2	10	3
Campodeidae		1	
Centruroides	1		
Ceuthophilus cunicularis	1	2	
Ceuthophilus Nymph	13	17	29
Ceuthophilus secretus		2	12
Ceuthophilus SP B	21	15	
Ceuthophilus Subadult	5	10	13
Chilopoda	1		
Cicadellidae		3	
Cicurina	4	3	5
Cicurina elliotti*	22	27	70
Cicurina varians	1	3	4
Coleoptera		2	
Collembola	22	38	24
Culicidae			2
Eidmannella	2	4	
Eleutherodactylus marnockii		1	3
Gastropoda	3	2	
Haplotaxida		2	3
Helicodiscus eigenmanni		3	5
Lycosidae	1		
Mycetophilidae	4	1	20
Plethodon albagula	19	8	1
Pseudouroctonus reddelli	6	2	2
Rana berlandieri	1		
Solenopsis invicta	None	None	None
Speodesmus*			2
Speodesmus bicornourus	14	14	9
Staphylinidae			2
Tartarocreagris	1	1	2
Texella Juvenile			2
Texella reyesi*	5	2	7

District Park Cave (City of Austin) (#4316)	Faunal Survey Dates (FY 09)		
	1/23/2009	4/17/2009	8/19/2009
Observers	MS, KOC	MS, KOC	MS, JC
Humidity (%)	91-97	92-97	85-90
Temperature (deg C)	19	18-19	22-25
Total time spent (mins)	88	108	48
Acari			1
Cambala speobia	11	26	12
Ceuthophilus Nymph	15	21	16
Ceuthophilus secretus		4	62
Ceuthophilus secretus Subadult		12	
Ceuthophilus SP B	7	1	
Ceuthophilus Subadult	6	12	5
Cicurina	5		
Cicurina bandida*	14	23	6
Cicurina varians			2
Collembola	2	5	4
Diptera (Midge/Fly)		2	
Lepidoptera		1	1
Mycetophilidae	1		1
Solenopsis invicta	None	None	None
Speodesmus*	1	1	
Texella mulaiki	1	1	
Texoreddellia texensis	1	1	

Dun Vegan Dungeon Cave (City of Austin) (#4383)	Faunal Survey Dates (FY 09)
	1/8/2009
Observers	MS, NH, KT
Temperature (deg C)	19
Total time spent (mins)	34
Achaearanea porteri	2
Armadillidium	1
Ceuthophilus cunicularis	2
Ceuthophilus Nymph	14
Ceuthophilus SP B	4
Cicurina	12
Cicurina bandida*	7
Cicurina varians	28
Helicodiscus eigenmanni	16
Lepidoptera	6
Perimyotis subflavus	19
Plethodon albagula	1
Pseudouroctonus reddelli	4
Solenopsis invicta	None

Flint Ridge Cave (City of Austin) (#4317)	Faunal Survey Dates (FY 09)		
	1/23/2009	5/1/2009	8/19/2009
Observers	KOC, MS	RB, KOC, MS	TB, JC, MS
Humidity (%)	88-97	90-100	90-97
Temperature (deg C)	20-21	21	22
Total time spent (mins)	168	231	126
Cambala speobia	2		
Campodeidae	1		1
Ceuthophilus cunicularis	1	1	2
Ceuthophilus cunicularis Subadult		4	
Ceuthophilus Nymph	57	7	8
Ceuthophilus secretus			8
Ceuthophilus secretus Subadult		1	
Ceuthophilus SP B	2	5	
Ceuthophilus Subadult	15	3	3
Cicurina	4	3	
Cicurina bandida*	45	48	20
Cicurina varians	2	1	6
Coleoptera		2	
Collembola	105	144	44
Eidmannella			1
Eleutherodactylus marnockii			1
Formicidae	2		
Helicodiscus eigenmanni	6	2	1
Lepidoptera	1	1	
Mycetophilidae	8		4
Pseudouroctonus reddelli	2	3	
Solenopsis invicta	None	None	None
Speodesmus*	73	143	123
Staphylinidae	8	4	

