Balcones Canyonlands Preserve
Karst Monitoring and Management
FY 2025 Annual Report



This annual report is dedicated to Jose (Marcelino) Reyes Gómez who made numerous biological collections throughout Texas and Mexico, discovering many new rare and endangered karst invertebrates including species found on the BCP
December 17, 1956 – September 30, 2024

Travis County
Department of Transportation and Natural Resources
Natural Resources and Environmental Quality Division
and
City of Austin Balcones Canyonlands Preserve – Austin Water (AW)

October 1, 2024 – September 30, 2025

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EXHIBIT A: KARST FAUNAL SURVEY REPORTS: 91
TRAVIS COUNTY (38 REPORTS)
CITY OF AUSTIN (66 REPORTS)

EXHIBIT B: CAVE CRICKET EXIT COUNT DATA REPORTS: 98
TRAVIS COUNTY (21 REPORTS)
CITY OF AUSTIN (41 REPORTS)

1.0 REGIONAL PERMIT

There are six species of endangered karst invertebrates (ES; Table 1) and 25 karst species of concern (SOC; Table 2) 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 (USFWS 1996a). 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 36 endangered species caves and 26 additional caves that support SOC, for a total of 62 karst features (60 caves, one mine and one karst spring). Several of these karst features occur in clusters, identified in the Regional Permit's associated Habitat Conservation Plan/Environmental Impact Statement (HCP/EIS) as the Four Points, McNeil, and Northwood cave clusters (USFWS 1996b). As of Fiscal Year 2025, (FY25), 52 of the 62 BCCP karst features have some form of formal protection on properties owned and managed by COA, TC, and BCCP partners, Texas Cave Management Association (TCMA), as well as private mitigation lands.

Table 1. Federally Listed Karst Species Covered by the BCCP
Footnotes follow table.

Common Name	Scientific Name
Tooth Cave pseudoscorpion	*Tartarocreagris texana*
Tooth Cave spider	*Tayshaneta myopica*[1]
Tooth Cave ground beetle	*Rhadine persephone*
Kretschmarr Cave mold beetle	*Texamaurops reddelli*
Bee Creek Cave harvestman	*Texella reddelli*
Bone Cave harvestman	*Texella reyesi*

[1] *Tayshaneta myopica* is listed in the regional permit as *Neoleptoneta myopica*, but a 2012 study revised the genus *Neoleptoneta,* thus identifying this species in the genus *Tayshaneta* (Campbell et al. 2012).

Table 2. Karst Species of Concern Covered by the BCCP

Footnotes follow table.

Common Name	Scientific Name
Flatworm	*Sphalloplana mohri*
Ostracod	*Candona* sp. nr. s*tagnalis*
Isopod	*Caecidotea reddelli*
Isopod	*Trichoniscinae N. S.*
Isopod	*Miktoniscus N. S.*
Spider	*Cicurina bandida*
Spider	*Cicurina cueva*
Spider	*Cicurina ellioti*
Spider	*Cicurina reddelli*
Spider	*Cicurina reyesi*
Spider	*Cicurina travisae*
Spider	*Cicurina wartoni*
Spider	*Tayshaneta concinna*[1]
Spider	*Tayshaneta devia*[1]
Spider	*Eidmannella reclusa*
Pseudoscorpion	*Aphrastochthonius* N. S.
Pseudoscorpion	*Tartarocreagris comanche*[2]
Pseudoscorpion	*Tartarocreagris reddelli*
Pseudoscorpion	*Tartarocreagris intermedia*
Pseudoscorpion	*Tartarocreagris* N. S. 3
Harvestman	*Texella spinoperca*
Millipede	*Speodesmus* N. S
Ground Beetle	*Rhadine s. subterranea*
Ground Beetle	*Rhadine s. mitchelli*
Ground Beetle	*Rhadine austinica*

[1] *Tayshaneta concinna* and *Tayshaneta devia* are listed in the regional permit with the genus *Neoleptoneta*, but a 2012 study revised the genus *Neoleptoneta,* thus identifying these species in the genus *Tayshaneta* (Campbell et al. 2012).

[2] *Tartarocreagris comanche* is improperly listed in the regional permit as the New Comanche Trail Cave harvestman.

2.0 CAVE MANAGEMENT SUMMARY

This annual report covers the fiscal year 10/01/24 - 9/30/25 (FY25). In FY25, 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 (see Tables 3 and 5 for species localities).

Of the 62 BCCP permit caves, a total of 24 are still in the hands of private landowners and 38 are formally protected on the BCP. Of the 24 that are privately owned, four caves (Cave X, Cold Cave, Pennie's, and Pipeline) have protection agreements that include development setbacks from the cave entrance. TC BCP also conducts species monitoring for the privately owned Cold Cave for the Preston Oaks HOA, and Zara Environmental conducts species monitoring and management for the privately owned Pennie's Cave for the Oak Point Real Estate Group. As of May 4, 2021, the City of Austin BCP finalized a Cave Management Agreement (CMA) with TCMA, this agreement spells out the responsibilities of both parties for managing, monitoring and protecting Lost Oasis and Whirlpool Caves. This CMA is set to expire on May 4, 2026 and thus needs to be renewed by both parties prior to that date. Also, in February 2020, AW BCP purchased the 4.7-acre lot that encompasses most of Whirlpool Cave, including the Travis County Room. This brings the total to 52 caves that are afforded some level of protection or monitoring, and nine (Armadillo Ranch Cave, Bandit Cave, Bee Creek Cave, Ceiling Slot, Fossil Garden Cave, Hole-In-The-Road Cave, Jacks Joint, McNeil Bat Cave and Moss Pit) that are still unprotected, and it is unclear what management activities are conducted, if any at these nine caves. Lost Gold Cave had development setbacks but is considered unprotected and negatively impacted since the owner has removed the buffer fencing, cleared vegetation in the surface catchment area, and installed infrastructure within the surface catchment area years ago and was granted an administrative variance by the City Environmental Officer to allow these negative impacts to remain in place and so therefore, the cave will not be restored.

It should be noted that some of these protected caves only have protected entrances but could be threatened by surrounding development or planned development. The 48 BCCP caves that are formally part of the BCP are currently managed as follows: 22 caves protected and managed to some extent as part of the BCP on COA land; one cave protected on the Texas Nature Conservancy (TNC) land; two caves protected on combined TCMA/COA land; 15 caves protected as part of the BCP on TC land; eight caves protected as part of private Section 10(a) or Section 7 agreements with USFWS. Ownership and protection status of each of the 62 BCCP caves is detailed in Table 7.

The monitoring and management of BCCP permit caves entails annual, biannual, or quarterly faunal surveys for all caves with ES or SOC species. Red-imported fire ant (RIFA) treatments are performed at various times of the year for caves that have RIFA infestations.
In addition to protecting and monitoring caves covered by the BCCP permit, COA and TC also provide protection for other karst features found on the BCP containing ES and SOC (Tables 4 and 6). Some of these additional karst features are incorporated into TC and COA's shared biological monitoring program, as described in Section 6.0. As of FY25, 17 endangered species karst features which were not listed on the BCCP permit are being protected on BCP lands (six features on TC BCP; eleven features on COA BCP; Table 4). Additionally, 26 SOC karst features not listed on the Permit are also being protected on BCP lands (eleven features on TC BCP; fifteen features on COA BCP; Table 6).

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 maintain 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.

Table 3. Endangered Karst Invertebrate Locations within BCCP caves of Travis County, Texas

This table, originally in the BCCP 1996 documents, has been revised to show new species location information. *Key and footnotes follow table.*

Cave Name	**Current Preserve Status**	**Karst Fauna Region**	**Tooth Cave Pseudoscorpion** *Tartarocreagris texana*	**Tooth Cave Spider** *Tayshaneta 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		X 2010 (Reddell)	X 1996		
Bandit Cave	Private	Rollingwood					P 1996 X 2009	
Beard Ranch Cave	BCP Ivanhoe/COA	Jollyville Plateau						X 1996
Bee Creek Cave	Private	Rollingwood					X 1996	
Broken Arrow Cave	BCP Lime Creek Preserve/COA	Cedar Park			X 1996			
Cold Cave	Private	McNeil/Round Rock						X 1996
Cotterell Cave	BCP Spicewood Springs Park/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 Park/COA	McNeil/Round Rock						X 1996
Fossil Garden Cave	Private	McNeil/Round Rock						X 1996
Gallifer Cave	BCP Jollyville/TC	Jollyville Plateau		P 1996 X 2010 (Ledford)	P 1996 X 2005	X 2009 (Chandler)		X 1996
Hole-in-the-Road Cave	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 Delete X 2017 (Ubick)	X 2017 (Ubick)

Cave Name	Current Preserve Status	Karst Fauna Region	Tooth Cave Pseudoscorpion *Tartarocreagris texana*	Tooth Cave Spider *Tayshaneta myopica*	Tooth Cave Ground Beetle *Rhadine persephone*	Kretschmarr Cave Mold Beetle *Texamaurops reddelli*	Bee Creek Cave Harvestman *Texella reddelli*	Bone Cave Harvestman *Texella reyesi*
Jester Estates Cave	BCP Forest Ridge/COA	Jollyville Plateau	X 2008 (Cokendolpher)	X 2010 (Ledford)			X 1996	
Jollyville Plateau Cave	BCP Private 10(a)	Jollyville			X 1996			X 1996
Kretschmarr Cave	BCP Jollyville/TC	Jollyville Plateau			X 1996	X 1996		
Kretschmarr Double Pit	BCP Jollyville/TC	Jollyville Plateau	P 1996 X 2005		P 1996 X 2005	X 2016 (Reddell)		
Lamm Cave	Private Section 7	Jollyville Plateau			X 1996			
Little Bee Creek 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 2010 (Ledford)				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 Trail Cave	BCP Lake Travis/TC	Jollyville Plateau		X 1996				X 1996
No Rent Cave	BCP McNeil/TC	McNeil/Round Rock						X 1996
North Root Cave	BCP Jollyville/TC	Jollyville Plateau			X 1996			X 2017 (Ubick)
Pickle Pit Cave	Private Section 7	Jollyville Plateau						X 2018 (USFWS)
Rolling Rock Cave	BCP Lime Creek Preserve/ COA Sec.10(a)	Cedar Park			X 1996			
Root Cave	BCP Jollyville/TC	Jollyville Plateau		X 2010 (Ledford)	X 1996			X 1996

Cave Name	Current Preserve Status	Karst Fauna Region	Tooth Cave Pseudoscorpion *Tartarocreagris texana*	Tooth Cave Spider *Tayshaneta myopica*	Tooth Cave Ground Beetle *Rhadine persephone*	Kretschmarr Cave Mold Beetle *Texamaurops reddelli*	Bee Creek Cave Harvestman *Texella reddelli*	Bone Cave Harvestman *Texella reyesi*
Spider Cave	BCP Park West/COA	Jollyville Plateau			X 2004 (Reddell)		X 2004 (Reddell)	
Stark's North Mine Cave	BCP Stark's/TC	Not within a KFR					X 2009 (USFWS)	
Stovepipe Cave	BCP Canyon Creek/ COA	Jollyville Plateau		X 2009 Delete X 2018 (USFWS)	X 1996	X 1996		P 1996 X 2009 (USFWS)
Tardus Hole	BCP Jollyville/TC	Jollyville Plateau			X 1996	X 2009 (Chandler)		
Tooth Cave	BCP Jollyville/TC	Jollyville Plateau	X 1996	X 1996	X 1996	X 1996		X 1996
Weldon Cave	BCP McNeil/TC	McNeil/Round Rock						X 1996

Sources: BCCP Permit 1996; Elliott 1992; Reddell 2004,2005, 2010, 2016; HNTB 2005; USFWS 1994, 2009a, 2009b, 2009c; Ledford 2010, Ubick 2017.

Key and Footnotes

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 2004 (Reddell) = confirmed by J. Reddell (pers. comm 2004)
X 2005 = was listed as confirmed in the HNTB summary of James Reddell's data, 2005 report for USFWS
X 2008 = Cokendolpher (pers. comm 2008) confirmed that Jester Estates Cave is a new site for *Tartarocreagris texana*, as also reported in USFWS 2009b.
X 2009 = USFWS – according to the 2009 5-year review on *Texella reyesi* the report lists *T. reyesi* as confirmed for Stovepipe Cave (USFWS 2009a); *Texella reddelli* 5-year review confirms *T. reddelli* for Stark's North Mine (USFWS 2009c); *Neoleptoneta myopica* 5-year review confirms this species for Stovepipe Cave (USFWS 2009b).
X 2009 (Chandler) = confirmed by D. Chandler, as reported in USFWS 5-year review (2009b).
X 2010 (Ledford) = confirmed by J. Ledford (pers. comm 2010)
X 2010 (Reddell) = confirmed by J. Reddell (pers. comm 2010)
X 2016 (Reddell) = confirmed by J. Reddell (pers. comm 2016)
Delete X 2017 (Ubick) = *T. reddelli* was accidentally listed as occurring in this cave, the species is actually *T. reyesi* (personal communication Ubick 2017)
X 2017 (Ubick) = confirmed by D. Ubick (pers. comm 2017)
X 2018 (USFWS) = according to the 2018 5-year review on *Texella reyesi* the report list *T. reyesi* as confirmed for Pickle Pit Cave (USFWS 2018)
Delete X 2018 (USFWS) = according to the 2018 5-year review on *Tayshaneta myopica* the report list *T. devia* as confirmed for Stovepipe Cave (USFWS 2018)

Table 4. Non-BCCP listed Caves/Karst Features with Listed Invertebrates Protected on BCP

Key follows table.

Cave Name	Current Preserve Status	Karst Fauna Region	Tooth Cave Pseudoscorpion *Tartarocreagris texana*	Tooth Cave Spider *Tayshaneta myopica*	Tooth Cave Ground Beetle *Rhadine persephone*	Kretschmarr Cave Mold Beetle *Texamaurops reddelli*	Bee Creek Cave Harvestman *Texella reddelli*	Bone Cave Harvestman *Texella reyesi*
Black-cap Cave	COA	Jollyville Plateau		P				X 2021
Cortana Cave	COA	Jollyville Plateau		X 2010				X 2008
Down Dip Sink	COA	Jollyville Plateau			X 2007a			
Garden Hoe Cave	COA	Jollyville Plateau			X 2007b			
Gaping Maw	COA	Jollyville Plateau			P			P
Geode Cave	TC	Jollyville Plateau		X 2008	X 2008			X 2008
Hammett's Cave	Westcave	Pedernales					P 2021 (Ubick)	
LU-11	TC	Jollyville Plateau		X 2008				
LU-12	TC	Jollyville Plateau						X 2008
Little Black Hole	COA	Rollingwood					X 2009c	
Merkin Hole	COA	Jollyville Plateau						P
Persephone Caverns	COA	Jollyville Plateau			P	P		P
Pond Party Pit	COA	Jollyville Plateau			X 2016			X 2010

Cave Name	Current Preserve Status	Karst Fauna Region	Tooth Cave Pseudoscorpion *Tartarocreagris texana*	Tooth Cave Spider *Tayshaneta myopica*	Tooth Cave Ground Beetle *Rhadine persephone*	Kretschmarr Cave Mold Beetle *Texamaurops reddelli*	Bee Creek Cave Harvestman *Texella reddelli*	Bone Cave Harvestman *Texella reyesi*
RI-1	TC	Jollyville Plateau					X 2010	
Sacred Grove Cave	COA	Jollyville Plateau			P 2024			P 2024
Tight Pit Cave	TC	Jollyville Plateau		X 2010				
Two Trunks Cave	TC	Jollyville Plateau			X 2008 (USFWS)			X 2025
Wooden Derrick Cave	COA	Jollyville Plateau						P 2024

Sources: Reddell 2016; USFWS 2008, 2009c; Zara Environmental 2007a, 2007b, 2008, and 2010 and Ubick 2021.
X 2018 (USFWS) = according to the 2018 5-year review on *Texella reyesi*
Key: X = confirmed occurrence based on collected specimen
P = probable location based on proximity to other known sites and being within the known range of the species.

Table 5. Karst Invertebrate SOC within BCCP Caves, Travis County, Texas[1,2]

Key and footnotes follow table.

Cave Name	*Aphrastochilhonius N.S.*	*Caecidotea reddelli*	*Candona sp. nr. stagnalis*	*Cicurina bandida* [3]	*Cicurina travisae* [4]	*Cicurina sp.* [5]	*Eidmannella reclusa*	*Miktoniscus N.S.*	*Tayshaneta concinna*	*Tayshaneta devia*	*Rhadine austinica*	*Rhadine s. subterranea*	*Rhadine s. mitchelli*	*Speodesmus N.S.*	*Sphalloplana mohri*	*Tartarocreagris comanche*	*Tartarocreagris intermedia*	*Tartarocreagris N.S. 3*	*Texella spinoperca*	*Trichoniscinae N.S.*
Adobe Springs Cave						X														
Airmen's Cave				X							X						X		X	
Amber Cave					X								X							
Armadillo Ranch Sink		X																		
Arrow Cave				X							X									
Bandit Cave				X							X									X
Beard Ranch Cave					X															
Bee Creek Cave				X							X									
Blowing Sink Cave				X							X									
Broken Arrow Cave																				
Buda Boulder Spring		X																		
Cave X		X	X	X				X			X			X						
Cave Y				X							X									
Ceiling Slot Cave						X														
Cold Cave						X						X								

Cave Name	*Aphrastochithonius N.S.*	*Caecidotea reddelli*	*Candona sp. nr. stagnalis*	*Cicurina bandida* [3]	*Cicurina travisae* [4]	*Cicurina sp.* [5]	*Eidmannella reclusa*	*Miktoniscus N.S.*	*Tayshaneta concinna*	*Tayshaneta devia*	*Rhadine austinica*	*Rhadine s. subterranea*	*Rhadine s. mitchelli*	*Speodesmus N.S.*	*Sphalloplana mohri*	*Tartarocreagris comanche*	*Tartarocreagris intermedia*	*Tartarocreagris N.S. 3*	*Texella spinoperca*	*Trichoniscinae N.S.*
Cotterell Cave					X							X								
Disbelievers Cave						X														
District Park Cave				X							X									
Eluvial Cave																				
Flint Ridge Cave				X							X									
Fossil Cave												X								
Fossil Garden Cave						X						X								
Gallifer Cave					X															
Get Down Cave				X							X									
Goat Cave				X										X						
Hole-in-the-Road Cave						X														
Ireland's Cave				X							X									
Jack's Joint		X				X														
Japygid Cave																				
Jest John Cave					X															
Jester Estates Cave					X							X								

Cave Name	*Aphrastochithonius N.S.*	*Caecidotea reddelli*	*Candona sp. nr. stagnalis*	*Cicurina bandida* [3]	*Cicurina travisae* [4]	*Cicurina sp.* [5]	*Eidmannella reclusa*	*Miktoniscus N.S.*	*Tayshaneta concinna*	*Tayshaneta devia*	*Rhadine austinica*	*Rhadine s. subterranea*	*Rhadine s. mitchelli*	*Speodesmus N.S.*	*Sphalloplana mohri*	*Tartarocreagris comanche*	*Tartarocreagris intermedia*	*Tartarocreagris N.S. 3*	*Texella spinoperca*	*Trichoniscinae N.S.*
Jollyville Plateau Cave																				
Kretschmarr Cave					X								X							
Kretschmarr Double Pit					X															
Lamm Cave																				
Little Bee Creek Cave				X							X									
Lost Gold Cave				X					X		X									
Lost Oasis Cave				X							X									
M.W.A. Cave																		X		
Maple Run Cave				X							X									
McDonald Cave					X					X										
McNeil Bat Cave												X								
Midnight Cave				X							X									
Moss Pit																				
New Comanche Trail Cave					X		X									X				
No Rent Cave	P					X						X								
North Root Cave					X															

Cave Name	*Aphrastochithonius N.S.*	*Caecidotea reddelli*	*Candona sp. nr. stagnalis*	*Cicurina bandida* [3]	*Cicurina travisae* [4]	*Cicurina sp.* [5]	*Eidmannella reclusa*	*Miktoniscus N.S.*	*Tayshaneta concinna*	*Tayshaneta devia*	*Rhadine austinica*	*Rhadine s. subterranea*	*Rhadine s. mitchelli*	*Speodesmus N.S.*	*Sphalloplana mohri*	*Tartarocreagris comanche*	*Tartarocreagris intermedia*	*Tartarocreagris N.S. 3*	*Texella spinoperca*	*Trichoniscinae N.S.*
Pennie's Cave				X							X			X						
Pickle Pit					X															
Pipeline Cave				X										X						
Rolling Rock Cave						X								X						
Root Cave					X															
Slaughter Creek Cave				X																
Spanish Wells Cave		X				X									X					
Spider Cave					X		X													
Stark's North Mine									X											
Stovepipe Cave	X				X		X			X										
Talus Springs Cave																				
Tardus Hole																				
Tooth Cave					X		X						X							
Weldon Cave	X					X						X								
Whirlpool Cave				X							X									

Sources: Elliot 1997, Paquin and Hedin 2005, Paquin et al. 2008, TMM 2007, Zara Environmental 2008, 2010, Ledford et al. 2012, Hedin 2015, Reddell 2016, Hedin 2022.

Key and Footnotes

X = confirmed location based on collected specimen.

[1] *Cicurina ellioti* listed as an SOC in the regional permit is not included in this table because this species has now been synonymized with *Cicurina buwata*, a non-SOC (Cokendolpher 2004).

[2] *Tartarocreagris reddelli* listed as a SOC in the regional permit is not included in this table because this species has now been synonymized with *Tartarocreagris infernalis*, a non-SOC (Muchmore 2001).

[3] Occurrences of *Cicurina bandida* include localities formerly listed as *Cicurina cueva* and *Cicurina reyesi*, which have been formally grouped together into the single species *C. bandida* (Paquin et al. 2008).

[4] Occurrences of *Cicurina travisae* include localities formerly listed as *Cicurina reddelli* and *Cicurina wartoni*, which have been formally grouped together into the single species *C. travisae* (Hedin 2015).

[5] Localities of possible SOCs; blind *Cicurina* specimens not yet confirmed to species level.

Table 6. Non-BCCP Caves/Karst Features with Karst SOC Protected on BCP[1,2]

Key and footnotes follow table.

