Section 6 (Texas Traditional) Report Review

Attachment to letter dated OCT 1 0 2008

Project Title: Examining possible foraging differences in urban and rural cave cricket populations: Preliminary study of carbon and nitrogen isotope ratios (δ13C, δ 15N) as indicators of trophic level

Final or Interim Report? Interim

Job #: WFR 15 **Grant #:** E-59

Reviewer Station: Austin ESFO

Lead station was contacted and concurs with the following comments:
☐ Yes ☐ No ☒ Not applicable (reviewer is from lead station)

Interim Report (check one):

☐ is acceptable as is

☐ is acceptable as is, but comments below need to be addressed in the next report

☐ needs revision (see comments below)

Final Report (check one):

☒ is acceptable as is

☐ is acceptable, but needs minor revision (see comments below)

☐ needs major revision (see comments below)

Comments:

FINAL REPORT

As Required by

THE ENDANGERED SPECIES PROGRAM

TEXAS

Grant No. E - 59

Endangered and Threatened Species Conservation

Examining possible foraging differences in urban and rural cave cricket populations: Preliminary study of carbon and nitrogen isotope ratios (δ13C, δ 15N) as indicators of trophic level

Prepared by:

Steve Taylor

TEXAS PARKS & WILDLIFE

Carter Smith
Executive Director

Mike Berger
Division Director, Wildlife

5 December 2007

FINAL REPORT

STATE: Texas **GRANT NUMBER:** E - 59

GRANT TITLE: Examining possible foraging differences in urban and rural cave cricket populations: Preliminary study of carbon and nitrogen isotope ratios (δ13C, δ15N) as indicators of trophic level

REPORTING PERIOD: 10/01/04 to 12/1/07

OBJECTIVE(S):

To use stable isotope analysis to examine foraging differences between *Solenopsis invicta* and cave cricket populations in urban and rural settings in relation to available food supply.

Significant Deviation:

None

Summary Of Progress:

Please see Attachment A (.pdf file).

Location: Bexar, Travis, Hays County, Texas

Cost: Not available at the time of this report

Prepared by: Craig Farquhar **Date:** 5 December 2007

Approved by: C. Craig Farquhar **Date:** 8 Dec 07

Examining possible foraging differences in urban and rural cave cricket populations: Carbon and nitrogen isotope ratios ($\delta^{13}C$, $\delta^{15}N$) as indicators of trophic level

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30 November 2007
Illinois Natural History Survey Technical Report 2007 (59)

prepared for:
Attn: Dr. C. Craig Farquhar
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Cover: *Cicurina varians* (Araneae) in web in Surprise Sink, Bexar County, Texas. Note *Pseudosinella violenta* (Collembola) in lower left and fresh fecal pellets of *Ceuthophilus* sp. to left of center. Photo by Jean K. Krejca.

Abstract

The energy regime in small Texas caves differs significantly from many caves of the better studied eastern United States in that surface-foraging cave crickets (*Ceuthophilus secretus* and *Ceuthophilus* "species B") are major contributors to these systems. The federally listed endangered cave invertebrates of Travis, Williamson, and Bexar counties, Texas, are dependent on these crickets to transport energy from the surface to the cave environment. Using stable isotope analysis in combination with in-cave counts of animal life we examined foraging differences between *S. invicata* and cave cricket populations in nine caves chosen based on their low, medium, and high levels of human impact. Surface foraging cave crickets do not utilize the same food resources as as *Solenopsis invicata*, rather, *S. invicta* functions at the same trophic level as *Ceuthophilus cunicularis*, a cave-limited species, and also feeds on surface-inhabing invertebrates which are not part of the cave ecosystem. The trophic position of the entire cave invertebrate community differed significantly between all three levels of human impact, for both $\delta^{13}C$ and $\delta^{15}N$. Numbers of individuals of all cave taxa, including *Ceuthophilus* spp., are correlated with the level of human impact. As the percentage of impervious cover and percentage of impacted area increased, the total number of cave taxa decreased. This trend held true when either 11.2 or 90 acres around the cave entrance were considered in scoring the level of impact. Additionally, the total number of individuals of other taxa recorded from the caves was strongly correlated with the total number cave cave crickets. Maintining land in a natural state within the foraging range of cave crickets (*C. secretus* and *C*. species B), and controlling the fire ant, *S. invicta*, are therefore important considerations in the management of Texas' federally listed endangered cave invertebrates.

Introduction

Although several leading karst researchers consider primary energy inputs in karst systems to be dissolved and particulate organic carbon entering through sinkholes, pits, soils, and epikarst (Simon *et al*. 2007), this is not the case for many caves in central Texas, some of which are home to federally listed endangered invertebrates (USFWS 1988, 1993, 2000) or closely related, often rare taxa (Reddell 2001, Reddell and Cokendolpher 2001a). The majority of these caves are small, and few of them harbor large numbers of bats. These energy poor caves primarily receive energy from detritus and surface animals that fall or are washed into the caves and from energy brought into the caves by cave crickets (*Ceuthophilus secretus*, *Ceuthophilus* "species B," and perhaps *Ceuthophilus cunicularis*) and other trogloxenes such as the harvestman (*Lieobunum townsendii*). Most of these caves are dry – that is, they lack streams, and only rarely receive large influxes of water during storm events. From a hydrological perspective, it is the drainage basin of a cave that is typically thought of as the unit that defines energy flow into caves (Simon *et al*. 2007), but many small central Texas caves were developed in a phreatic environment, and have little modern catchment. In these cases, cave crickets are likely most important a a primary energy input, not water flow, and it is their foraging range, not (just) the drainage basin that is the appropriate unit for analyzing energy flux. Cave crickets contributions to the caves' carbon budget are quite significant (Lavoie *et al*. 2007; Taylor *et al*. 2003, 2004, 2005) because they forage widely on the surface and then roost in the caves during the daytime, ultimately contributing their carbon to the cave ecosystem (Lavoie *et al*. 2007; Taylor *et al*. 2003, 2004, 2005).

We know a great deal about the ecology of caves in general (Culver 1982, Howarth 1983, Poulson and White 1969, Vandel 1965). In many of the caves, nutrients appear to be concentrated near the cave entrance, arriving in the form of falling organic debris and the feces and bodies of various organisms (Peck 1976). Deeper in the caves of central Texas, the feces, eggs, and bodies of *Ceuthophilus* spp. appear to comprise a more important energy source. All of the above generalizations vary widely

from cave to cave, but may serve as a conceptual starting point for understanding the cave communities of central Texas.

The red imported fire ant (*Solenopsis invicta* Buren, RIFA) has been shown to enter and forage in caves in central Texas (Elliott 1992, 1994; Reddell 2001; Reddell and Cokendolpher 2001b, Taylor *et al*. 2003). Land managers with an interest in protecting the rare and endangered karst invertebrates have expended considerable financial resources in an attempt to control RIFA activity around cave entrances. Effective control is accomplished through the killing of individual mounds with boiling water or steam applications which must be repeated on a regular basis. The area to be treated includes susceptible area around the cave entrance or cave footprint, with the intention of excluding the ants from the cave. As the foraging range of the red imported fire ant is about 25 meters, the area to be treated is at least 0.19 hectares, more if the footprint of the cave determines treatment area.

Control efforts directed at *S. invica* are further complicated by the foraging range of cave crickets. *C. secretus* forages at night on the surface and roosts in the caves during the day. Elliott (1992), working with *C. secretus* and a closely related, undescribed species (*Ceuthophilus* "species B"), noted that "Cave crickets mostly feed within 5 or 10 m of the cave entrance, but large adults may travel 50 m or more." Based on Elliott's (1992, 1994) work, it was thought that most cave crickets forage within 30 m of the entrances of caves (Reddell and Cokendolpher 2001b). Because of the presumed interactions (competition and/or predation) of red imported fire ants and cave crickets on the surface, land managers have used this figure to enlarge the RIFA treatment area around cave entrances. Recent research by Taylor *et al*. (2003, 2004, 2005) has demonstrated that *C. secretus* forages more than 100 m from cave entrances. This figure greatly increases the area that would need to be treated to avoid fire ant/cave cricket interactions above ground, and land managers have valid concerns about costs and other logistics associated with treating these larger areas.

One issue that is poorly understood with the cave crickets of central Texas (and, indeed, elsewhere), is their food preferences. Elliott (1992) made observations on

foraging by *C. secretus* and an undescribed species[1], noting they "were mostly seen on foliage, dead leaves, lichens on sticks, and grass, but they were not chewing although they used their palpi to probe the substrate." Elliott (1992) also observed a cave cricket with a dead RIFA in its mandibles. According to Reddell (personal communication, August 2001), adults of the two *Ceuthophilus* species that Elliott worked with in Travis and Williamson counties seem to be dominant at different times of year (Elliott 1992). Taylor *et al*. (2003) found that *C. secretus* tended to abandoned rich food sources (bait stations) when RIFA began recruiting large numbers of individuals to the food resource, thus demonstrating that RIFA / *C. secretus* may compete for resources, and that RIFA can outcompete *C. secretus* at least under experimental conditions. Because *Ceuthophilus secretus* forages more than 100 meters from cave entrances (Taylor *et al*. 2003, 2004, 2005), there are strong implications for preserve design.

Our general knowledge of the biology of cave-inhabiting crickets of the genus *Ceuthophilus* is surprisingly unbalanced. While we know a good deal about seasonality, reproduction, physiology, behavior, laboratory rearing, parasites and genetic variation of some species (e.g., Allegracci *et al*. 1991; Caccone and Sbordoni 1987; Campbell 1976; Cockley *et al*. 1977; Chinn and Arnaud 1993; Cokendolpher *et al.* 2001; Cokendolpher 2001; Cyr *et al.*1991; Eades 1964; Hubbell and Norton 1978; Leja and Poulson 1984; Lamb and Willey 1987; Nagel and Cade 1983, Northup and Crawford 1992; Northup *et al*. 1993; Northup and Kuper 1987; Poulson *et al*. 1995; Richards 1961; Robaux *et al*. 1976; Sbordoni *et al*. 1981; Smith and Campbell 1975; Studier 1996; Studier *et al*. 1986; Studier *et al*. 1987a,b; Studier *et al*. 1988; Studier *et al*. 1991; Studier *et al*. 2002; Studier and Lavoie 1990; Taylor *et al*. 2007; Turner 1915; Webb *et al*. 1977; Yoder *et al*. 2002), we know little about foraging activities, trophic position and food items of cave-inhabiting rhaphidophorids. In southern New Mexico, Campbell (1976) noted both animal and plant material in the stomachs the cave-inhabiting cricket *Ceuthophilus conicaudus*, and Cokendolpher *et al.* (2001) collected the cavernicoles *Ceuthophilus carlsbadensis* and *Ceuthophilus longipes* at a variety of bait types (jelly, tuna, and rancid liver), with bait preferences varying seasonally. In addition Krejca and

[1] This work was carried out in Travis and Williamson counties. The undescribed species is *Ceuthophilus* "species B." A third species present in central Texas caves, *C. cunnicularis*, is rarely observed leaving caves to forage.

Meyers (2005) attracted *C. carlsbadensis* and *C. longipes* to bait stations using cat food, but showed that they also eat human food scraps. At Fort Hood, Texas, Taylor *et al*. (2004) showed that isotopes could be used to characterize the trophic structure of cave ecosystems, and the present study expands on that work.

In summary, we have limited knowledge about foraging by the cave cricket species occurring in central Texas, *C. secretus*, *C.* species B and *C. cunicularis*. It is generally thought that cave crickets are scavengers or omnivores. We have some evidence (Taylor *et al*. 2003) that they compete for food resources with the *S. invicta*. If the crickets and ants are utilizing different food sources and fire ants do not depredate the crickets, the foraging range of the crickets may not need to be protected[2], and thus the implications for control of fire ants at caves could be significant.

If land managers are attempting to manage landscapes around cave entrances to protect rare and endemic troglobites, they must gain an understanding of what components of the epigean flora and fauna comprise major constituents of the energy brought into caves by the keystone trogloxenes, *C. secretus* and *C.* species B. It is reasonable to presume that protection of the cave fauna would be facilitated by encouraging populations or communities of epigean elements that are major contributors to the diets of *C. secretus* and *C.* species B. Enhancing our understanding of food web relationships within and among caves could prove useful in guiding management decisions.

The federally listed endangered karst invertebrates of Travis, Williamson, and Bexar counties, Texas, are dependent on energy brought into the caves. Cave crickets, *C. secretus* and *C.* species B, are important in transporting energy from the surface to the cave environment. One of the leading threats to the cave faunas in these counties is urbanization (USFWS 1988, 1993, 2000, 2003). As development increasingly encroaches on the foraging range of the cave crickets, there may be dramatic shifts in the composition of the available food supply. Therefore, quantifying the importance epigean food resources which needed to be maintained around cave entrances to help

[2] This scenario is relatively unlikely: Two of us (SJT & JKK) have observed both the fire ants and the cave crickets feeding at (unnatural) tuna bait stations, and also have seen *Solenopsis invicta* scavenging on the body of *C. secretus* – if significant *C. secretus* mortality occurs on the surface due to *S. invicta* predation, the cricket foraging range should still be protected.

ensure the natural flow of nutrients into the caves is a high priority. When preserve areas are small, crickets may need to forage in habitats that appear to be sub-optimal. However, it is also possible that urban landscapes (e.g., mowed grassland) may provide sufficient forage for the crickets.

Here, we use stable isotope analysis in combination with in-cave counts of animal life to examine foraging differences between *S. invicata* and cave cricket populations in urban and rural settings in relation to available food supply.