Goat Cave (City of Austin) (#4318)	Faunal Survey Dates (FY 09)
	1/30/2009
Observers	KOC, MS
Humidity (%)	99-100
Temperature (deg C)	13-16
Total time spent (mins)	108
Abacion texense	~100
Araneae	15
Ceuthophilus Nymph	6
Ceuthophilus SP B	6
Ceuthophilus Subadult	12
Cicurina bandida*	4
Cicurina varians	3
Coleoptera	4
Diplopoda	1
Gastropoda	3
Haplotaxida	5
Lepidoptera	1
Mycetophilidae	6
Plethodon albagula	11
Speodesmus*	1
Staphylinidae	1

Jest John Cave (City of Austin) (#4299)	Faunal Survey Dates (FY 09)
	9/18/2009
Observers	KOC, MS
Humidity (%)	99
Temperature (deg C)	22
Total time spent (mins)	156
Achaearanea porteri	4
Agyneta llanoensis	20
Cambala speobia	92
Ceuthophilus Nymph	80
Ceuthophilus secretus	~160
Ceuthophilus SP B	1
Ceuthophilus Subadult	53
Cicurina	5
Cicurina blind	25
Cicurina varians	13
Coleoptera	2
Collembola	~290
Diptera (Midge/Fly)	3
Helicodiscus eigenmanni	1
Leiobunum townsendii	~200
Lepidoptera	2
Mycetophilidae	11
Solenopsis invicta	None
Speodesmus*	18
Staphylinidae	1
Symphylan	1
Texella Juvenile	1
Texella reddelli*	11
Texoreddellia texensis	1

Jester Estates Cave (City of Austin) (#4300)	Faunal Survey Dates (FY 09)
	9/18/2009
Observers	KOC, MS
Humidity (%)	100
Temperature (deg C)	22
Total time spent (mins)	45
Acari	3
Achaearanea porteri	1
Araneae	1
Bufo nebulifer	2
Cambala speobia	9
Ceuthophilus SP B	1
Ceuthophilus Subadult	3
Cicurina blind	3
Collembola	39
Helicodiscus eigenmanni	1
Neoleptoneta	13
Oniscidea	2
Pheidole	3
Solenopsis invicta	None
Speodesmus*	16
Tartarocreagris reddelli*	1
Texella reddelli*	3

Kretschmarr Double Pit (Travis County) (#4327)	Faunal Survey Dates (FY 09)		
	1/21/2009	5/4/2009	8/10/2009
Observers	KOC, MS	TB, MS, KOC	TB, KOC
Humidity (%)	90	93	100
Temperature (deg C)	13	19	22-26
Total time spent (mins)	63	80	102
Pseudouroctonus reddelli			1
Achaearanea porteri	5	6	5
Araneae	1		3
Cambala speobia		3	2
Carabidae			3
Ceuthophilus cunicularis Subadult			1
Ceuthophilus secretus			5
Cicurina			1
Cicurina travisae*	2	7	3
Collembola	1	23	8
Diptera (Midge/Fly)			1
Eidmannella			3
Eleutherodactylus marnockii		2	2
Gastropoda			1
Haplotaxida		1	
Helicodiscus eigenmanni	1	3	6
Lepidoptera			1
Mycetophilidae	2	3	
Plethodon albagula		1	
Solenopsis invicta	None	None	None
Speodesmus*			2
Symphylan		1	
Tartarocreagris texana*		1	
Texoreddellia texensis		1	

Little Bee Creek Cave (City of Austin) (#4302)	Faunal Survey Dates (FY 09)
	5/22/2009
Observers	MS, JC
Humidity (%)	81-96
Temperature (deg C)	23
Total time spent (mins)	76
Araneae	1
Cambala speobia	25
Ceuthophilus secretus	15
Cicurina bandida*	4
Collembola	12
Culicidae	7
Eidmannella	3
Leiobunum townsendii	36
Mycetophilidae	43
Reduviidae	1
Solenopsis invicta	None
Texella reddelli*	1

