

# Warbler and Vireo Preserve Size



**Richard Heilbrun**

# Impacts Analysis Assessment

County	Potential Habitat in 2000			Potential Habitat Loss 2009-2040			Annual Loss
	Low	Mid	High	Low	Mid	High	
	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	
Bandera	103,919	218,963	244,466	3,090	8,249	9,777	266
Bexar	52,069	92,785	99,880	14,635	26,317	28,404	849
Blanco	20,591	79,526	113,754	240	1,162	1,614	37
Comal	72,016	157,961	173,950	16,573	37,367	40,939	1,205
Kendall	18,778	80,371	112,133	4,253	15,937	21,372	514
Kerr	83,755	201,368	234,591	1,115	3,809	4,604	123
Medina	73,527	113,833	121,440	4,842	6,250	6,434	202
<b>TOTAL</b>	424,655	944,807	1,100,214	44,748	99,091	113,144	3,196
<i>w/o Comal</i>	352,639	786,846	926,264	28,175	61,724	72,205	1,991

# Approach

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1. Determine Biological need of each bird species according to the conservation goals that we have already set.
2. Develop scenarios in which various percentages of the habitat are conserved in each county.
3. Ensure that all estimates include buffer for encroachment and edge effect

# Guidance from FWS

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- It is better to err on the high side
  - Lessens the need for major amendment
  - Take commensurate with mitigation
- $\text{Take} + \text{Protected Habitat} < \text{Available Habitat}$
- Be consistent in levels used for estimate
- Encourage the use of buffers
- We must provide location of Take and Mitigation

# BAT and CAC Conservation Goals

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- A. Protect and manage sensitive native habitats for the GCWA and BCVI, and other native species that depend on these habitats.
- B. Protect and manage karst habitat, surface and subsurface drainage basins, and surface vegetative communities for sensitive karst organisms.
- C. As part of this document, the proposed activities of CAC should contribute to recovery of the species.**
- D. Contribute to the protection of other important ecosystem functions, such as water quality and quantity in the Edward's Aquifer system, through biologically significant conservation actions for the covered species.

# What is Contributing to Recovery?

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- We anticipate being included in 2-3

## Recovery Units

- Recovery is 3,000 breeding pairs / unit
- Average Territory Size ~ 7 acres
- Average Density = 1 pair / 15 acres
- Contributing is 75% of Recovery

# Biological Method

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- $15 \text{ acres / pair} * 3000 \text{ pairs} * 2 \text{ Units} *.75$

$$= 67,500 + \text{buffer}$$

$$= 84,375 \text{ acres}$$

- Not yet spatially explicit
- Does not give location of preserve

# Take Method - Assumptions

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We do not know the boundaries of the new Recovery Units

Take must not exceed an area's ability to provide mitigation

Mitigation must be as close as possible to the impact

We must consider the ecological harm to the species when determining acceptable habitat loss rates (Threshold?)

Mitigation will occur at an average of 2:1, except in areas with extraordinary threats to the species (3:1 in Bexar County and surrounding areas)



# Take Method

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## Scenario 1-Take 100% of Estimated Loss

County	Available Habitat	Estimated Loss	Mitigation Result	Difference
Bandera	218,963	8,249	16498	194,216
Bexar	92,785	26,317	78951	-12,483
Blanco	79,526	1,162	2324	76,040
Comal	157,961	37,367	74,734	45,860
Kendall	80,371	15,937	31874	32,560
Kerr	201,368	3,809	7618	189,941
Medina	113,833	6,250	12500	95,083
<b>TOTAL</b>	944,807	99,091	224,499	621,217
<i>w/o Comal</i>	786,846	61,724	<b>149,765</b>	575,357

**Preserve Size= 187,206 acres**

# Take Method

Scenario 2- 70% of habitat in Bexar  
50% of habitat in Medina & Kendall  
40% of habitat in Kerr; 20% other

County	Available Habitat	Estimated Loss	Mitigation Result	Difference
Bandera	218,963	8,249	3299.6	207,414
Bexar	92,785	26,317	55265.7	11,202
Blanco	79,526	1,162	464.8	77,899
Comal	157,961	37,367	14,947	105,647
Kendall	80,371	15,937	15937	48,497
Kerr	201,368	3,809	3047.2	194,512
Medina	113,833	6,250	6250	101,333
<b>TOTAL</b>	<b>944,807</b>	<b>99,091</b>	<b>99,211</b>	<b>746,505</b>
<b>w/o Comal</b>	<b>786,846</b>	<b>61,724</b>	<b>84,264</b>	<b>640,858</b>

**Preserve Size= 105,330 acres**

# Take Method

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Scenario 3-      Take 50% of Available Habitat In Bexar  
                          Take 20% of Available Habitat elsewhere

County	Available Habitat	Estimated Loss	Mitigation Result	Difference
Bandera	218,963	8,249	3299.6	207,414
Bexar	92,785	26,317	39475.5	26,993
Blanco	79,526	1,162	464.8	77,899
Comal	157,961	37,367	14,947	105,647
Kendall	80,371	15,937	6374.8	58,059
Kerr	201,368	3,809	1523.6	196,035
Medina	113,833	6,250	2500	105,083
<b>TOTAL</b>	<b>944,807</b>	<b>99,091</b>	<b>68,585</b>	<b>777,131</b>
<i>w/o Comal</i>	786,846	61,724	<b>53,638</b>	671,484

**Preserve Size= 67,048 acres**

# Challenges

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We do not have model validation

We do not have Impact Analysis revisions

We do not have spatial data

We cannot determine focal areas

Result: We can only issue preliminary recs.