Methods

Carbon and Nitrogen isotope ratio analysis

Stable isotopes are popular tools for investigating ecosystems (Griffiths 1998, Lajtha and Michener 1994, Peterson and Fry 1987, Rounick and Winterbourn 1986, Rundel *et al*. 1988). The stable isotopes of nitrogen and carbon occur in virtually all animal tissues (Peterson and Fry 1987), and their ratios ($\delta^{13}C$, $\delta^{15}N$) have been used to track the movement of energy through a food web (Cabana and Rasmussen 1994, Fry and Sherr 1984, Herrera *et al*. 1998, Magnusson *et al*. 1999., McNabb *et al*. 2001, Neilson *et al*. 2002, Ostrom *et al*. 1997, Polz *et al.* 1998, Ponsard and Arditi 2000, Sanzone *et al.* 2003, Scheu and Falca 2000, Tayasu *et al*. 1997, Whitledge and Rabeni 1997) and to help identify the food sources of animals which are difficult to observe in the wild (e.g., Fry *et al*. 1978, Hollows *et al*. 2002, Markow *et al.* 2000, Mihuc and Toetz 1994, Neilson *et al.* 2000, Rico-Gray and Sternberg 1991). These isotope "signatures" essentially represent a running average[3] of the feeding history of an organism (O'Reilly *et al*. 2002), and thus are not as biased as individual observations of instances of food resource utilization. Rather, this signature depends on the turnover rate of the isotopes in the tissue of the animals being examined. Species at higher trophic levels typically have enriched $\delta^{15}N$ relative to their prey (e.g., Oelbermann and Scheu 2002), but often utilize a variety of food sources (Pain 1988, Persson 1999, Post 2002). Therefore the isotope ratios must be partitioned among the possible sources (e.g., Koch and Phillips

[3] Carbon isotope turnover in the chiton of locusts (*Locusta migratoria* Linnaeus 1758; Orthoptera: Acrididae) can occur in as little as eight days (Webb *et al*. 1998).

2002, Phillips and Koch 2002, Phillips and Gregg 2003, Robbins *et al.* 2002). Thus, while isotope studies often result in new insights into trophic relationships, they rarely give completely decisive explanations of ecosystem functioning.

Stable isotopes of nitrogen and carbon have been used with some success to characterize food webs and trophic levels of a cave in Arkansas (Graening 2000), with sea cave-inhabiting fruit bats in Mexicoa (Ceballos 1997), in cave communities at Fort Hood, Texas (Taylor *et al*. 2004) and in anchialine aquatic cave communities in Mexico (Pohlman *et al*. 1997) and northwestern Australia (Humphreys 1999). In spite of a fairly substantive body of research on the biology of North American cave crickets (cited earlier, and see Lavoie *et al*. [2007]), there are no other studies of cave-inhabiting Rhaphidophoridae (*Ceuthophilus* spp., *Haedonoecus* spp., etc.) that have utilized stable isotope analyses.

Site Selection

During initial visits to potential field sites, we investigated numerous caves, finally selecting the following 9 caves for our study: Bonepile Cave and Surprise Sink (both in Government Canyon State Natural Area), Genesis Cave (San Antonio), Academy Cave (San Marcos), and five Austin caves: Lost Oasis Cave, Blowing Sink Cave, Driskill Cave, LaCross Cave, and Slaughter Creek Cave. These caves were selected to represent a variety of urban and rural settings (Table 1).

Levels of Human Impact

During the last field visit, we also characterized levels of human impact using aerial photography (Figure 1), examining an area of 11.2 acres (radius 120 meters from cave entrance), corresponding to the maximum foraging distance of *Ceuthophilus* (*C*.) *secretus* recorded by Taylor et al. 2004) and an area of 90 acres (radius of 340 meters), corresponding to some estimates of recommended karst preserve size. By overlaying a grid of points and scoring each point into one of several categories (Grass/Herb Natural; Yard/Flower Beds, etc.; Trees/Shrubs Natural; Trees/Shrubs Cultivated; Dirt/Gravel Road; Paved Road/Lot; Cement Sidewalk; Building/Structure; Bare Ground/Dirt Trails) which were then classified as Pervious/ Impervious and Natural/ Modified as in Figure 2.

These scorings which was verified and corrected (as needed) on the ground, and percentages Pervious/ Impervious and Natural/ Modified were then recorded. The 9 caves ended up falling out very nicely into three levels of human impact, allowing evaluation of in-cave counts of animal life in relation to levels of human impact.

Stable Isotopes

Stable isotope ($\delta^{13}C$ and $\delta^{15}N$) data were obtained from cave crickets and other organic constituents of the epigean and subterranean ecosystems at three urban, three 'intermediate' and three rural cave sites (corresponding to high, medium and low human impact, see below) during each of the four seasons (spring, summer, fall, winter), with the exception of one cave which was missed during one sampling period.

We obtained samples of the dominant cave crickets (what we thought[4] to be *Ceuthophilus cunicularis*, *Ceuthophilus secretus* and *Ceuthophilus* species B), RIFA, a selection of the more common (visually dominant) plant taxa near the cave entrance, and other selected cavernicoles including millipeds (*Cambala speobia* (Chamberlin), *Speodesmus* sp.), spiders (*Cicurina varians* and other, non-endangered, *Cicurina* species]), springtails (mostly *Pseudosinella violenta*), harvestmen (*Lieobunum townsendii*) and a selection of other taxa from these nine caves. Federally listed endangered taxa were not sampled, and at some of the caves with higher levels of impact it was not feasible to obtain samples of all of the above taxa.

Methods for isotope analysis are almost the same as for Taylor *et al*. (2004), but are repeated here for clarity and convenience. Samples of invertebrates were collected and kept on dry ice for shipping to the laboratory in Illinois, where they were kept frozen until processed. For some taxa, multiple individuals were collected and pooled to obtain sufficient material for analysis, because individual biomass was low. Vegetative samples of abundant plant species were collected and cleaned of arthropods. Selected individuals of each taxon (plants and animals) were preserved as vouchers, and

[4] The taxonomy of the genus *Ceuthophilus* in Texas is presently unstable below the subgeneric level. Here we refer to *Ceuthophilus* (*Ceuthophilus*) *secretus* sensu lato, *Ceuthophilus* (*Geotettix*) *cunicularis* sensu lato, and *Ceuthophilus* (*Ceuthophilus*) species B as the animals generally recognized by current workers to belong to that undescribed species. These problems are discussed in Taylor et al. (2007).

Table 1. List of sites studied in central Texas.

Cave Name	County	Location	Landowner	Endangered Species?	Impact
Surprise Sink	Bexar	Govt. Canyon State Natural Area	Texas Parks and Wildlife	yes	low
Lost Oasis Cave	Travis	South Austin	Texas Cave Management Association	no	medium
Bone Pile Cave	Bexar	Govt. Canyon State Natural Area	Texas Parks and Wildlife	yes	low
Blowing Sink Cave	Travis	Austin	City of Austin	no	low
Genesis Cave	Bexar	San Antonoio	A Church	yes	high
Academy Cave	Hays	San Marcos	Texas State University	no	high
Slaughter Creek Cave	Travis	SW of Austin	City of Austin	no	medium
Driskill Cave	Travis	South Austin	Texas Department of Transportation	no	high
Lacrosse Cave	Travis	SW of Austin	The University of Texas Austin	no	medium

identifications confirmed by an appropriate expert (SJT or JKK for most animals, Dr. Geoff Levin [INHS] for plants). Vouchers specimens will be deposited in the Illinois Natural History Survey herbarium (plants) and insect collection (arthropods). Non-voucher plant and animal samples were oven dried, ground, and submitted for isotope analysis.

Dried samples were analyzed for the composition of C and N isotopes. As appropriate, samples were divided into subsamples and the stable isotope compositions were determined for each subsample separately – the sample isotope composition is presented as the mean of the subsamples ± standard error. When sufficient resources were available, additional samples were obtained.

Nitrogen and carbon isotopes were measured using a Finnigan Mat 252 isotope ratio mass spectrometer (IRMS) with an attached Carlo Erba NC 2500 Elemental Analyzer (EA) with a ConFlo II Split Interface. Insect and plant samples were dried in an oven at 80 °C for at least 72 hours and ground using a mortar and pestle to homogenize the samples. Dried samples were stored in a desiccator until they could be weighed and analyzed for their carbon and nitrogen isotopic composition. Approximately 400-700 µg of the insect samples were used for the simultaneous nitrogen and carbon isotope analyses. Due to the low N-content, plant samples were analyzed separately for nitrogen (using ~1500 to 2700 µg of sample) and carbon (using ~500 µg of sample) isotope analysis. Samples were wrapped in tin capsules and combusted in the EA which was set at 1020°C. The N_2 and CO_2 gases released during combustion were separated by a gas chromatograph column and introduced into the IRMS for analysis through a capillary tube.

The isotopic composition is reported in the delta (δ) notation which compares the ratio of two isotopes of the same element in a sample to the same ratio in an internationally accepted standard. The delta notation is defined as:

$$\delta X = [(R_{smpl} - R_{std})/ R_{std}] \times 1000$$

Where X is the isotope of interest such as, ^{15}N or ^{13}C, and R is the ratio of the isotopes being analyzed; for N the ratio is $^{15}N/^{14}N$ and for C the ratio is $^{13}C/^{12}C$. Thus, the isotopic ratio in a sample is compared to the same ratio in the standard. The results are reported in parts per thousand or per mil (‰). If the sample contains a greater amount of the heavier isotopes compared to the standard, the delta value is positive, if there are less heavy isotopes in the sample compared to the standard, the δ value is negative.

The $\delta^{15}N$ and $\delta^{13}C$ values are reported relative to air and the Vienna Pee Dee Belemnite (V-PDB) international standards, respectively. The samples were measured against a laboratory reference standard which is calibrated to V-PDB through analysis of NBS-19 which has a $\delta^{13}C$ value -1.95 ‰ (Coplen, 1994). Reproducibility for both $\delta^{15}N$ and $\delta^{13}C$ is ± 0.15 and ± 0.25 ‰ based on multiple analyses of an internal standard with similar N and C concentrations as the samples run during this study.

Weight percents were calculated by comparing the measured peak area, sample weight, and a set peak area defined using a thiourea standard with 36.8 % nitrogen and 15.8 % carbon. The reproducibility of weight percents was ± 5 % of the total weight percent for the samples. Each sequence of samples was run with the following standards: three internal standards at the beginning, two in the middle, and two at the end of the run, and every tenth sample was run as a duplicate. A thiourea standard was used to set weight percent at the start of each run followed by another thiourea and a hydroxyproline to verify weight percents.

Nitrogen and carbon isotope compositions derived from the above procedures were then plotted on graphs, and the distribution of the data was used to assess potential trophic relationships among the taxa examined.

Cave Fauna Census

For all nine caves, we obtained four seasons of in-cave timed counts of animal life in the caves. During each of these visits, the field crew – usually two people – systematically moved through each cave counting all of the animals encountered. The nine caves are all relatively small (like many of the endangered species caves in the Austin/San Antonio area). For the largest of these caves (Blowing Sink [low impact], Genesis [high impact], and Surprise Sink [low impact]), we sampled only the areas of the caves closer to the entrance, including a portion of the dark zone comperable to the other cave.which made this approach feasible. For many of the taxa, fairly specific field identifications were possible because the field crew consisted of persons experienced in working with the biota of central Texas caves.

Census data were supplemented in a few cases with cricket exit counts. Crickets (*Ceuthophilus* spp.) were counted as they exited the caves during the two hours immediately following sunset. Observers sat quietly at the cave entrance, using red lights to count crickets as they exited the cave. Red lights minimize disturbance of natural cricket behavior, and white lights were available for searching areas that were too far away to see with red light.

Figure 1. Arial photograph in the vicinity of one of the caves with high levels of human impact.

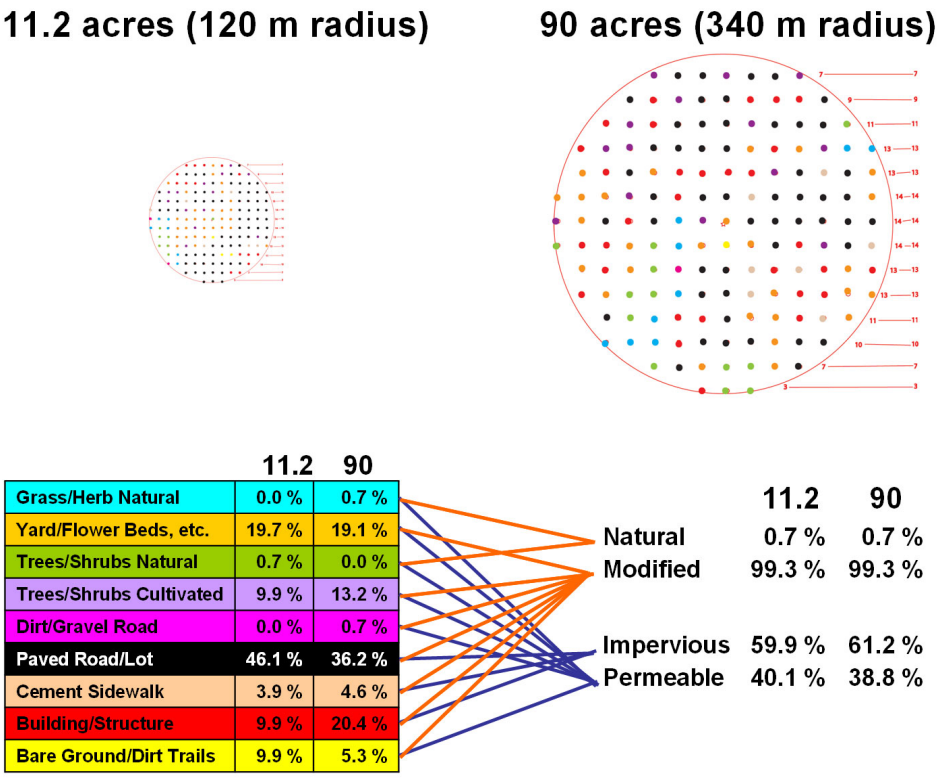

Figure 2. Categories used to score aerial photographs centered on each of the nine caves.