Maple Run Cave (City of Austin) (#4319)	Faunal Survey Dates (FY 09)
	9/29/2009
Observers	JC, MS
Humidity (%)	95-99
Temperature (deg C)	22
Total time spent (mins)	52
Araneae	1
Cambala speobia	1
Ceuthophilus Nymph	4
Ceuthophilus Subadult	1
Cicurina bandida*	1
Pseudouroctonus reddelli	1
Solenopsis invicta	None
Speodesmus*	1
Texella mulaiki	1

McDonald Cave	Faunal Survey Dates (FY 09)			
(Travis county) (#4328)	11/11/2008	1/21/2009	5/6/2009	9/3/2009
Observers	KOC, PF	KOC, MS, PF	PF, KOC	TB, PF, MS
Humidity (%)	77-100	90-100	100	94-97
Temperature (deg C)	205-216	16-17	19	23
Total time spent (mins)	93	124	118	121
Acari				5
Achaearanea porteri	6			
Araneae		2	3	120
Cambala speobia	6	4	1	11
Ceuthophilus				3
Ceuthophilus cunicularis Subadult	1			
Ceuthophilus Nymph			3	6
Ceuthophilus secretus			3	7
Ceuthophilus secretus Adult	1			
Ceuthophilus Subadult		1	1	11
Cicurina	11	12	7	7
Cicurina travisae*	7	7	19	9
Cicurina varians				4
Collembola		1	7	18
Culicidae	5	1	4	
Diptera (Midge/Fly)	1		1	2
Eidmannella		19	6	9
Eidmannella reclusa*	5			
Eleutherodactylus marnockii	1	1		
Helicodiscus eigenmanni		3		2
Lepidoptera		3	3	2
Mycetophilidae		2		
Neoleptoneta		3		5
Neoleptoneta devia*	7		4	
Plethodon albagula	2			
Procyon lotor				1
Pselaphinae	1			
Pseudouroctonus reddelli	3	1	2	
Solenopsis invicta	None	None	None	Light-Heavy
Speodesmus*		8	3	7
Speodesmus bicornourus	1			1
Tartarocreagris reddelli*				2
Texella reyesi	1	1	1	2
Texoreddellia texensis		1	1	

Midnight Cave (City of Austin) (#4320)	Faunal Survey Dates (FY 09) 2/6/2009
Observers	RB, MS, KOC
Humidity (%)	92
Temperature (deg C)	21
Total time spent (mins)	93
Armadillidiidae	1
Batrisodes	1
Cambala speobia	52
Ceuthophilus cunicularis	16
Ceuthophilus Nymph	51
Ceuthophilus SP B	31
Ceuthophilus Subadult	188
Cicurina	3
Cicurina bandida*	19
Cicurina varians	5
Collembola	~235
Eidmannella	4
Haplotaxida	4
Helicodiscus eigenmanni	37
Mycetophilidae	9
Oniscidea	2
Oxidus gracilis	4
Solenopsis invicta	None
Speodesmus*	4
Symphylan	1
Texoreddellia texensis	3

Pond Party Pit[1] **(Zara Environmental) (#4304)**	Faunal Survey Dates (FY 09) 8/31/2009
Observers	PS, SZ, KMD, KOC
Humidity (%)	50
Temperature (deg C)	25
Total time spent (mins)	0
Acari	2
Araneae	3
Cambala speobia	3
Ceuthophilus	1
Collembola	5
Diplopoda	2
Diptera (Midge/Fly)	1
Eidmannella	1
Eleutherodactylus marnockii	1
Formicidae	3
Gastropoda	1
Helicodiscus eigenmanni	1
Leiobunum townsendii	2
Reduviidae	1
Speodesmus*	3
Staphylinidae	2
Tartarocreagris	1
Texella reyesi **	1
Texoreddellia texensis	1

Rolling Rock Cave (City of Austin) (#4305)	Faunal Survey Dates (FY 09)
	1/27/2009
Observers	KN, MS
Humidity (%)	96
Temperature (deg C)	13
Total time spent (mins)	59
Agyneta llanoensis	7
Ceuthophilus Nymph	5
Ceuthophilus SP B	9
Ceuthophilus Subadult	8
Cicurina	1
Collembola	~55
Plethodon albagula	1
Rana berlandieri	1
Solenopsis invicta	None
Staphylinidae	1