## Estimated BCV Habitat Loss

County	BCV Habitat Estimate (ac)*	Estimated BCV Habitat Loss 2009 – 2040 (ac)	Ave Annual BCV Habitat Loss 2009 – 2040 (ac)
Bandera	7,599	344	11
Bexar	47,854	5,315	172
Blanco	2,275	29	1
Comal	3,591	847	27
Kendall	4,945	890	29
Kerr	53,074	1,143	37
Medina	62,292	3,257	105
<b>Total w/o Comal</b>	<b>178,039</b>	<b>10,978</b>	<b>354.2</b>

\* As reported in Wilkins et al. (2006)

# Discussion



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# Southern Edwards Plateau Regional HCP



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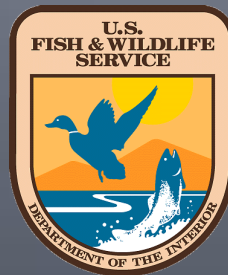
**Charlotte Kucera**

Fish & Wildlife Biologist  
Austin Field Office  
Austin, Texas

# Recommendations to the BAT

## Karst species

take and mitigation  
strategies





# What are the issues?

- How to assess take
- How to determine mitigation
- Pressure points
- Recent findings
- Acquisition strategies



# Assessing Take

- Direct vs. Indirect
  - Direct – generally, effects to cave footprint (surface and subsurface drainage basin)
    - No seasonal component
    - Higher mitigation ratio, as appropriate
  - Indirect – generally, adverse effect likely to occur later in time
    - Decrease in food source, increased predation, fragmentation, growth inducement, etc.

# Determining Mitigation

- Mitigation ratios
  - Must be commensurate with impact
  - Requires analysis focal area-by-focal area, as determined by the BAT
  - Ratio will be determined by rate and severity of loss in a particular area
  - Impact vs. availability of sufficient areas to mitigate influence ratio
  - Recovery Team – considering 3 caves within each KFR (for each species), at least one of which must be high quality

# Recent findings

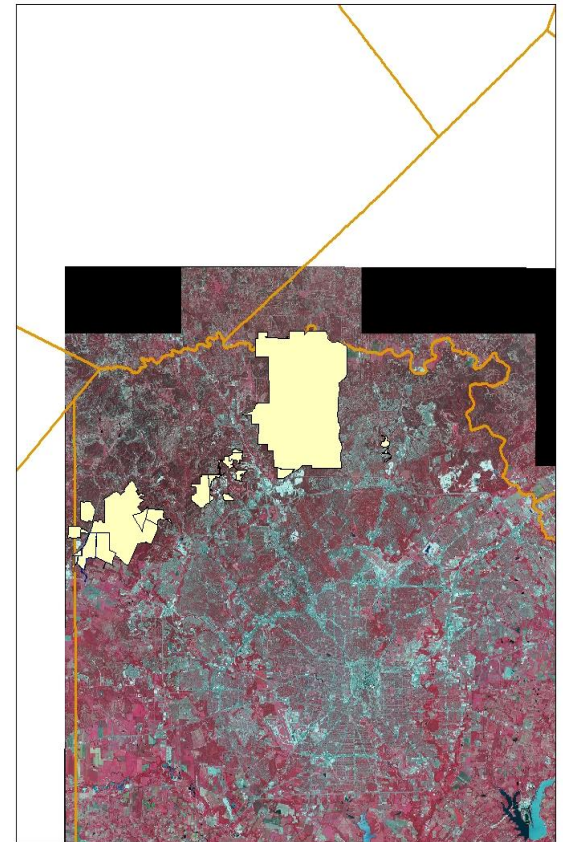
- Consider . . .

Similarities in data presented thus far:

- Rapid loss of habitat over permit life
- Varying levels of habitat suitability still left
- Bexar County is the known range of these species at this time
- Do the math and consider what ***counts*** for recovery and what ***counts*** toward the RHCP

# Pressure Points

- Focal Areas
  - Good idea
  - Impact and Mitigation
  - May have different ratios
  - Other activity i.e. Camp Bullis



# Acquisition Strategies

- Conservation Banking
  - $\geq 3$  KFA's within each KFR, one of which must be high quality
  - Must be known occupied
  - Requires maintenance of the conservation value
  - Requires conservation easement or similar legal documentation
  - No public access – except on a case-by-case basis where the conservation value is maintained or exceeded

# Acquisition Strategies

- Fee simple
- Fee-in-lieu, as appropriate as long as mitigation precedes disturbance
- Leverage partnerships to maximize benefits
- Section 6 program
- Be creative . . .