Results & Discussion

Levels of Human Impact

The nine caves selected a priori to represent three levels of human impact (low, medium, high) fit quite nicely in these categories, based both on percentage of impervious cover (Figure 3) and percentage of modified habitat (Figure 4) for both 11.2 acre (120 m radius) and 90 acre (340 m radius) circles overlaid on topographic maps. Detailed results of aerial photograph scoring are in Appendix A. Slaughter Creek Cave showed a lower level of human impact for the smaller area than the larger, because it is situated in a preserve bordered by development, and the larger area encompassed some of that development.

Stable Isotopes

After removing outliers, and specimens that did not yield useable results (low voltage, insufficient sample mass [especially for springtails], etc.) a total of 960 samples were available for analysis. Of these, 80 lacked good $\delta^{15}N$ data (primarily due to problems with obtaining sufficient mass of plants to get reliable N readings) and three lacked good $\delta^{13}C$ data, leaving 877 samples which could be plotted for both $\delta^{13}C$ and $\delta^{15}N$ (Appendix B).

Examining the general distribution of plant and animal isotope ratios (Figure 5), there appears to be a broad distribution of nitrogen isotopic ratios, indicating a variety of trophic levels are present in the dataset. Plants with different photosynthetic pathways are differentiated on the $\delta^{13}C$ axis, with C3 plants, comprising the majority of our samples, on the left and CAM (in the present study, only *Opuntia*) and C4 plants on the right. The distribution of the animal samples on both axes strongly suggests that the majority of the energy input into this ecosystem is from C3 plants, however, clearly there some utilization of the C4 and/or CAM plants. A few of the C3 plant samples, towards the upper right of Figure 5 (those above and to the right of a line running from $\delta^{13}C = -25$, $\delta^{15}N = -0.5$ to $\delta^{13}C = -28.5$, $\delta^{15}N = 3.8$), may have been contaminated with animal material even though an effort was made to clean off arthropods.

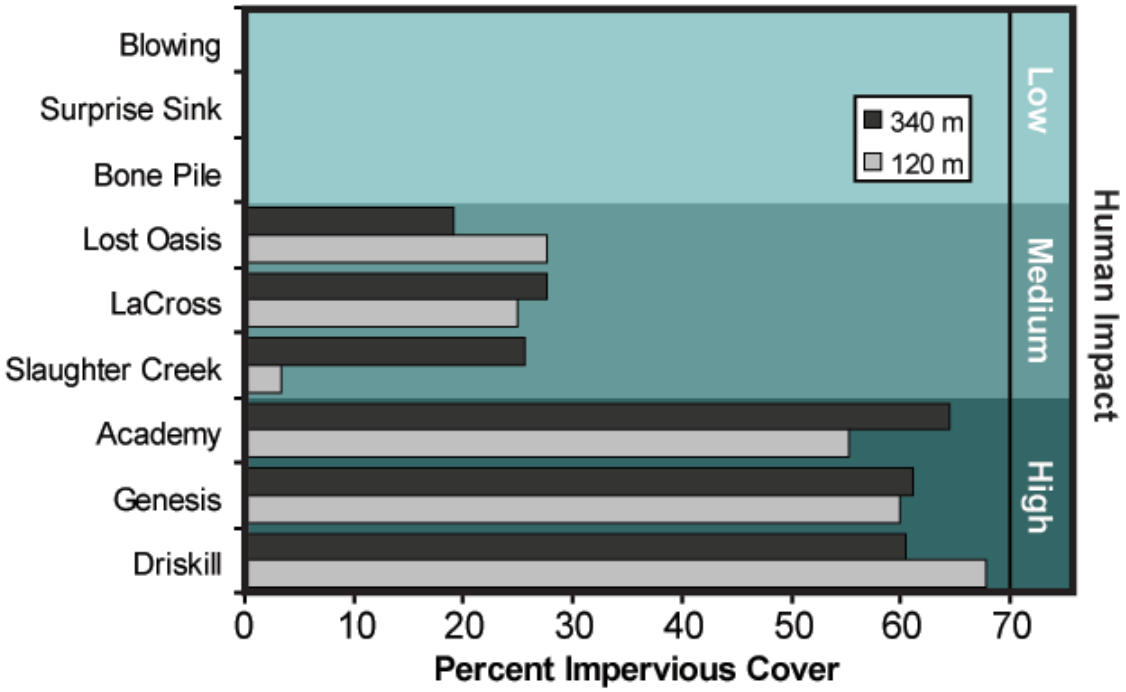

Figure 3. Percentage of impervious covered at each of nine Texas caves, based on scoring aerial photographs.

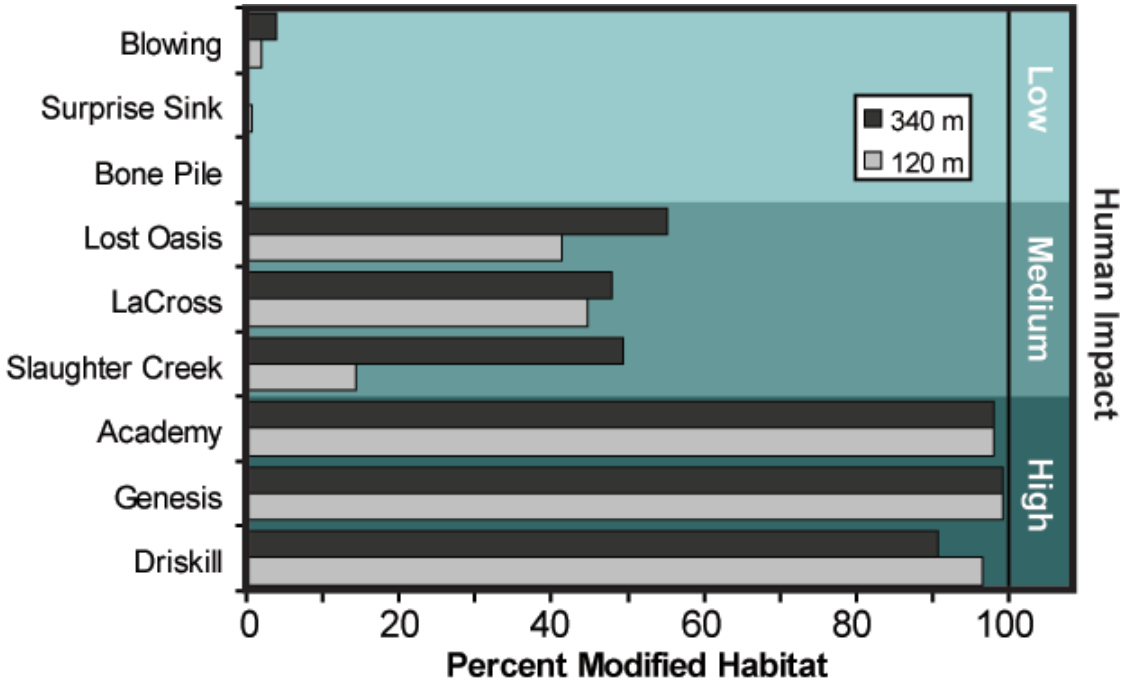

Figure 4. Percentage of modified at each of nine Texas caves, based on scoring aerial photographs.

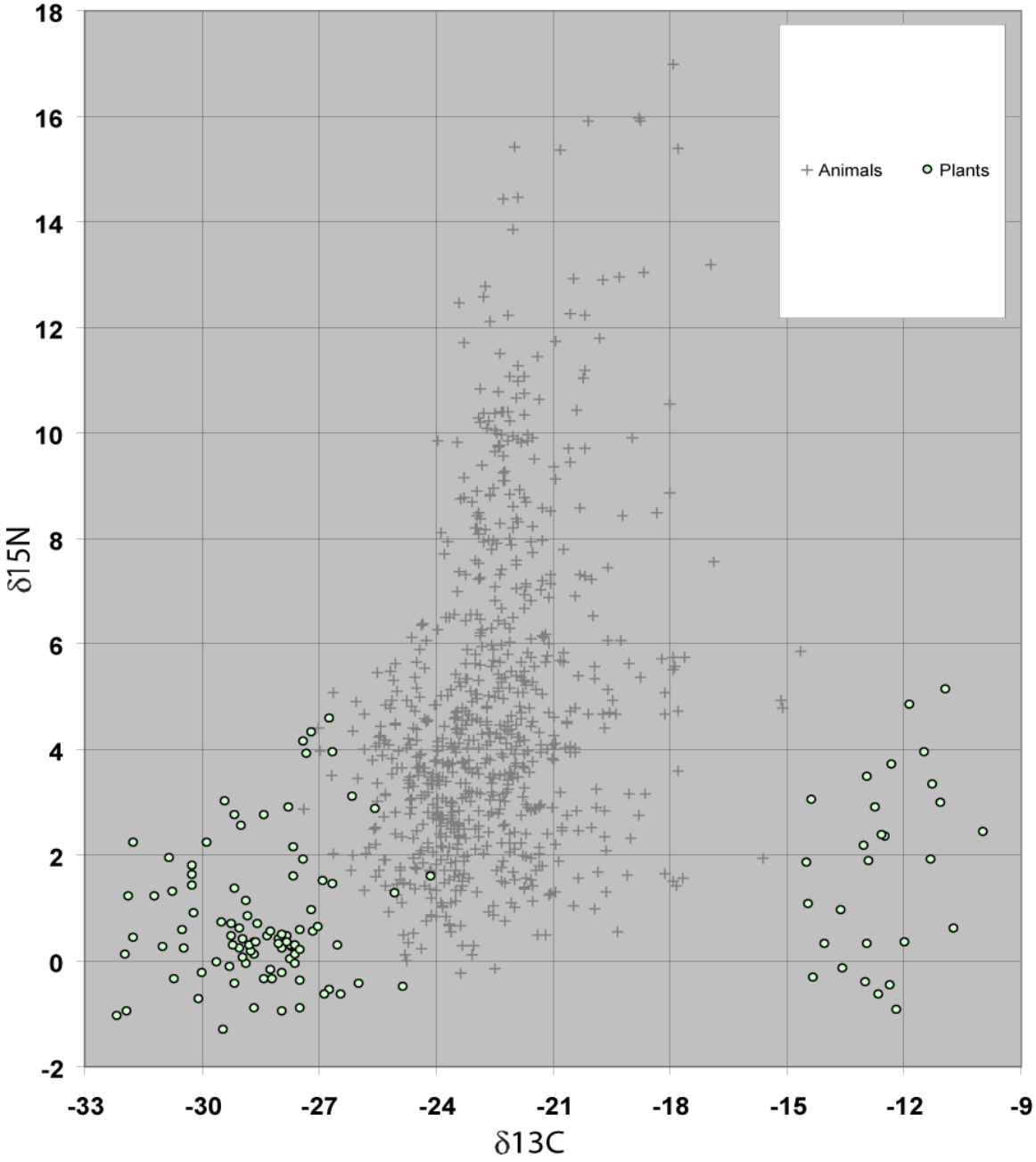

Figure 5. Carbon and Nitrogen isotope ratios for all samples from all sites. Gray crosses represent invertebrate samples. Plant samples (circles) are represented by C3 plants on the lower left, and C4 + CAM plants on the lower right.

When individual plant taxa are plotted (Figure 6), no obvious patter, beyond the photosynthetic pathway, is apparent, and therefore we pooled all plant taxa within photosynthetic pathways for the remaining analyses. Of the 35 visually dominant plant taxa recorded in this study (Table 2) the majority are native and non-invasive. None of the invasive or introduced taxa were recorded from the three sites with low levels of human impact (Bone Pile, Blowing Sink, and Surprise Sink caves) (Table 2). Taxa occurring dominantly at the greatest number of sites included Texas Persimmon (all 9 sites), Plateau Live Oak (7 sites), Algarita (6 sites), Ashe's Juniper (6 sites), Cedar Sedge (6 sites). Twenty of the plant taxa were considered visually dominant at only one site (Table 2).

Of the three *Ceuthophilus* (cave cricket) taxa (Figure 7), *Ceuthophilus* (*Geotettix*) *cunicularis* appears to generally be carnivorus, occurring higher up on the $\delta^{15}N$ than the other two taxa, *Ceuthophilus* (*Ceuthophilus*) *secretus* and *Ceuthophilus* (*Ceuthophilus*) species B. These latter two species appear to be primarily herbivorous, with few differences between the species. The range of values for *C*. (*C*.) species B falls within the range of values for *C*. (*C*.) *secretus*, but *C*. (*C*.) *secretus* has a slightly stronger affinity for C3 plants than *C*. (*C*.) species B. The range of trophic levels for *C*. (*G*.) *cunicularis* is rather broad, and it is unclear whether some of the more extreme data points represent erroneous data, or if, instead, this species feeds broadly across trophic levels, with prey ranging from primary producers to scavengers and predators. The common harvestman *Leiobunum townsendii* also appears to be primarily herbivorous, and occupies a narrow range of $\delta^{13}C$ valuesin an area generally to the left of the two *Ceuthophilus* taxa in the subgenus *Ceuthophilus* in the stable isotope plot (Figure 8), indicating they probably rely on a narrower range of food sources than do the two herbivorous *Ceuthophilus* species. Unidentified harvestmen appear to belong to *L. townsendii*. Overall, the two *Ceuthophilus* subgenera and *L. townsendii* tended to occupy differing trophic positions (Table 3), and *C. secretus* and *C*. species B feed at the same trophic level.