Seibert Sink (City of Austin) (#4321)	Faunal Survey Dates (FY 09)
	1/26/2009
Observers	BR, MS
Humidity (%)	95
Temperature (deg C)	18
Total time spent (mins)	110
Araneae	4
Blattodea (Blattaria)	1
Ceuthophilus Nymph	6
Ceuthophilus Subadult	4
Cicurina bandida*	2
Cicurina varians	3
Culicidae	1
Diplopoda	1
Eleutherodactylus marnockii	1
Gastropoda	5
Helicodiscus eigenmanni	3
Mycetophilidae	3
Plethodon albagula	4
Pseudouroctonus reddelli	4
Solenopsis invicta	None

Slaughter Creek Cave (City of Austin) (#4323)	Faunal Survey Dates (FY 09)
	2/6/2009
Observers	KOC, MS
Humidity (%)	88-97
Temperature (deg C)	19-20
Total time spent (mins)	122
Cambala speobia	2
Centruroides	4
Ceuthophilus cunicularis	7
Ceuthophilus cunicularis Subadult	4
Ceuthophilus Nymph	42
Ceuthophilus SP B	7
Ceuthophilus Subadult	18
Cicurina bandida*	7
Cicurina varians	20
Collembola	53
Formicidae	6
Helicodiscus eigenmanni	1
Lepidoptera	6
Mycetophilidae	4
Plethodon albagula	1
Solenopsis invicta	None
Speodesmus*	1

Spider Cave (City of Austin) (#4306)	Faunal Survey Dates (FY 09)		
	1/27/2009	4/22/2009	8/21/2009
Observers	KN, MS	KN, MS	MS, KN
Humidity (%)	97	86	88
Temperature (deg C)	16	22	25
Total time spent (mins)	44	54	62
Cambala speobia		2	2
Ceuthophilus cunicularis		1	
Ceuthophilus Nymph	2	5	3
Ceuthophilus secretus		2	1
Ceuthophilus SP B		3	
Ceuthophilus Subadult	2	3	5
Chilopoda			1
Cicurina		1	
Cicurina blind	6	32	23
Cicurina varians	3	1	1
Collembola	6	56	~20
Culicidae		1	
Eidmannella		1	2
Eleutherodactylus marnockii		1	
Helicodiscus eigenmanni			1
Leiobunum townsendii		10	~1000
Lepidoptera	1		
Mycetophilidae		2	8
Oniscidea			1
Rhadine persephone **			4
Solenopsis invicta	None	None	None
Speodesmus*			4
Staphylinidae	1		2

Stovepipe Cave (City of Austin) (#4307)	Faunal Survey Dates (FY 09)
	9/18/2009
Observers	MS, KOC
Humidity (%)	98
Temperature (deg C)	22
Total time spent (mins)	118
Cambala speobia	26
Ceuthophilus cunicularis	2
Ceuthophilus Nymph	9
Ceuthophilus secretus	7
Ceuthophilus SP B	1
Ceuthophilus Subadult	3
Cicurina	1
Cicurina blind	3
Cicurina varians	1
Collembola	~235
Eidmannella	2
Eidmannella reclusa*	3
Gastropoda	1
Haplotaxida	3
Helicodiscus eigenmanni	3
Leiobunum townsendii	~200
Mycetophilidae	1
Neoleptoneta	4
Oniscidea	2
Rhadine persephone	1
Solenopsis invicta	None
Speodesmus*	~75
Staphylinidae	1
Tartarocreagris	2
Texamaurops reddelli	1
Texella reyesi	3
Trichoniscinae NS*	7

Testudo Tube Cave (City of Austin) (#4308)	**Faunal Survey Dates (FY 09)**
	9/14/2009
Observers	MS
Total time spent (mins)	135
Cambala speobia	~35
Ceuthophilus Nymph	12
Ceuthophilus secretus	~100
Ceuthophilus Subadult	35
Cicurina blind	7
Solenopsis invicta	None
Speodesmus*	12
Sphalloplana	6
Stygobromus	25