# Needed

- What caves are known? How many of those are protected?
- Surface and subsurface maps of known occupied caves in the Plan Area
- What's still available that meets a high quality KFA? By County or Focal Area.
- Use current data, i.e. aerials
- Cave management strategies to maintain or exceed the conservation value



# QUESTIONS



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# Karst Terminology

An aerial photograph of a karst landscape. The terrain is characterized by light-colored, fractured rock formations. A large, dark, irregularly shaped cave entrance is visible in the center of the image. The surrounding area is dotted with small, green, coniferous trees and shrubs, interspersed with patches of dry, brownish ground. The overall scene illustrates typical karst features like cave openings and rocky outcrops.

Felton Cave, Sutton Co., TX



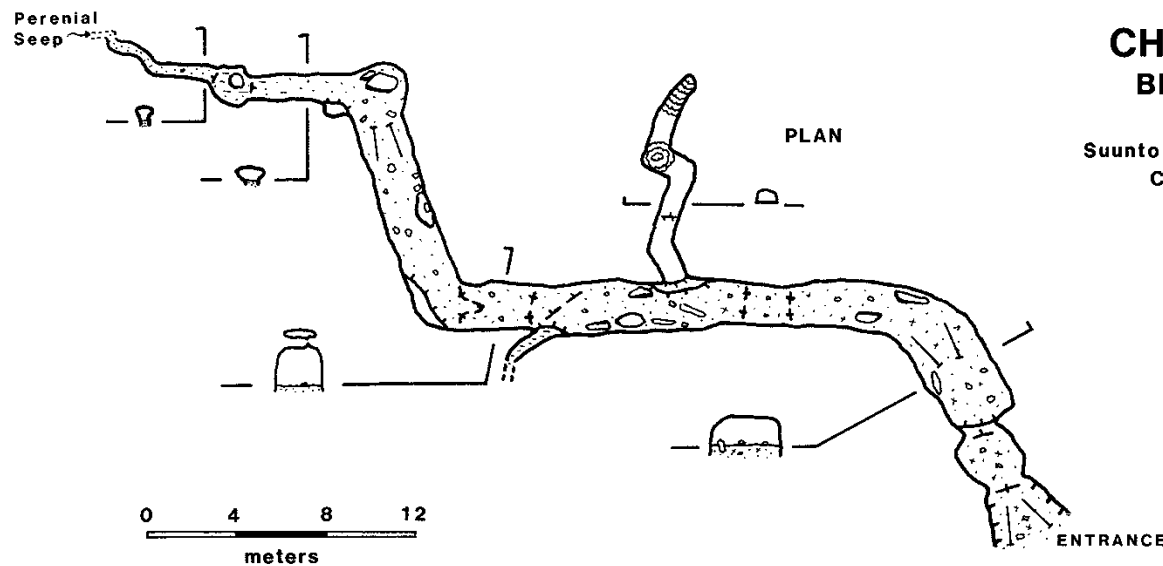
A photograph of a man crouching on a rock in a karst spring habitat. The man is wearing a blue shirt and jeans. He is looking down at the water. The water is flowing over rocks and is surrounded by lush green grass and trees. In the background, there is a wooden building. The text "Karst Karst feature Cave" is overlaid on the image in yellow.

# Karst Karst feature Cave

Spring habitat: niche between surface and subsurface  
Cobb Springs, Williamson County, TX



# Entrance Footprint

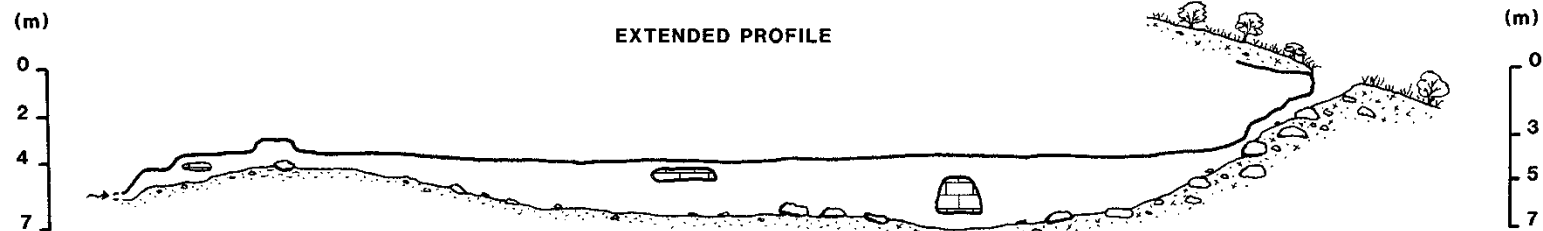


## CHRISTMAS CAVE BEXAR CO., TEXAS

Suunto & Tape Survey, 16 July 1983  
Carmen Goyette, Joe Ivy,  
George Veni (draft)