Cave Name	BCP Owner	*Aphrastochithonius N.S.*	*Caecidotea reddelli*	*Candona sp. nr. Stagnalis*	*Cicurina bandida* [3]	*Cicurina travisae* [4]	*Cicurina sp.* [5]	*Eidmannella rechusa*	*Miktoniscus N.S.*	*Tayshaneta concinna*	*Tayshaneta devia*	*Rhadine austinica*	*Rhadine s. 15ubterraneam*	*Rhadine s. mitchelli*	*Speodesmus N.S.*	*Sphalloplana mohri*	*Tartarocreagris attenuata*	*Tartarocreagris comanche*	*Tartarocreagris intermedia*	*Tartarocreagris N.S. 3*	*Texella spinoperca*	*Trichoniscinae N.S.*
Artificial Intelligence Cave	TC						X															
Black-cap Cave	COA						X	P														
Brewpot Cave	TC										X											
Caverns of Sweet Nora	COA						X															
Cedar Chopper Cave	TC						X															
Cortana Cave	COA						X															
Devil's Lair Cave	TC						X															
Down Dip Cave	COA						X															
Gaping Maw	COA						X	P			P		P				P					
Flying Kave	TC						X															
Geode Cave	TC					X		X														
Hammett's Cave	Westcave						X															
Hoskin's Cave	COA				X																	
LU-29	TC						X															

Cave Name	BCP Owner	*Aphrastochithonius N.S.*	*Caecidotea reddelli*	*Candona sp. nr. Stagnalis*	*Cicurina bandida* [3]	*Cicurina travisae* [4]	*Cicurina sp.* [5]	*Eidmannella reclusa*	*Miktoniscus N.S.*	*Tayshaneta concinna*	*Tayshaneta devia*	*Rhadine austinica*	*Rhadine s. 15ubterranean*	*Rhadine s. mitchelli*	*Speodesmus N.S.*	*Sphalloplana mohri*	*Tartarocreagris attenuata*	*Tartarocreagris comanche*	*Tartarocreagris intermedia*	*Tartarocreagris N.S. 3*	*Texella spinoperca*	*Trichoniscinae N.S.*
McMac Cave	TC						X															
Merkin Hole	COA					P																
Millennium Cave	COA				X																	
Persephone Caverns	COA					P		P					P				P					
Pond Party Pit	COA					X							X									
RI-1	TC						X															
RI-3	TC						X															
Sacred Grove	COA					P																
Siebert Sink	COA				X					X											X	
Two Trunks Cave	TC					X																
Wooden Derrick Cave	COA					P																
Wyoaka Cave	COA				X																	
Y2 Cave	COA				X																	

Sources: Bayless pers. comm 2013, Paquin and Hedin 2005, Sanders pers. comm 2013, TMM 2007, Zara Environmental 2008, 2010, Hedin 2015, Reddell 2016, Hedin 2022.

Key and Footnotes
X = confirmed location based on collected specimen.
P = probable location based on proximity to other known sites and being within the known range of the species.

[1] *Cicurina ellioti* listed as an SOC in the regional permit is not included in this table because this species has now been synonymized with *Cicurina buwata*, a non-SOC (Cokendolpher 2004).
[2] *Tartarocreagris reddelli* listed as a SOC in the regional permit is not included in this table because this species has now been synonymized with *Tartarocreagris infernalis*, a non-SOC (Muchmore 2001).
[3] Occurrences of *Cicurina bandida* include localities formerly listed as *Cicurina cueva* and *Cicurina reyesi*, which have been formally grouped together into the single species *C. bandida* (Paquin et al. 2008).
[4] Occurrences of *Cicurina travisae* include localities formerly listed as *Cicurina reddelli* and *Cicurina wartoni*, which have been formally grouped together into the single species *C. travisae* (Hedin 2015).
[5]Localities of possible SOCs; blind *Cicurina* specimens not yet confirmed to species level.

3.0 OWNERSHIP AND PROTECTION STATUS

Many karst features listed in the BCCP permit have adequate protection, based on the criteria outlined in USFWS's *Karst Preserve Design Recommendations* (USFWS 2012). However, some of the caves listed in Table 7 as protected may not be adequately protected as defined in USFWS (2012). Efforts are being made by the BCCP Permit Holders to contact owners of privately owned caves to assess their protection efforts and to assist them with protection where possible.

Though not specifically required in the BCCP permit, the updated USFWS karst preserve design recommendations direct that the protected area surrounding the cave should be at least 16–40 ha (40-99 acres) in size to capture most of the plant and animal community elements needed to support the karst ecosystem, as well as protect the cave footprint and surface/subsurface drainage basins of the cave (USFWS 2014a). Some caves within the BCP meet or exceed these recommendations, while others do not due to conditions that existed before the Permit was issued, such as pre-existing development in the form of subdivisions, roads, power lines, petroleum lines, and sewer lines that preclude complete protection of the recommended preserve areas. BCCP Permit Holders will continue to do what is reasonable to protect these features from pre-existing development and continue efforts to acquire and protect the karst features listed in the BCCP permit.

Per BCCP Permit Conditions S2 and T2, if new karst features "are discovered with a significant diversity of troglobitic fauna, those karst features may be submitted to the Service for consideration for exchange with karst features identified for protection by the BCCP" (USFWS 1996a). In order to allow the Permit holders to implement these Permit conditions, COA and TC created a Cave Substitution Policy that provides a process that allows caves listed in the BCCP permit to be substituted with other suitable caves in a manner that is transparent, science based, and consistent with the vision and intent established for the BCCP. This policy includes a definition of "significant diversity of troglobitic fauna" as it applies to eligibility of a cave for substitution and determines parameters that quantify preservation of environmental integrity for BCCP-listed caves and candidate substitution caves as it applies to management of caves. These defined criteria will be used in determining both the need to substitute a feature listed on the Permit as well as whether the substitution cave will adequately replace the previously identified BCCP cave or caves. The BCCP Cave Substitution Policy was adopted by the BCCP Coordinating Committee in August 2015.

Karst Preserve Management

Karst preserves, even those pre-existing at the time containing permit caves, were not specified in the HCP/EIS. Karst preserves were directed to be created for the 62 listed karst features in the governing documents that generally include the water sources to the caves (surface and subsurface catchment areas) and other management areas.

Twelve of the 62 caves lie on City of Austin property that is managed by Austin Parks & Recreation Department (PARD). An interdepartmental management agreement between PARD and AW that specifies management activities of BCP land management plans are in progress. The dual management sites include Bull Creek District Park and Greenbelt, St. Edward's Park, Barrow Preserve, Commons Ford Park, Shoal Creek Greenbelt (Buda Boulder Spring); Barton Creek Wilderness Area and Greenbelt (Airmen's Cave and Cave Y), Mt. Bonnell, Blowing Sink Research Management Unit now renamed William H. Russell Karst Preserve (Blowing Sink Cave), Stillhouse Hollow Nature Preserve (Cotterell Cave), Goat Cave Karst Nature Preserve (Goat Cave and Maple Run Cave); Dick Nichols District Park (District Park Cave); Circle C Ranch on Slaughter Creek (Midnight Cave, Arrow Cave, and Slaughter Creek Caves); and Hubert C. Schroeter Neighborhood Park (Fossil Cave). This agreement would allow AW BCP to conduct necessary restoration and cave management, to provide adequate protection for the sites, fence as necessary to protect the preserve, find and restore non-BCCP permit caves for potential substitution of impacted permit caves, and eliminate toxic chemical application in sensitive water source areas.

William H. Russell Karst Preserve

Blowing Sink Cave is the deepest cave on the BCCP permit, extending 240 ft to the water table, it had been obstructed since October 2013, however, in FY 25 volunteer cavers led by Peter Sprouse successfully removed the blocked passage of sediment and rock and therefore the cave is now open to the water table. The entire preserve contains surface and/or subsurface catchment area for Blowing Sink Cave. This preserve is managed by Austin Nature Preserves of Austin Parks and Recreation Department. In February 2020, a Tier III Management Plan was produced for the newly renamed William H. Russell Karst Preserve by AW BCP and Austin Nature Preserves Division of Austin Parks & Recreation Department, however, there is no formal interdepartmental agreement in place. While the land management plan specifies the required management work, the interdepartmental agreement specifies which department is responsible for and empowered to accomplish the management tasks.

As mentioned above, in 2025 Pard Preserves renewed the permit to volunteer cavers lead by Peter Sprouse to restore and map caves on this preserve. There were 18 workday events involving many local volunteer cavers. Total number of volunteer hours for FY25 was an

amazing 806 hours with 1,097 buckets of sediment and rock removed from 6 caves on the preserve. Some notable achievements for FY25 were opening up blowing sink cave all the way to the water table, thus allowing for future Barton Springs salamander monitoring and hydrological studies, as well as discovering over 100 meters of new passage in blowing sink cave. This newly discovered passage allows for more access to the water table and thus more potential for finding and studying the Barton Springs salamander.

Village at Western Oaks Karst Preserve and Watershed Management Area

The Village at Western Oaks Karst Preserve and Watershed Management Area (VWO Karst Preserve) contains Get Down Cave, which is a BCCP permit cave, was acquired by the City of Austin in June 2016 under Watershed Protection Department management. An interdepartmental agreement in July 2018 delegated AW BCP with management of the karst preserve and Watershed Protection responsibility for the water quality ponds and Millennium Cave, a non-permit education cave that underlies one pond.

The preserve has public trails maintained by the Village at Western Oaks Homeowners Association, including trash removal, pet waste bags, and trail maintenance. A formal agreement between VWOHOA and AW BCP was drafted in FY21 and is expected completed in FY26 along with a Tier III management plan.

A Friends of the Preserve group was started by neighbor Stephanie Simmons, which participates in public education of preserve sensitivity through a Facebook page. The Friends educate neighbors on alternatives to pesticides, including the use of boiling water to suppress red imported fire ants, the benefits of increasing our tree canopy, and use of native plants, along with information on endangered songbirds and karst invertebrate ecosystems. They also notify and facilitate events, including neighborhood cave tours, Tree Folks planting, Native Plant Giveaways, Boy Scout projects, and others.

Karst Preserve Friends

Village at Western Oaks Karst Preserve and Watershed Management Area

Karst Preserve Friends Activities

The Karst Preserve continues to experience significant tree canopy loss due to the perpetual lack of reliable rainfall accompanied with above average and extreme high temperatures during the summer months that continues through the autumn season.

Replacing this extreme canopy loss with a diversity of native tree species focusing on providing wildlife habitat continues to be the top priority for Karst Preserve Friends.

Events were held throughout the year to engage community members in planting a wide diversity of BCP approved Texas native tree saplings, rescued plants and seeds. The newly opened clearings caused by tree falls were used to introduce more species of annual wildflowers further into the Karst Preserve's boundaries.

The Karst Preserve Friends held three community events to provide education and steward the land between Oct 1st, 2024 → Sept 30th, 2025.

Texas Arbor Day Celebration

On Nov 4, we hosted our 2024 TX Arbor Day TreeID at the Karst Preserve! event with TreeFolks as part of the City of Austin's annual Roots&Wings Festival. Texas A&M Forest Service provided attendees with *Ungnadia speciosa* and *Sapindus saponaria var. drummondii* seedlings.

MLK Day of Service

Saplings that were not taken home from our Arbor Day event were planted at our first MLK Jr. Day of Service held on an extremely cold **Jan 20th, 2025**. At this event, a dedicated group of Karst Preserve Friends also planted many native annual and perennial seeds in clearings, including *Quercus macrocarpa* acorns!

The *Frangula caroliniana* provided by Mark Sanders of Austin Water, Balcones Canyonlands Preserve for our spring 2024 were also planted in new clearings, using downed logs as protection. Some of these are now over 2' tall and happy!

Droste Can Planting Method

In Jan 2025, *Quercus macrocarpa* acorns were planted in two different clearings using the ***"Droste Can Method"***. This planting technique uses an inverted and burned vegetable can to protect the acorns from predation at planting. Each can has several holes punched through their bottom that allows saplings to grow through and towards the light. By pre-burning the cans before use, their protective coating is removed so that they can more easily rust away in situ.

When planting multiple acorns per Droste Can (roughly 2-4 acorns depending on the can and acorn sizes), ***we achieved roughly 80% successful germination for each can!***

These saplings were holding their own until the lack of rainfall started in Aug 2025. They will be inspected in the coming months and replanted, if needed.

"Texas Most Wanted: Invasive Plant Buy-Back & Native Plant Swap"

Our 10th Annual "Texas Most Wanted: Invasive Plant Buy-Back & Native Plant Swap" event was held the weekend of March 22nd-23rd, 2025.

In addition to native Texas plants brought in by the community, Mark Sanders of Austin Water, Balcones Canyonlands Preserve shared these crowd favorite natives for attendees to take home:

- *Viguiera dentata*
- *Eysenhardtia texana*
- *Morus microphylla* ← *some of these are being grown out at the AISD Bailey Middle School Native Plants and Animals, Native Orchard!*
- *Chrysactinia mexicana*
- *Ageratina havanensis*

Due to the fall 2024 drought, the Bluebonnets were sparse along the Karst Preserve Trail in the spring of 2025. Bluebonnet seed cycle education material was available, but very few Bluebonnets were rescued from the trail, and we did not host a "Bluebonnet Seed Rescue" in May.

Plant Survival …

These 2024 plantings were still alive at the end of Sep 2025:

- North side of trail, near informal trail to Beckett Place Townhomes:
  - *Maclura pomifera* (Osage Orange)
  - *Verbesina virginica* (Frostweed)
- Downstream of Equinox Cave near the stone creek crossing
  - *Geum canadense* (White Avens)
- South edge of the Davis Ln trail entrance:
  - *Pavonia lasiopetala* (Rock Rose)
  - *Tradescantia gigantea* (Giant Spiderwort)
- Seeded plants seen throughout the Preserve that increase native plant diversity:
  - *Pavonia lasiopetala* (Rock Rose)
  - *Salvia coccinea* (Tropical Sage)
  - *Verbesina encelioides* (Cowpen Daisy)

Ongoing Plantings & Plant Protections

- La Cresada Trail Entrance

  In May 2025, the Karst Preserve Trail entrance at La Cresada was reworked to prevent crushed granite from flowing from the trail onto the sidewalk. The Karst Preserve friends planted Bluebonnets, that have already appeared, and other sun loving native forb seeds where the soil was disrupted and bare.

- Senatorial Sink/Live Oak Cave

  Over Memorial Day weekend in 2025, a large *Quercus fusiforma* collapsed in Senatorial Sink, near Live Oak Cave, crushing the black chain link fence. When the arborists removed the hazard **in July 2025**, we worked with them to ensure that the adjacent 2" endemic Prunus serotina var. eximia (Escarpment black cherry) was protected during their work.

- Central Texas Plant Rescuers

  Karst Preserve Friends participated in some Central Texas Plant Rescuers events to harvest wild natives for transplanting into the newly opened clearings caused by tree falls. Some of these species were:

  - *Nolina lindheimeriana*
  - *Frangula caroliniana*

FIND US!

- https://www.facebook.com/VWOKPWMA
- https://www.facebook.com/groups/KarstPreserveFriends

Whirlpool Karst Preserve

Whirlpool Cave is the third largest cave of the 62 permit caves and has historically been used in public education and recreation. The entrance to the cave is owned and managed by the Texas Cave Management Association. In February 2020, AW BCP acquired a 4.7-acre private lot that overlies the majority of Whirlpool Cave. Whirlpool Cave Preserve is recognized as a formal BCP karst preserve (Figure 1). Most of the South Cavern's passage lies outside the preserve in private homeowners' association. A future step will be to seek inclusion of about 200 ft in the preserve through easement, acquisition, or management agreement. In FY25 a significant amount of invasive vegetation removal was caried out throughout the preserve including a contract with Mas Verde to remove invasive and dead vegetation along the East boundary creating a shaded fuel break. The piles of vegetation from the previous years were chipped and used as mulch within the property. Portions of the property were seeded with native shade tolerant grass and wildflower mixes. Acorns and other seeds were planted along

with saplings on the East boundary of the property. In FY26 it is proposed for contractors to conduct invasive and dead vegetation removal along the East portion of the South boundary as well as well as along the North boundary fronting the parking lot.

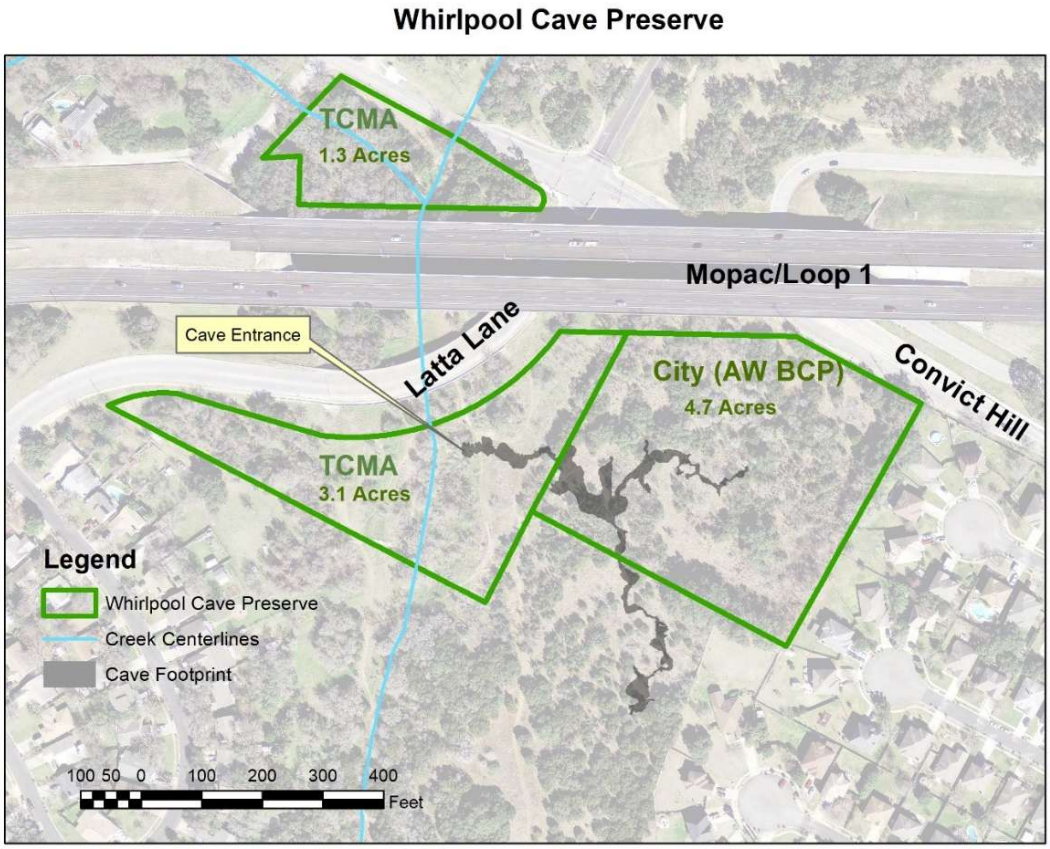


Figure 1. Whirlpool Cave Preserve showing known footprint of the cave.

Lost Oasis Karst Preserve

Lost Oasis Cave Preserve is managed by Patricia Calabrese on behalf of TCMA. Lost Oasis Karst Preserve shares a property boundary with the Tabor tract owned by Austin Wildland Conservation's Water Quality Protection Lands and is where BCP permit cave Flint Ridge is located. A formal agreement for BCP management was created with TCMA which includes regular fire ant treatments, annual faunal surveys, visitor traffic counts, etc. TCMA volunteers continued to excavate the lower passage of the cave. There is still strong airflow so excavation work will continue in FY26. A significant amount of native revegetation work was done on the property to encourage canopy regrowth to replace lost trees from the 2023 winter storm and to provide diverse nutrients for cave crickets and wildlife. An open house was hosted by

the TCMA along with Bailey Middle Schools Native Plant Sale resulting in 150 patrons being able to tour the first room of the cave throughout the day.

Four Points Private Karst Preserve

On February 27, 2019, AW and TC BCP staff met with representatives of the Four Points Preserves that contain four (Disbelievers, Eluvial, Japygid, and MWA Caves) of the 62 permit caves in a private karst preserve (Figure 2). BCP requested ownership and management responsibilities for the preserves. On September 13, 2019, representatives of the owner committed to transferring ownership after buildout of associated development and a certificate of occupancy is issued, which may take several years. BCP has no data on what, if any, management has been occurring on this preserve or the status of the four permit caves, as this is reported directly to USFWS. The transfer process was initiated in FY22, and the properties will be surveyed and hopefully COA BCP will take over ownership and management in FY26.

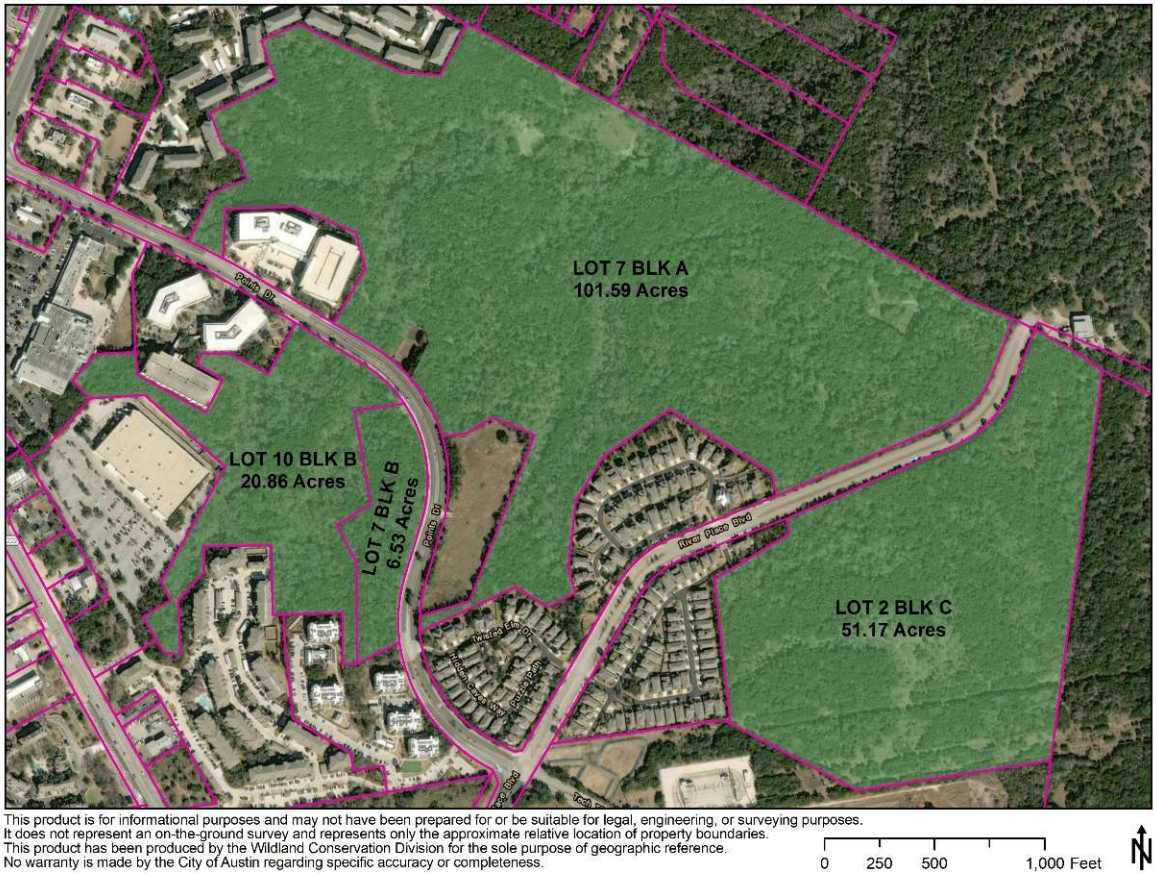


Figure 2. Four Points Preserve Map

In FY21, AW BCP utilized Section 7 conservation measures funding from TxDOT to develop formal karst preserves near FM 2222 and FM 620 by excavating previously unknown caves of ranch fill and extending the few previously known caves on Stovepipe (Canyon Creek), Cortaña, Park West, and Kent Butler preserves, as described in the Hydrological Studies and Cave Restoration section. The caves reveal new cave drip areas and creates habitat to enhance the preserves. Many of these karst areas are associated with springs which are also investigated for fauna and water quality/discharge rate.