Spiders identified as *Cicurina* sp. are small pale or eyeless taxa, but occasionally include immature *Cicurina varians* specimens which were not identified to species level. Both *Cicurina* sp. and *Cicurina varians* are clearly top predators in the cave ecosystems

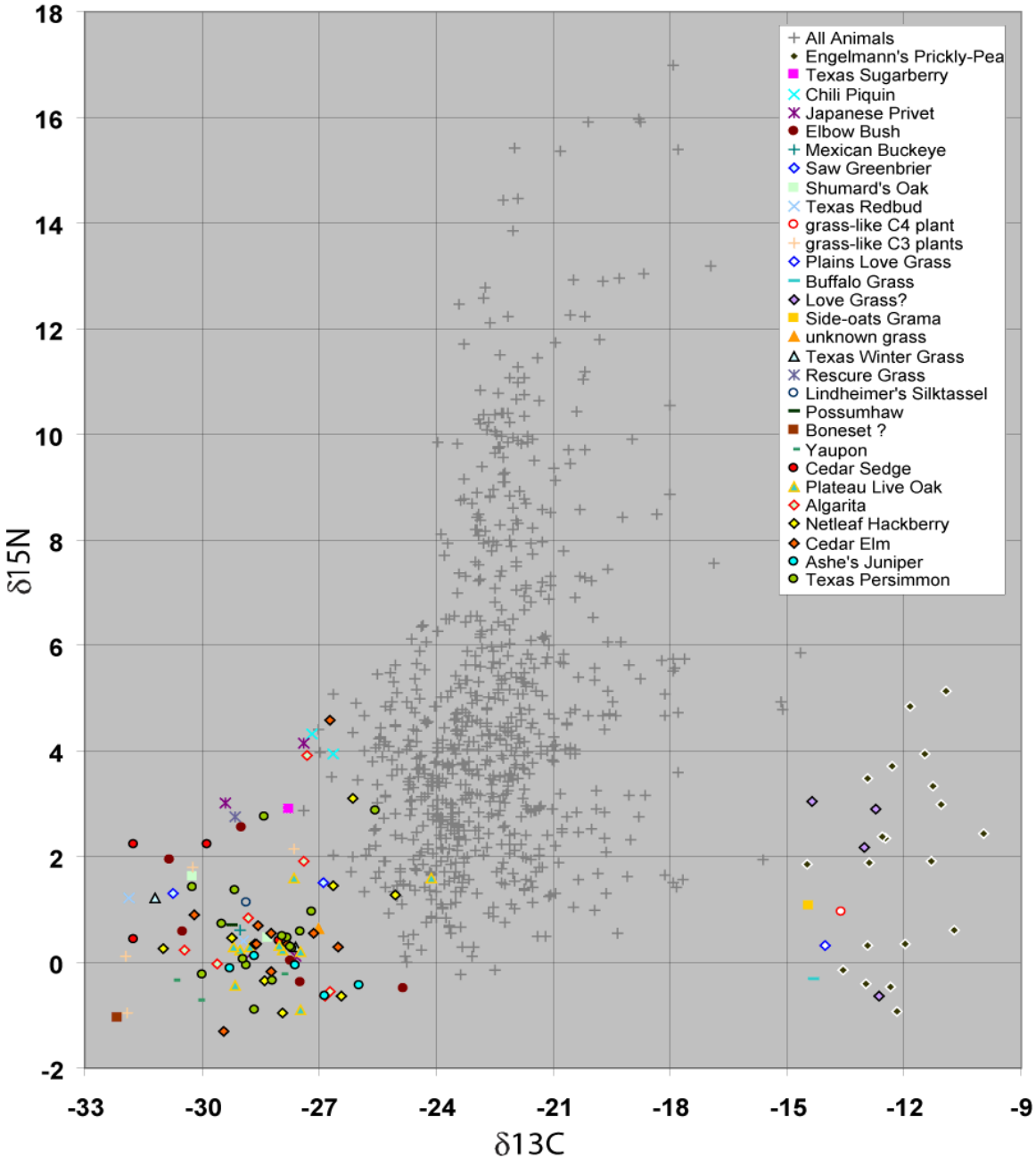

Figure 6. Carbon and Nitrogen isotope ratios for all samples from all sites, with individual plant taxa identified (see Table 2 for scientific names).

Table 2. Visually dominant plant taxa recorded from each site. Nativity and invasiveness based on Levin and Taylor (2007).

Family	Common Name	Scientific Name	Native	Invasive	Academy	Blowing	Bonepile	Drillskill	Genesis	LaCrosse	LostOasis	Slaughter	Surprise
Poaceae	Buffalo Grass	*Buchloe dactyloides* (Nutt.) Engelm.	Y	Y	.	.	.	.	.	.	+	.	.
Poaceae	Rescue Grass	*Bromus catharticus* Vahl	N	Y	+	.	.	.	.	.	.	.	.
Poaceae	Bermuda Grass	*Cynodon dactylon* (L.) Pers.	N	Y	+	.	.	.	.	.	.	.	.
Aquifoliaceae	Possumhaw	*Ilex decidua* Walter	Y	N	.	.	.	+	.	.	.	.	.
Aquifoliaceae	Yaupon	*Ilex vomitoria* Sol.	Y	N	.	+	.	.	.	.	.	+	.
Berberidaceae	Algarita	*Berberis trifoliolata* Moric.	Y	N	+	.	.	+	+	+	.	+	+
Boraginaceae	Anacua, Sugarberry	*Ehretia anacua* (Terán & Berl.) I.M. Johnston	Y	N	+	.	.	.	.	.	.	.	.
Cactaceae	Engelmann's Prickly-Pear	*Opuntia cf. phaecantha* Engelm.	Y	N	.	.	.	.	+	.	.	.	.
Cupressaceae	Ashe's juniper	*Juniperus ashei* J. Buchholz	Y	N	.	+	+	+	.	.	+	+	+
Cyperaceae	Cedar sedge	*Carex planostachys* Kuntze	Y	N	+	+	.	.	+	+	.	+	+
Ebenaceae	Texas Persimmon	*Diospyros texana* Scheele	Y	N	+	+	+	+	+	+	+	+	+
Fabaceae	Texas Redbud	*Cercis canadensis* L. var. *texensis* (S. Wats.) M. Hopkins	Y	N	.	.	+	.	.	.	.	.	.
Fagaceae	Plateau Live Oak	*Quercus fusiformis* Small	Y	N	.	.	.	+	+	+	+	+	+
Fagaceae	Shumard's Oak	*Quercus shumardii* Buckley	Y	N	.	.	+	.	.	.	.	.	.
Garryaceae	Lindheimer's Silktassel	*Garrya ovata* Benth. subsp. *lindheimeri* (Torr.) Dahling	Y	N	.	.	+	.	.	.	.	.	.
Moraceae	Texas Mulberry	*Morus microphylla* Buckley	Y	N	.	.	.	.	.	.	.	.	+
Oleaceae	Spring-Herald, Elbow-Bush, Stretchberry	*Forestiera pubescens* Nutt. var. *pubescens*	Y	N	.	+	.	+	.	.	.	.	+
Poaceae	Side-oats Grama	*Bouteloua curtipendula* (Michx.) Torr.	Y	N	.	.	.	+	.	.	.	.	.

(continued on following page)

Table 2. (concluded).

Family	Common Name	Scientific Name	Native	Invasive	Academy	Blowing	Bonepile	Drillskill	Genesis	LaCrosse	LostOasis	Slaughter	Surprise
Poaceae	Texas Grama	*Bouteloua rigidiseta* (Steud.) A.S. Hitchc.	Y	N	.	.	.	.	.	+	.	.	.
Poaceae	Virginia Wild Rye	*Elymus virginicus* L.	Y	N	.	.	.	.	.	.	+	.	.
Poaceae	Plains Love Grass	*Eragrostis intermedia* Hitchc.	Y	N	.	.	+	.	.	.	.	.	.
Poaceae	Texas Winter Grass	*Nassella leucotricha* (Trin. & Rupr.) Barkworth	Y	N	.	+	.	.	.	+	+	.	.
Poaceae	Needleleaf Rosette Grass	*Panicum cf. aciculare* Desv. ex Poir.	Y	N	.	.	.	+	.	.	.	.	.
Sapindaceae	Mexican-Buckeye	*Ungnadia speciosa* Endl.	Y	N	.	.	+	.	.	.	.	.	.
Smilacaceae	Saw Greenbrier	*Smilax bona-nox* L.	Y	N	.	.	+	.	.	+	+	.	.
Solanaceae	Chilitepin, Chile Piquin, Bird Pepper	*Capsicum annuum* L. var. *glabriusculum* (Dunal) Heiser & Pickersgill	Y	N	+	.	.	.	.	.	.	.	.
Ulmaceae	Netleaf Hackberry	*Celtis laevigata* Willd. var. *reticulata (*Torr.) L. Benson	Y	N	.	+	.	+	+	.	+	.	.
Ulmaceae	Texas Sugarberry	*Celtis laevigata* Willd. var. *texana* (Scheele) Sarg.	Y	N	+	.	.	.	.	+	.	.	.
Ulmaceae	Cedar Elm	*Ulmus crassifolia* Nutt.	Y	N	+	+	.	+	.	+	.	+	.
Oleaceae	Japanese Privet	*Ligustrum japonicum* Thunb.	N	N	+	.	.	+	.	.	.	.	.
Poaceae	King Ranch Bluestem	*Bothriochloa ischaemum* (L.) Keng var. *songarica* (Rupr. ex Fisch. & C.A. Mey.) Celarier & Harlan	N	N	.	.	.	.	.	.	.	+	.
Poaceae	King Ranch Bluestem	*cf. Bothriochloa ischaemum* (L.) Keng	N	N	.	.	.	.	+	.	.	.	.
Asteraceae?	Boneset?	*Eupatorium* ?	.	.	.	.	+	.	.	.	.	.	.
Poaceae	Love Grass?	*cf. Eragrostis*	.	.	.	.	.	+	+	+	.	.	+
Poaceae	Unknown grass	unidentified Poaceae	.	.	.	.	+	.	.	.	+	.	.

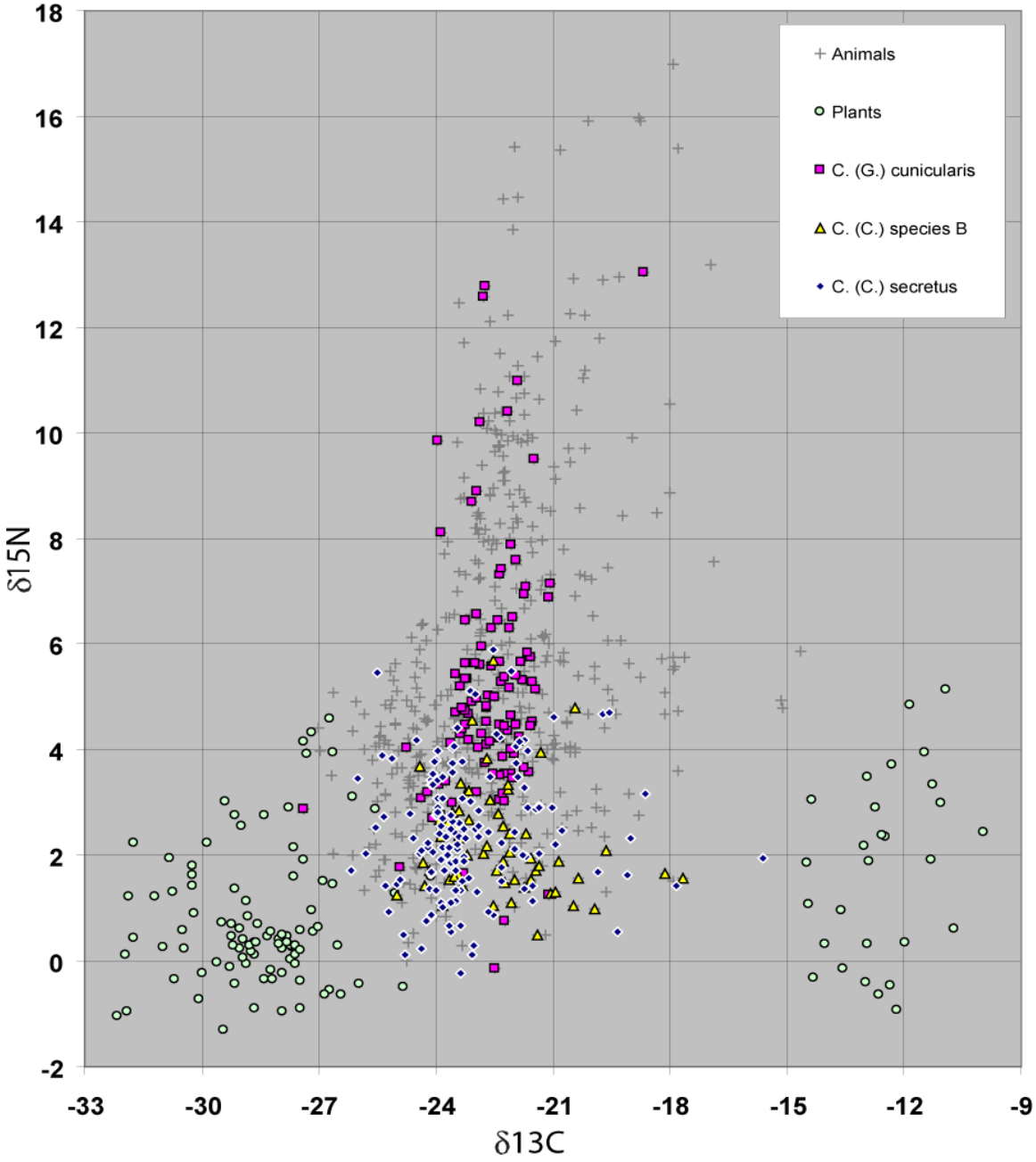

Figure 7. Carbon and Nitrogen isotope ratios for all samples from all sites, with *Ceuthophilus* taxa highlighted.

Table 3. Summary of statistical tests comparing trophic position ofcave crickets and harvestmen. Means with the same letter below them are not significantly different in *post hoc* multiple comparisons (Tukey's), *post hoc* test not given for non-significant overall tests. sig.=level of significance, ns=not significant, *=significant at α=0.05, **=significant at α =0.01, ***=significant at α =0.001.