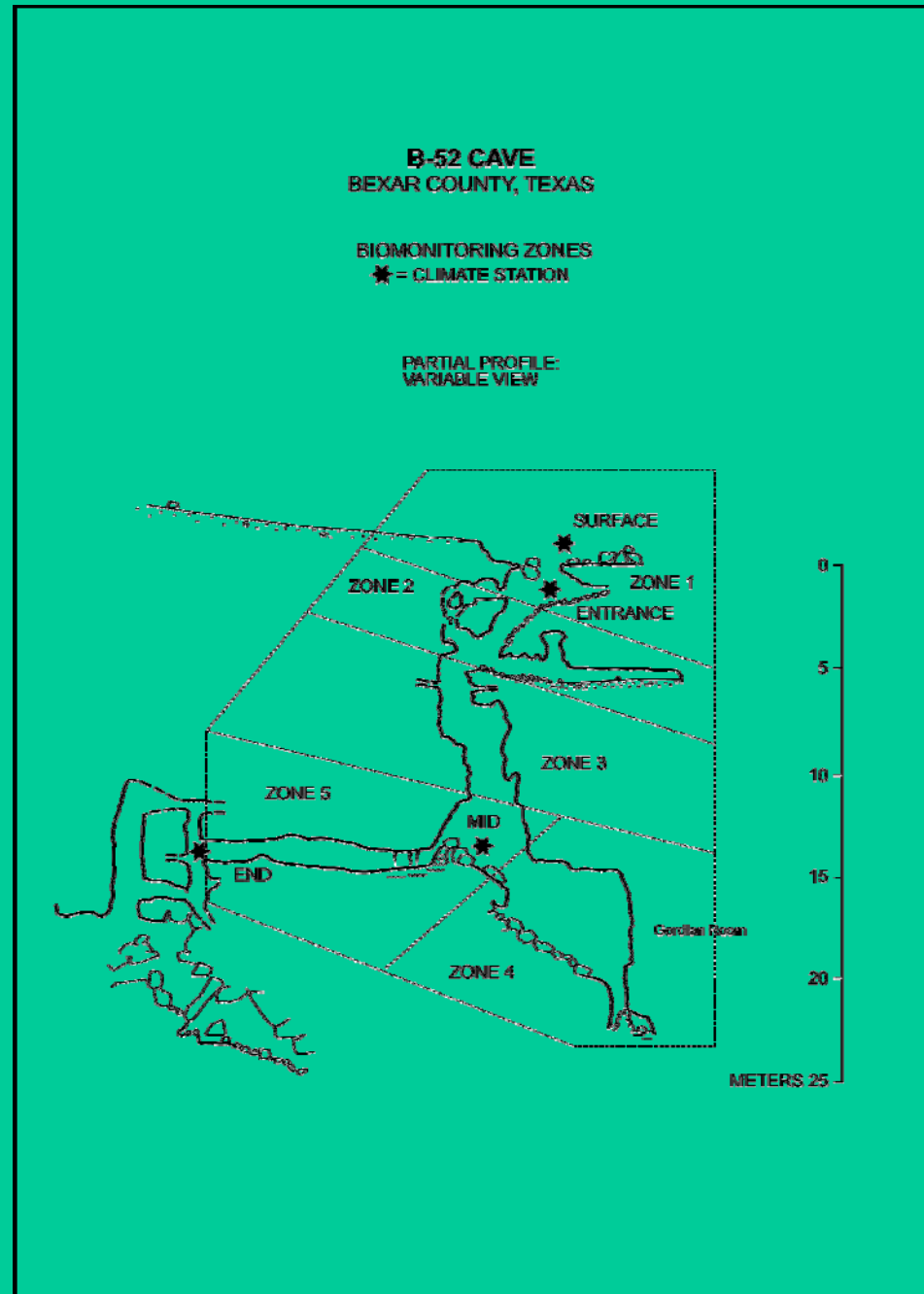
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