Table 7. FY25 Ownership, protection, monitoring and access status of the 62 BCCP caves/karst features (36 caves with ES and 25 caves with SOC) [1, 2].

Cave Name	ES or SOC	BCP or Private/ Current Owner	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
Adobe Springs Cave	SOC	BCP/TNC	Fenced	Protected on preserve	TC bi-annual surface monitoring; bi-annual cave cricket exit counts; bi-annual species monitoring	none
Airmen's Cave	SOC	BCP/COA	Gated	Protected on parkland Owners of Brodie Oaks Mall approved an access easement to the BCP for the portion of the cave that lies beneath their property	COA quarterly surface monitoring; annual species monitoring; Easement was granted from the private landowner to the BCP for access (Appendices)	access by permit*
Amber Cave	ES	BCP/TC	Gated and fenced	Protected on preserve (very close to road and sewer line)	TC quarterly surface monitoring; red-imported fire ant (RIFA) survey/ control; annual species monitoring; annual cave cricket exit count	none
Armadillo Ranch Sink	SOC	Private		Private - Unknown		none
Arrow Cave	SOC	BCP/COA	Gated	Protected on parkland (There are nearby homes immediately south of the cave entrance).	COA quarterly surface monitoring; annual species monitoring	none
Bandit Cave	ES	Private	Gated	Currently owned by a private, ecologically concerned landowner		none
Beard Ranch Cave	ES	BCP/COA		Protected on preserve	COA quarterly surface monitoring; annual faunal survey	none
Bee Creek Cave	ES	Private		Private- AW BCP inquired about purchasing in April 2021 but not interested in selling at this time.		none
Blowing Sink Cave	SOC	BCP/COA	Gated	Protected on preserve (200 acre preserve, but subsurface catchment extends	COA monthly surface and annual species monitoring;	none

Cave Name	ES or SOC	BCP or Private/ Current Owner	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
				more than a mile west). Lower half of the cave had been inaccessible since 2013 but was opened by volunteers in 2025. A Tier III plan was completed February 28, 2020.	RIFA control as needed	
Broken Arrow Cave	ES	BCP/COA	Fenced	Protected on preserve	COA quarterly surface monitoring; quarterly cave cricket exit counts; quarterly species monitoring; RIFA control as needed TCA invaded the cave in Fall 2024	none
Buda Boulder Spring	SOC	BCP/COA		Protected on parkland (close proximity to a hike and bike trail).	COA bi-annual surface monitoring; annual species monitoring.	none
Cave X	SOC	Private/COA Protection Agreement	Gated and fenced	Protected by landowner with 4.5-acre setback to protect cave entrance. Protected to some extent (not actively managed and the setback is inadequate). Owner rejected COA offer on Sept. 19, 2017, to assist in cave management and monitoring. Regents built a sports field within the Cave X buffer, over the footprint of the cave sometime between January 2018 and November 2019. WP approved Regents restoration plan in March 2023, the plan called for revegetating the disturbed area with native shrubs and trees. Regents completed restoration efforts in FY 25.	In the past, occasional species and surface monitoring by COA and SWCA. SWCA completed cave cricket exit counts in October 2015 and one partial cave faunal survey in February 2016 as part of an agreement to allow for on-site construction of a berm to reduce flooding concerns. It is unknown if further biological monitoring has been performed.	none
Cave Y[1]	SOC	BCP/COA	Gated	Protected on parkland. .	COA quarterly surface monitoring, bi-annual species monitoring; bi-annual cave cricket exit counts; RIFA control as needed	none
Ceiling Slot Cave	SOC	Private		Private - Unknown		none

Cave Name	ES or SOC	BCP or Private/ Current Owner	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
Cold Cave	ES	Private	Gated and fenced	Private - Unknown	TC bi-annual surface monitoring; bi-annual cave cricket exit counts; bi-annual species monitoring	none
Cotterell Cave	ES	BCP/COA	Gated and fenced	Protected on parkland. (There are nearby homes immediately east of the cave entrance)	COA quarterly surface monitoring; bi-annual cave cricket exit counts; bi-annual species monitoring; RIFA control as needed	none
Disbelievers Cave	ES	BCP/Private Section 10(a)		Protected by 10a permit, hired Plateau Land & Wildlife Management		none
District Park Cave	SOC	BCP/COA	Gated	Protected on parkland.	COA quarterly surface monitoring; bi-annual cave cricket exit counts; bi-annual species monitoring; RIFA control as needed	1st room open, past 1st room protected by gate, access by permit*
Eluvial Cave	ES	BCP/Private Section 10(a)		Protected by 10a permit, hired Plateau Land & Wildlife Management		none
Flint Ridge Cave	SOC	BCP/COA	Gated	Protected on Water Quality Protection Land (portions of the cave and its catchment area are overlain by the newly constructed SH45 SW)	COA quarterly surface monitoring; bi-annual cave cricket exit counts; bi-annual species monitoring; RIFA control as needed	none
Fossil Cave	ES	BCP/COA	Access protected by large rocks	Protected on parkland. All caves in park are filled in and require restoration.	Exact location of cave is unknown. COA quarterly surface monitoring of features suspected to be Fossil Cave	none
Fossil Garden Cave	ES	Private		Private – Unknown		none

Cave Name	ES or SOC	BCP or Private/ Current Owner	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
Gallifer Cave	ES	BCP/TC	Gated and fenced	Protected on preserve	TC quarterly surface monitoring; bi-annual cave cricket exit counts; RIFA survey/control; bi-annual species monitoring	none
Get Down Cave	SOC	BCP/COA	Gated and fenced	Protected on preserve	COA monthly surface monitoring; annual cave cricket exit count; annual species monitoring; RIFA control as needed	none
Goat Cave	SOC	BCP/COA	Fenced	Protected on parkland.	COA monthly surface monitoring; annual species monitoring; RIFA control as needed	access by permit*
Hole-in-the-Road	ES	Private		Private –Unknown. (very close to a major roadway so will likely need to find a substitution cave).		none
Ireland's Cave	SOC	BCP/ TC	Gated and fenced	Protected on preserve	TC quarterly surface monitoring; RIFA survey/control; annual species monitoring	none
Jack's Joint	SOC	Private		Private - Unknown		none
Japygid Cave	ES	BCP/Private Section 10(a)		Protected by 10a permit, managed by Plateau Land & Wildlife Management		none
Jest John Cave	ES	BCP/COA		Protected on preserve	COA annual cave cricket exit count; bi-annual surface monitoring	none
Jester Estates Cave	ES	BCP/COA	Gated and fenced	Protected on preserve (3.2 acre preserve surrounded by homes).	COA monthly surface monitoring; bi-annual cave cricket exit counts; bi-annual species monitoring; RIFA control as needed	none

Cave Name	ES or SOC	BCP or Private/ Current Owner	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
Jollyville Plateau Cave	ES	BCP/Private Section 10(a)		Protected by 10a permit, managed by Plateau Land & Wildlife Management		none
Kretschmarr Cave	ES	BCP/TC	Gated and fenced	Protected on preserve. Close to roadway and in power line ROW.	TC quarterly surface monitoring; RIFA survey/control; bi-annual cave cricket exit counts; bi-annual species monitoring	none
Kretschmarr Double Pit	ES	BCP/TC	Fenced	Protected on preserve	TC quarterly surface monitoring; RIFA survey/control; annual species monitoring	none
Lamm Cave	ES	BCP/Private Section 7	Gated and fenced	COA negotiated setback (approximately 150')	Occasional surface and species monitoring by COA and TC	none
Little Bee Creek Cave	ES	BCP/COA	Gated	Protected on preserve	COA quarterly surface monitoring; annual cricket exit count	none
Lost Gold Cave	SOC	Private	Gated	Private – COA WPD had negotiated a small setback from future development. In FY19, silt-laden runoff from a new water well and playscape structures were found built in the buffer by City inspectors, due to these violations a stop order was in place on the well installation, City staff initially attempted to work with the landowner to remove the illegal improvements and restore the site, however, the City Environmental Officer decided to give property owner a variance which allows all the structures to remain and so therefore, the site will not be restored		none
Lost Oasis Cave	SOC	Private/ TCMA	Gated and fenced	Protected by TCMA. Formal management agreement with AW BCP to ensure permit compliance was signed on May 4, 2021	COA monthly surface monitoring; bi-annual cave cricket exit counts; bi-annual species monitoring; RIFA control as needed	controlled access**

Cave Name	ES or SOC	BCP or Private/ Current Owner	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
M.W.A. Cave	ES	BCP/Private Section 10(a)		Protected by 10a permit, managed by Plateau Land & Wildlife Management		
Maple Run Cave	SOC	BCP/COA	Gated	Protected on parkland.	COA monthly surface monitoring bi-annual cave cricket exit counts; bi-annual species monitoring; RIFA control as needed	access by permit*
McDonald Cave	ES	BCP /TC	Fenced	Protected on preserve	TC quarterly surface monitoring; RIFA survey/control; annual species monitoring	none
McNeil Bat Cave	ES	Private		Private – Unknown (close proximity to high school)		none
Midnight Cave	SOC	BCP/COA	Fenced	Protected on parkland (close proximity to soccer fields).	COA quarterly surface monitoring; bi-annual cave cricket exit counts; bi-annual species monitoring; RIFA control as needed	access by permit*
Moss Pit	SOC	Private		Private – Unknown		none
New Comanche Trail Cave	ES	BCP/TC	Fenced	Protected on preserve	TC quarterly surface monitoring; RIFA survey/control; annual cave cricket exit count; annual species monitoring	none
No Rent Cave	ES	BCP/TC	Gated and fenced	Protected on preserve	TC quarterly surface monitoring; RIFA survey/control; quarterly cave cricket exit counts; quarterly species monitoring	none

Cave Name	ES or SOC	BCP or Private/ Current Owner	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
North Root Cave	ES	BCP/TC	Fenced	Protected on preserve	TC quarterly surface monitoring; RIFA survey/control; annual species monitoring	none
Pennie's Cave	SOC	Private		Landowner had filled entrance but Zara excavated and gated the entrance in May 2008. COA WPD established a 300 ft. buffer around the cave. Zara's Management report is attached in the Appendix	Zara Environmental annual species monitoring; Zara Environmental bi-annual RIFA surveys/control	none
Pickle Pit[4]	ES	BCP/Private Sec. 7	Gated	Protected by Section 7 permit.	TC/COA occasional species monitoring; sporadic surface inspections by concerned neighbor	none
Pipeline Cave	SOC	Private	Gated	Private – nearby petroleum pipeline exists. Lacks formal management agreement to ensure permit compliance. Permission granted for temporary access to allow for restoration, faunal surveys, and hydrogeological studies.	COA quarterly surface monitoring; bi-annual cave cricket exit counts; bi-annual species monitoring; RIFA control as needed	none
Rolling Rock Cave	ES	BCP/COA	Fenced	Protected on preserve	COA quarterly surface and annual species monitoring; RIFA control as needed	none
Root Cave	ES	BCP/TC	Fenced	Protected on preserve	TC quarterly surface monitoring; RIFA survey/control; annual species monitoring	none
Slaughter Creek Cave	SOC	BCP/COA	Gated	Protected on parkland (Nearby homes are immediately south of cave entrance,	COA quarterly surface and annual species monitoring; RIFA control	none

Cave Name	ES or SOC	BCP or Private/ Current Owner	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
				and Mopac South excavation to cave level 500' east).	as needed.	
Spanish Wells Cave	SOC	BCP/TC	Fenced	Protected on preserve	TC quarterly surface monitoring; bi-annual cave cricket exit counts; RIFA survey/control; bi-annual species monitoring	none
Spider Cave	ES	BCP/COA	Fenced	Protected on preserve	COA quarterly surface monitoring; bi-annual cave cricket exit counts; bi-annual species monitoring; RIFA control as needed	none
Stark's North Mine[2]	ES	BCP/TC	Gated	Protected on preserve	TC quarterly surface monitoring; bi-annual cave cricket exit counts; RIFA survey/control; bi-annual species monitoring	none
Stovepipe Cave	ES	BCP/ COA	Fenced	Protected on preserve	COA quarterly surface monitoring; bi-annual cave cricket exit counts; bi-annual species monitoring; RIFA control as needed	none
Talus Springs Cave[3]	N/A	BCP/Private Section 10(a)	Gated	Protected by Homeowners Association and TC, only has 50' setback from houses and is probably affected by uphill development.	TC bi-annual surface monitoring; RIFA survey/control; annual species monitoring	none
Tardus Hole	ES	BCP/TC	Fenced	Protected on preserve	TC quarterly surface monitoring; RIFA survey/control; annual species monitoring	none
Tooth Cave	ES	BCP/TC	Gated and fenced	Protected on preserve	TC quarterly surface monitoring; bi-annual cave cricket exit counts; RIFA survey/control; bi-annual species monitoring	none

Cave Name	ES or SOC	BCP or Private/ Current Owner	Gated/ Fenced	Protection Area Status /Adequate Preserve size	Species Monitoring Status	Public Access
Weldon Cave	ES	BCP/TC	Gated and fenced	Protected on preserve	TC quarterly surface monitoring; RIFA survey/control; quarterly cave cricket exit counts; quarterly species monitoring	none
Whirlpool Cave	SOC	Private/ TCMA	Gated	Protected by TCMA. Formal management agreement with AW BCP to ensure permit compliance was finalized and signed by all parties on May 4, 2021. On February 2020, AW BCP acquired a private lot that overlies much of the cave footprint	TCMA routine surface monitoring; COA bi-annual species monitoring and cave cricket exit counts	controlled access**

[1]Cave Y was considered an ES cave *(Texella reddelli*) in the 1996 BCCP Permit but has since been determined not to contain *Texella reddelli* (Reddell 2004).
[2]Stark's North Mine was listed as a SOC cave in the 1996 BCCP Permit but has since been determined to contain *Texella reddelli* (USFWS 2009c).
[3] Talus Springs Cave has never been known to contain ES or SOC. This cave was placed on the BCCP permit because it contained the amphipod *Stygobromus birfurcatus*, originally considered as a SOC candidate; however, *S. birfurcatus* was not included in the Permit's final list of 25 SOC karst species to be protected.
[4] Pickle Pit was listed as a SOC cave in the 1996 BCCP Permit but has since been determined to contain *Texella reyesi* (USFWS 2018).

* Access by Permit - Permit may be issued by COA – Austin Water Utility or Austin Parks and Recreation Department (PARD) staff.
** Controlled Access - Private cave owners control the access.

4.0 ACCESS STATUS AND KARST EDUCATION/RESTORATION ACTIVITIES

Public education on caves and cave ecosystems is recognized as vital for karst species preservation in the BCP Karst Land Management Plan (2016). Currently, most opportunities for children to enter caves and learn about cave ecosystems is through programs provided by COA Watershed Protection Department (WPD), the Balcones Canyonlands Preserve Program of Austin Water (BCP), and Austin Nature and Science Center (ANSC) summer camps. Adult wild cave tours in the Austin area are not widely available, although many tours are conducted through TCMA and the Underground Texas Grotto. Overall, there is more demand for cave education than can be met with existing programs.

One factor limiting cave education is a deficit of caves suitable for immersion, especially when the high demand and its effectiveness as both a teaching tool and management practice to support stewardship for cave ecosystems is considered. Cave education/recreation primarily occurs in 10% of the BCCP caves, which have been used for this purpose prior to the 1996 permit. Whirlpool Cave (owned and managed by TCMA) has the highest traffic of all the BCCP caves, totaling 1,306 person trips in FY25. Although studies on human impacts to cave ecosystems are limited, it is assumed that high human traffic in a cave will negatively impact the cave fauna.

Wildflower and LaCrosse Caves are relatively small non-BCCP caves on the Lady Bird Johnson Wildflower Center that received 1,460 and 91 visitors respectively in FY25. Wildflower Cave has been used for education by COA Earth Camp since 1997 after it was restored by cleaning out trash fill. Wildflower Cave is unsuitable for many cave tours due to its currently limited extent and small size.

Restoring Non-BCCP Caves for Education

By developing non-BCCP caves as a safe and accessible option for adequately trained and responsible groups for guided education/recreation tours, education can be promoted while reducing BCCP cave impacts. Restoration of filled non-BCCP caves for educational purposes is expected to reduce traffic/impact to other publicly accessed BCCP listed caves, namely District Park, Goat, Lost Oasis, Maple Run, and Whirlpool Caves. Caves are a heritage for the Austin area and provide resources for public education and opportunities to connect with local communities.

While obvious, once trash and ranch fill are removed, the cave ecosystem improves. In education caves such as LaCrosse, Wade, and Wildflower it is still assumed that excessive traffic is detrimental to cave ecosystems until more detailed analysis is conducted and reported.

Consequently, it is a goal to restore new education caves to provide more resources for public cave education and to reduce traffic on federal permit caves. In FY21, an interlocal agreement with the Lady Bird Johnson Wildflower Center allowed AW BCP to restore filled caves there for education and cave ecosystem preservation. In the fall of 2023, work was started on the lead at the bottom of Wildflower Cave which led to a significant breakthrough in FY24. This restoration work is covered in more detail in the Hydrogeological Studies and Cave Restoration section below. Cricket Cave discovered at the Wildflower Center is a very significant cave, but the difficulty of entering the cave combined with the extremely delicate formations makes it unsuitable for an education cave. There are other features nearby that could be restored in the following years that will likely be more suitable for education trips, but this remains unclear until they are opened up.

2024-2025 School Year Cave Education Summary

Austin Watershed Protection Education Programs:

During the 2024-2025 school year, Austin Watershed Protection conducted cave and aquifer education through Earth Camp and Earth School (water quality programs for fifth graders), Watershed Detectives (middle school program), Hydrofiles (high school program), and supporting additional outreach though a cave guide training for City of Austin staff, Clean Creek Camp (a summer parent/child water quality program), and the Groundwater to the Gulf Summer Institute for Educators at the Lady Bird Johnson Wildflower Center. The 2024-2025 school year updates are detailed below:

Earth Camp and **Earth School**:

Earth Camp is available to Title I (low socio-economic) schools in Austin Independent School District (AISD). The Lady Bird Johnson Wildflower Center is partnered with Earth Camp. During the 2024-2025 school year, students participated in a fieldtrip to Wildflower Cave to learn about the cave habitat, how water flows through karstic limestone from the recharge zone of the Edwards Aquifer to Barton Springs, and how actions on the land affect water quality. Throughout the school year, 1,233 fifth-grade students from Title 1 schools participated in tours of Wildflower Cave through this program. In April, the Earth Camp experience was also offered to Austin Watershed Protection staff. Through this opportunity, 20 Austin Watershed Protection staff participated in educational tour of Wildflower Cave. An additional 1,188 fifth graders received Earth School, which included live hands-on experiments with watershed models that feature a recharge zone with sinkholes and a karst aquifer model (Table 8). More details on these programs can be found online at: www.austintexas.gov/EarthCamp and www.austintexas.gov/earthschool.

Watershed Detectives and Hydrofiles:

Watershed Detectives and Hydrofiles reach middle and high school classes with hands-on inquiry-based investigations 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 "Austin Underground" videos and cave tours led by Austin Watershed Protection staff. During the 2024-2025 school year, 108 middle school students and 16 high school students participated in educational caving tours in Whirlpool Cave, and an additional 30 high school students participated in an educational tour of LaCrosse Cave. More details on these programs can be found online at: www.austintexas.gov/watersheddetectives.

City of Austin Cave Guide Training, Clean Creek Camp and Groundwater to the Gulf Summer Institute:

In May 2025, Austin Watershed Protection and Austin Water Wildland Conservation provided a cave guide training in Whirlpool Cave to 20 City of Austin staff. In summer 2025, families, educators, and members of the general public were given opportunities to receive educational caving tours through Clean Creek Camp for families and the Groundwater to the Gulf Summer Institute for Educators at Lady Bird Johnson Wildflower Center. Clean Creek Camp is a partnership between Austin Watershed Protection 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 9-14. Clean Creek Camp brought 14 youth and 15 adults into LaCrosse Cave and 14 youth and 13 adults into Wildflower Cave (Table 8). During the Groundwater to Gulf Summer Institute for Educators at Lady Bird Johnson Wildflower Center, 15 educators participated in tours of LaCrosse Cave with Austin Watershed Protection staff and an additional 15 educators toured Wildflower Cave with Austin Water Wildland Conservation staff (Table 8). - More details on these programs can be found online at: www.austintexas.gov/department/clean-creek-camp and www.coloradoriver.org/groundwater-to-the-gulf/.

Table 8. Summary of school year 2024-2025 Austin Watershed Protection programs providing cave field trips and aquifer outreach.

Program	Grade	Total reached
Earth Camp (cave tour)	5th	1,233
Earth Camp for Austin Watershed Protection staff	N/A	20
Earth School* (*presentation does not include cave immersion, but it does involve demonstrations of watershed model that features a recharge zone with sinkholes and a karst aquifer model)	5th	1,188
Watershed Detectives (cave tour)	6th-8th	108
Hydrofiles (cave tour)	9th-12th	46
City of Austin Cave Guide Training (cave tour)	N/A	20
Clean Creek Camp (cave tour)	N/A	56
Groundwater to the Gulf Summer Institute for Educators (cave tour)	N/A	30

Austin Water Balcones Canyonlands Preserve Program

- **Oct 7th, 2024**: Colin Strickland did Teams interview with UT Student Reporter, Darby Tippit, about karst invertebrates, species of concern and the work we are doing to protect their habitat.

- **Oct 17th, 2024**: Westcave Roundtable event with Barbara Atwell. Barbra Attwell, Colin Strickland, and Cait McCann Teran, presented about the cave life paintings, cave biology and the Wildland Conservation Division.

- **October 22nd, 2024**: Barton Springs University. BCP and WCD staff tabled, describing lands and species preserved by the BCP and WQPL programs.

- **November 18th, 2024**: Mark Sanders and Colin Strickland gave presentation and then took AP Biology students at McNeil High School into Millipede Annex Cave.

- **May 12th, 2025**: Mark Sanders and Colin Strickland gave presentation and then took AP Biology students at McNeil High School into Millipede Annex Cave.

- **June 10th, 2025**: Groundwater to the Gulf. Colin Strickland and Drew Thompson assisted other WCD staff with cave tours for teachers at the Lady Bird Johnson Wildflower Center.

Colin Strickland continues to produce short educational videos about karst invertebrates that are shared on the Wildlands Facebook page and used in cave training classes. Caves - YouTube

Austin Parks and Recreation
The Splash! Exhibit in Zilker Park includes a simulated cave and indoor displays, movies, and activities regarding the Edwards Aquifer.
http://www.austintexas.gov/department/austin-nature-science-center

FY25 Access Status

In FY25, access was granted to COA-owned BCCP caves, TCMA-owned BCCP caves and other non-BCCP caves for educational/recreational/rescue training. The increased number of non-BCCP caves available has reduced traffic to BCCP caves. In FY25, 254 people entered COA-owned BCCP caves, with visitors issued access permits by COA staff. COA-owned BCCP caves include District Park (48), Goat (48), Maple Run (132), and Midnight Caves (26). A total of 1,461 people were granted access to TCMA-owned BCCP caves including Lost Oasis (155) and Whirlpool (1,306) Caves. An additional 1,790 people visited non-BCCP caves including Grassy Cove (239), LaCrosse (91), and Wildflower (1,460) (Table 9). See Table 3 for access and gating status of all the BCCP caves.