Isotope Ratio	**Taxon (n, Mean±Standard Error)**							
	C. cunicularis	***C. secretus***	***C.* species B**	***L. townsendii***	**df**	**F**	**P**	**sig.**
$\delta^{13}C$	105, -22.61±0.0967 A	143, -23.11±0.134	62, -22.424±0.184 A	62, -24.799±0.094	3,368	45.12	<0.0001	***
$\delta^{15}N$	105, 5.20±0.229	143, 2.453±0.102 A	62, 2.264±0.127 A	63, 3.452±0.183	3,369	69.42	<0.0001	***

of central Texas caves, occurring higher on the $\delta^{15}N$ axis than any of the other taxa, feeding at a higher trophic level than *C*. (*C*.) *secretus* and *C*. (*C*.) species B, and most commonly occurring higher on the $\delta^{15}N$ axis than *C*. (*G*.) *cunicularis*. Several unidentified spiders and the scorpion *Pseudouroctonus reddelli* (a common troglophile) also have isotopic signatures typical of predators (Figure 8).

Two genera of millipeds commonly occur in central Texas caves, and these are often most abundant in association with *Ceuthophilus* spp. guano (Taylor et al. 2003). Specimens of the genus *Cambala*, most if not all of which belong to the species *Cambala speobia* (Chamberlin) (Figure 9), were common, and appear to be feeding at a trophic level that is consistent with a cave cricket guanophile (Figure 10). The other common milliped, *Speodesmus*, falls out somewhat to the right of the *Cambala* on the $\delta^{13}C$ axis, suggesting more of an association with C4 or CAM plant pathways. The trophic position of these two milliped taxa also is consistent with feeding on the guano of *L. townsendii* (Figure 8).

Two terrestrial isopod taxa were encountered in the caves, the facultatively troglophilic *Porcellio* sp. isopods, which apparently function as high-level predators in the caves (Figure 11), at a level similar to *Cicurina* spp. The more cave-adapted *Brackenridgia* sp. isopods, also function at a fairly high tropic level (Figure 11), somewhat higher, on average, than *C*. (*G*.) *cunicularis*. *C*. (*G*.) *cunicularis* and *Brackenridgia* sp. likely feed by scavenging, hunting, and as guanophiles in association with the guano deposits of the surface-foraging *Ceuthophilus* species. Unidentified isopods are attributable to *Brackenridgia* sp., based on their trophic position.

Among the remaining taxa analyzed for carbon and nitrogen isotopes, the red imported fire ant, *S. invicta*, stands out in two ways (Figure 12). First, it appears generally to be feeding at a level typical of carnivores, scavengers and omnivores, and certainly functioning at a higher trophic level than the crickets *C*. (*C*.) *secretus* and *C*. (*C*.) species B (Figure 7). Second, *S. invicta* is rather broadly distributed on the $\delta^{13}C$ axis, suggesting a stronger association with the C4 and CAM photosynthetic pathways than is typical of the members of the cave community. These data suggest that RIFA is not competing with surface foraging *Ceuthophilus* species for plant materials (because

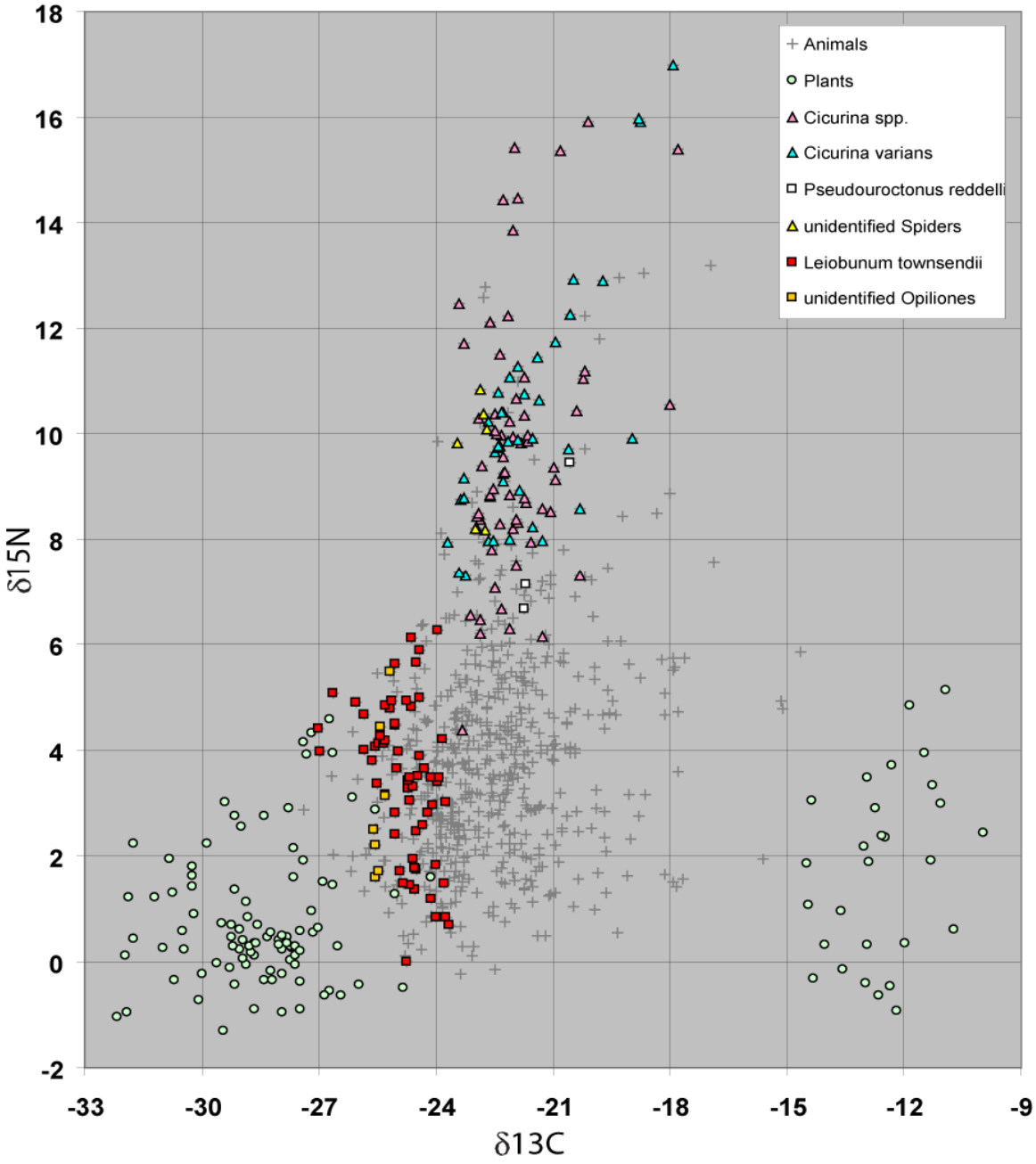

Figure 8. Carbon and Nitrogen isotope ratios for all samples from all sites, with arachnid taxa highlighted.

Figure 9. *Cambala speobia* (Chamberlin) on fecal pellets of *Ceuthophilus* spp. in Surprise Sink, Bexar County, Texas. A small springtail, *Pseudosinella violenta*, can be seen to the right of the center of the image. Photo by Jean K. Krejca.

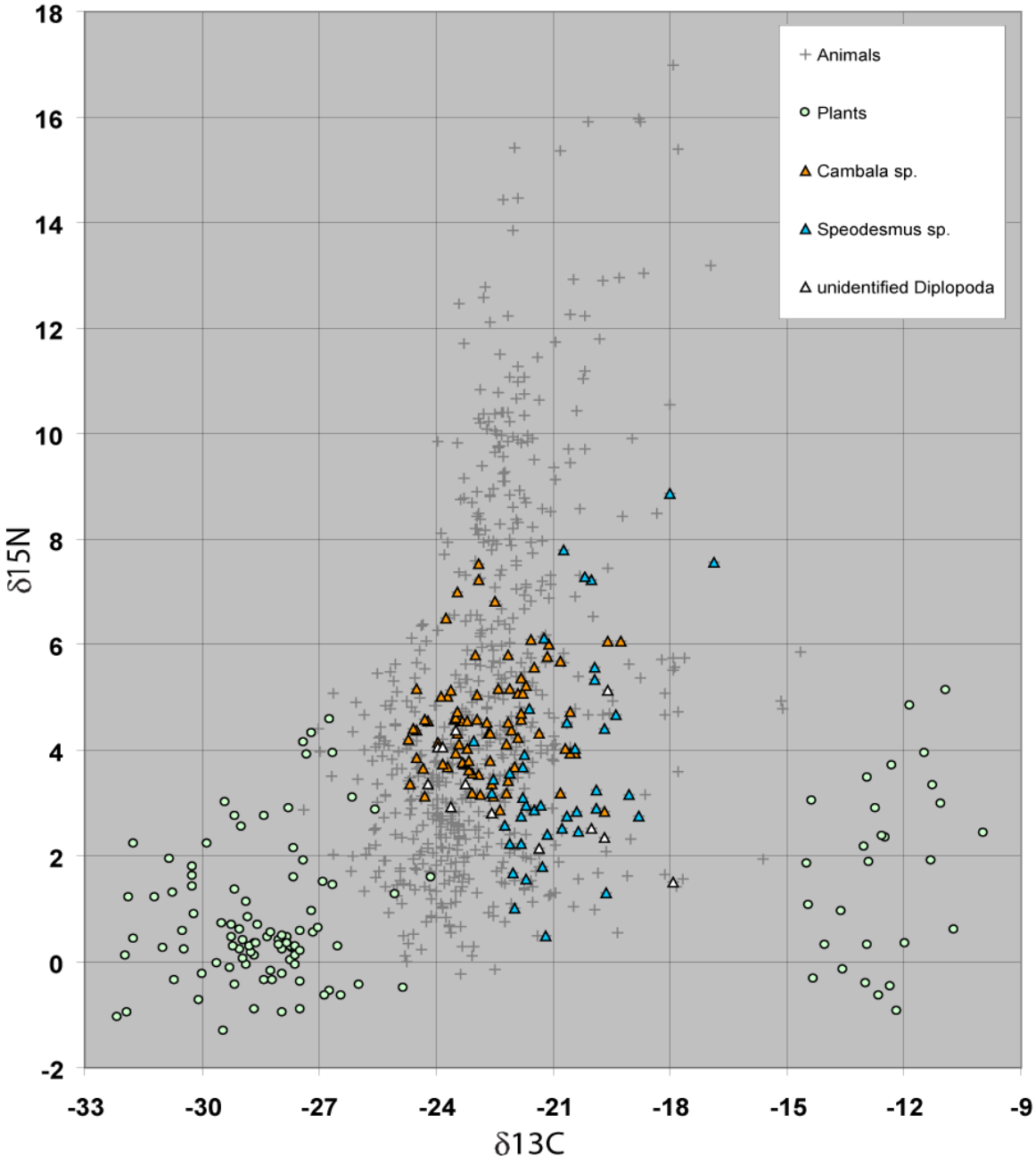

Figure 10. Carbon and Nitrogen isotope ratios for all samples from all sites, with milliped taxa highlighted.

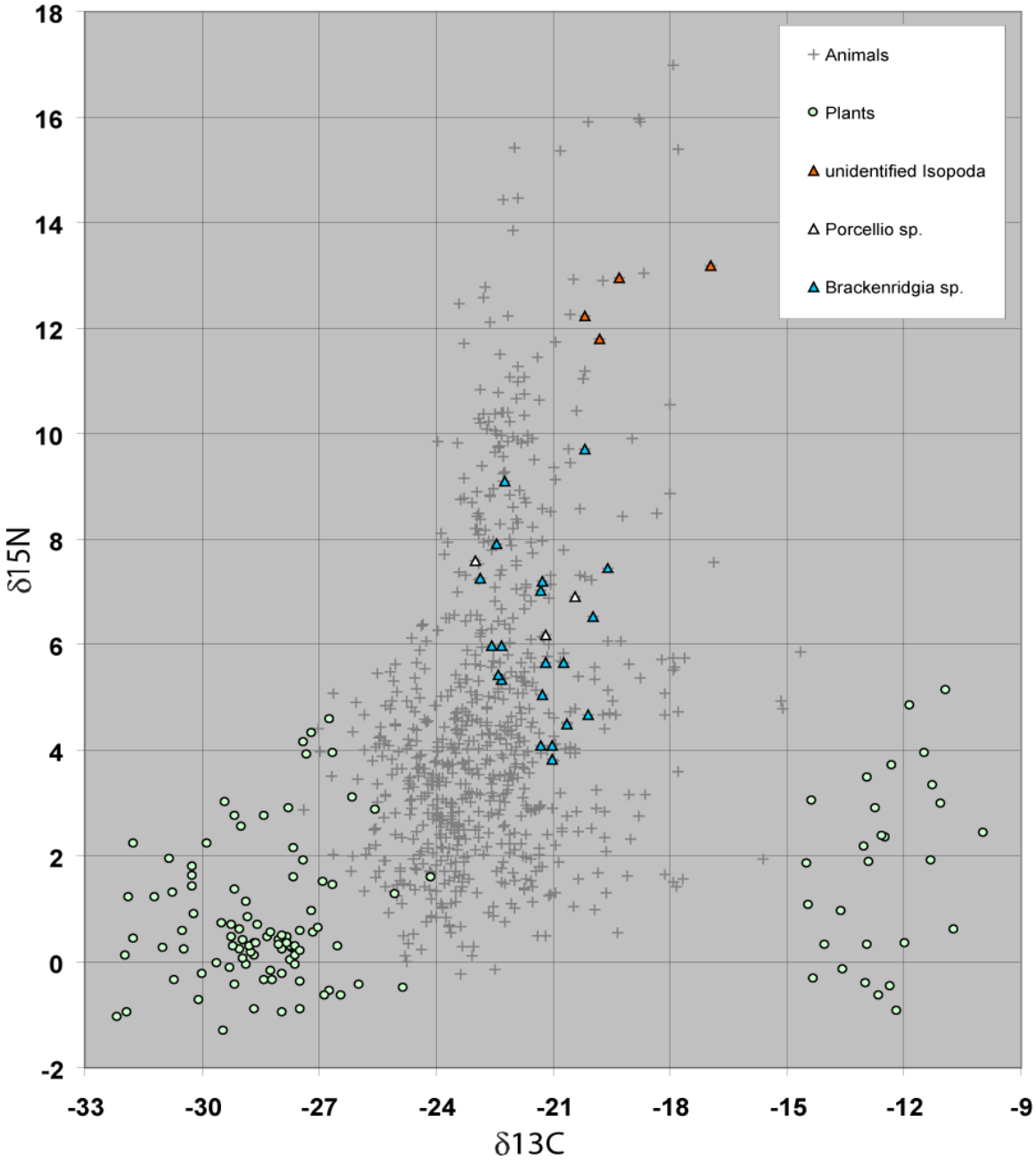

Figure 11. Carbon and Nitrogen isotope ratios for all samples from all sites, with isopod taxa highlighted.

