

# **Annual Report: A Test of the Relative Abundance and Distribution of Ants at the Wild Basin Preserve in Relation to Habitat Manipulation for the Black-capped Vireo**

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## Introduction

This study proposes to monitor the ants of Wild Basin/ City of Austin Vireo Research Area in relationship to habitat manipulation for the Black-capped Vireo. Specifically we want to see if and how manipulation of habitat for the Black-capped Vireo will affect the associated arthropod community, or more specifically the ant fauna.

Arthropods are commonly being used in rapid biodiversity surveys for conservation purposes. Among the arthropods ants have commonly served as the focal group for structured inventories of arthropod diversity and abundance for a number of reasons. Ants are good bio-indicators as they are diverse, abundant and colonies are generally in a fixed position. Further ants are thought to be a keystone taxon in the functioning of terrestrial ecosystems due to their impact on soil ventilation, plant-arthropod interactions, seed dispersal, and predation. And finally a number of studies have tested protocols and sampling methods for ants and have identified efficient practices and methodologies for strict inventory or community characterization.

A specific research project just being initiated at City of Austin Vireo Research Area, adjacent to Wild Basin Wilderness Preserve (by AWH and students) is titled “A Test of the Relative Abundance and Distribution of Ants at the Vireo Research Area in Relation to Habitat Manipulation for the Black-capped Vireo”. This study proposes to sample ant abundance and distribution along transects within an area that has been manipulated (Ash Juniper removed) to improve the habitat for the endangered Black-capped Vireo at the City of Austin Vireo Research Area, in Austin Texas. Pitfall samples will be used to sample ant abundance and distribution in a treated (manipulated) area and an adjacent untreated area (natural meadow). This way it can be documented how the ant fauna might change in the treated compared to untreated area. We are interested in seeing how manipulation of the habitat for the Black-capped Vireo will influence the associated ant/arthropod community. It is expected that sampling will take place two times per year (spring/fall) for a period of a least three years.

## Methods

Pitfall Traps will be used to sample ant abundance and distribution in treated (manipulated) areas and adjacent untreated areas (fig. 1). Presently two plots (treated versus untreated) of 20 pitfall traps have been established in the City of Austin Vireo Research Area. Plot 1A was placed in a recently cleared (treated) area (Fig. 2) and Plot 1B was place in a natural, unaltered meadow nearby (Fig. 3).

Both plots contained of 20 pitfall traps placed 10 m apart in four rows with five traps. Each trap consists of a short (7cm) length of PCV pipe that contains an 80cc centrifuge tube with the top portion (grooved section) removed so as to fit in the PVC pipe (Fig. 4). When not in use the cut tube is switched out with a tube containing a screw cap so that the trap is closed (Fig. 5). Holes for the PVC pipe were created by hammering a 1 inch by 7 inch conduit nipple into the ground and then removed with soil inside (Fig. 6).

Each trap received a numbered metal tag, attached to a 15.24 cm nail (driven into the ground) by 24 gauge steel galvanized wire. Attached upright to each nail was a “blue stake whisker” to facilitate relocating of the trap. Each trap had a GPS location recorded. Traps will normally be run for a period of 7 days and will be non-baited, but will contain nontoxic propylene glycol. When not in use empty traps will be closed so as not to capture any organisms. Samples will be collected in Whirl-Pak sample bags and frozen until processed. When processed ants and any other arthropods will sorted, counted and sorted to morphospecies. Representative morphospecies will be pinned and identified to species. Dr. Ed LeBrun at the University of Texas’ Brackenridge field Laboratory (fire ant research lab) will confirm our identifications. It is expected that sampling will take place two times per year (spring/fall) for a period of a least a three years. This research will document changes in the ant fauna in the treated compared to untreated area and how this may impact the terrestrial community in the treated areas.

## Results

On 14 April 2012 pitfall trap plots were established in the City of Austin Vireo Research Area. On 22 September 2012 traps were “baited” with propylene glycol in the morning. On 28 September 2012, late afternoon, pitfall trap samples were collected in individual Whirl-Pak sample bags with added 100% ethanol to preserve specimens. Collection tubes were replaced with centrifuge tubes with caps, so traps could be closed. Whirl-Pak sample bags were kept in a freezer until specimens were sorted. We had planned to collect the samples on 29 September (Saturday) except significant rain was predicted for that day so we collected 4-6pm on the 28<sup>th</sup>. We are in the process of sorting ants into morphospecies. We are now in the process of pinning and identifying these ant species.

Table, figures and “appendix”: one table, six figures and appendix with copies of original notes follow.

Table 1: Plot 1A: Pitfall Trap Numbers and GPS Locations.