Tooth Cave (Travis County) (#4332)	**Faunal Survey Dates (FY 09)**			
	11/12/2008	1/29/2009	5/14/2009	9/3/2009
Observers	KOC, PF, RB	KOC, MS, PF	TB, PF, KOC	PF, MS, TB
Humidity (%)	95-99	97	81-93	94-97
Temperature (deg C)	18-22	19	20-22	23-25
Total time spent (mins)	168	221	164	252
Acari			1	
Achaearanea porteri	1			7
Bufo nebulifer	2			1
Cambala speobia	8	7	15	17
Centruroides	1	1		
Ceuthophilus cunicularis	3			
Ceuthophilus cunicularis Subadult	7		4	
Ceuthophilus Nymph	46	21	5	12
Ceuthophilus secretus Subadult	3			
Ceuthophilus secretus	27	12	4	80
Ceuthophilus Subadult		13	10	14
Chilopoda		2		
Cicurina	3	16	54	5
Cicurina travisae*	11	42	11	14
Cicurina varians	24	6	4	8
Coleoptera	1	2		
Collembola	50	105	73	134
Culicidae		>10	5	
Diplopoda		1		
Diptera (Midge/Fly)	11	1	1	6
Eidmannella		1		
Eidmannella reclusa*	1	1	3	
Eleutherodactylus marnockii		2	7	12
Helicodiscus eigenmanni	16	23	79	14
Lepidoptera	7	4	5	7
Mycetophilidae	1	11	11	4
Neoleptoneta			1	
Neoleptoneta myopica	6	14	1	5
Plethodon albagula	64		3	
Pseudouroctonus reddelli	9	7	1	
Solenopsis invicta	None	None	None	Light-Moderate
Speodesmus*			2	1
Speodesmus bicornourus	3	1		
Staphylinidae	3	2		
Symphylan	1	1		1
Tartarocreagris texana*		1		
Texamaurops reddelli*			2	
Texella reyesi*	36	25	21	16
Texoreddellia texensis			1	

EXHIBIT B:

CRICKET COUNT DATA REPORTS
CITY OF AUSTIN (4 CAVES)
TRAVIS COUNTY (10 CAVES)

CRICKET COUNT DATA REPORTS

City of Austin Caves:

Surveyed Caves	January 2009				April 2009				August 2009			
	N:	J:	A:	TI:	N:	J:	A:	TI:	N:	J:	A:	TI:
Cotterell Cave	600	219	27	846	660	56	7	723	436	36	5	477
District Park Cave	464	239	1	704	414	50	232	696	53	58	277	388
Flintridge Cave	108	23	7	138	179	22	53	254	138	56	102	296
Spider Cave	4	0	0	4*	50	17	19	86	5	13	54	72

* very cold night, high of 49 F, low of 37 F.

Travis County Caves:

Surveyed Caves	November 2008				February 2009				April 2009				August/September 2009			
	N:	J:	A:	TI:	N:	J:	A:	TI:	N:	J:	A:	TI:	N:	J:	A:	TI:
Amber Cave	5	10	1	16	74	22	25	121	67	15	2	84	83	56	71	210
Gallifer Cave	4	10	15	29	1	10	15	26	17	9	4	30	26	29	77	132
Geode Cave	--	--	--	n/a	--	--	--	n/a	--	--	--	n/a	0	6	17	23
Kretschmarr Cave	7	2	11	20	4	20	5	29	16	4	0	20	7	4	10	21
Kretschmarr Dbl Pit Cave	19	16	14	49	--	--	--	n/a	--	--	--	n/a	1	4	2	7
McDonald Cave	--	--	--	n/a	--	--	--	n/a	--	--	--	n/a	1	1	14	16
Root Cave	--	--	--	n/a	--	--	--	n/a	--	--	--	n/a	10	1	4	15
North Root Cave	--	--	--	n/a	--	--	--	n/a	--	--	--	n/a	2	5	6	13
Tardus Hole Cave	0	0	0	0	--	--	--	n/a	--	--	--	n/a	0	1	6	7
Tooth Cave	4	1	9	14	50	13	0	63	59	15	4	78	5	0	1	6