Table 9. Summary of FY25 educational and recreational cave trips into non-BCCP Caves compared to BCCP Caves.

Status	Cave	Visitors	Total Visitors
Non-BCCP Caves	Grassy Cove	239	1790
	LaCrosse	91	
	Wildflower	1460	
BCCP Caves	District Park	48	1715
	Goat	48	
	Lost Oasis	155	
	Maple Run	132	
	Midnight	26	
	Whirlpool	1306	
Non-BCCP and BCCP Caves Combined			3505

5.0 MANAGEMENT COORDINATION AND OVERSIGHT

COA and TC determined that there was a need to create a master database on BCP karst fauna monitoring and management with the ability to analyze these data to determine status and compliance with the regional permit, as well as determine future needs of the listed species. The Karst Database houses all faunal survey data from BCCP caves and provides much of the information needed for these karst analyses. This database is now available for use by BCP partners to enter survey data, and all available data have 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 protocol. This database will focus on permit compliance, species status, and contribution to recovery.

Based on recommendations made in Dr. Butch Weckerly's analyses of karst survey efforts on the BCP (Weckerly 2010), COA and TC modified and expanded the BCP's cave monitoring program in FY11. COA and TC identified 25 caves within Travis County managed through BCP partners that provide a more evenly distributed dataset across cave clusters and karst fauna regions (KFRs); this dataset includes both BCCP caves and other ES/SOC caves on the BCP. The number and frequency of karst faunal surveys and cave cricket exit counts are now synchronized among managing partners to better accommodate comparisons and determine species trends. The goal of the cave monitoring program is to provide a clearer understanding of the species distribution and health of karst ecosystems across the BCP.

In FY16, COA/TC BCP staff collaborated on creating guidelines to provide best management practices (BMPs) at construction sites where tawny crazy ants (TCA; *Nylandaria fulva*) have not been confirmed, to supplement BMPs created in FY15 focusing on construction activities within known TCA sites. TCA are a newly discovered non-native ant species which could adversely affect forest and karst ecosystems on the BCP. Implementation of these BMPs will be critical to minimizing the potential of introducing new populations of this destructive species to other parts of Austin and elsewhere. In FY24, these BMPs continue to be disseminated to appropriate TC/COA departments and other agencies.

6.0 BIOLOGICAL MONITORING

Dedication

José Justo (Marcelino) Reyes Gómez
1956-2024
…
By James Reddell





José Justo (Marcelino) Reyes Gómez was born on December 17, 1956, in Ilobasco, Cabañas, El Salvador. During the El Salvadoran civil war, he made his way through Guatemala, Belize, and Mexico, eventually arriving in California in 1978. He took the name Marcelino because José was "too common." He eventually made his way to Austin where I met him in 1982. We moved in together in 1983 and remained partners until his death on September 30, 2024. He is survived by his wife Sonia, his sons Sergio and Marcello, his daughter Rocio and her fiancée Asael (El Gato) Godinez Ponce, his stepdaughter Gabriela Reyes de Portillo, his granddaughter Marielos, and grandson Ulises. He died of a heart attack while visiting his family in El Salvador and was buried in Ilobasco.

I introduced him to caving and cave biology on a short trip in 1983 to Mexico where we collected in a cave at the ruins of Teotihuacan and in Grutas de Cahuilla. He began helping me in my laboratory at the University of Texas in 1983 and continued helping process collections until his death. He began collecting in Texas caves in 1984. He deeply loved caving and collecting and was the best collector I have ever worked with.

Marcelino was involved in numerous projects centering on endangered species throughout Bexar, Travis, and Williamson counties. In 1990 we began a project on Fort Hood. We were involved in this project for 30 years (with some years skipped due to budget shortfalls). The Fort Hood project was the largest and longest karst project in Texas. There are currently more than 2,000 karst features documented, including at least 316 caves. Marcelino and I primarily did biological surveys and assisted David McKenzie in mapping roads and surveying off-road to accurately locate caves. In later years we expanded our efforts to conducting karst surveys and to obtain accurate GPS locations for all features previously located. Marcelino assisted Mike Warton and later Jerry Fant in mapping caves and other significant karst features. He and I also conducted two spring studies using mophead traps to collect aquatic organisms.

A second long-term project was begun in 1995 with studies in the Sun City area. Although most caves were found by Mike Warton, Marcelino and I located and documented a large number of sinks and discovered a few new caves. We also began a 20+ year management and fauna monitoring study of selected caves.

We made trips to the Yucatan Peninsula from 2001-2003, and in 2007. Thanks to Marcelino's Spanish and willingness to talk to anyone, we made 50 collections in 40 caves (all but two previously unknown). We also documented numerous cenotes that we did not enter and assisted David McKenzie and Jerry Fant in mapping four significant caves.

Marcelino made at least 1,433 collections in at least 810 caves and other karst features in Bandera, Bell, Bexar, Burnet, Comal, Coryell, Culberson, Hays, Kendall, Kinney, Llano, Randall, Travis, Val Verde, Ward, and Williamson counties, Texas. These numbers are exceeded only by myself. He also assisted in mapping at least 342 caves and other karst features and was an ardent digger and karst surveyor.

Eight species were named in his honor: the ostracod *Dolerocypris reyesi*, the spider *Cicurina reyesi*, the pseudoscorpions *Cheiridium reyesi* and *Tartarocreagris reyesi*, the endangered Bone Cave harvestman *Texella reyesi*, the millipede *Speorthus reyesi*, the ground beetle *Rhadine reyesi*, and the antlike litter beetle *Batrisodes reyesi.*

Marcelino was funny, caring, and generous. He loved traveling, archeology, and history and was devoted to his garden and our numerous cats. He never knew a stranger and everyone who knew him well loved him very much. Charles Pekins, the karst specialist at Fort Cavazos, said of Marcelino that "his smile and enthusiasm were uplifting." He deeply loved his family and me and we loved him more than we can say. His death has left a void in our lives that can never be filled.

Background

Caves containing endangered and rare karst invertebrates on BCP properties are monitored to determine long term trends in populations of cave organisms and overall cave conditions. All COA and TC-owned BCP caves with endangered species are surveyed annually. In addition, TC and COA incorporated the newly expanded monitoring plan in FY11, which includes the 25 Travis County caves selected to represent an evenly distributed dataset across cave clusters and KFRs. Caves included in this monitoring plan are surveyed bi-annually, occurring in Spring (May) and Fall (November) or Summer (August) and Winter (mid-January-mid February). Biomonitoring of the caves follow methodology and techniques supported by USFWS to provide results that can be compared between caves throughout the region for better study and analysis (USFWS 2014a).

Beyond USFWS recommendations, survey methodology also follow guidelines described in the *2016 Balcones Canyonlands Preserve Land Management Plan: Tier II-A Chapter IX Karst Species Management*. The protocol for research and monitoring cave fauna involves the use of one to seven (depending on size of cave and logistics) predesignated, permanent survey zones per cave in which all living organisms encountered are identified and enumerated. Survey zones are either transects approximately 5 meters in length that span the width of the cave, or distinct units of the cave such as a small room or an easily discernible section, so that the size and location of the survey area remains constant during the study for trend comparison. For each survey zone, start and end time and the presence of trash or new vandalism are recorded. Relative humidity, temperature, nutrient input, dampness condition, and the presence of red-imported fire ants (RIFA; *Solenopsis invicta*) and TCA are also recorded both outside the cave and at each transect or zone. All data collected during cave surveys are entered into the BCP Karst Database.

Any unknown invertebrates observed during faunal surveys are collected and identified by a karst invertebrate specialist. In caves containing endangered species, collecting only occurs with a special collecting permit obtained by USFWS. All collected specimens are deposited

within the Texas Memorial Museum or other reputable facility (USFWS 2014a). The date of deposition and collection number is also recorded (USFWS 2014a).

Land managers also monitor the entrances of caves containing endangered species at least once a year for anything that might harm the rare invertebrates including presence of toxic substances, unauthorized access by recreational cavers, and surface disturbances which might have erosive potential or cause changes in surface drainage patterns.

The overall health of caves is also monitored by performing semi-annual cave cricket exit counts. Cave cricket exit counts are done as crickets emerge from caves during good weather nights (i.e., not raining, warm, etc.). The duration of the counts is timed for two hours starting at sunset, to maintain consistency with all surveys done between managing partners. Current weather conditions, surface temperature, and relative humidity are documented for each survey. Crickets emerging are placed in one of three age classes: nymph (up to 5 mm), sub-adult/juvenile (5-12mm) and adult (>12mm). Number of individuals exiting the cave is counted in ten-minute intervals. Time of first cave cricket exit and any other vertebrates exiting the cave are also recorded. An evaluation of TC/COA's cave cricket exit count survey protocol determined that this methodology meets criteria necessary to assess cave cricket abundance at caves as well as estimate changes over time in the number of cave crickets that emerge from cave entrances, both of which are necessary for determining the state of cave ecosystems and evaluating the effectiveness of the BCP's karst management goals (Weckerly 2012).

TC has begun implementing recorded cave cricket exit counts using Reconyx cameras. These counts follow the same methodology as in-person surveys, with cameras positioned to capture the primary exit areas used by crickets. This approach was adopted to remove the observer from the count, reducing potential bias that could influence cricket emergence behavior. Cameras are typically installed approximately three feet from the exit surface, with the number of cameras determined by the size of the surface area relative to the cave aperture. All methods are designed to closely replicate in-person observation protocols.

FY25 TC/COA Collaborative Monitoring Projects

Since FY12, BCP staff have included monitoring for presence of TCA at all visits to cave sites, using a monitoring and collection protocol and reporting procedures created by TC and COA BCP staff and updated in FY15. In FY13, at least two BCCP caves (Whirlpool and No Rent Caves) were confirmed to be infested by TCAs. COA and TC staff continued to conduct quarterly biological surveys at Whirlpool Cave from FY13 – FY17 to document TCA use of cave environments and assess impacts of this new invasive species on cave fauna. Surveys at

Whirlpool Cave were reduced to bi-annually in FY18. For FY25, staff did not observe any TCA activity in Whirlpool Cave.

In FY14, TC and COA expanded monitoring efforts at Weldon and No Rent Caves to document the arrival and potential impacts of a TCA population in the vicinity of these features. The TCA population at both caves subsequently disappeared for unknown reasons and remained absent until February FY22, when TCA were again documented in and around No Rent Cave. At that time, TCA were also observed near the entrance of Weldon Cave but were not detected within the cave until May 2022. In response, quarterly faunal surveys and cricket exit counts were reinstated to assess potential TCA impacts on these caves. During FY26, TC continued collaborating with Dr. Ed LeBrun (BFL) to study the McNeil population and implement inoculation with a microsporidian pathogen to reduce potential impacts to karst invertebrates. After TCA densities increased in FY23, populations began declining in FY24 following establishment of the pathogen, a trend well documented across the site. By FY25, TCA were observed only in Weldon and No Rent Caves during November and were otherwise absent for the remainder of the year. For additional information see Dr. LeBrun's report in the Appendix of BCCP FY25 Annual Report.

In August 2024 TCA were observed near Broken Arrow cave located on the COA Lime Creek Preserve. To get a better handle on potential impacts, COA BCP staff increased in-cave and cave cricket exit surveys at Broken Arrow Cave from biannual to quarterly surveys. Dr. Ed LeBrun inoculated the population near Broken Arrow Cave as well as the nearby Wilcox Karst Preserve with the microsporidian pathogen in Spring FY25 and have continued to monitor TCA at these sites for signs of successful inoculation.

TC and COA BCP staff began conducting bi-annual cave faunal surveys of Millipede Cave and Millipede Annex Cave in FY13 and continued surveys for FY25 to gather baseline data for the McNeil High School courtyard restoration project, which commenced in FY15. Management activities such as vegetation planting and trash removal were coordinated with McNeil High School staff and students to improve surface conditions of these two non-BCCP ES caves, with the intent of increasing nutrient input while also benefiting cave crickets and fauna. In FY18, staff observed and collected a non-native arachnid, Order Schizomida from Millipede Cave for species identification, it was also confirmed in the adjacent Millipede Annex Cave in December 2021 (Figures 5 - 7). The specimen was determined to be *Stenochrus portoricensis*, likely a native to the Yucatan Peninsula and has been discovered in greenhouses in Europe. It's proposed that this species was inadvertently introduced via plants purchased at local nurseries by school staff and likely uses parthenogenesis which makes it able to colonize new locations with no males (Monjaraz-Ruedas et al., 2022). This could explain why all

specimens collected to date in these caves have been female. Their numbers increased in both caves, especially Millipede Annex, before falling again. The fall in numbers may be due to the prolonged drought. The counts of *T. reyesi* and *T. myopica* are lower in both caves than before the arrival of *S. portoricensis*. *S. portoricensis* was reported by environmental consultants in Dead Dog Cave # 2 which is 5.6 miles away from McNeil High School. BCP staff will continue to monitor this newly introduced predator to see what direct and/or indirect impacts it will have on cave fauna.



Figure 5. *Stenochrus portoricensis* in Millipede Cave, 12/5/2018, photo by Colin Strickland

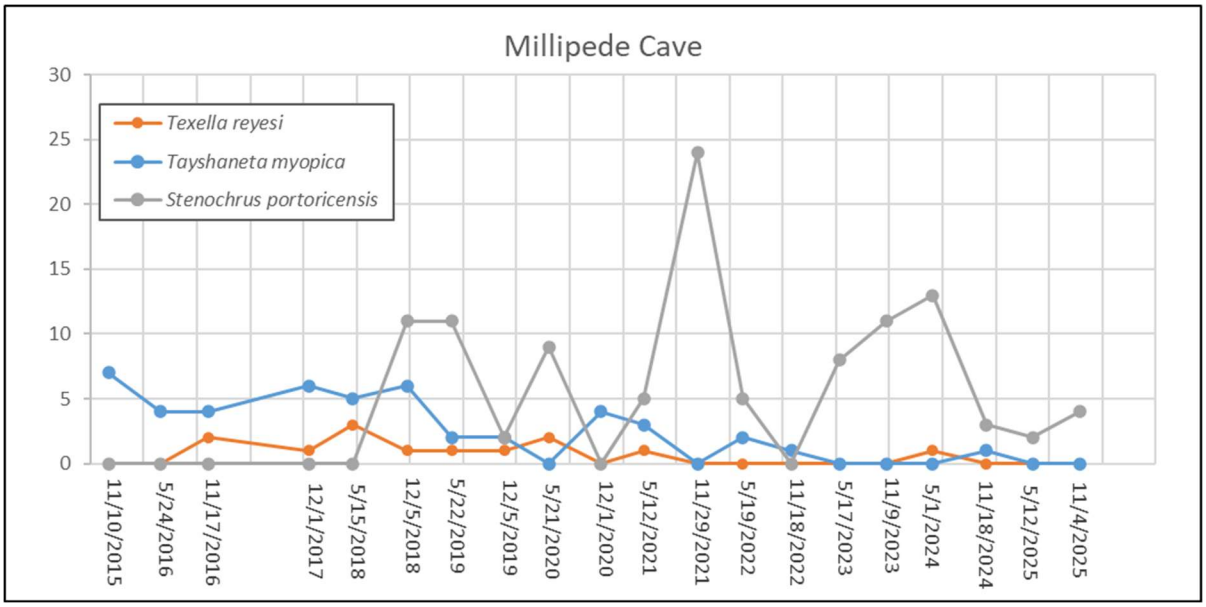


Figure 6. Counts of *Texella reyesi*, *Tayshaneta myopica*, and *Stenochrus portoricensis* during faunal surveys in Millipede Cave (*S. portoricensis* first found 12/5/2018)

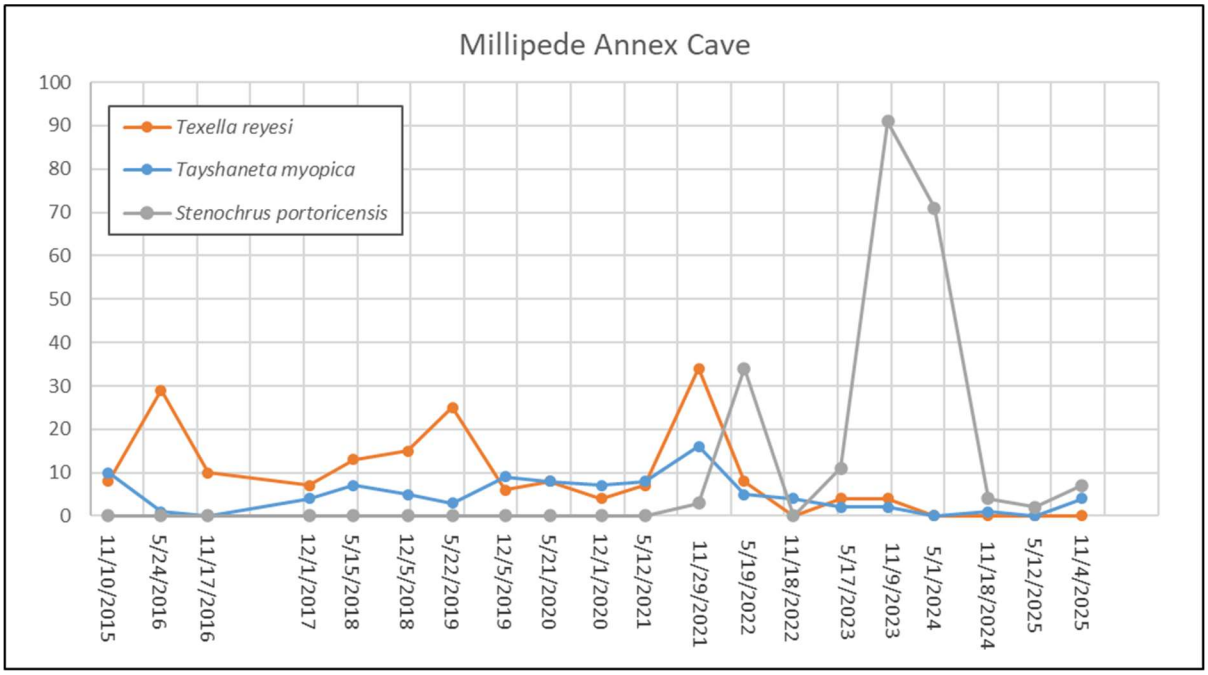


Figure 7. Counts of *Texella reyesi*, *Tayshaneta myopica*, and *Stenochrus portoricensis* during faunal surveys in Millipede Annex Cave (*S. portoricensis* first found 11/29/2021)

Starting in FY20, COA and TC staff assisted with the USFWS to address phylogenetic and species determination questions for the federally listed cave mold beetles of Travis and Williamson Counties. The goal was to collect up to three specimens from a large list of caves

that were within the known ranges of *Texamaurops reddelli*, *Batrisodes reyesi*, *Batrisodes texanus*, and *Batrisodes cryptotexanus*. This phylogenomic approach provided the information needed to answer the species delimitation questions with a robust molecular dataset. Collections for this project were completed in FY21, and staff along with other collaborators were able to successfully collect from many of the selected caves. Results show that within the McNeil/ Round Rock KFR what was thought to be *B. reyesi*, pending further morphological examination may actually be a new undescribed species, likely sister to *B. texanus/cryptotexanus*. Results still show overlap in range distribution for *B. texanus* and *B. cryptotexanus*, and that there was no support for the concept of *Texamaurops* as an independent genus, thus should be listed as *Batrisodes* (Wood et al., 2025).

Phylogenomics of endangered troglobiotic rove beetles (Coleoptera: Staphylinidae: Pselaphinae) from central Texas karst regions

In FY22, USFWS staff requested COA and TC staff collect more *Texella* specimens in selected caves to allow for a more thorough analysis of the species range and if some of these sites have undescribed species. In FY25, COA and Travis County staff have continued efforts to collect specimens from the selected caves.

TC and COA BCP continued to assist James Reddell with his project of updating the cave faunal lists and accurate locations of area caves for the Texas Speleological Society (TSS) database.

City of Austin FY25 Biological Monitoring

During FY25, COA BCP staff conducted bi-annual monitoring on the following 13 pre-selected caves: Cave Y, Cortana Cave (non-BCCP cave), Cotterell Cave, District Park Cave, Flint Ridge Cave, Jester Estates Cave, Maple Run Cave, Midnight Cave, Pond Party Pit (non-BCCP cave), Seibert Sink (non-BCCP cave), Spider Cave, Stovepipe Cave, and Testudo Tube (non-BCCP cave). Due to the recent TCA infestation, survey frequency for Broken Arrow Cave was increased from twice yearly to quarterly surveys. Airmen's Cave and Little Bee Creek Cave survey frequency were dropped to once a year to limit staff exposure to Tick-Borne Relapsing Fever (TBRF), (EXHIBIT A). To get a better handle on baseline data, in FY18 COA BCP staff completed one year of quarterly faunal surveys at Get Down Cave, Lost Oasis Cave, and Pipeline Cave. Survey frequency for these caves has been reduced to bi-annual surveys for Pipeline Cave and Lost Oasis and just annually for Get Down Cave. The reduction in survey frequency for Get Down Cave was also to limit staff exposure to soft ticks/TBRF. Staff completed quarterly surveys for one year for the newly restored Black Cap

Cave, and Persephone Caverns and will now drop surveys annually for Black Cap Cave and three times per year for Persephone Caverns. Staff also completed twice yearly surveys for the recently restored Gaping Maw Cave and completed quarterly surveys for recently restored Sacred Grove Cave. Staff completed twice yearly faunal surveys for the recently restored Merkin Hole Cave. (EXHIBIT A). Faunal surveys in these caves were conducted by permitted COA biologists in either Fall 2024/Spring 2025 or Winter 2025/Summer 2025. As part of a long-term site restoration project, COA BCP staff continued to conduct bi-annual surveys at Millipede and Millipede Annex Caves (EXHIBIT A). Annual faunal surveys were also conducted in Arrow Cave, Beard Ranch Cave, Blowing Sink, Cricket Cave, Gaping Jaw Cave, Goat Cave, LaCrosse Cave, Rolling Rock Cave, Slaughter Creek Cave, Wildflower Cave, and Wooden Derrick Cave (EXHIBIT A).

In FY25, COA BCP staff conducted bi-annual cave cricket exit counts at 13 caves pre-selected for faunal surveys. Due to the presence of TCA, survey frequency for Broken Arrow Cave was increased from twice yearly to quarterly surveys. The Airmen's Cave cricket count was dropped due to safety concerns with soft ticks/TBRF. Also, the Little Bee Creek Cave cricket exit count was dropped due to low numbers observed, more crickets are counted during the in-cave survey (EXHIBIT B). Staff completed bi-annual cricket exit counts for the newly restored Persephone Caverns and Gaping Maw Cave. Staff also completed twice yearly surveys for Lost Oasis, and Pipeline Cave and will continue twice yearly surveys for these caves (EXHIBIT B). COA BCP staff also conducted annual cricket exit counts at Black Cap Cave, Get Down Cave, and Jest John Cave (EXHIBIT B).