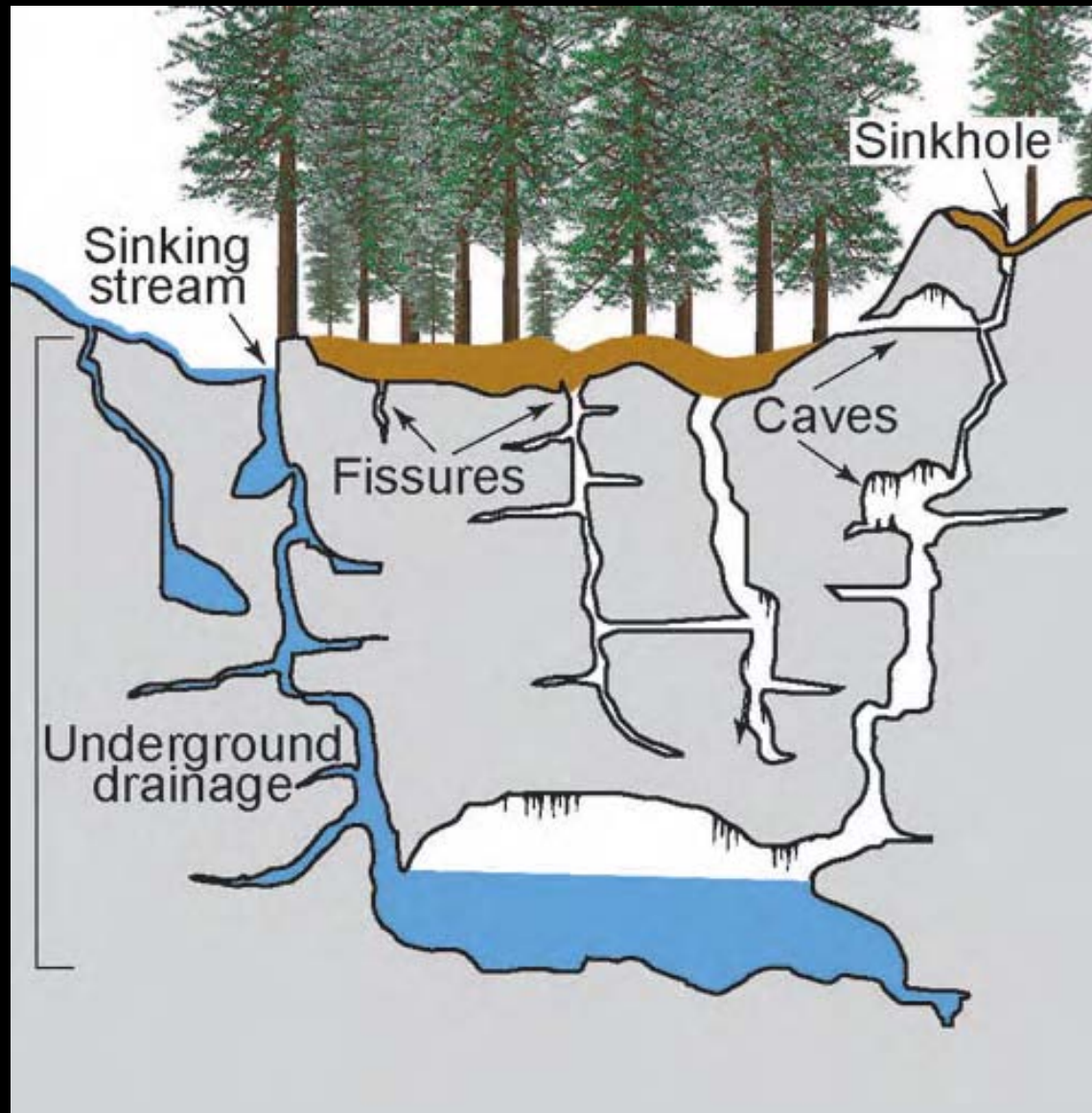
Depth: 7.2m