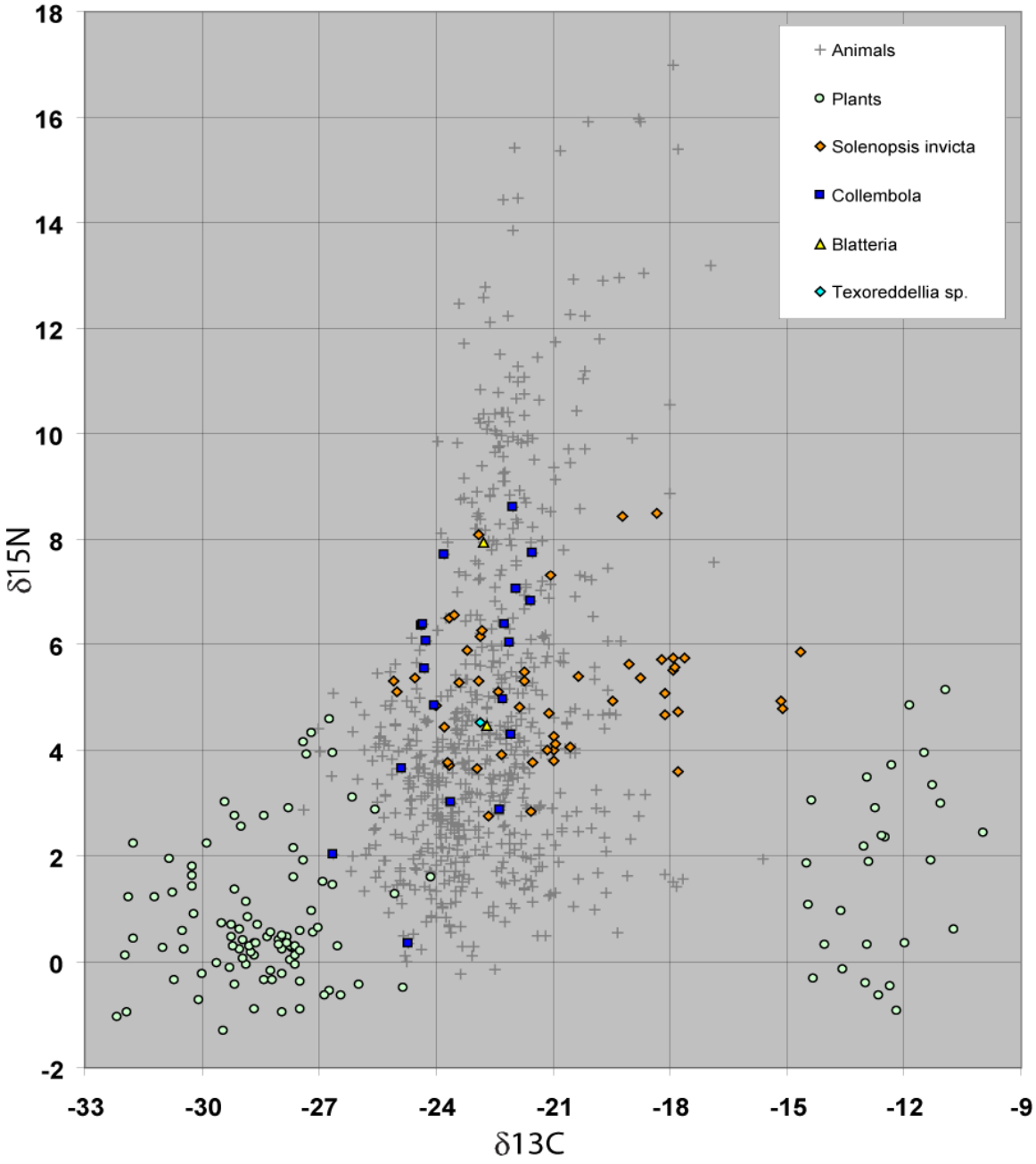

Figure 12. Carbon and Nitrogen isotope ratios for all samples from all sites, with fire ants, springtails, cockroaches, and bristletail highlighted.

the crickets are feeding at a lower trophic level), although we know that it does compete with *C*. (*C*.) *secretus* at bait stations (Taylor et al. 2003, Helf 2005), prey upon cavernicoles, and feed on *C*. (*C*.) *secretus* (e.g., Taylor et al. 2003 [see cover photo of that report]).

The springtails recorded in this study mostly belong to the species *Pseudosinella violenta* (Figure 13). Due to their small size, we commonly had trouble with isotopic analysis of springtails, and we believe the distribution of sample values includes much more error than for most other samples. Many of the springtails came out somewhat high on the $\delta^{15}N$ axis than expected (Figure 12), and this may be the result of problems in the detection of the isotopes in samples with very little mass. These animals are freaquently found in association with cricket guano, and association with guano might cause them to plot relatively high on the $\delta^{15}N$ axis – guano of many animals contains considerable quantieis of N, much of this being present as ammonia, which would have a tendency to evaporate (though perhaps not so readily in the cave environment), increasing the $\delta^{15}N$ of the remaining material. Vertebrate manure ranges from about +8 to +25 ‰ (Clark and Fritz 1997, Kendall 1998), but we are not aware of similar studies for herbivorous arthropod guano. Finally, if some of the guano on which the collembolan are feeding is bat guano, we might expect still higher $\delta^{15}N$ values, as bats are insectivorous. For bats in particular, Graening and Brown (2001) found guano isotopic values ranging from +9 to +14.2 ‰. Similarly, if there is guano from other animals in the caves (*Peromyscus*, etc.) we might expect individual isotopic signatures of springtail samples to be somewhat variable due to the varied sources.

Ignoring the less common taxa and focusing just on the numerically more abundant taxa, a general sense of the trophic structure can be obtained by evaluating mean values for $\delta^{13}C$ and $\delta^{15}N$ with standard deviations providing a sense of variability (Figure 14). This view (Figure 14) allows us to estimate the distance between trophic levels on a per mil (‰) basis. The generally accepted distance between trophic levels is about 3.4 ‰ on the $\delta^{15}N$ axis (Michener and Schell 1994, Wada *et al*. 1991). However, it appears (Figure 14) that C. secretus and C. species B are only about 1.50 to 1.68 ‰ above the mean value of C3 plants on the $\delta^{15}N$ axis. This problematic

Figure 13. *Pseudosinella violenta* in association with Ceuthophilus guano and fungi on the guano in Surprise Sink, Bexar County, Texas. Photo by Jean K. Krejca.

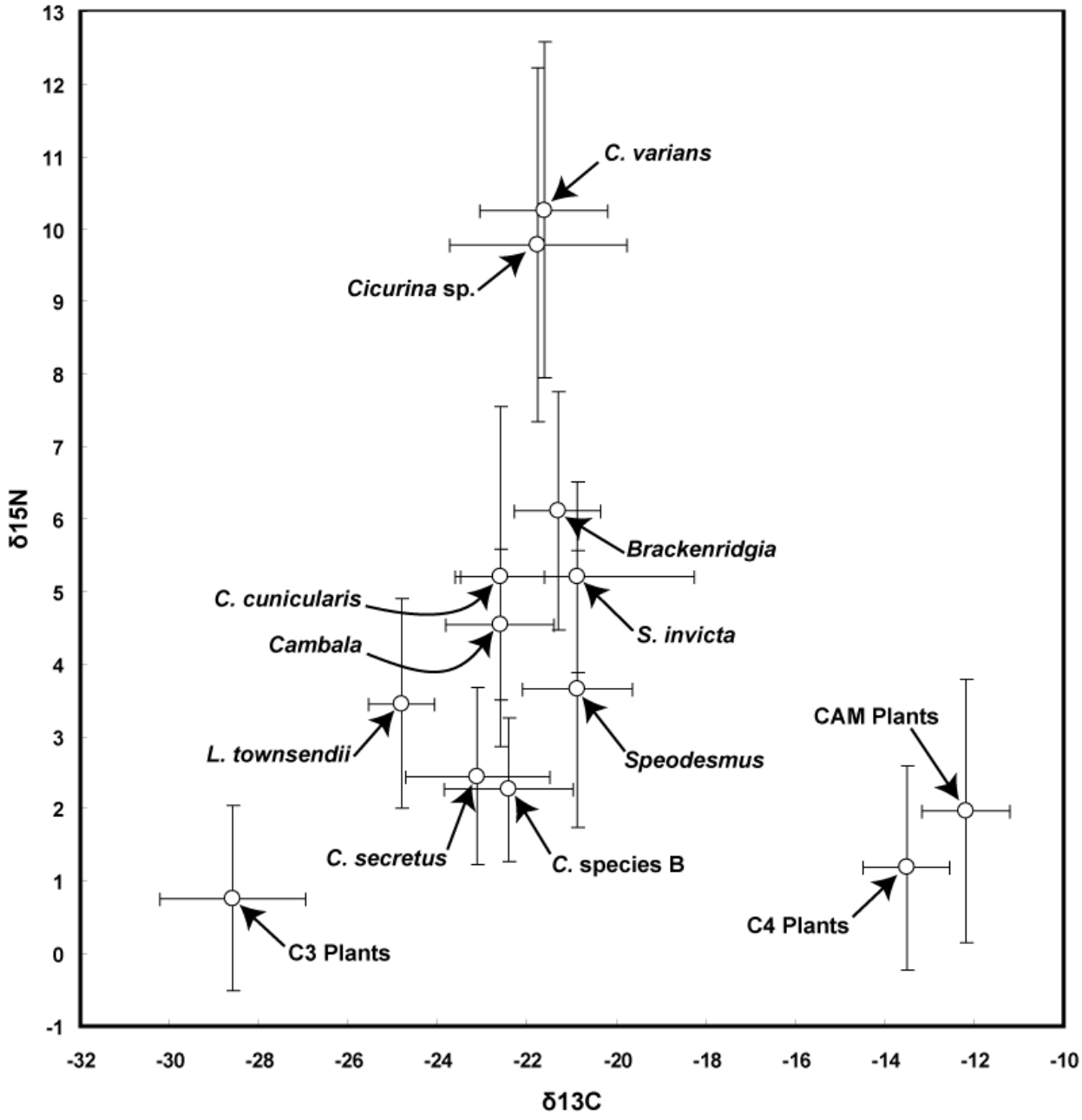

Figure 14. General summary of trophic structure of plants and cave macroinvertebrates in small central Texas caves. Points are mean values, error bars are standard deviations. Less frequently encountered taxa are omitted for clarity.

situation may be accounted for in part by the capacity for C. secretus to store food in their crop. We did not dissect out the digestive tract of the animals before drying and grinding the specimens – this could account for part of the discrepancy. In addition, it is possible that some of the C3 plant samples were not cleaned sufficiently (to remove phytophygous insects) which could result in their position moving up on the on the $\delta^{15}N$ axis, bringing them closer to the two cricket taxa. The distance between the more predatory *C. cunicularis* and the herbivorous *Ceuthophilus* taxa is only about 2.75 ‰ on the $\delta^{15}N$ axis (Figure 14), perhaps suggesting that *C. cunicularis* takes in a mix of plant and animal material. As can be clearly seen in Figure 5, assigning taxa to specific trophic levels is merely a convenience for understanding the trophic structure of the community – in fact, there is a continuum of trophic levels among individual animals. The failure to meet the expected ~3.4 ‰ stepwise enrichment by trophic level is not necessarily, however, indicative of a problem in the dataset or sample pricessing – Scrimgeour *et al*. (1995) and Scheu (2002) suggested that these values are not so clearly applicable to invertebrates, and the presence of mycoflora (e.g., Benoit *et al*. 2004, Stephenson *et al*. 2007) or microbial nitrogen fixation (Nardi *et al*. 2002) could explain much of the deviation from the classic 3.4 ‰ differentiation among trophic levels. See also discussion above under springtails.