Travis County FY25 Biological Monitoring

TC BCP staff conducted biannual monitoring at seven pre-selected caves: Cold Cave, Gallifer Cave, Geode Cave (a non-BCCP cave), Kretschmarr Cave, Spanish Wells Cave, Stark's North Mine, and Tooth Cave. Faunal surveys in these caves were completed by permitted TC biologists during Fall 2024/Spring 2025 or Winter 2025/Summer 2025 (EXHIBIT A). In response to a recent resurgence of TCA, TC staff continued quarterly faunal surveys at two County-owned BCCP caves: No Rent and Weldon Caves. Annual faunal surveys were also conducted at four additional County-owned BCCP caves supporting federally listed species—Kretschmarr Double Pit, McDonald Cave, New Comanche Trail Cave, and Tardus Hole (EXHIBIT A). In addition, an annual faunal survey was conducted at one other BCCP cave—Ireland's Cave (EXHIBIT A).

TC BCP staff conducted biannual cave cricket exit counts at all caves pre-selected for faunal surveys except Stark's North Mine, including Cold Cave, Gallifer Cave, Geode Cave,

Kretschmarr Cave, Spanish Wells Cave, and Tooth Cave. One annual exit count was also completed at New Comanche Trail Cave. Surveys were conducted during Fall 2024/Spring 2025 or Winter 2025/Summer 2025. In response to the reintroduction of TCA, TC staff also continued quarterly cave cricket exit counts at No Rent and Weldon Caves (EXHIBIT B).

Red imported fire ant (RIFA) surveys were conducted in Spring 2025 at five of the fifteen County–owned BCCP caves supporting federally listed species. Surveys targeted RIFA mounds within an 80-meter radius of cave entrances, and all active mounds detected were treated with boiling water in accordance with USFWS (2014b) recommendations. Prior to mechanical issues in Spring 2025, a total of 42 RIFA mounds were treated within the 80-meter cave survey areas, with an additional six mounds treated in the vicinity of caves but outside the designated survey areas. Survey results and treatment details for individual caves are provided in Table 10.

In addition to managing the karst features required in the BCCP permit, TC voluntarily managed other karst features located on BCP land in FY24 including Cactus Pit, Brew Pot Cave, Kretschmarr Sink, and karst features RI-1, LU-11, and LU-12.

TC received funding from TxDOT for impacts to karst zone 1 habitat along the FM 620 corridor that was utilized for restoration projects for several caves. Zara Environmental LLC was contracted for these karst management activities on the Cuevas, Cuevas East, Grandview Hills, and Texas System of Natural Laboratories (TSNL) tracts of the Balcones Canyonlands Preserve within the Jollyville Plateau of northwest Travis County, Texas. Efforts focused on evaluation, excavation, restoration, and incidental faunal surveys at eight caves. Excavation, restoration, and faunal surveys were conducted at Amber, Encinal, Kretschmarr, Root, and Two Trunks Caves, while evaluations at Kretschmarr Double Pit, Kretschmarr Sink, and North Root Cave informed future management actions. Continued excavation is recommended at Amber and Encinal Caves; mapping is recommended for Two Trunks Cave; and future excavation is recommended at Kretschmarr Sink and North Root Cave, followed by remapping of the Root–North Root Cave complex. Four additional caves—Cactus Pit, Kretschmarr Fluted Sink, Mold Hole, and Tight Pit—should be reevaluated in FY26 to help prioritize future efforts. Any survey conducted that observed ES is documented in EXHIBIT A with TC* for the monitoring agency and the full report can be viewed in the APPENDIX.

White-nose Syndrome Sampling

White-nose Syndrome (WNS) poses a significant threat to bat populations across the United States. To help mitigate its impacts and prevent potential spread within BCP, a comprehensive

monitoring plan was developed to assess the presence of *Pseudogymnoascus destructans* (*Pd*). *Pd* is a cold-adapted fungus that thrives in the cool, stable environments characteristic of caves, mines, tunnels, and other bat hibernacula (Wolf et al. 2022).

WNS is the disease manifestation caused by *Pd* infecting the skin and fat layers of hibernating bats. The fungus acts as an irritant, disrupting normal hibernation cycles and causing bats to arouse prematurely from their low-energy torpor state. These repeated arousals rapidly deplete critical fat reserves and water stores, weaken immune function, and often result in mortality from starvation or dehydration within the hibernaculum. In some cases, bats emerge to forage during winter months when food resources are extremely limited, increasing the likelihood of exposure, exhaustion, or freezing temperatures, which can also lead to death.

TC staff initiated monitoring for *Pd* in February 2025. A total of 53 swab samples were collected from five of the ten caves identified as having environmental conditions potentially conducive to *Pd* incubation, as well as 20 *P. subflavus* found within three caves (Stark's North Mine, Gallifer, and Weldon Caves). All samples were submitted and processed by the Pathogen and Microbiome Institute (PMI) at Northern Arizona University, which specializes in wildlife infectious disease and microbiome research. All initial results came back as negative for *Pd* except one *P. subflavus* that was found in Weldon Cave. All results can be found in the APPENDIX.

Other Biological Monitoring Efforts

Zara Environmental conducted biological monitoring at Pennie's Cave in FY25 as part of an adaptive cave management plan for a development project that began with the reopening of the cave's entrance in 2012. Due to high CO_2 levels, in FY18 Zara installed a semi-permanent in-cave air ventilation system that greatly improved air quality, thus allowing for in-cave faunal monitoring, staff was also able to complete the interior cave mapping. A written report of their work in FY25 was also provided (Zara Environmental 2025a; Appendix T10 of BCCP FY25 Annual Report).

COA BCP staff have continued conducting bat monitoring activities in FY 2025. Acoustic bat monitoring equipment (SM4BAT-FS Ultrasonic Bat Detector) were deployed in the entrances of Goat and County Line Bat Caves. A meter was deployed at Barker Bat Cave in late 2025 utilizing an external battery for longer recording duration. Once more data is collected, it will be analyzed with Kaleidoscope Pro to determine what species of bats are present during different times of the year.

In FY25 COA BCP staff continued to assist James Reddell and the Texas Speleological Survey (TSS) in surveying, excavating, and mapping the karst of the USFWS Balcones Canyonlands National Wildlife Refuge (BCNWR). One cave of interest that may be a suitable substitution for another BCP permit cave that has inadequate protections is Collaboration Cave (Figure 9). Collaboration Cave was initially a 25.5 ft deep shaft plugged with rocks and soil. After 14 days of excavation the shaft is approximately 35 ft deep and there is about 40 ft of horizontal passage with a small stream flowing through it. The stream is inhabited by stygobitic isopods *Caecidotea reddelli* and amphipods *Stygobromus* sp. (Figure 8).



Figure 8. Stygobites in Collaboration Cave 7/30/2018, *Stygobromus* sp. (middle and left), *Caecidotea reddelli* (right), photo by Colin Strickland

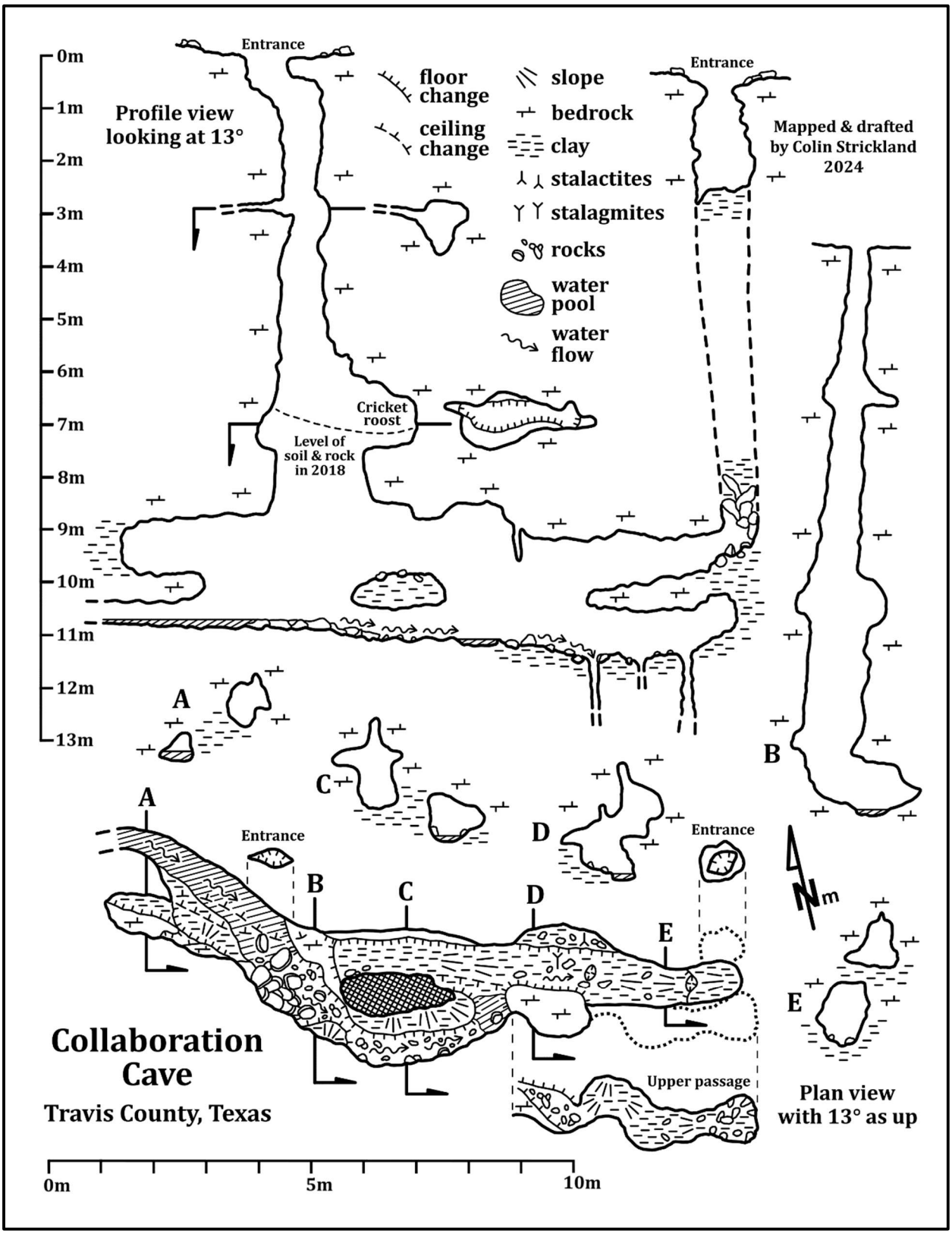


Figure 9. Collaboration Cave Map, mapped and drafted by Colin Strickland in 2024

Excavation activities at Collaboration Cave have concluded. Some nearby features were found using LIDAR. The most promising feature was named Mark Sandal Cave, and one day of excavation was done in May 2024 (Figure 10). In February 2025, while Mark Sanders, Drew Thompson and Guin McDaid continued work on Mark Sandal Cave, Colin Strickland took photos and video in Collaboration Cave and collected a *Tartarocreagris* sp. (Figure 11). Upon reviewing videos, he took of stygobites Colin noticed tiny aquatic cave snails that he had not noticed while in the cave. We will attempt to collect some in FY26. Colin then walked to another sink on the Rogers track to the south-east of Mark Sandal which with minimal effort revealed an approximately 12-foot-deep pit which he named Civil Service Cave (Figures 12 & 13). There is a large rock blocking the entrance. We plan to continue work on Mark Sandal and further investigate Civil Service Cave in FY26. These efforts continue to expand the knowledge of cave fauna in the karst fauna region shared by two BCCP caves: Jack's Joint and Armadillo Ranch Sink.



Figure 10. Entrance of Mark Sandal Cave



Figure 11. *Tartarocreagris* sp. Collaboration Cave 2/25/2025, by Colin Strickland



Figure 12. Civil Service Cave before excavation 2/25/2025, photo by Colin Strickland



Figure 13. View into Civil Service Cave, 2/25/2025, photo by Colin Strickland

COA BCP has continued to collaborate with Texas State University, Baylor School of Medicine, and the Centers for Disease Control (CDC) on a study to further understand and document the recent increased occurrence of Tick-borne Relapsing Fever (TBRF) in Central Texas. TBRF is a bacterial infection that can cause recurring bouts of fever, headache, muscle and joint aches, and nausea. *Borrelia* bacteria that cause TBRF are transmitted to humans through the bite of infected soft ticks of the genus *Ornithodoros*. All recently confirmed cases of TBRF in the Austin area have been attributed to *Borrelia turicatae*, and the ticks have all been confirmed as *Ornithodoros turicata* (Figure 14). Soft ticks (Family: Argasidae) differ from the more familiar hard ticks (Family: Ixodidae) in two main ways. They have a short feeding duration, usually less than half an hour, and they do not search for hosts in grass or brush but instead reside in animal burrows (CDC TBRF, 2015).



Figure 14. *Ornithodoros turicata* in Airmen's Cave 1/22/2018, photo by Colin Strickland

COA BCP continues to monitor soft tick populations to better understand the level of risk that may be associated with caves accessed by the public. Priority has been given to the education caves due to the large number of children visiting them, followed by caves in the Barton Creek Greenbelt that are well known hangouts for hikers seeking relief from the Texas heat.

Pit fall traps using dry ice were deployed in caves in the Austin area to survey soft tick populations. Specimens were collected live and stored in ventilated plastic vials for transport to delivered to Job Lopez at Baylor College of Medicine for *Borrelia* identification and further TBRF research. The information gathered is being shared with Dr. Ivan Castro at Texas State University and other tick born illness researchers.

A research permit is being created in FY26 by Texas State University and Baylor University to help continue our efforts in the study of the rise and fall of tick numbers within our caves. It is unclear what causes some caves to have such high numbers. It is likely due to the presence of favorable cave environments (soft, dry soil that is easy to burrow in) and ample access for specific host species such as mice, racoons, and rock squirrels. Reddell (1988) noted that relapsing fever is typically associated with dry, shelter-like cave entrances with specific mammals such as goats and that infections of a cave by *O. turicata* with *Borrelia turicatae* could possibly by cyclic. Some birds and mammals, particularly predators, are associated with reductions in ticks, either by reducing/intimidating host species such as rodents or by directly preying on ticks (Hofmeester et al., 2017; Ostfeld et al., 2018). COA BCP will continue to

monitor education and public access caves, such as Airman's and Bullet Caves. The detection of a single tick does not make a cave high risk for relapsing fever; however, cave guides should be informed about the risk of TBRF should later symptoms arise. There is concern that fear-driven over reaction to TBRF could lead to impairment or destruction of cave ecosystems, as was historically the case in earlier planned bat extermination efforts because of irrational fear of rabies. Furthermore, the soft ticks must be infected with *Borrelia turicatae* to transmit TBRF.

In FY25, caves identified as a high risk for TBRF include Live Oak Cave and Get Down Cave at Village at Western Oaks Karst Preserve; Airmen's Cave, Spider Wire Cave, and Bullet Cave along the Barton Creek greenbelt; and Little Black Hole, Little Bee Creek Cave, and Under the Road Cave near the Ullrich water treatment plant. In FY25 staff observed and collected 45 soft ticks from Little Bee Creek Cave. The results came back that none of the ticks were hosts of *Borrelia turicatae.* The numbers of ticks observed in Little Bee Creek Cave greatly increased from FY24. Due to the potential threat of TBRF moving in from neighboring caves known to be hosts, staff have decided to drop in-cave faunal surveys, limiting monitoring to an annual cave cricket exit count. Drew Thompson was bitten by soft ticks in Get Down Cave, so the bi-annual cricket count and faunal surveys were reduced to annually, in the month January, when cold temperatures make the ticks less active. With the rise in the number of ticks in the entrance to Airman's Cave, the cricket counts for that cave will be postponed until a safe way to do so is conceived.

7.0 HYDROGEOLOGIC STUDIES & CAVE RESTORATION

The understanding and protection of water sources to caves is vital for preserving cave life that relies on it. Water sources include surface catchment areas that direct runoff to the cave entrance and subsurface catchment areas where overlying water infiltration from either rainfall or runoff supports cave drips. Surface catchment area delineation generally involves examination of a combination of field GPS delineation of catchment divides and drainages as well as surface topographic contour coverages. Subsurface catchment studies may involve direct tracing, water-quality characterization, drip rate monitoring, geological mapping, cave survey mapping, and cave radio surveying.

Cave restoration is an extremely slow and labor-intensive part of cave preserve management that is a prerequisite for conducting hydrogeological studies, vital for re-establishing necessary nutrient input, and habitat for cave ecosystems. Historical land use practices over karst areas across the Austin area involved plugging caves and sinkholes to keep water at the surface for

livestock ponds, mills, and access to shallow sources. Caves were also historically used for trash disposal. Open caves also created hazards for people and livestock, and filling caves with trash seemed like a practical solution to ranchers, particularly given that, prior to local dye tracing studies, many scientists erroneously believed groundwater flowed slowly through tiny pores and that ground water was completely filtered before reaching the water table. Many caves were also covered by urbanization and many local caves that could have been preserved were filled in under the assumption that this measure protected the underlying aquifer from contamination. Efforts to remove trash and fill from caves is slow and regulated to a small group of cave-trained women and men. Once trash and fill are removed from a cave, utilization of the cave by cave-adapted organisms follow, including cave crickets, bats, and other mammals that bring nutrients from the surface. Many of the 62 federal permit caves required excavation of fill or trash, and some such as in the cases of Pipeline Cave and Midnight Cave still require it. In addition to restoring cave habitat, cave restoration can also serve to restore recharge and reduce flooding where the cave catchment area is large, improve water-quality in caves filled with trash, and provide educational resources necessary to allow the public to make connections with natural ecosystems. To support cave restoration efforts, AW BCP produced a Guidelines for Cave Restoration in February 2020. In November 2018, AW BCP released version 3 of Austin Cave Activity Hazards and Safety Report that describes unique cave hazards, protocols for addressing them, and relevant safety regulations.

In addition to the large challenges of widespread historical cave filling, the highly specialized skill and dedicated physical effort required to restore them, and limited resources available for cave restoration, in January 2018, while attempting to unplug BCCP permit Blowing Sink Cave, it was observed that regulation of cave restoration was unclear. In order to clarify the regulatory status of cave restoration and provide distinction of cave restoration from other development activities that could harm caves, Austin Water, Watershed Protection Department, Parks and Recreation Department, and the Development Services Department finalized an MOA which took effect on April 1, 2020, that clarifies that cave restoration using hand-held tools is not a development activity requiring a permit. However, for cave restoration, the use of backhoes and similar heavy machinery, and laying of impervious cover requires prior discussion with WPD staff. The Texas Commission on Environmental Quality Edwards Rules similarly requires approval prior to the use of heavy machinery for cave restoration.

Some Central Texas caves are known to have high levels of CO_2 during certain times of the year, with generally higher levels in the hotter months and lower levels in the cooler months. Some of these caves are utilized for public tours, and some are inhabited by rare karst invertebrates and require faunal surveys, so knowing when CO_2 levels are lower is important.

In FY25 Vaisala CO2 meters were placed in Testudo Tube and Broken Arrow Caves. These record CO2 levels every three hours. Once a years' worth of data has been collected the meters will be moved to Lost Oasis Cave. Lost Oasis is known to have high CO2 levels in the summer but strangely during a TCMA dig night the CO2 levels were high in the entrance room but low in the deeper section of the cave where they were working. A meter will be place in the entrance room and the deeper section to see how the CO2 levels differ.

In May 2019, State Highway 45 SW began operation as a toll road over Flintridge Cave and its subsurface catchment area. Continuous monitoring of Flint Ridge Cave ended in FY25 when the flow meters stopped functioning, and it was deemed we had enough data. The data-logging Hydrolab sonde that had been continually recording water quality readings (temperature, specific conductivity, pH, dissolved oxygen, and turbidity) every hour since July 31st, 2019, was moved to Testudo Tube Cave. In FY26 we will collaborate with hydrogeologists at Watershed Protection to analyze the post SH45 flow and water quality data and we hope to do one more sample run utilizing grab samples rather that time sequence autosampler samples.

The cave restoration portion of hydrogeological studies is the slowest, most labor and funding intensive portion. There are limited resources for cave restoration, and it requires specialized cave expertise which is not common. FY25 cave restoration efforts are described below.

City of Austin FY25 Cave Restoration Projects

Stovepipe Karst Preserve Cave Restoration

In preparation for an upcoming hydrological study of Stovepipe Cave multiple features on Stovepipe Karst Preserve have been restored including Mossy Elm Cave, Caverns of Sweet Nora, Persephone Caverns, Gaping Maw Cave, Gaping Jaw Cave, Sacred Grove Cave, Coffee Mug Sink and Melinoë Sink. Prior to restoration efforts Stovepipe was the only known cave on the property. Now there are seven caves on Stovepipe Karst Preserve with likely more to come.

Persephone Caverns

Now the longest known cave on the Jollyville Plateau, Persephone Caverns is the kind of restoration project we always hope for (Figure 15). With minimal excavation large portions of cave passage are now accessible. The cave entrance was initially plugged with approximately 10 feet of soil and rock. After opening the entrance nutrients were allowed to enter and the cave was colonized by cave crickets, tricolored bats, western slimy salamanders

and cliff chirping frogs. The increases in nutrients have cause increases in both the abundance and diversity of troglobitic species.

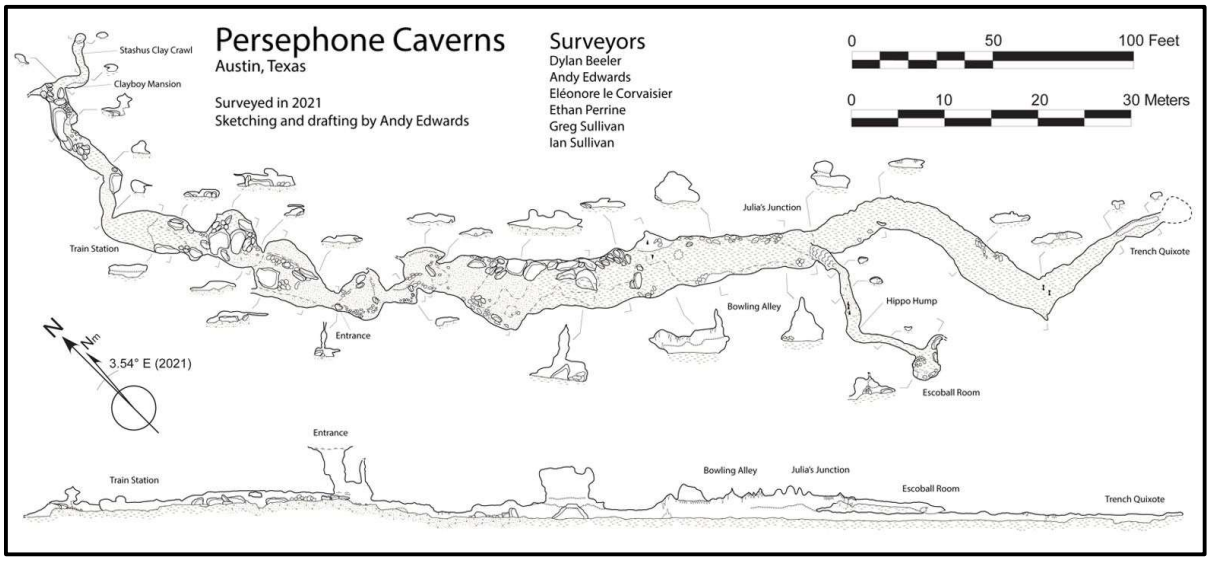


Figure 15. Persephone Caverns map, sketched and drafted by Andy Edwards in 2021

Faunal surveys were initially performed quarterly to document the changes after restoration, but the winter survey has been dropped due to hibernating Tricolored bats in the entrance room. By continually surveying over time since the cave was restored, we have been able to document increases in both *Texella reyesi* and *Rhadine persephone*. There was a significant increasing trend in the number of *Texella reyesi* observed in Persephone Caverns since 5/14/2021, $r(14) = .80$, $p < 0.001$. (Figure 16). The increasing trend in the number of *Rhadine persephone* observed in Persephone Caverns since 5/14/2021 was not significant, $r(14) = .26$, $p = 0.34$. (Figure 16).