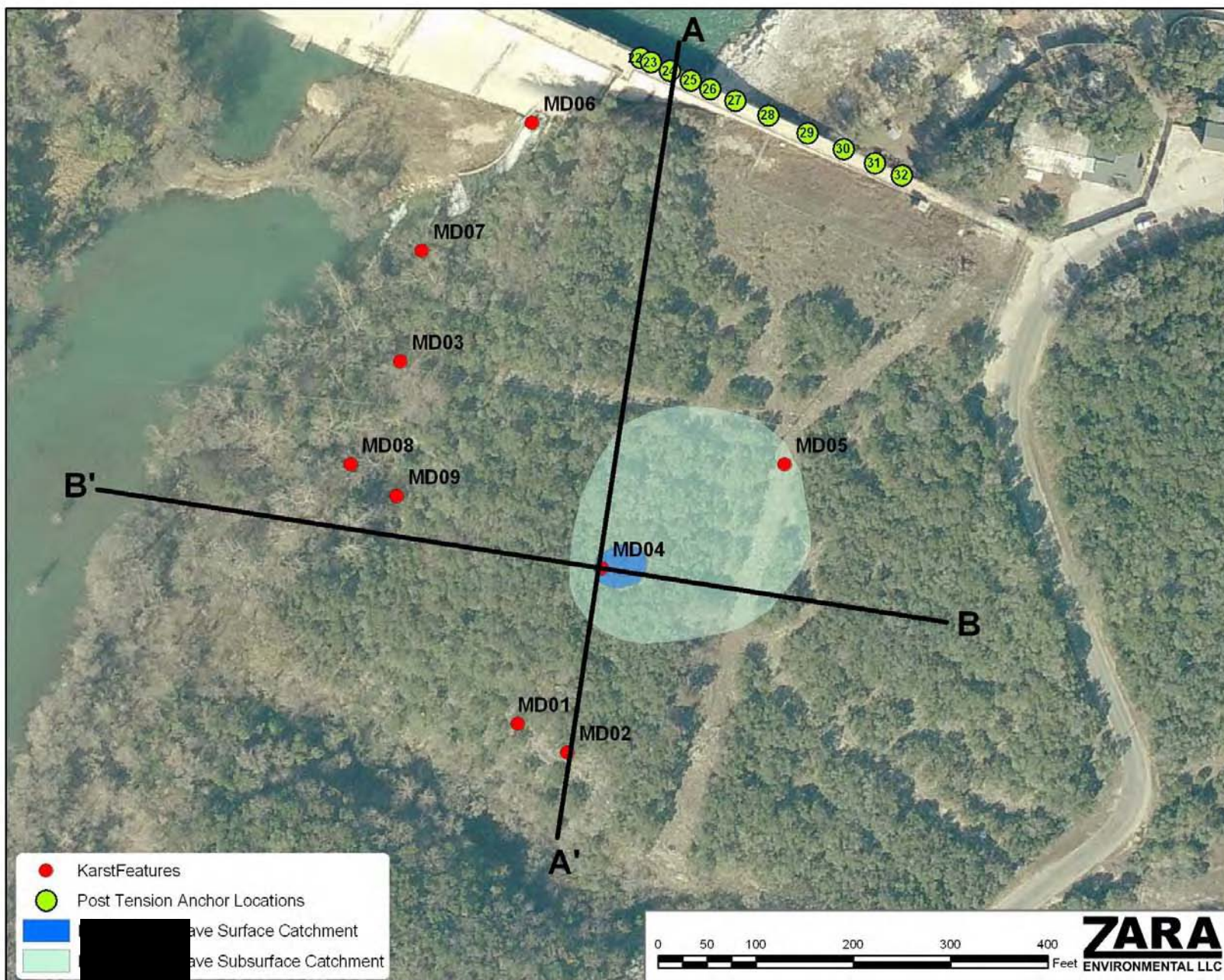
# Drainage basins

- Cave map showing horizontal and vertical extent
- Surface
- Subsurface

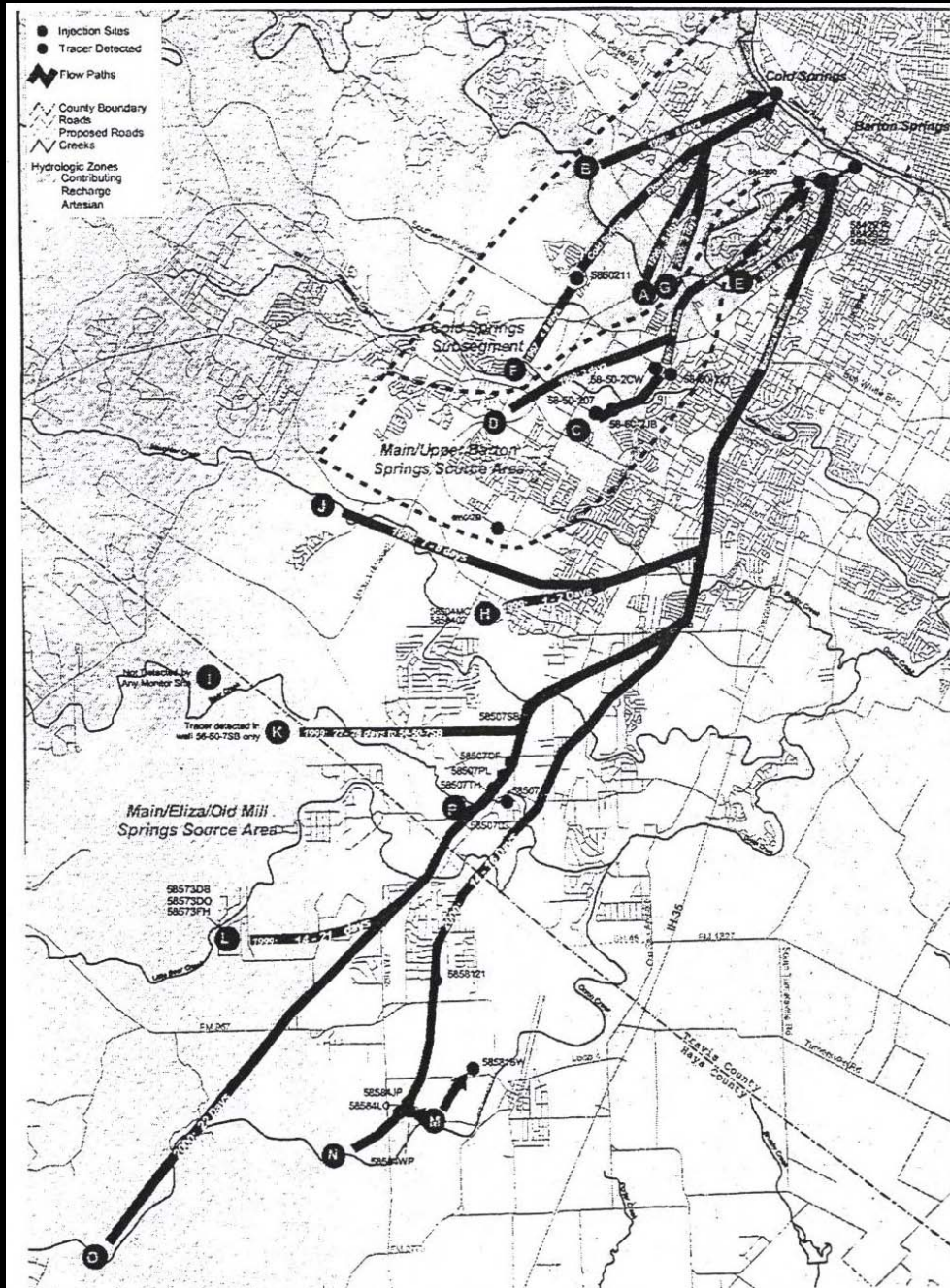












Dye trace results in  