We coded isotope samples by level of human impact (low, medium, high) to assess possible differences in isotopic composition based on level of impact (Figure 15). Somewhat surprisingly, the samples from low, medium, and high impact sites had significantly different values of $\delta^{15}N$, with low impact sites having lower values for $\delta^{15}N$ for animals in general (Table 4). The lowest animal $\delta^{15}N$ values (*Ceuthophilus* spp., and *L. townsendii*) occured at the low impact sites. Additionally, the top predators at the low impact sites had lower maximum $\delta^{15}N$ values than did those at the medium and high impact sites (Figure 15). In addition, animal samples, collectively, differed in $\delta^{13}C$ values between the three levels of impact (Table 4), with all pairwise comparisons between impact levels differing. Mean values for $\delta^{13}C$ were lowest (closest to the C3 plants) in the low impact samples, and highest (closer to the C4 and CAM plants) at the high impact sites. It is possible that soil conditions at the individual sites just happened

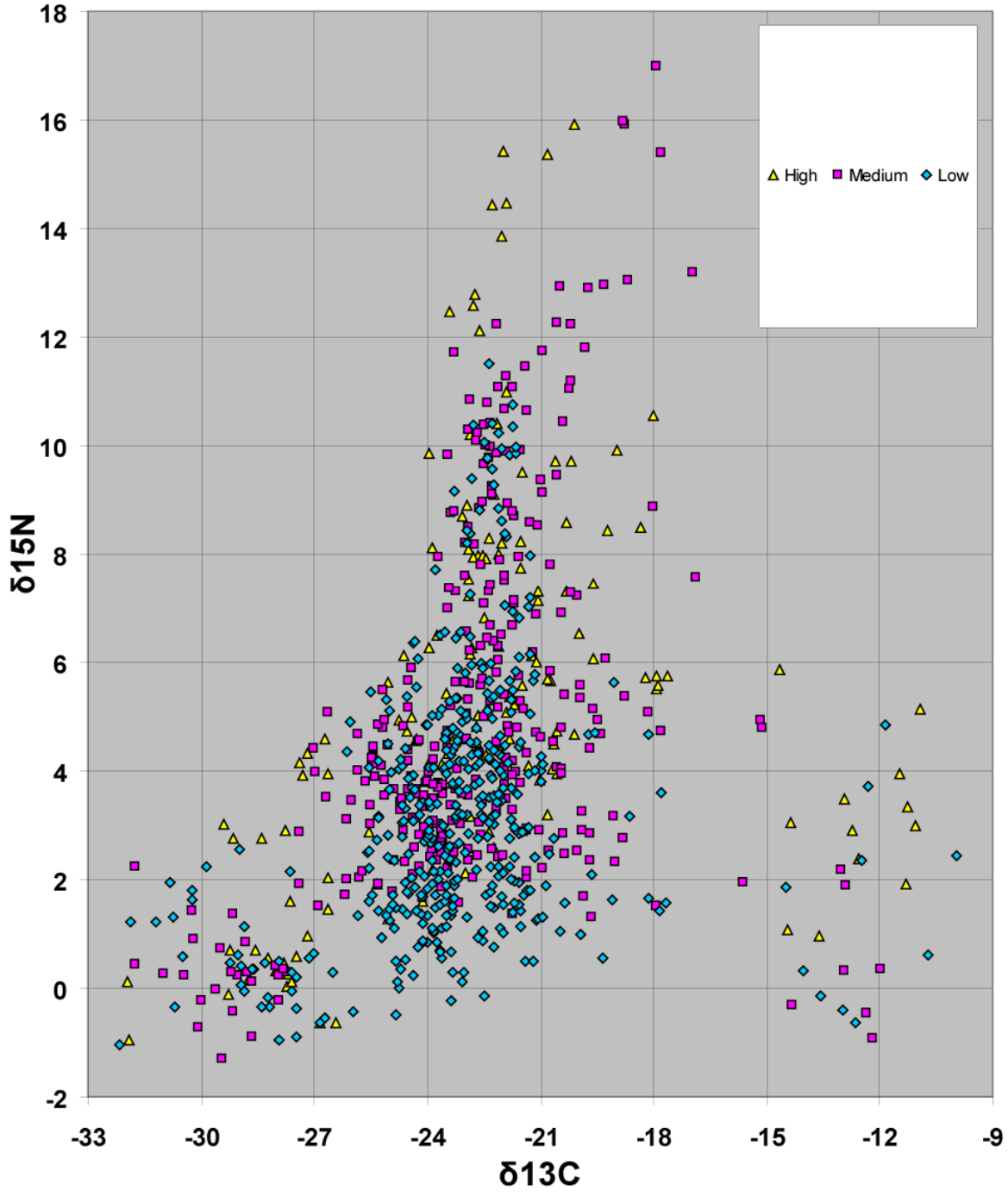

Figure 15. Carbon and Nitrogen isotope ratios for all samples from all sites, coded by level of human impact.

Table 4. Summary of statistical tests (one-way ANOVA) comparing samples from low, medium and high impact sites. Only taxa, or groups of taxa, with sufficient sample size for statistical analysis are shown. Means with the same letter below them are not significantly different in *post hoc* multiple comparisons (Tukey's), *post hoc* test not given for non-significant overall tests. sig.=level of significance, ns=not significant, *=significant at α=0.05, **=significant at α =0.01, ***=significant at α =0.001.

Sample Type	Isotope Ratio	Level of Impact (n, Mean±Standard Error) Low	Medium	High	df	F	P	sig.
All Animals	$\delta^{13}C$	368, -22.89±0.085	310, -22.48±0.119	112, -21.86±0.172	2,787	14.20	<0.0001	***
	$\delta^{15}N$	364, 3.62±0.122	290, 5.43±0.183	103, 6.88±0.310	2,754	69.84	<0.0001	***
All Plants	$\delta^{13}C$	59, -25.08±0.810	55, -25.30±0.988	53, -23.79±0.951	2,164	0.72	0.4883	ns
	$\delta^{15}N$	48, 0.65±0.179 A	34, 0.48±0.171 A	41, 1.82±0.257	2,120	12.15	<0.0001	***
C3 Plants	$\delta^{13}C$	46, -28.61±0.237 A	42, -29.27±0.228 B	39, -27.81±0.242 A B	2,124	9.13	0.0002	***
	$\delta^{15}N$	38, 0.43±0.151 A	27, 0.49±0.186 A	30, 1.46±0.300	2,92	7.09	0.0014	**
C. cunicularis	$\delta^{13}C$	62, -22.68±0.099	26, -22.42±0.285	17, -22.66±0.198	2,102	0.63	0.5334	ns
C. cunicularis	$\delta^{15}N$	62, 4.04±0.157	26, 6.02±0.388	17, 8.18±0.688	2,102	40.03	<0.0001	***

(continued on following page)

Table 4. Continued.

Sample Type	Isotope Ratio	Level of Impact (n, Mean±Standard Error) Low	Medium	High	df	F	P	sig.
C. secretus	$\delta^{13}C$	83, -23.18±0.166	58, -23.00±0.231	2, -22.87±0.439	2,140	0.23	0.7932	ns
C. secretus	$\delta^{15}N$	83, 2.09±0.146 A	58, 2.92±0.107 A	2, 4.03±0.257	2,140	10.78	<0.0001	***
Cambala	$\delta^{13}C$	31, -23.05±0.169 A	24, -22.67±0.288 A B	28, -22.06±0.217 B	2,80	5.35	0.006	**
Cambala	$\delta^{15}N$	29, 4.19±0.152 A	24, 4.48±0.190 A B	28, 5.01±0.244 B	2,75	4.53	0.0139	*
Cicurina sp.	$\delta^{13}C$	25, -21.77±0.593	33, -21.82±0.190	13, -21.57±0.395	2,68	0.08	0.9262	ns
Cicurina sp.	$\delta^{15}N$	22, 8.87±0.359 A	30, 9.41±0.353 A	12, 12.36±0.891	2,61	11.46	<0.0001	***
C. varians	$\delta^{13}C$	5, -22.22±0.343	25, -21.62±0.306	7, -21.24±0.512	2,34	0.68	0.5140	ns
C. varians	$\delta^{15}N$	5, 9.48±0.454	25, 10.88±0.508	7, 8.63±0.317	2,34	3.25	0.0511	ns

(continued on following page)

Table 4. Continued.

Sample Type	Isotope Ratio	Level of Impact (n, Mean±Standard Error) Low	Medium	High	df	F	P	sig.
L. townsendii	$\delta^{13}C$	27, -24.67±0.108	30, -24.96±0.163	5, -24.55±0.186	2,59	1.42	0.2503	ns
L. townsendii	$\delta^{15}N$	28, 2.46±0.255	30, 4.02±0.149	5, 5.58±0.281	2,60	25.83	<0.0001	***
S. invicta	$\delta^{13}C$	23, -22.08, 0.411 A	15, -20.26, 0.736 A B	13, -19.46±0.708 B	2,48	5.62	0.0064	**
S. invicta	$\delta^{15}N$	23, 4.69, 0.217 A	15, 4.65, 0.150 A	13, 6.72, 0.344	2,48	20.63	<0.0001	***
Speodesmus	$\delta^{13}C$	19, -21.75±0.122 A	25, -20.14±0.236 B	2, -21.74±0.501 A B	2,43	16.41	<0.0001	***
Speodesmus	$\delta^{15}N$	19, 2.51±0.212 A	22, 4.57±0.436 A	2, 4.35±1.768	2,40	8.11	0.0011	**

to differ in a manner that would yield these results, but it is more likely that some other factor is responsible for the observed differences. Unfortunately the study design, which serves well for looking at differences among impact levels, does not allow us to assess variability in isotopic values among sites within a level of impact.

While these effects are not so visually apparent in plant samples in Figure 15, we did find statistically significant differences between the three impact levels for plants (all taxa pooled) for $\delta^{15}N$ (Table 4), with *post hoc* multiple comparisons showing no difference between low and medium impact levels, but significant differences between all other pairwise comparisons. However, similar effect was not found for $\delta^{13}C$ values of plants in general (Table 4). The observed differences in plant $\delta^{15}N$ levels, which seem to trickle up the trophic levels for various taxa for which we has sufficient sample size to make comparisons among the three levels of impact (Table 4), could be attributable to differences in vegetative community structure – but this would also be a measure of human impact (that is, most of the remaining vegetation in the high impact sites is comprised of cultivated plants, mowed grass, etc.). These data, then, collectively suggest there are very real differences among the sites, and probably among the levels of impact, in the flow of nutrients through the cave ecosystems.

Cave Fauna Census

Cave fauna census data (Table 5) were collected as a part of the field work, although the timing did not always coincide with the seasonal sampling for isotopes (Table 6). Cave crickets (Ceuthophilus spp.) were by far the most abundant taxa, especially in low human impact caves, where as many as 2,900 individuals of *C*. (*C*.) *secretus* were counted in a single visit to Surprise Sink in August 2006 (Figure 16). High numbers of this species were also recorded during exit counts at medium and low human impact caves (Table 7). Few *C*. (*C*.) species B and no *C*. (*G*.) *cunicularis* were recorded exiting the caves during these counts.

In perhaps the most remarkable finding of this study, we found that not only were numbers of individuals of *Ceuthophilus* spp. fairly well correlated with the level of human impact, but that the total numbers of individuals of other taxa recorded from the caves

Table 5. Summary of timed census data for nine central Texas caves over four seasons.

Common Name	Scientific Name	Adaptation	Academy	Blowing Sink	Bonepile	Driskill	Genesis	LaCrosse	Lost Oasis	Slaughter Creek	Surprise Sink
cave cricket	*Ceuthophilus secretus*	TX	0	137	2122	2	2	39	284	483	3220
cave cricket	*Ceuthophilus cunicularis*	TB?	9	36	161	3	3	26	24	13	212
cave cricket	*Ceuthophilus sp. B*	TX	0	0	76	0	1	20	0	2	171
harvestman	*Leiobunum townsendii*	fTX	0	1080	552	0	0	62	94	415	453
harvestman	*Texella reyesi*	TB	0	0	0	0	0	0	0	0	0
harvestman	*Chinquipellobunus madlae*	TB	0	0	0	0	2	0	0	0	7
ground beetle	*Rhadine exilis*	TB	0	0	2	0	0	0	0	0	1
ground beetle	*Rhadine howdeni*	TP	0	0	0	0	0	0	0	0	2
ground beetle	*Rhadine infernalis*	TB	0	0	2	0	0	0	0	0	2
ground beetle	*Rhadine noctivaga*	TB	0	0	0	0	0	0	0	0	1
ground beetle	*Rhadine persphone*	TB	0	0	3	0	0	0	0	0	0
ground beetle	*Rhadine subterranea*	TB?	0	0	0	0	0	0	0	0	0
ground beetle	carabid		0	0	0	1	0	1	0	0	5
ground beetle	*Tachys* sp.		0	0	0	0	0	0	0	0	0
rove beetles	Staphylinidae		1	0	64	1	3	4	0	2	8
mold beetles	*Batrisodes* sp.	TB/TP	0	0	1	0	0	0	1	0	0
beetle	Passalidae		1	0	0	0	0	0	0	0	0
beetle	Coleoptera		1	1	1	1	0	1	0	0	0
springtails	Collembola		279	120	515	49	17	128	154	48	556
dipluran	Campodeidae		2	1	0	1	0	0	0	0	29
silverfish	*Texoreddellia* sp.	TB	0	0	4	0	0	0	1	1	11
Bristletails	Microcoryphia		0	0	0	0	0	0	1	0	5
red imported fire ant	*Solenopsis invicta*		0	1	0	0	0	0	6	1	107
ant	*Myrmecodesmus*		0	0	0	0	0	0	0	0	0
ant	unidentified Formicidae		0	4	11	0	0	0	0	0	0
wasp	unidentified Hymenoptera		0	0	0	0	0	0	0	0	1
milliped	*Cambala*	TB	0	0	171	11	18	0	275	4	174
milliped	*Speodesmus*	TB	4	0	436	1	0	0	37	17	1
hothouse milliped	*Orthomorpha gracilis*		10	0	15	0	0	0	0	0	0
milliped	*Spirobola* sp.		0	0	2	0	0	0	0	0	1
brown milliped	Diplopoda		0	1	0	0	0	2	0	0	0
centipede	Scutigeridae		0	1	0	0	0	0	0	0	0