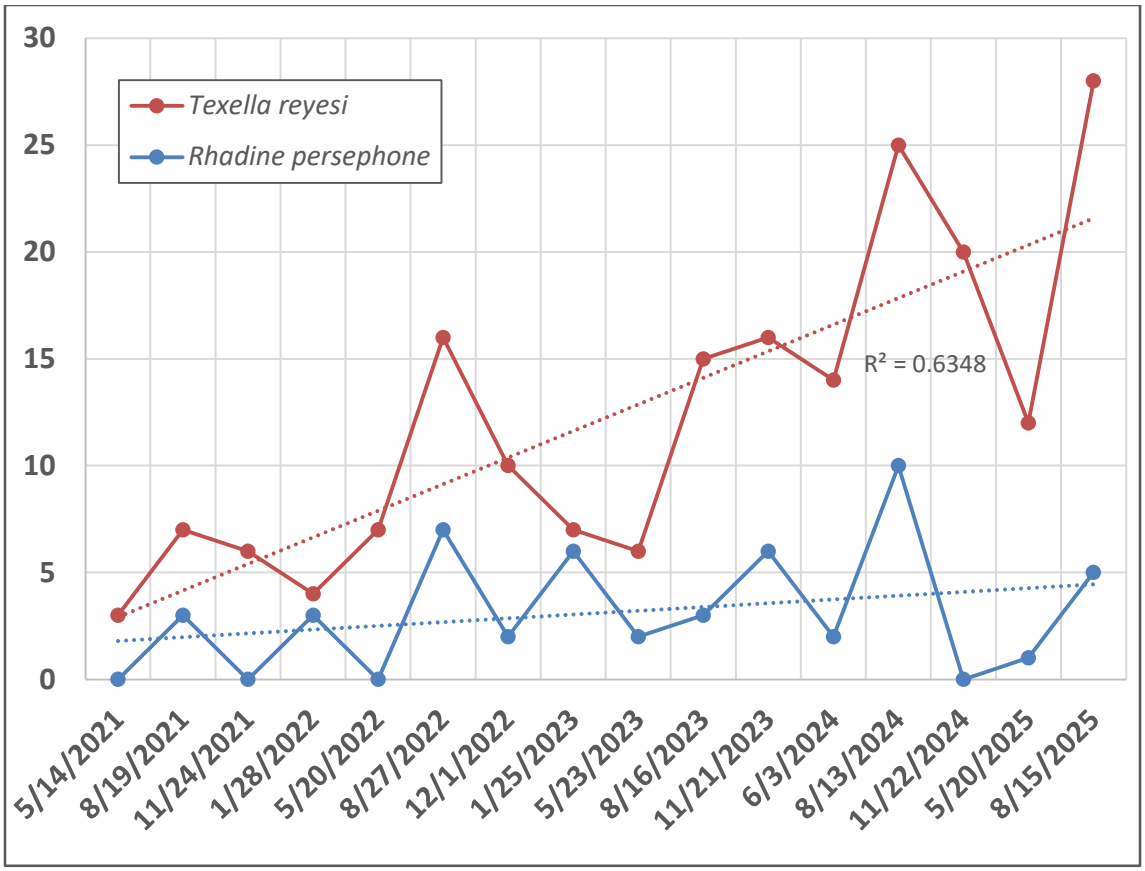


Figure 16. Counts of *Texella reyesi* and *Rhadine persephone* in Persephone Caverns

In summer of 2025 Zarria Environmental continued work to extend Persephone Caverns. The goal was to pursue leads in the SE end of the cave in order to access potential new faunal habitat. The first effort focused on continuing work in Trench Quixote (Figure 15). Progress was made trenching forward, until the stone floor rose making in too narrow to proceed, with the trench now about 30 feet long. Figure 17 shows the end of the trench with the floor raising towards the ceiling.

They moved their attention to a nearby lead heading SW from the main passage. After clearing the passage for about ten feet it turned upward, and they were able to dig into a new passage perpendicular to the main passage and approximately eight feet wide. There is good airflow in this new passage but past a large dome in the ceiling the passage becomes very constricted. The estimated total of new passage that can be accessed is about 63 feet (Figures 18-21). This new passage could be extended, but it would be technically challenging, though steady airflow on the Jollyville Plateau may make the effort worth it in the future.

Lastly, several travel and access issues near the entrance were addressed, including removal of a difficult pinch point and the widening of a black dirt belly crawl, making accessing the southern portion of the cave much easier.



Figure 17. End of Trench Quixote, photo by Rich Zarria



Figure 18. Interior of the excavated SW lead before the upward turn, photo by Rich Zarria



Figure 19. Looking south in new passage, Photo by Rich Zarria



Figure 20. Colin Strickland in dome, Photo by Rich Zarria



Figure 21. Stalactites in new passage, photo by Colin Strickland

Sacred Grove Cave

Sacred Grove was initially found by Colin Strickland in 2019, and he made it about 6 ft deep when restoration work started in 2020. Zarria Environmental worked on it during August and September 2022 and hit void. Then in FY23, Zarria Environmental enlarged the passage and hit a small room.

Zarria Environmental Consulting excavated a side passage with airflow in 2024 and hit a new small room. Then *Texella reyesi*, and *Rhadine persephone* were found after opening the new section of the cave. Other troglobites found include *Cicurina travisae,* and *Eidmannella reclusa*. Colin finished the map of the cave in 2024 (Figure 22).

In Spring 2025 as mitigation for expansion of Lakeline Blvd. ACI Environmental Consulting worked to enlarge the passage to the new room and then dig a lead in the floor. All rock and soil were removed from the cave.

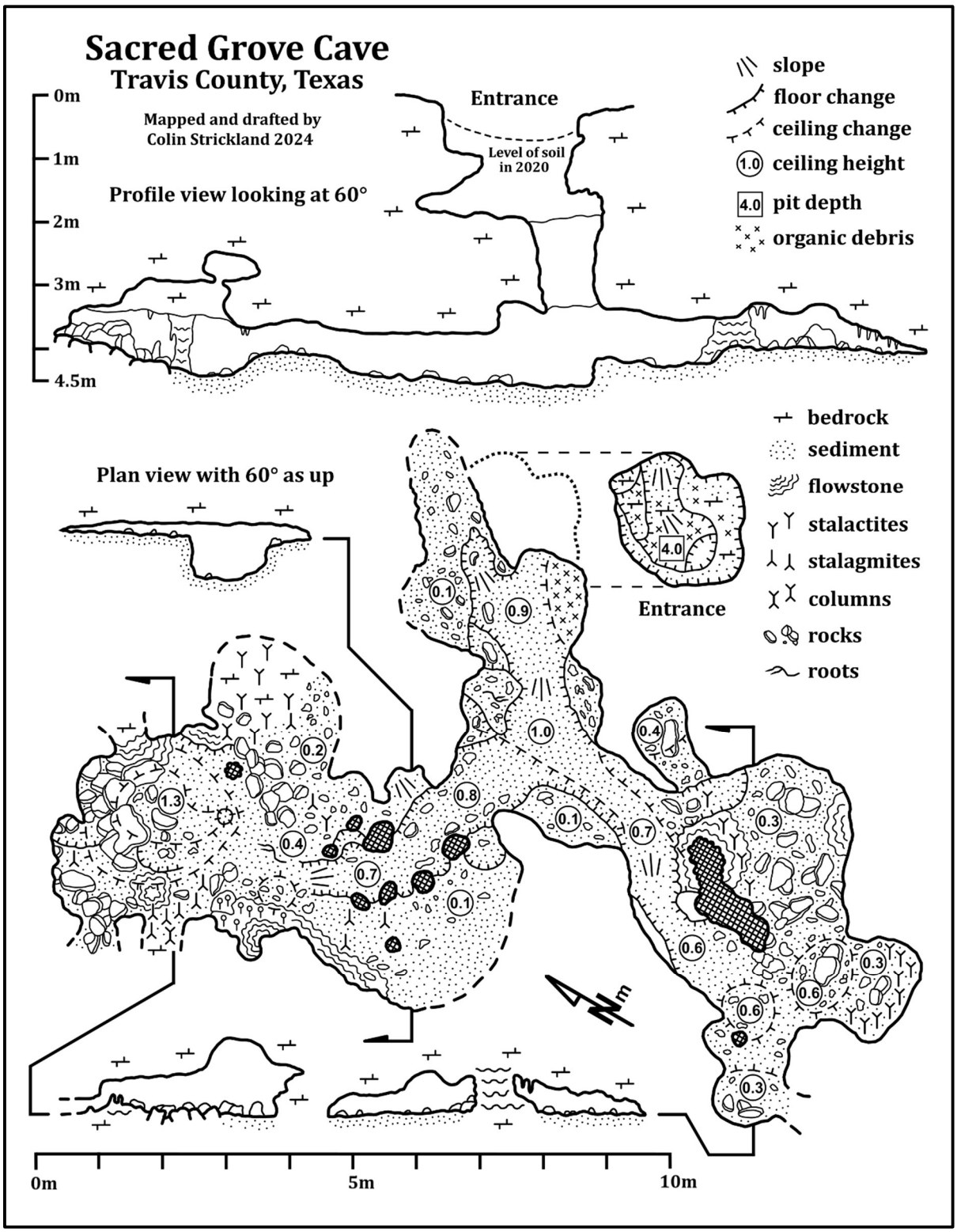


Figure 22. Sacred Grove Cave map, mapped and drafted by Colin Strickland in 2024

Gaping Jaw Cave

In September 2025 4Caves Institute worked expand Gaping Jaw Cave. The primary cave passage was extended past the previous extent 10-1/2 feet continuing Northeast. A side lead was extended about five feet to the Southeast. A volume of approximately 100 cubic feet of cave area was opened up (Figure 23). During excavation Justin observed the following cave species of note *Ceuthophilous secretus*, *Cambala speobia*, *Rhadine* sp., and *Pseudosinella violenta* (Figure 24).



Figure 23. Before and after excavation with flagging shown in both, photos by Justin Shaw.



Figure 24. Cave Crickets (Ceuthophilus secretus) inside Gaping Jaw Cave.

After excavation Colin Strickland added habitat rocks throughout the cave. He saw large numbers of *Ceuthophilus secretus* in the newly opened section and fresh cricket guano on the floor. The cave will be surveyed quarterly for two years to document the colonization of the restored habitat and then dropped to biannual and eventually to once annually.

Kent Butler Preserve Cave Restoration

4Caves Institute worked to enlarge the entrance shaft and first room in Merkin Hole Cave. The cave was a known Texella reyesi site, but it was hard to preform surveys in due to being extremely constricted. After descending an approximately 15-foot pit, there was a large "pancake" room approximately 30 by 15 feet but only about 1.5 feet tall at its highest. 4Caves worked to lower the floor by two feet in a large portion of the room allowing easier access for faunal surveys. Figure 25 shows this floor lowering in progress.



Figure 25. Floor lowering in Merkin Hole Cave 6/23/2025, photo by Colin Strickland

After material was removed a faunal survey was done on 7/17/25. Troglobitic species included *Texella reyesi* (4), *Rhadine persephone* (1), *Speodesmus* sp. (2), *Cambala speobia* (~58), and *Texoreddellia* sp. (1). All of the *Texella* were found under rocks on the ledge of dirt that had not been removed. The rest of the room was devoid of habitat rock, so Colin Strickland and Guin McDaid added approximately one hundred rocks to the room (Figure 26).

The biological response to this restoration project was greater than anticipated. It seems that cave crickets did not like to roost on the ceiling when it was only 1.5 feet tall but at three feet tall, they roosted in high numbers leaving large amounts of nutrient rich cricket guano on the floor. Another faunal survey was done on 8/21/2025, so about a month after adding the habitat rock. The number of *Texella reyesi* found was 17 a 325% increase from the four found on the previous survey. Interestingly the numbers of *Cambala speobia* increased from 58 to 425 a 633% increase. The area under the cricket dome swarmed with *Cambala* and many rocks in the back section of the room had ten or more under each (Figure 27).



Figure 26. Before and after habitat rock was added to Merkin Hole Cave on 7/23/2025, photos by Colin Strickland



Figure 27. *Cambala speobia* under cricket dome in Merkin Hole Cave 8/21/2025, photo by Colin Strickland

Mekin Hole still has a lot of potential so more work will be done in FY26 to enlarge more of the room and hopefully access lower levels with active drips and more troglobitic species.

South Austin Cave Restoration

William H Russell Karst Preserve

Cave volunteer Peter Sprouse's permit was reissued from the Austin Nature Preserves Program to restore and map features on the preserve. In FY25 volunteers supervised by Peter Sprouse continued to remove sediment and rocks from multiple features including Blowing Sink Cave, Jody Lane Cave, Sink in the Woods Cave, Sinky Dinky Cave, Winter Woods Cave, and Wyoka Cave. The volunteers successfully reached the water table in Blowing Sink Cave (Eileens River) which is a major flow path to Barton Springs. This will allow for vital monitoring of the Barton Springs salamander and is vital for future hydrological studies. Volunteers also discovered over 100 meters of new passage in the Dark Side of the Moon section of Blowing Sink Cave. A major goal for FY 26 will be to remove the large number of stored bags of sediment from Blowing Sink Cave to ensure that it does not plug back up again. Creating a

sediment trap by extending the chimney would also prove to be greatly beneficial to reduce the amount of material washing into the passage thus preventing further issues in the future.

Lost Oasis Cave

TCMA volunteers lead by Drew Thompson continued to follow the airflow in the lower lead. Excavations revealed 6 feet of new passage. Further excavations will continue into 2026.

Cricket Cave

Cricket Cave was discovered by Lady Bird Johnson Wildflower Center (WFC) staff in 2018. It was found due by observing a large vapor plume early on a cold morning. The entrance was approximately 4 inches in diameter, but a depth of over 6 ft could be seen. The initial excavation was conducted in November of 2021 by Drew Thompson, Mark Sanders, Colin Strickland, and Patty Calabrese. After work by Drew Thompson, Ethan Perrine, Eléonore Le Corvaisier multiple large rooms were discovered (Figure 28).

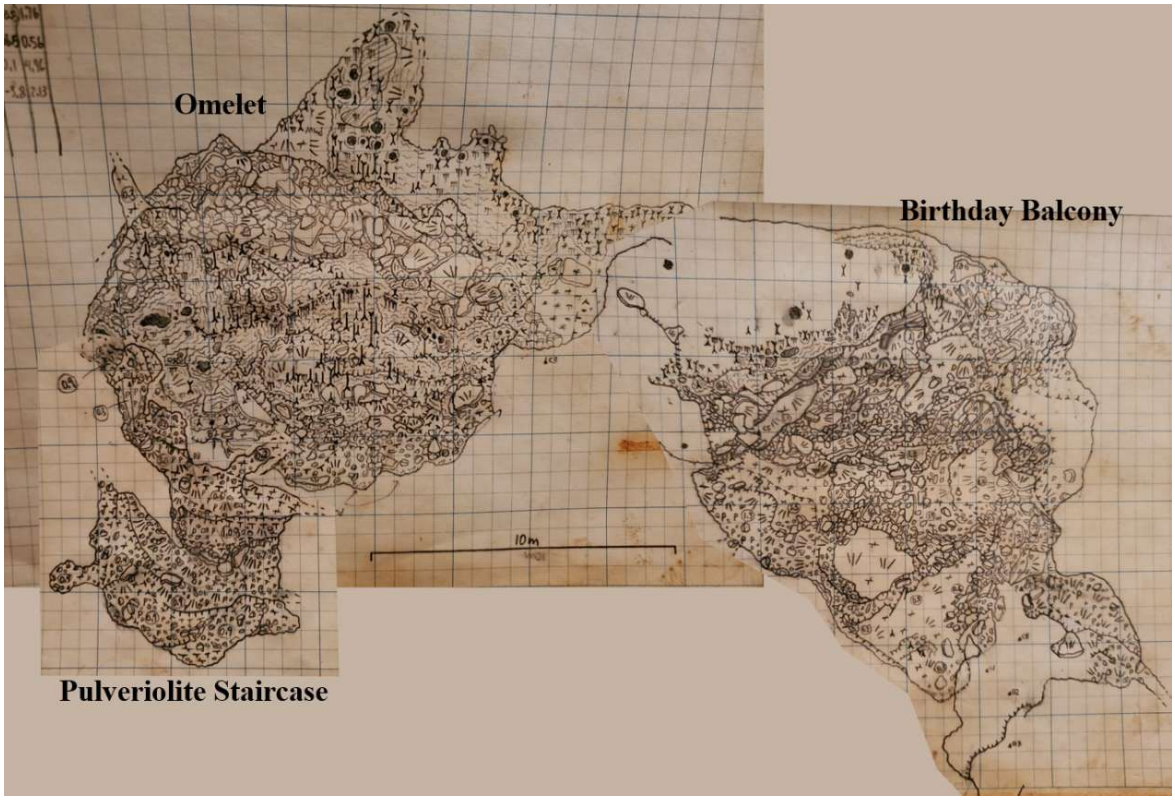


Figure 28. Plan sketch of Cricket Cave lower level by Colin Strickland

In FY24 Colin completed most of the sketching to draft a final map, but at the end of the Birthday Balcony he discovered a narrow passage that led to another large room. The room is a dome that is close to the surface and there must be a small entrance because the ceiling was covered in hundreds of *Ceuthophilous secretus* (Figure 29). The room was named Secretus

Society since the cave crickets congregate there each day away from prying eyes. You can see the layout of the cave in the profile line plot shown in Figure 28. In FY25 Colin got all the profile and cross-section sketches done and started drafting the final map. Progress has been made, and a final map is planned to be completed in FY26 (Figure 31).



Figure 29. Colin looking at flowstone in Secretus Society Room

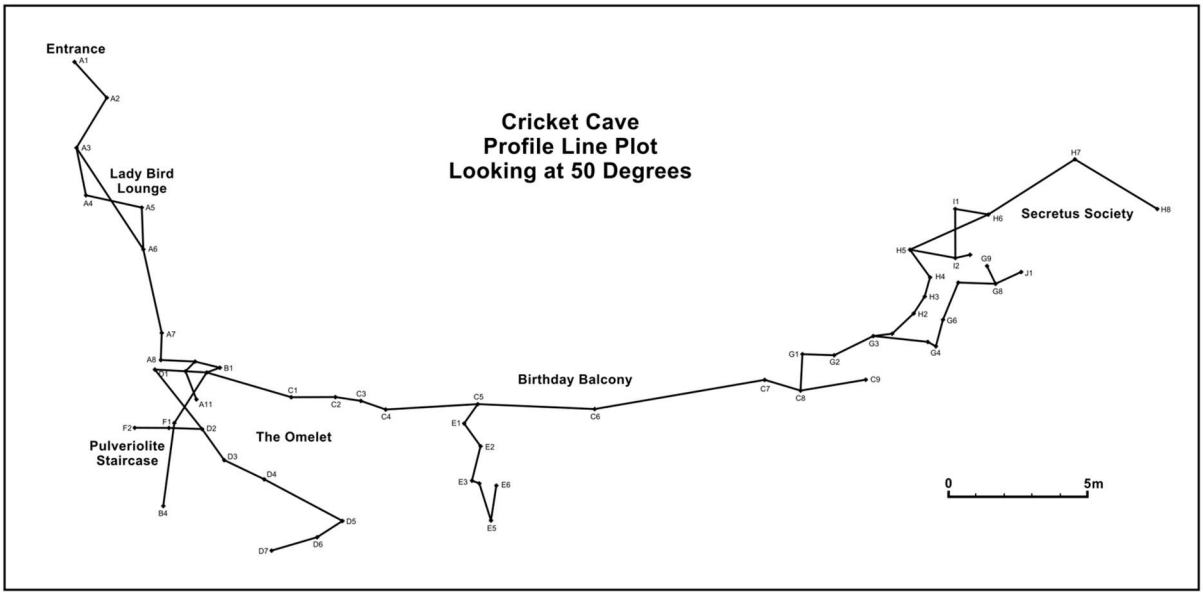


Figure 30. Profile line Plot of Cricket cave with major rooms labeled.

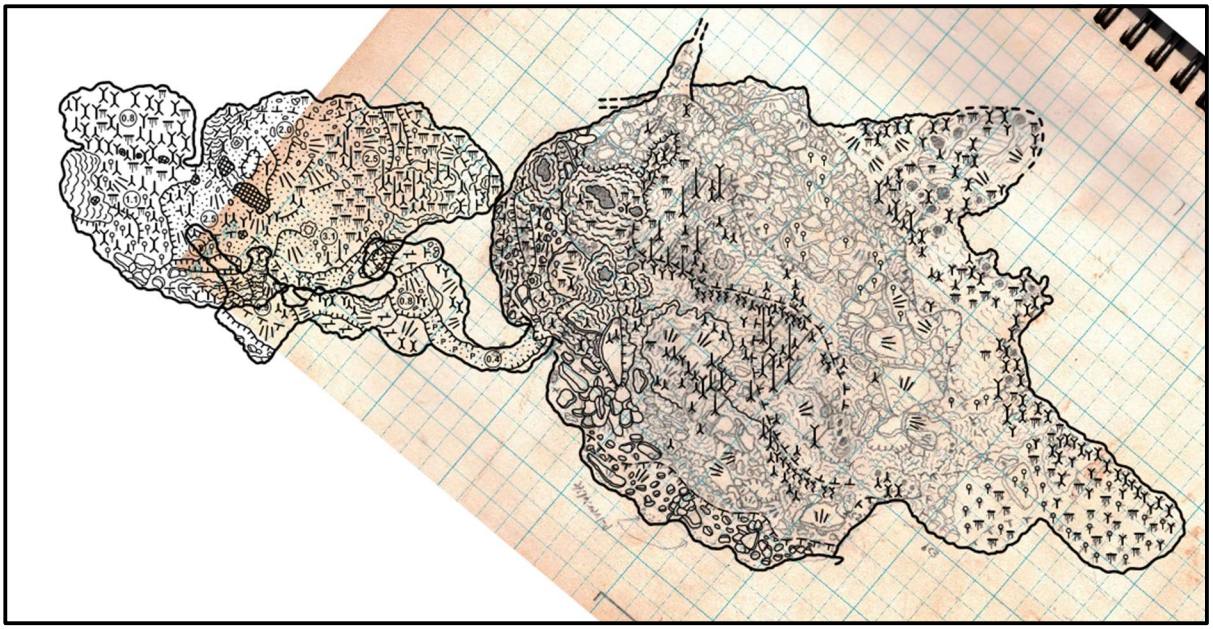


Figure 31. Progress of Cricket Cave plan view, with Omelet partially completed.