South Austin  
From Hauwert et al. 2002





Sinkhole for aquifer recharge:  
Pedernales River, Blanco Co., TX





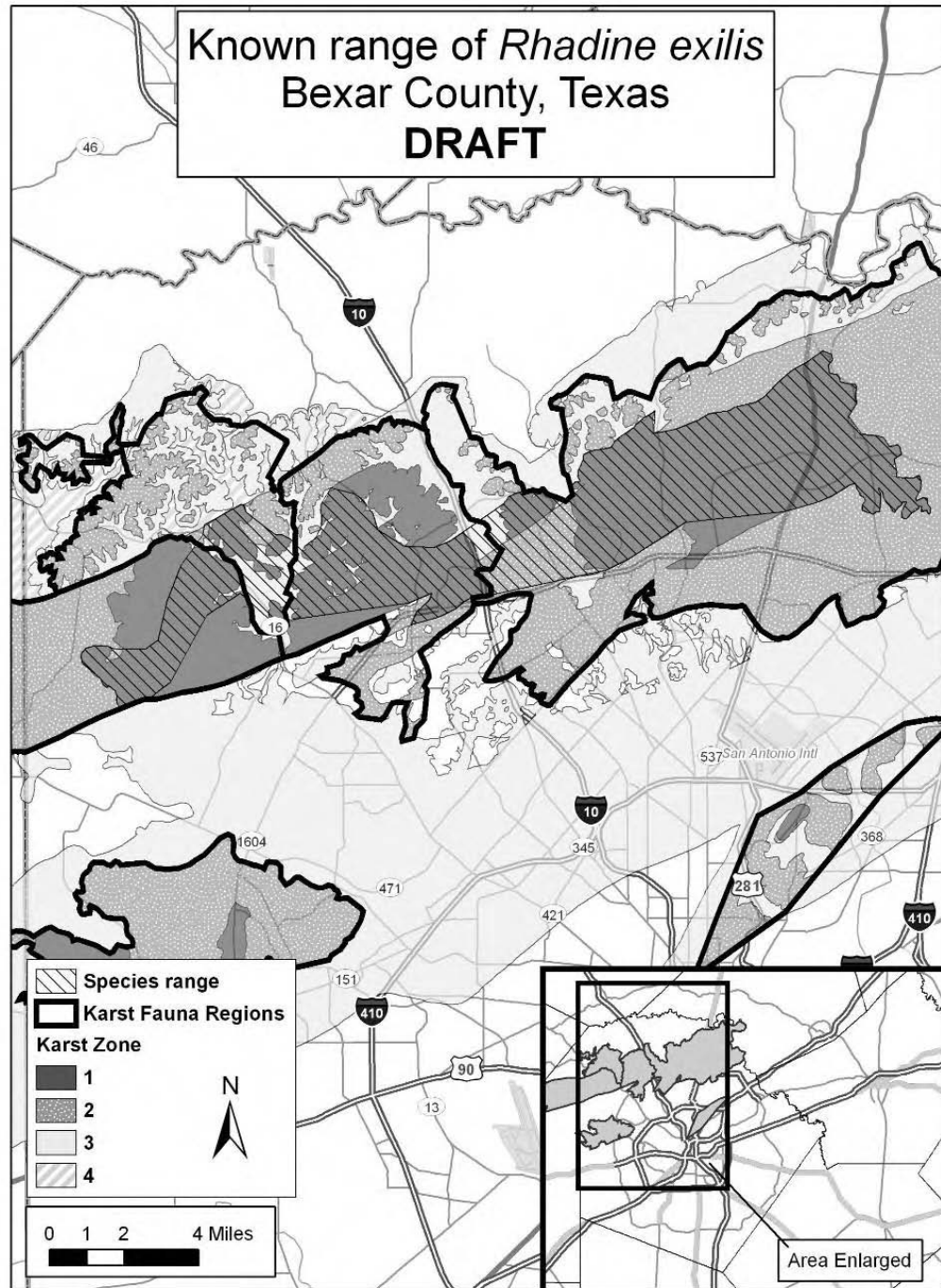
Cueva del Ojo de Agua Grande, Veracruz, Mexico