Pitfall Trap Plot 1A

Trap Number	GPS Location	
1	N30°18.706'	W97°49.092'
2	N30°18.708'	W97°49.100'
3	N30°18.709'	W97°49.105'
4	N30°18.709'	W97°49.111'
5	N30°18.710'	W97°49.116'
6	N30°18.712'	W97°49.091'
7	N30°18.713'	W97°49.099'
8	N30°18.714'	W97°49.106'
9	N30°18.714'	W97°49.113'
10	N30°18.713'	W97°49.116'
11	N30°18.717'	W97°49.092'
12	N30°18.717'	W97°49.098'
13	N30°18.718'	W97°49.104'
14	N30°18.719'	W97°49.111'
15	N30°18.719'	W97°49.117'
16	N30°18.723'	W97°49.090'
17	N30°18.722'	W97°49.097'
18	N30°18.722'	W97°49.103'
19	N30°18.724'	W97°49.110'
20	N30°18.724'	W97°49.116'

Pitfall Trap Plot 1B

21	N30°18.623'	W97°48.985'
22	N30°18.628'	W97°48.980'
23	N30°18.633'	W97°48.978'
24	N30°18.638'	W97°48.976'
25	N30°18.641'	W97°48.973'
26	N30°18.623'	W97°48.979'
27	N30°18.627'	W97°48.977'
28	N30°18.632'	W97°48.975'
29	N30°18.637'	W97°48.972'
30	N30°18.642'	W97°48.969'
31	N30°18.622'	W97°48.973'
32	N30°18.627'	W97°48.971'
33	N30°18.632'	W97°48.970'
34	N30°18.636'	W97°48.966'
35	N30°18.639'	W97°48.963'
36	N30°18.623'	W97°48.967'
37	N30°18.630'	W97°48.965'
38	N30°18.630'	W97°48.967'
39	N30°18.636'	W97°48.962'
40	N30°18.639'	W97°48.958'



Figure 1. Map showing two pitfall trap plots at Wild Basin/Vireo Preserve. Plot 1A (oval yellow boundary) closest to Loop 360 is “manipulated or treated plot”. Second pitfall trap plot (yellow “circle”), Plot 1B is in a natural meadow, located about 300m east of Plot 1A.



Figure 2. View of treated (Ash Juniper removed) pitfall trap Plot 1A.



Figure 3. View of untreated (natural meadow) pitfall trap Plot 2B.



Figure 4. Pitfall trap #5 showing PVC insert in soil, cut centrifuge tube, centrifuge tube with cap, metal tag with blue stake whisker.



Figure 5. Pitfall trap, number 35, showing centrifuge tube with cap, inserted into PVC tube (trap closed). Also shown is nail holding numbered metal tag and stake whisker to the left of the capped-tube.



Figure 6. Conduit nipple used to create hole for PVC pipe.

Plot 1A - manipulated site

100° 18.706' 2 18.708' 3 18.701' 4 18.708' 5 18.710' ✓  
 100° 49.972' 49.100' 49.105' 49.111' 49.116'

6 18.712' 7 18.715' 8 18.714' 9 18.714' 10 18.713'  
 405.49.091' 404 49.091' 709 49.104' 708 49.115' 709 49.116'

11 18.711' 12 18.717' 13 18.718' 14 18.719' 15 18.719'  
 410 49.081' 411 49.088' 412 49.104' 413 49.111' 414 49.117'

16 18.723' 17 18.722' 18 18.722' 19 18.724' 20 18.724'  
 415 49.090' 416 49.087' 417 49.105' 418 49.110' 419 49.112'

Hook 450  
 533  
 Elevation 834

22.1X.12  
 baited traps

Original Notes. Plot 1A (treated site) showing pitfall trap number (metal tag numbers) 1-20. GPS location written next to each pitfall trap number. Elevation 834 feet.

Plot 1 B - untreated site

Elevation: 790 ft

21	N30° 18.623'	22	18.628'	23	18.633'	24	18.638'	X → ✓	
<del>720</del>	W 97° 48.985'	<del>721</del>	49.980'	<del>722</del>	48.978'	<del>723</del>	48.976'		
•		•		•		•			
25	18.623'	27	18.627'	28	18.632'	29	18.637'	30	18.642'
<del>725</del>	48.979'	<del>726</del>	48.977'	<del>727</del>	48.975'	<del>728</del>	48.972'	<del>729</del>	48.969'
•		•		•		•		•	
31	18.622'	32	18.627'	33	18.632'	34	18.637'	35	18.639'
<del>730</del>	48.973'	<del>731</del>	48.971'	<del>732</del>	48.970'	<del>733</del>	48.968'	<del>734</del>	48.965'
•		•		•		•		•	
36	18.625'	37	18.630'	38	18.635'	39	18.640'	40	18.639'
<del>735</del>	48.967'	<del>736</del>	48.965'	<del>737</del>	48.967'	<del>738</del>	48.962'	<del>739</del>	48.958'
•		•		•		•		•	

↙ base of oak tree location

Original Notes. Plot 1B (untreated site, natural meadow) showing pitfall trap number (metal tag numbers) 21-40. GPS location written next to each pitfall trap number. Elevation 790 feet.