8.0 RECOMMENDATIONS

COA and TC should continue to contact the owners of each privately-owned BCCP cave to assess current faunal assemblages and negotiate protection of these caves. The precise location of some of these privately owned caves is currently unknown; therefore, COA and TC should attempt to locate these caves to make a meaningful assessment. Staff will also continue to search for possible substitutions for caves that cannot be acquired or lack adequate protections. Additionally, COA and TC will continue to evaluate the adequacy of protections for all 62 BCCP caves by continuing hydrological studies initiated in FY19 and prioritize efforts accordingly. Karst preserves will be established to preserve the surface and subsurface catchment areas, cave cricket foraging areas, and other guidelines for preserves outlined by USFWS (2012).

Future research needs for the BCP should include an effort to determine to species level currently unknown troglobites such as *Speodesmus* spp., *Eidmannella* spp., and Trichoniscidae found in BCP caves to determine if these species are species of concern listed on the BCCP Permit. A recent research need has also been identified by James Reddell concerning *Rhadine* beetles in the region, with the possibility that potentially two undescribed species could be found within BCP caves. Future research and funding may be needed to answer these research questions.

9.0 KARST MANAGEMENT ACTIVITIES

The BCP Karst Land Management Plan (2016) outlines planned activities concerning the 62 BCCP karst features. Table 10 below includes a summary of monitoring and management activities for these features completed in FY24.

Table 10. FY25 BCCP Karst Feature Monitoring and Management Activities.
Adobe Springs Cave The Nature Conservancy 1. TC was unable to conduct any management or monitoring activities during FY25 but expects to complete all biannual activities in FY26.
Airmen's Cave City of Austin 1. Conducted annual cave faunal survey (See EXHIBIT A). 2. COA installed a cave gate within 18 ft of the entrance of the cave in January 2012. The cave gate not only protects the cave from ongoing vandalism but also serves to protect the public from future accidents that would come from uncontrolled access. Access is still allowed via permit. 3. Conducted quarterly site inspections and continued to operate security camera. No signs of vandalism to the cave gate were noted. 4. An interdepartmental agreement between PARD and AW BCP is being sought necessary to establish formal BCCP karst preserve management. 5.An access easement with one of the overlying property owners was approved on August 16, 2023 it secures future access for monitoring and management activities.
Amber Cave Travis County 1. Performed periodic 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. Surveyed site for RIFA but no mounds were located in Spring 2025. 4. TC conducted annual cave faunal survey (see EXHIBIT A). 5. Excavation activities were conducted by Zara Environmental opening up the lower passage.
Armadillo Ranch Sink Private
Arrow Cave City of Austin 1. Completed annual cave faunal survey (See EXHIBIT A). 2. Conducted quarterly site inspections with no signs of vandalism to the cave entrance/ gate. 3. An interdepartmental agreement between PARD and AW BCP is being sought to establish formal BCCP karst preserve management.
Bandit Cave Private
Beard Ranch Cave (Featherman's Cave) City of Austin 1. Completed annual cave faunal survey (See EXHIBIT A). 2. Conducted quarterly site inspections.

Table 10. FY25 BCCP Karst Feature Monitoring and Management Activities.
3. No RIFA were found. A healthy population of native fire ants was found near the cave.
Bee Creek Cave Private 1. The owner was contacted in FY21 to inquire about acquisition or management, with negative results 2. AW BCP will continue seeking acquisition of Bee Creek Cave or acquisition of substitution cave.
Blowing Sink Cave City of Austin 1. Inspected monthly and continued to operate security cameras, no signs of vandalism were noted. 2. Completed annual cave faunal survey (See EXHIBIT A). 3. PARD ANP reissued a permit to caver volunteer Peter Sprouse to lead and oversee work on excavating multiple features on William Russell Karst Preserve including Blowing Sink cave. FY 25 there was 18 volunteer events that led to great success including opening up the blocked passageway in blowing sink cave down to the water table, thus allowing for future Barton Springs salamander research and monitoring. 4. Staff conducted annual RIFA control with boiling water. 5. An interdepartmental agreement between PARD and AW BCP is being sought to establish formal BCCP karst preserve management. 6. COA BCP appreciates permission from PARD Natural Resources Division Austin Nature Preserves to access the site.
Broken Arrow Cave City of Austin 1. Inspected quarterly with no sign of human visitation or vandalism. 2. Completed quarterly faunal surveys (See EXHIBIT A). 3. Completed quarterly cave cricket exit counts. (See EXHIBIT B). 4. On August 13, 2024 Edward LeBrun (UT) confirmed that tawny crazy ants (TCA) have invaded Lime Creek Preserve and in the Fall of 2025 staff observed TCA inside the cave. UT staff inoculated TCA with microsporidium in the Spring of 2025, it is hoped that this parasite will control this highly invasive ant and thus prevent future harm to the cave fauna and surface species. 5. Staff set up a CO2 monitoring station to try to get a better understanding on yearly level fluctuations and any predictable patterns, data is downloaded every 6 weeks.
Buda Boulder Spring City of Austin 1. COA BCP staff conducted bi-annual site visits and noted signs of recent transient camps near the spring. COA PARD Rangers were notified and now periodically patrol the site. 2. An interdepartmental agreement between PARD and AW BCP is being sought to establish formal BCCP karst preserve management.
Cave X Private 1. COA entered into a Private Landowner Agreement entitled “Cave X, Management and Monitoring Plan, Covenants and Restrictions” with the property owners (Regent’s School) in Oct. 1999. The agreement sets aside a 4.5-acre area to protect the cave footprint. USFWS was involved in the discussions on protection. 2. Cave entrance is gated and has a fence for added protection. 3. Regent’s School staff conduct periodic surface inspections of the cave including gate and lock maintenance. 4. To get a better understanding of CO_2 levels in Cave X and assist in managing/monitoring, COA BCP staff requested access to install air monitoring equipment but were declined by the owner in September 2017. 5. Regents built a sports field within the Cave X buffer, over the footprint of the cave sometime between January 2018 and November 2019. Regents School sent WP staff a proposed restoration plan on December 6, 2022, which was approved in March 2023, implemented in FY24 and completed in FY25.
Cave Y City of Austin 1. Conducted quarterly site inspections.

Table 10. FY25 BCCP Karst Feature Monitoring and Management Activities.
2. Completed bi-annual cave faunal survey (See EXHIBIT A). 3. Completed bi-annual cave cricket exit counts. (See EXHIBIT B). 4. Surveyed site for RIFA; no mounds were discovered within the cave's treatment area. 5. An interdepartmental agreement between PARD and AW BCP is being sought to establish formal BCCP karst preserve management.
Ceiling Slot Cave Private
Cold Cave 1. TC is negotiating with the landowners concerning the possibility of purchase, conservation easement, or a management agreement for this 8-acre tract. 2. TC gained continued permission from landowners to perform bi-annual faunal surveys and cave cricket exit counts for the expanded BCP Cave Monitoring program. 3. TC performed surface inspections with no signs of vandalism to the cave entrance or in the cave, but the cave gate is still in need of repair 4. TC conducted bi-annual cave faunal surveys (see EXHIBIT A). 5. TC conducted bi-annual cave cricket exit surveys. (See EXHIBIT B). 6. Sampling was conducted to test for the presence of *Pd*. Only three substrate samples were taken, and all results were negative.
Cotterell Cave City of Austin 1. Conducted quarterly site inspections. 2. RIFA surveys determined that the ants were located approximately 300 ft from the cave, so no treatment was needed. 3. Conducted bi-annual cave faunal surveys (see EXHIBIT A). 4. Conducted bi-annual cave cricket exit surveys. (See EXHIBIT B). 5. An interdepartmental agreement between PARD and AW BCP is being sought to establish formal BCCP karst preserve management.
Disbelievers Cave Private 10a Permit: PRT-808694
District Park Cave City of Austin 1. BCP staff conducted bi-annual cave faunal surveys (See EXHIBIT A). 2. BCP staff and volunteers conducted bi-annual 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. COA BCP hydrogeologist continued to work on a hydrological study to determine the sub-surface drainage and to see if the adjacent developed area of the park could negatively impact the cave (ongoing). 7. Surveyed site for RIFA; no mounds were discovered within the cave's treatment area. 8. An interdepartmental agreement between PARD and AW BCP is being sought to establish formal BCCP karst preserve management.
Eluvial Cave Private 10a Permit: PRT-808694

Table 10. FY25 BCCP Karst Feature Monitoring and Management Activities.
Flint Ridge Cave City of Austin 1. Conducted monthly site visits and continued to operate security cameras, no signs of vandalism were noted. 2. Conducted bi-annual cave faunal surveys (See EXHIBIT A). 3. BCP staff conducted bi-annual cave cricket exit counts (See EXHIBIT B). 4. COA BCP drafted a hydrogeologic study report that will delineate the subsurface catchment areas of water sources. This is expected to be released in FY25. 5. Construction of SH45SW was completed and sections of this highway are over portions of the cave and its surface/subsurface catchment areas. 6. Staff conducted a Fall RIFA control with boiling water
Fossil Cave City of Austin 1. Inspected bi-annually and found no new signs of vandalism 2. Inspected for RIFA infestations on all visits. RIFA were observed within close proximity of the "suspected" cave. 3. While there are about 10 filled caves located in Schroeter Park, and it is unclear which might be Fossil Cave, once an interdepartmental Agreement with PARD is completed that would allow AW BCP to restore Fossil Cave and establish a formal karst preserve with protective measures within a city park.
Fossil Garden Cave Private 1. Apple Inc completed construction of their new campus in November 2020, the new campus is located immediately adjacent to Fossil Garden Cave and in FY 24 it was determined that Apple Inc owns the cave.
Gallifer Cave Travis County 1. Performed periodic 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. Surveyed site for RIFA but no mounds were located. 4. Conducted bi-annual cave faunal surveys (see EXHIBIT A). 5. Conducted bi-annual cave cricket exit surveys. (See EXHIBIT B). 6. Sampling was conducted to test for the presence of *Pd*. Three bat and three substrate samples were collected, and all were negative.
Get Down Cave City of Austin 1. In July of FY18, COA BCP and WPD signed an Interdepartmental Agreement which allows COA BCP to manage the karst preserve and Get Down Cave according to the Tier II karst management plan and allows WPD to manage the water quality ponds and underlying Millennium Cave, which they use in their aquifer education. 2. BCP staff continued to work with neighbors regarding ways to limit negative impacts to cave crickets while treating for RIFA on adjacent private property. The protocol was posted on their web site in FY24. 3. COA BCP staff helped support neighbor Stephanie Simmons with her "Texas Most Wanted" campaign, whose goal is to promote native plants by offering free plants to the public and encouraging neighbors to remove invasive non-native species. It is hoped that this type of public education will indirectly improve habitat on the preserve. 4. BCP staff completed annual cave faunal survey (See EXHIBIT A). 5. Conducted quarterly site visits and continued to operate security cameras, no vandalism was noted at the cave entrance/ gate. 6. Removed non-native invasive plants. 7. BCP staff continued to collect soft ticks from the nearby Live Oak Cave and to collaborate with Texas State and Baylor researchers who are trying to determine more information about tick borne relapsing fever (TBRF). 8. BCP staff approved the HOA plan to hire a contractor to clear the trail of the remaining downed vegetation. 9. Staff conducted annual RIFA control with boiling water. 10. Karst Preserve Trail entrance at La Cresada was reworked to prevent crushed granite from flowing from the trail onto the sidewalk.

Table 10. FY25 BCCP Karst Feature Monitoring and Management Activities.
Goat Cave City of Austin 1. Completed annual faunal survey (See EXHIBIT A). 2. Conducted quarterly site surveys, staff continue to operate a cellular game camera to continuously monitor the cave 3. Allowed permitted access to this cave. 4. An interdepartmental agreement between PARD and AW BCP is being sought to establish formal BCCP karst preserve management. 5. Surveyed site for RIFA; no mounds were discovered within the cave's treatment area.
Hole-in-the-Road Cave Private
Ireland's Cave Travis County 1. Performed periodic 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. TC conducted an annual cave faunal survey (see EXHIBIT A).
Jack's Joint Cave Private
Japygid Cave Private 10a Permit: PRT-808694
Jest John Cave City of Austin 1. Conducted biannual site visits. 2. Inspected site for RIFA infestations, no RIFA were observed in close proximity to the cave. 3. Conducted one cave cricket exist count. (See EXHIBIT B).
Jester Estates Cave City of Austin 1. BCP staff conducted 10 site visits looking for signs of illegally discharged pools, dumped brush and trash from neighbors. It appears that past and current educational efforts have paid off, since aside from minor brush dumping, no significant illegal activities were observed. 2. Conducted bi-annual cave faunal surveys (See EXHIBIT A). 3. Conducted bi-annual cave cricket exit counts. (SEE EXHIBIT B). 4. BCP staff removed non-native invasive vegetation. 5. Surveyed site for RIFA; site was treated in the Fall with boiling water.
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. Maintained fencing and signage to protect this area from unauthorized access and dumping. 3. Restoration activities were conducted within the 150-m buffer, during which 88 plants representing eight different species were planted. 5. Surveyed site for RIFA. A total of ten mounds were treated within the 80 m buffer and one outside of it in Spring 2025.

Table 10. FY25 BCCP Karst Feature Monitoring and Management Activities.
6. TC conducted bi-annual cave faunal surveys (see EXHIBIT A). 7. TC conducted bi-annual cave cricket exit surveys (See EXHIBIT B).
Kretschmarr Double Pit Travis County 1. Performed periodic 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. Surveyed site for RIFA but no mounds were located in Spring 2025. 4. Conducted annual cave faunal survey (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 ft south of the cave to a maximum of 340 ft north of the cave. 2. The cave was gated, and the preserve area was fenced following COA WPD and BCP staff recommendations and design. 3. No application of fertilizers, pesticides or herbicides will be allowed in the CEF area. 4. TC staff continue to periodically monitor the site to make certain that the gates and fences are secure. 5. Walmart has closed the store and sold the property. COA and TC BCP staff will continue to monitor the site and attempt to contact the new owner regarding management and monitoring needs.
Little Bee Creek Cave City of Austin 1. Conducted quarterly site visits. 2. Conducted annual cave faunal survey (See EXHIBIT A). 3. Soft ticks were observed and collected by staff to determine if they harbor TBRF. Specimens were delivered to Job Lopez (Baylor School of Medicine) to date, all specimens have tested negative.
Lost Oasis Cave TCMA 1. Conducted five site visits. 2. Staff continued excavation/ restoration efforts that have greatly increased the size and depth of the cave. 3. COA BCP staff treated the site for RIFA with boiling water. 4. Conducted bi-annual cave faunal survey (See EXHIBIT A). 5. Conducted bi-annual cave cricket exit counts. (See EXHIBIT B). 6. Removed non-native invasive plants. 7. New fencing was installed by TCMA. 8. Formal management agreement with AW BCP to ensure permit compliance was signed by all parties on May 4, 2021 9. COA BCP staff planted tree and shrub saplings to enhance cave cricket habitat.
Lost Gold Cave Private 1. The owner of the lot removed the fence for the buffer lot, cleared vegetation within the surface catchment up to the entrance of Lost Gold Cave, placed mulch and a playscape in the preserve buffer lot, WP staff attempted. to work with the owner to restore the site, however, at some point gave the City Environmental Officer gave the property owner a variance to allow the encroachment to stay in place so therefore the cave is not protected.
Maple Run Cave City of Austin 1. Conducted bi-annual cave faunal survey (See EXHIBIT A). 2. Conducted bi-annual cave cricket exit counts. (See EXHIBIT B).

Table 10. FY25 BCCP Karst Feature Monitoring and Management Activities.
3. COA BCP staff conducted quarterly site inspections and removed trash from preserve area, no vandalism was noted at the cave gate. 4. Permitted access to this cave is allowed. 5. An interdepartmental agreement between PARD and AW BCP is being sought to establish formal BCCP karst preserve management.
McDonald Cave Travis County 1. Performed periodic 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. Surveyed site for RIFA but no mounds were found in Spring 2025. 4. Conducted annual cave faunal surveys (see EXHIBIT A).
McNeil Bat Cave Private
Midnight Cave City of Austin 1. Conducted quarterly site inspections, no vandalism was noted. Staff continue to monitor a cellular game camera and continue to make improvements to the gate and fence to better secure the site. 2. Conducted bi-annual cave faunal surveys. (See EXHIBIT A). 3. Conducted bi-annual cave cricket exit counts. (See EXHIBIT B). 4. Permitted access to this cave is allowed, though no access permits were granted this fiscal year. 5. An interdepartmental agreement between PARD and AW BCP is being sought to establish formal BCCP karst preserve management. 6. COA BCP staff planted tree and shrub saplings to enhance cave cricket habitat. 7. Staff conducted annual RIFA control with boiling water.
M.W.A. Cave Private 10a Permit: PRT-808694
Moss Pit Cave Private
New Comanche Trail Cave Travis County 1. Performed periodic 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. TC conducted annual cave faunal survey (see EXHIBIT A). 4. TC conducted annual cave cricket exit survey. (See EXHIBIT B).
No Rent Cave Travis County 1. Performed periodic 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. TCA was first observed in February 2022 around the entrance of the cave as well as within. TC has been working with Dr. Ed LeBrun at BFL to study and inoculate the population. TCA was only observed during the Fall survey. 4. TC conducted quarterly cave faunal surveys (see EXHIBIT A). 5. TC conducted quarterly cave cricket exit surveys. (See EXHIBIT B). 6. Sampling was conducted to test for the presence of *Pd*. Only three substrate samples were taken, and all results were negative.

Table 10. FY25 BCCP Karst Feature Monitoring and Management Activities.
North Root Cave Travis County 1. Performed periodic 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. Surveyed site for RIFA. A total of 18 mounds were treated within the 80 m buffer and six outside of it in Spring 2025. 4. TC conducted an annual cave faunal survey (see EXHIBIT A). 5. Zara Environmental was scheduled to conduct excavation work but canceled the effort due to the presence of a *P. subflavus*.
Pennie's Cave Private 1 The entrance was re-excavated in 2012, providing access to the cave. 2.The cave entrance has been gated and fenced; boulders were also placed around the cave at the edge of a 300-ft buffer to better define the protected area. 3. Zara Environmental has continued to secure one-year contracts to conduct cave faunal surveys and treat the site for RIFA. Although only a one-year contract, it is hoped that the owner will extend the contract for multiple years. 4. Zara Environmental provided an annual report to the BCP on all monitoring and management activities (report can be seen in Balcones Canyonlands Conservation Plan Annual Report Appendices).
Pickle Pit Cave Private USFWS Section 7 Permit 2-15-93-F-075 1. A volunteer neighbor occasionally monitors the cave entrance/ gate monthly; no problems noted in FY25.
Pipeline Cave Private 1. A 2004 agreement between COA and Stratus set aside an approximately 8-acre buffer around Pipeline Cave that varies from 100 ft to the east and up to 300 ft west of the cave and an additional setback of 300 ft to the north and west; 150 ft. to east and south for the adjacent feature known as Confusion Sink. 2. Developer installed cave gate (including a gate on the nearby "Confusion Cave.") 3. In August 2018, COA BCP staff met with the property manager and obtained provisional access to begin monitoring and management of Pipeline and the adjacent Confusion Cave according to the Tier II karst land management plan. 4. Conducted bi-annual cave faunal surveys. (See EXHIBIT A). 5. Conducted bi-annual cave cricket exit counts. (See EXHIBIT B). 6. COA BCP provided a monitoring and management report to the property manager. 7. Staff have removed trash fill from the cave on multiple occasions, which is initially dated to late 1950's and early 1960's.
Rolling Rock Cave City of Austin 1. Inspected quarterly and no sign of human visitation or vandalism was found. 2. Conducted one cave faunal survey. (See EXHIBIT A).
Root Cave Travis County 1. Performed periodic 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. Surveyed site for RIFA. A total of 17 mounds were treated within the 80 m buffer and seven outside of it in Spring 2025. 4. Zara Environmental conducted excavation work to promote easier access to the cave.

Table 10. FY25 BCCP Karst Feature Monitoring and Management Activities.
Slaughter Creek Cave City of Austin 1. Conducted quarterly site inspections. 2. Conducted one cave faunal survey. (See EXHIBIT A) 3. An interdepartmental agreement between PARD and AW BCP is being sought to establish formal BCCP karst preserve management.
Spanish Wells Cave Travis County 1. Performed periodic surface inspections with no signs of vandalism to the cave entrance or in the cave. 2. Performed surface inspections with no signs of trespass or vandalism to the cave entrance or in the cave. 3. Surveyed site for RIFA. A total of ten were located within the 80 m buffer and none outside of it in Spring 2025. Was unable to treat due to mechanical complications. 3. Conducted bi-annual cave faunal surveys (See EXHIBIT A). 4. Conducted bi-annual cave cricket exit count. (See EXHIBIT B).
Spider Cave City of Austin 1. Conducted quarterly site visits, and no sign of human access or vandalism was found. 2.Conducted bi-annual cave faunal surveys (See EXHIBIT A). 3. Conducted bi-annual cave cricket exit counts. (See EXHIBIT B). 4. As part of the new adjacent highway expansion work, TXDOT has provided funds for hydrological studies, which includes excavation of features adjacent to Spider Cave, the ultimate goal of finding active drips which would allow for dye trace studies that would accurately determine the subsurface drainage basin.
Stark's North Mine Travis County 1. Performed surface inspections and detected signs of vandalism to the cave entrance and inside the cave. 2. Maintained fencing and signage to protect this area from unauthorized access and dumping. 3. Surveyed site for RIFA but no mounds were located in Spring 2025. 4. Conducted bi-annual cave faunal surveys (See EXHIBIT A). 5. Conducted bi-annual cave cricket exit counts (See EXHIBIT B). 6. Ten bats were sampled to test for the presence of *Pd*, and all results were negative.
Stovepipe Cave 1. Conducted 6 site inspections and continued to remove new and old trash from the preserve. 2. Conducted bi-annual cave faunal surveys (See EXHIBIT A). 3. Conducted bi-annual cave cricket exit counts (See EXHIBIT B). 4. Surveyed site for RIFA; no mounds were discovered within the cave's treatment area. 5. Continued karst assessment of site in FY25. 6. As part of the new adjacent highway expansion work, TXDOT has provided funds for hydrological studies, which includes excavation of features adjacent to stovepipe cave, the ultimate goal of finding active drips which would allow for dye trace studies that would accurately determine the subsurface drainage basin. 7. As part of a hydrological study, the drip gauge that was installed in FY 20 was continued to be monitored in FY24.
Talus Spring Cave Private 1. TC was unable to conduct any management or monitoring activities during FY25 but expects to complete all biannual activities in FY26.
Tardus Hole Cave Travis County 1. Performed periodic 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. Surveyed site for RIFA but no mounds were located in Spring 2025.