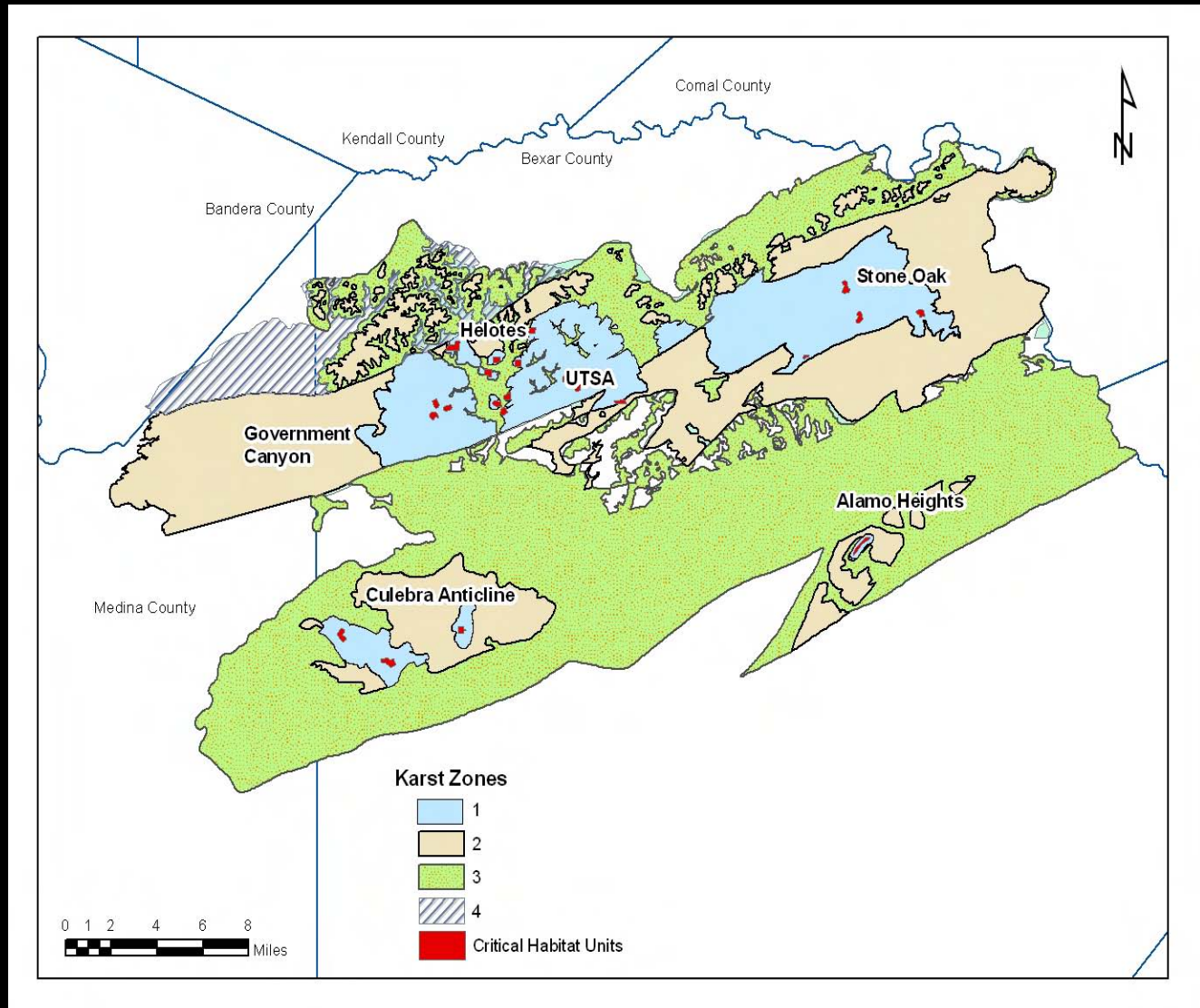




# Bexar County Karst Zones



# Karst Fauna Regions, Karst Fauna Areas & Critical Habitat Units



# Buffers and cave preserves: What are the needs of the species?

- High humidity and stable temperatures
- High water quality of surface and subsurface drainage basin
- Low invasive species (e.g. RIFA)
- Healthy troglodite population
- Natural surface communities
  - Native animals (inverts and verts in natural quantity and quality)
  - Native plants (sustaining popns and natural diversity and abundance)
- Adjacent karst features and caves for metapopulations
- Potential for connectivity with mesocaverns