Table 10. FY25 BCCP Karst Feature Monitoring and Management Activities.
4. Conducted annual cave faunal survey (see EXHIBIT A).
Tooth Cave Travis County 1. Performed periodic 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. Surveyed site for RIFA. A total of 11 was treated within the 80 m buffer and one outside of it in Spring 2025. 4. Conducted bi-annual cave faunal surveys (see EXHIBIT A). 5. Conducted bi-annual cave cricket exit surveys. (See EXHIBIT B).
Weldon Cave Travis County 1. TC performed surface inspections with no current signs of vandalism to the entrance of the cave or in the cave. 2. TCA was observed around the entrance of the cave in February 2022 and within the cave in May of 2022. TC has been working with Dr. Ed LeBrun at BFL to study and inoculate the population. TCA was only observed during the Fall survey. 3. TC conducted quarterly cave faunal surveys (see EXHIBIT A). 4. TC conducted quarterly cave cricket exit surveys. (See EXHIBIT B). 5. Thirteen substrate and eight bats were sampled to test for the presence of *Pd*. All samples came back negative except one *P. subflavus* tested positive for the presence of *Pd*.
Whirlpool Cave TCMA 1. Formal management agreement with AW BCP to ensure permit compliance was signed by all parties on May 4, 2021 2. COA conducted bi-annual cave faunal surveys (see EXHIBIT A). 3. COA conducted bi-annual cave cricket exit surveys. (See EXHIBIT B). 4. Continuous monitoring of CO_2, humidity, and airflow is being conducted in the East caverns passage by COA BCP staff.

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EXHIBIT A:

KARST FAUNAL SURVEY REPORTS

FY25 City of Austin/Travis County Karst Faunal Surveys[1, 2]

			Endangered Species						Species of Concern											Other Significant Troglobites							
Cave	**Survey Date**	**Monitoring Agency**	***Rhadine persephone***	***Tartarocreagris texana***	***Tayshaneta myopica***	***Texamaurops reddelli***	***Texella reddelli***	***Texella reyesi***	***Caecidotea reddelli***	***Cicurina bandida***	***Cicurina travisae***	***Eidmannella reclusa***	***Rhadine austinica***	***Rhadine subterranea***	***Sphalloplana mohri***	***Tartarocreagris comanche***	***Tayshaneta conchinna***	***Tayshaneta devia***	***Texella spinoperca***	***Cicurina buwata***	***Speodesmus bicornourus***	***Speodesmus* sp.**	***Tartarocreagris attenuata***	***Tartarocreagris infernalis***	***Tayshaneta* sp.**	***Texella mulaiki***	**Other notable species detected**
Amber Cave	11/22/2024	TC		1							6											22					*Batrisodes* sp. (1) *Cambala speobia* (12) *Eidmannella* sp. (1)
Amber Cave	6/27/2025	TC*				1																					
Amber Cave	7/11/2025	TC*				4																					
Amber Cave	7/16/2025	TC*	1	1																							
Amber Cave	8/5/2025	TC*				5																					
Airman's Cave	2/14/2025	COA								31			5						2		35						*Cambala speobia* (8) *Perimyotis subflavus* (3) *Texoreddellia* sp. (1)
Arrow Cave	9/10/2025	COA								16												2			2		*Cambala speobia* (3)
Beard Ranch Cave	9/10/2025	COA						12			4											1					
Black-cap Cave	5/19/2025	COA			1																						*Perimyotis subflavus* (1)
Blowing Sink Cave	9/24/2025	COA								28												6				2	*Texoreddellia* sp. (1) *Tartarocreagris* sp. (1)
Broken Arrow Cave	11/15/2024	COA							30											14	1						*Cambala speobia* (28) *Stygobromus russelli* (7)
Broken Arrow Cave	1/24/2025	COA	1						12											10							*Cambala speobia* (11) *Stygobromus russelli* (4)
Broken Arrow Cave	5/9/2025	COA							11											4							*Cambala speobia* (39) *Stygobromus russelli* (9)
Broken Arrow Cave	8/13/2025	COA							1											5	1						*Cambala speobia* (100)
Cave Y	1/15/2025	COA								2																	*Cambala speobia* (1) *Perimyotis subflavus* (7) *Texella grubbsi* (1)
Cave Y	8/7/2025	COA								16																	*Texella grubbsi* (6) *Cambala speobia* (1)
Cold Cave	2/21/2025	TC						4												9		9					*Batrisodes* sp. (3) *Cambala speobia* (26) Trichoniscidae (37)
Cold Cave	8/14/2025	TC						2												13		9					*Cambala speobia* (208) Pseudoscorpionida (1)
Cortana Cave	1/17/2025	COA			36			10			5	15										2					*Cambala speobia* (1)

Cave	Survey Date	Monitoring Agency	*Rhadine persephone*	*Tartarocreagris texana*	*Tayshaneta myopica*	*Texamaurops reddelli*	*Texella reddelli*	*Texella reyesi*	*Caecidotea reddelli*	*Cicurina bandida*	*Cicurina travisae*	*Eidmannella reclusa*	*Rhadine austinica*	*Rhadine subterranea*	*Sphalloplana mohri*	*Tartarocreagris comanche*	*Tayshaneta concinna*	*Tayshaneta devia*	*Texella spinoperca*	*Cicurina buwata*	*Speodesmus bicornourus*	*Speodesmus* sp.	*Tartarocreagris attenuata*	*Tartarocreagris infernalis*	*Tayshaneta* sp.	*Texella mulaiki*	Other notable species detected
			Endangered Species						**Species of Concern**											**Other Significant Troglobites**							
Cortana Cave	8/13/2025	COA			25			12				23										1					*Cambala speobia* (8) Campodeidae (1) *Tartarocreagris* sp. (1)
Cotterell Cave	1/31/2025	COA						12			68										14			6			*Cambala speobia* (9)
Cotterrell Cave	8/18/2025	COA						12			57										29			2			*Cambala speobia* (40)
Cricket Cave	11/5/2024	COA								13												1					*Batrisodes* sp. (1)
District Park Cave	11/21/2024	COA								13												3				1	*Cambala speobia* (9)
District Park Cave	5/16/2025	COA								9																	*Cambala speobia* (48)
Flint Ridge Cave	11/24/2024	COA								9											11						*Cambala speobia* (1) *Japygidae* (2)
Flint Ridge Cave	5/23/2025	COA								14											12					1	Campodeidae (2) *Texoreddellia* sp. (2)
Gallifer Cave	2/21/2025	TC			7			6			44																*Cambala speobia* (3) *Perimyotis subflavus* (3)
Gallifer Cave	9/2/2025	TC			3			19			46											1					*Cambala speobia* (145)
Gaping Maw Cave	11/14/2024	COA									3	9															*Cambala speobia* (2) *Tayshaneta devia* (9)
Gaping Maw Cave	5/27/2025	COA						3			4	8										1					*Cambala speobia* (3) *Tayshaneta devia* (2)
Geode Cave	1/15/2025	TC			2						4																*Perimyotis subflavus* (5) *Cambala speobia* (2)
Geode Cave	8/26/2025	TC			5			11			11	7										7					*Cambala speobia* (26) *Tartarocreagris* sp. (2) Trichoniscidae (2)
Get Down Cave	1/29/2025	COA								20																	*Cambala speobia* (2) *Perimyotis subflavus* (2)
Goat Cave	9/11/2025	COA								13																	*Cambala speobia* (5)
Hammett's Cave	12/11/2024	TC																									*Eidmannella* sp. (1) *Tayshaneta paraconcinna* (7) *Texella* sp. (8)
Hammett's Cave	8/27/2025	TC																				1					*Cambala speobia* (1) *Cicurina* sp. blind (1) *Eidmannella* sp. (5) Pseudoscorpionida (1) *Tayshaneta paraconcinna* (8) *Texella* sp. (13)

Ireland's Cave	2/4/2025	TC								37											1							*Cambala speobia* (1)
Jester Estates Cave	11/26/2024	COA		3	6			51			1																	*Cambala speobia* (3)
Jester Estates Cave	6/4/2025	COA		3	9			43			5											6						*Cambala speobia* (2)
			Endangered Species						**Species of Concern**												**Other Significant Troglobites**							
Cave	**Survey Date**	**Monitoring Agency**	***Rhadine persephone***	***Tartarocreagris texana***	***Tayshaneta myopica***	***Texamaurops reddelli***	***Texella reddelli***	***Texella reyesi***	***Caecidotea reddelli***	***Cicurina bandida***	***Cicurina travisae***	***Eidmannella reclusa***	***Rhadine austinica***	***Rhadine subterranea***	***Sphalloplana mohri***	***Tartarocreagris comanche***	***Tayshaneta concinna***	***Tayshaneta devia***	***Texella spinoperca***	***Cicurina buwata***	***Speodesmus bicornourus***	***Speodesmus* sp.**	***Turtarocreagris attenuata***	***Tartarocreagris infernalis***	***Tayshaneta* sp.**	***Texella mulaiki***	**Other notable species detected**
Kretschmarr Cave	12/30/2024	TC									17																	*Cambala speobia* (5) *Eidmannella* sp. (15)
Kretschmarr Cave	5/23/2025	TC									14																	*Cambala speobia* (6) *Eidmannella* sp. (7)
Kretschmarr Double Pit	11/22/2024	TC		2							1											1						*Cambala speobia* (2) *Eidmannella* sp. (6) *Perimyotis subflavus* (1)
LaCrosse Cave	11/5/2024	COA																				1						*Cambala speobia* (1)
Little Bee Creek Cave	5/14/2025	COA					28															4						*Cambala speobia* (44) *Batrisodes* (1)
Lost Oasis Cave	11/12/2024	COA								28												11						*Cambala speobia* (34) *Texoreddellia* sp. (1)
Lost Oasis Cave	5/16/2025	COA								40												4						*Cambala speobia* (45) *Texoreddellia* sp. (2)
Maple Run Cave	2/2/2025	COA								4																		
Maple Run Cave	9/5/2025	COA								4																		
Merkin Hole Cave	7/17/2025	COA	1					4														2						*Cambala speobia* (58) Campodeidae (2) *Texoreddellia* sp. (1)
Merkin Hole Cave	8/21/2025	COA						18			2																	*Cambala speobia* (425)
McDonald Cave	9/5/2025	TC						10			68							19			19			2				*Cambala speobia* (343) *Eidmannella rostrata* (25)
Midnight Cave	2/2/2025	COA								12			1								42							*Batrisodes* sp. (4) *Cambala speobia* (88)
Midnight Cave	8/14/2025	COA								10																		*Cambala speobia* (16)
Millipede Annex Cave	11/18/2024	COA			1															11								*Stenochrus Portoricensis* (4)
Millipede Annex Cave	5/12/2025	COA																		2								*Cambala speobia* (1) *Stenochrus Portoricensis* (2)

Cave	Survey Date	Monitoring Agency	*Rhadine persephone*	*Tartarocreagris texana*	*Tayshaneta myopica*	*Texamaurops reddelli*	*Texella reddelli*	*Texella reyesi*	*Caecidotea reddelli*	*Cicurina bandida*	*Cicurina travisae*	*Eidmannella reclusa*	*Rhadine austinica*	*Rhadine subterranea*	*Sphalloplana mohri*	*Tartarocreagris comanche*	*Tayshaneta concinna*	*Tayshaneta devia*	*Texella spinoperca*	*Cicurina buwata*	*Speodesmus bicornourus*	*Speodesmus* sp.	*Tartarocreagris attenuata*	*Tartarocreagris infernalis*	*Tayshaneta* sp.	*Texella mulaiki*	Other notable species detected
			Endangered Species						**Species of Concern**											**Other Significant Troglobites**							
Millipede Cave	11/18/2024	COA			1															6		1					*Cambala speobia* (4) *Stenochrus Portoricensis* (3)
Millipede Cave	5/12/2025	COA																		5							*Cambala speobia* (5) *Stenochrus Portoricensis* (2)
New Comanche Trail Cave	8/26/2025	TC			3																						
North Root	3/10/2025	TC*						1																			*Perimyotis subflavus* (1) Trichoniscidae (1)
North Root Cave	5/23/2025	TC									2	2															*Cambala speobia* (9) Pseudoscorpionida (1) *Texoreddellia* sp. (2) Trichoniscidae (1)
Millipede Cave	11/18/2024	COA			1															6		1					*Cambala speobia* (4) *Stenochrus Portoricensis* (3)
Millipede Cave	5/12/2025	COA																		5							*Cambala speobia* (5) *Stenochrus Portoricensis* (2)
New Comanche Trail Cave	8/26/2025	TC			3																						
North Root	3/10/2025	TC*						1																			*Perimyotis subflavus* (1) Trichoniscidae (1)
North Root Cave	5/23/2025	TC									2	2															*Cambala speobia* (9) Pseudoscorpionida (1) *Texoreddellia* sp. (2) Trichoniscidae (1)
No Rent Cave	11/26/2024	TC																		53							*Cambala speobia* (16) *Eidmannella* sp. (2) *Nylanderia fulva* (>1,075)
No Rent Cave	2/13/2025	TC																		27							*Cambala speobia* (15) *Nylanderia fulva* (~1200)
No Rent Cave	6/4/2025	TC																		20							*Cambala speobia* (10)
No Rent Cave	8/20/2025	TC																		35							*Batrisodes sp.* (1) *Cambala speobia* (27) *Eidmannella* sp. (3) *Texoreddellia* sp. (1)
Persephone Caverns	11/22/2024	COA				1		20			26	35										9					*Batrisodes sp.* (6) *Cambala speobia* (32)
Persephone Caverns	5/20/2025	COA	1			2		12			40	26										2	1				*Batrisodes sp.* (1) *Cambala speobia* (8)
Persephone Caverns	8/15/2025	COA	5					28			39	16										12					*Batrisodes* sp. (4) *Cambala speobia* (51) *Texoreddellia* sp. (2)
Pipeline Cave	12/6/2024	COA								28												24				15	*Batrisodes sp.* (1) *Cambala speobia* (1) *Texoreddellia* sp. (1)
Pipeline Cave	5/13/2025	COA								17												23				18	*Batrisodes sp.* (1) *Cambala speobia* (2) *Texoreddellia* sp. (5)
Pond Party Pit	2/13/2025	COA	1					15			5	1										12		4			*Cambala speobia* (9)
Pond Party Pit	8/29/2025	COA	2					27			6	2		1								32		5			*Cambala speobia* (69)
Rolling Rock Cave	11/15/2024	COA																		8		4					*Perimyotis subflavus* (5)
Sacred Grove Cave	11/21/2024	COA	1								2																*Cambala speobia* (4)
Sacred Grove Cave	1/16/2025	COA									2	4															*Cambala speobia* (1)

Sacred Grove Cave	5/8/2025	COA									6	2																*Cambala speobia* (1) *Texoreddellia* sp. (3)
Sacred Grove Cave	8/6/2025	COA	1					2			13	1										17						*Cambala speobia* (20)
Seibert Sink	1/15/2025	COA								5									1									
Seibert Sink	8/11/2025	COA								4							1		3			1						
Slaughter Creek Cave	9/10/2025	COA								27												3						*Cambala speobia* (2)
Spanish Wells	2/3/2025	TC													~70													*Stygobromus russelli* (~200)
			Endangered Species						**Species of Concern**												**Other Significant Troglobites**							
Cave	**Survey Date**	**Monitoring Agency**	***Rhadine persephone***	***Tartarocreagris texana***	***Tayshaneta myopica***	***Texamaurops reddelli***	***Texella reddelli***	***Texella reyesi***	***Cuecidotea reddelli***	***Cicurina bandida***	***Cicurina travisae***	***Eidmannella rechsa***	***Rhadine austinica***	***Rhadine subterranea***	***Sphalloplana mohri***	***Tartarocreagris comanche***	***Tayshaneta concinna***	***Tayshaneta devia***	***Texella spinoperca***	***Cicurina buwata***	***Speodesmus bicornourus***	***Speodesmus* sp.**	***Tartarocreagris attenuata***	***Tartarocreagris infernalis***	***Tayshaneta* sp.**	***Texella mulaiki***	**Other notable species detected**
Spanish Wells	8/12/2025	TC													~75													*Eidmannella* sp. (1) *Stygobromus russelli* (~50)
Spider Cave	11/25/2024	COA						3			21	1										3						
Spider Cave	6/3/2025	COA						1			17											5						*Cambala speobia* (5)
Stark's North Mine	11/18/2024	TC															10											*Eidmannella* sp. (3) *Perimyotis subflavus* (15) Pseudoscorpionida (1)
Stark's North Mine	7/22/2025	TC															4											*Perimyotis subflavus* (1) Pseudoscorpionida (10)
Stovepipe Cave	2/7/2025	COA	8			2		23			3	9									47		3					*Cambala speobia* (10)
Stovepipe Cave	8/19/2025	COA				8		38			1	16									53		4					*Cambala speobia* (181)
Tardus Hole	11/22/2024	TC									2																	
Testudo Tube Cave	1/24/2025	COA	1												5					31		12						*Cambala speobia* (113) *Eurycea tonkawae* (5) *Stygobromus* sp. (~40)
Testudo Tube Cave	8/13/2025	COA													12					13		8						*Batrisodes uncicornis* (6) *Cambala speobia* (~200) *Eurycea tonkawae* (10) *Stygobromus* sp. (6) *Texoreddellia* sp. (1)
Tooth Cave	11/19/2024	TC		1	6			34			8	2									1							*Cambala speobia* (12)
Tooth Cave	6/17/2025	TC			3	3		42			60	5									7							*Cambala speobia* (54)
Two Trunks Cave	1/17/2025	TC																										*Cambala speobia* (6) *Eidmannella* sp. (2)

Two Trunks Cave	3/18/2025	TC*						1																				
Weldon Cave	11/26/2024	TC																			6							*Cambala speobia* (5) *Nylanderia fulva* (~700) *Perimyotis subflavus* (4)
Weldon Cave	2/13/2025	TC						1						6							7							*Cambala speobia* (17) *Perimyotis subflavus* (7)
Weldon Cave	6/4/2025	TC						3						3							9		1					*Eidmannella* sp. (3) *Cambala speobia* (21)
Weldon Cave	8/20/2025	TC						3													17		2					*Cambala speobia* (44) *Eidmannella* sp. (1) Pseudoscorpionida (1) *Tayshaneta* sp. (1)
			Endangered Species						**Species of Concern**												**Other Significant Troglobites**							
Cave	**Survey Date**	**Monitoring Agency**	***Rhadine persephone***	***Tartarocreagris texana***	***Tayshaneta myopica***	***Texamaurops reddelli***	***Texella reddelli***	***Texella reyesi***	***Caecidotea reddelli***	***Cicurina bandida***	***Cicurina travisae***	***Eidmannella reclusa***	***Rhadine austinica***	***Rhadine subterranea***	***Sphalloplana mohri***	***Tartarocreagris comanche***	***Tayshaneta concinna***	***Tayshaneta devia***	***Texella spinoperca***	***Cicurina buwata***	***Speodesmus bicornourus***	***Speodesmus* sp.**	***Tartarocreagris attenuata***	***Tartarocreagris infernalis***	***Tayshaneta* sp.**	***Texella mulaiki***	**Other notable species detected**
Whirlpool Cave	1/17/2025	COA								3																		
Whirlpool Cave	8/11/2025	COA								21			2														1	
Wildflower Cave	11/5/2024	COA								4																	1	*Texoreddellia* sp. (2)
Wooden Derrick Cave	8/5/2025	COA						1			4	1											3					*Cambala speobia* (6) *Tartarocreagris* sp. (1)

[1] All survey data and full species lists available by request through COA and TC.

[2] Surveyors in FY24 include: Addison Denton, Annica Lyssy, Leslie Bell, Patty Calabrese, Cristina Campbell, Christina Tello, Eleonore le Corvaisier, Issac Rosenstein, Travis Clark, Makayla Timms, Madison Ebest, Chris Franke, Paul Fushille, Nick Gladstone, Devin Grobert, Darrell Hutchinson, David Morgan, Ethan Perrine, Mark Sanders, Micheal Zsembik, Jonny Scalise, Colin Strickland, Drew Thompson, and Rachel Jessup.

EXHIBIT B:

CAVE CRICKET EXIT COUNT DATA REPORTS

FY25 COA/TC CAVE CRICKET EXIT COUNT DATA REPORTS

Surveyed Caves	Fall 2024 (November/ December)				Winter 2025 (January/February)				Spring 2025 (May/ June)				Summer 2025 (August/ September)			
	N:	J:	A:	TI:	N:	J:	A:	TI:	N:	J:	A:	TI:	N:	J:	A:	TI:
Black-cap Cave									33	5	7	45				
Broken Arrow Cave	32	24	75	131	78	69	51	198	135	41	326	502	47	36	219	302
Cave Y					16	21	7	44					92	63	86	241
Cold Cave					163	886	208	1257					196	31	1949	2176
Cortana Cave					10	1	5	16					23	27	153	203
Cotterell Cave					315	56	32	403					282	43	27	352
District Park Cave	190	26	3	219												
Flint Ridge Cave	6	11	11	28					98	42	213	353				
Gallifer Cave					0	17	5	22					26	5	179	210
Gaping Maw	97	26	51	174					166	143	965	1274				
Geode Cave					3	18	7	28					4	4	11	19
Get Down Cave					249	167	9	425								
Jest John Cave													81	92	144	317
Jester Estates Cave	210	55	37	302					139	48	35	222				
Kretschmarr Cave	27	9	20	56					8	7	25	40				
Lost Oasis Cave	140	55	77	272												
Maple Run Cave					74	18	17	109					15	25	36	76
Midnight Cave					7096	10135	3493	20724					4380	3510	3153	11043
New Comanche Trail Cave													0	0	285	285
No Rent Cave	13	61	54	128	126	232	59	417	75	210	1816	2101	13	22	2015	2050
Persephone Caverns	203	21	1	225					41	28	11	80				
Pipeline Cave	85	39	23	147					1914	905	1788	4607				
Pond Party Pit					387	57	12	456					22	17	85	124
Seibert Sink					359	298	229	886					184	91	201	476

Surveyed Caves	Fall 2024 (November/December)				Winter 2025 (January/February)				Spring 2025 (May/ June)				Summer 2025 (July/ August/ September)			
Spanish Wells Cave					42	179	220	441					43	39	901	983
Spider Cave	14	2	3	19					33	35	60	128				
Stovepipe Cave					137	120	106	363					84	61	191	336
Testudo Tube					33	43	4	80					8	9	48	65
Tooth Cave	10	7	7	24					16	3	286	305				
Weldon Cave	125	522	625	1272	303	1341	938	2582	198	330	1251	1779	104	27	6242	6373
Whirlpool Cave					3446	1335	324	5105					1317	427	354	2098

N= nymphs; J= juveniles; A= adults; TI= total individuals.