centipede	Lithobiomorph		1	1	0	2	0	0	0	1	1
centipede	Geophilomorph		0	0	0	0	0	0	0	0	0
spider	*Cicurina varians*	TP	6	9	12	2	7	38	22	26	35
spider	*Cicurina* sp. small, white	TB	0	11	6	1	2	6	7	5	15
spider	*Eidmannella* sp.	TB/TP	0	1	6	0	0	0	0	1	0
small spiders	unidentified Araneae		5	9	0	13	8	22	12	8	18
spider	surface Araneae		0	0	0	0	8	14	0	0	0
wolf spider	Lycosidae		0	1	0	0	0	0	0	0	0
jumping spider	Salticidae	AC	0	1	0	0	0	0	0	0	0
scorpion	*Pseudouroctunus reddelli*	TP	2	0	0	0	1	40	24	12	23
scorpion	*Centruroides*		0	0	1	0	1	0	0	0	3
mites	Acarina		0	1	10	3	0	0	0	0	354
snails	*Helicodiscus*	TP?	13	0	2	0	6	7	5	3	3
webworms	Mycetophilidae		0	1	0	0	0	0	0	1	5
mosquito	Culicidae		0	0	200	2	0	0	0	11	2
gnats	Diptera		0	25	1	6	0	4	1	3	13
flies	Diptera		0	0	6	0	0	1	0	5	0
cockroaches	Blatteria		4	1	1	1	0	0	2	0	0
earthworm	Annelida: Oligochaeta		4	0	0	0	1	0	0	0	0
surface isopod	Armadellid or Porcelionid		0	7	0	33	3	67	29	5	2
triconiscid isopod	*Brackenridgia cavernarum*	TB	13	0	11	1	2	0	0	0	4
Moth	Lepidoptera		1	1	261	0	0	6	2	12	6
book or bark louse	Psocoptera		6	0	2	0	3	7	25	0	0
leafhopper	Cicadellidae		0	0	0	0	0	0	0	0	0
assasin bug	Reduviidae: *Triatoma*		0	0	2	0	0	16	0	0	0
salamander	*Eurycea*	TB/TP	0	0	0	0	0	0	0	0	1
salamander	*Plethodon albagula*	TP	12	0	0	0	0	0	0	5	1
gulf coast toad	*Bufo valliceps*		0	0	0	0	1	0	0	0	0
cliff frog	*Syrrhophus marnocki*	TP	5	1	0	11	2	2	1	1	5
black tailed rattlesnake	*Crotalus molossus*		0	0	1	0	0	0	0	0	0
eastern pipistrelle	*Pipistrellus subflavus*	TX	1	0	0	0	0	0	0	0	0
		Total	**383**	**1452**	**4660**	**145**	**91**	**513**	**1007**	**1085**	**5458**

Table 6. Summary of seasonal activities carried out as part of this project. General invertebrate census was not carried out in August of 2005, except for in-cave cricket census carried out at three caves. Isotope sampling was teminated after the May 2006 samling period. Cricket exit counts were only carried out at select caves, and only once.

ISOTOPE SAMPLES	Aug 05	Nov 05	Feb 06	May 06	Aug 06
Academy Cave	x	x	x	x	
Blowing Sink	x	x	x	x	
Bone Pile	x	x	x	x	
Driskill	x	x	x	x	
Genesis	x	x	x	x	
LaCross	x	x	x	x	
Lost Oasis	x	x	x	x	
Slaughter Creek	x	x	x	x	
Surprise Sink	x	x	x	x	

INVERT COUNTS	Aug 05	Nov 05	Feb 06	May 06	Aug 06
Academy Cave		x	x	x	x
Blowing Sink	Crickets only	x	x	x	x
Bone Pile		x	x	x	x
Driskill	Crickets only	x	x	x	x
Genesis		Data Lost	x	x	x
LaCrosse		x	x	x	x
Lost Oasis		x	x	x	x
Slaughter Creek	Crickets only	x	x	x	x
Surprise Sink		x	x	x	x

CRICKET EXIT COUNTS	Aug 05	Nov 05	Feb 06	May 06	Aug 06
Academy Cave					
Blowing Sink	x				
Bone Pile	x				
Driskill					
Genesis	x				
LaCrosse				x	
Lost Oasis	x				
Slaughter Creek	x				
Surprise Sink					

Figure 16. *Ceuthophilus* (*Ceuthophilus*) sp. roosting on ceiling of Surprise Sink, Bexar County, Texas. Photo by Jean K. Krejca and Steve Taylor.

Table 7. Cricket exit counts at selected central Texas caves.

Cave	Level of Human Impact	Date	*C. secretus* adults	*C. secretus* large nymphs	*C. secretus* medium & small nymphs	*C.* species B	*C. cunicularis*
Genesis	High	23-Aug-05	0	4	2	0	0
Academy	High						
Driskill	High						
LaCrosse	Medium	24-May-06	48	17	5	0	0
Lost Oasis	Medium	17-Aug-05	357	4	11	4	0
Slaughter Creek	Medium	31-Aug-05	390	0	30	0	0
Blowing Sink	Low	31-Aug-05	35	0	0	0	0
Bone Pile	Low	23-Aug-05	2275	23	4	0	0
Surprise Sink	Low						

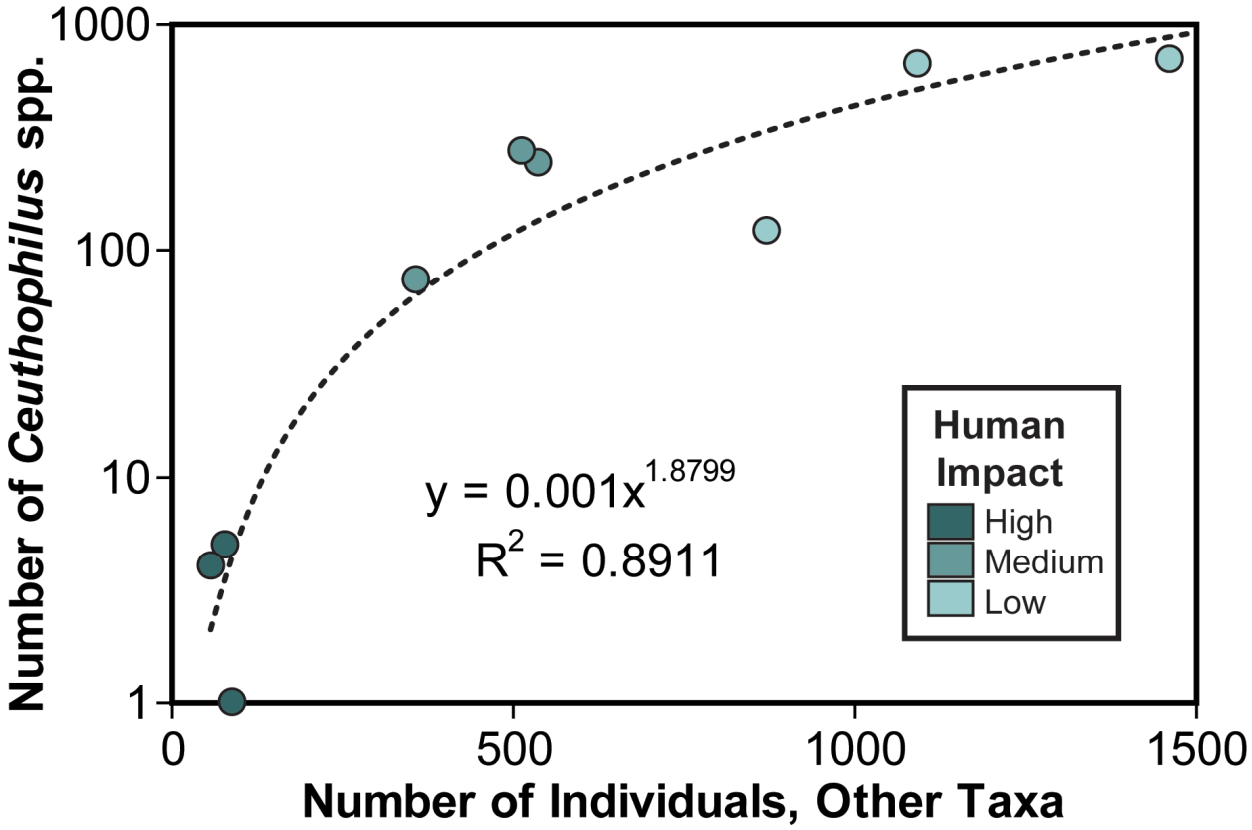

Figure 17. Correlation between number of cave crickets and number of other animals recorded from each of nine central Texas caves, with level of human impact indicated.

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were strongly correlated with the total number of cave crickets (Figure 17). While the finding that 89% of the variation in numbers of other animals was explained by variation in number of *Ceuthophilus* spp. is rather remarkable[5], it is consistent with what we see in the isotope plots (Figures 7, 8, 10, 11, 12), wherein there is a strong link between utilization of vegetation as a food source by surface-foraging *C.* (*C.*) *secretus* and *C.* (*C.*) species B.

[5] This is especially surprising because there is so much individual variation among caves – in their morphology, size, shape, exposure, slope, etc., that even though such a trend might be expected, the noise from other confounding factors might be expected to result in a somewhat weaker correlation.

Looking more closely at these same data in relation to the two measures of human impact (modified/natural and impervious/permeable), we see strong correlations for both cave cricket and other cave inhabitants with percentage of impervious cover (Figure 18) and the percentage of modified habitat (Figure 19) for both the 11.2 acre and 90 acre sampling areas. Impervious cover explained 89 (crickets) to 91 (other organisms) percent of the variation in numbers of individuals when scored for an 11.2 acre impact sampling area, and still had very strong explanatory value in the 90 acre sample area, at 85 and 97 percent of the variation in numbers explained for crickets and other organisms, respetively. The same pattern holds for percentage of modified habitat, with variations in percentage of modified habitat explaining from 75 to 96 percent of the variation in numbers of individuals, and the same loglinear trend seen at both sample area sizes. These data indicate that at preserve sizes greater than 11.2 acres (centered on the cave entrance), the cave ecosystem is still sensitive to changes in cover type. That is, our data suggest that a preserve size of 11.2 acres is not sufficient to maintain a fully functioning cave ecosystem in central Texas.

While it is intuitive that more modified habitat and impervious cover around a cave decreases the habitat quality and therefore negatively impacts the populations of cavernicoles, this is the first study to quantify those variables and show strong correlations for central Texas cave ecosytems. The slopes shown in Figures 17-19 are a start towards finding the tipping point at which urbanization degrades the cave community. Other researchers have attempted to examine impact of urbanization above caves by monitoring rare and endangered predator populations (Sprouse *et al*. 2007), but these animals have long life spans, and the time lag between habitat degradation and population decline distorts the view of what is happening to the ecosystem. The impact levels examined here provide a realistic pictures of how urbanization happens around caves, and can help land managers determine their comfort level for development within 120 and 340 meters of occupied caves, and the subsequent risks posed to the endangered species.

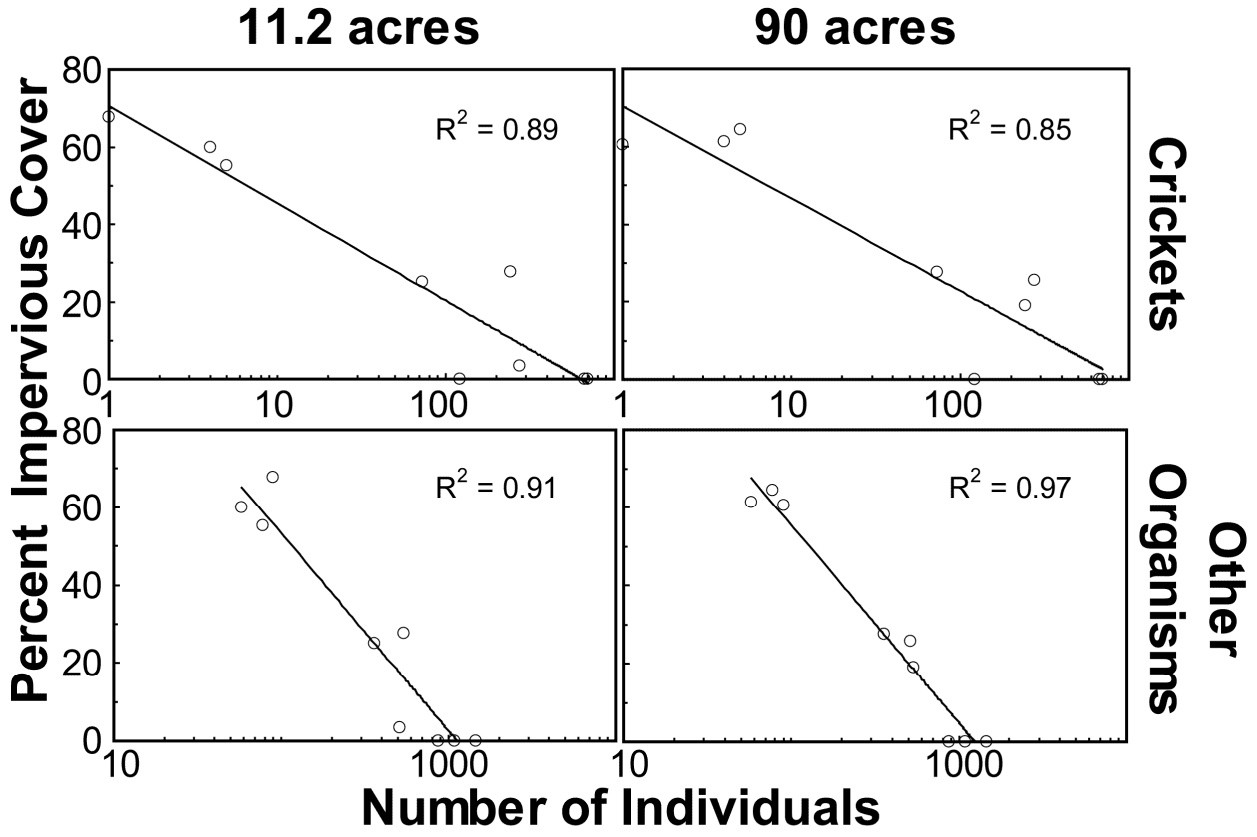

Figure 18. Percentage impervious cover (from ground-truthed aerial photography) in relation to total number of individuals (log_{10} scale) for cave crickets and other cave inhabitants at nine central Texas caves.

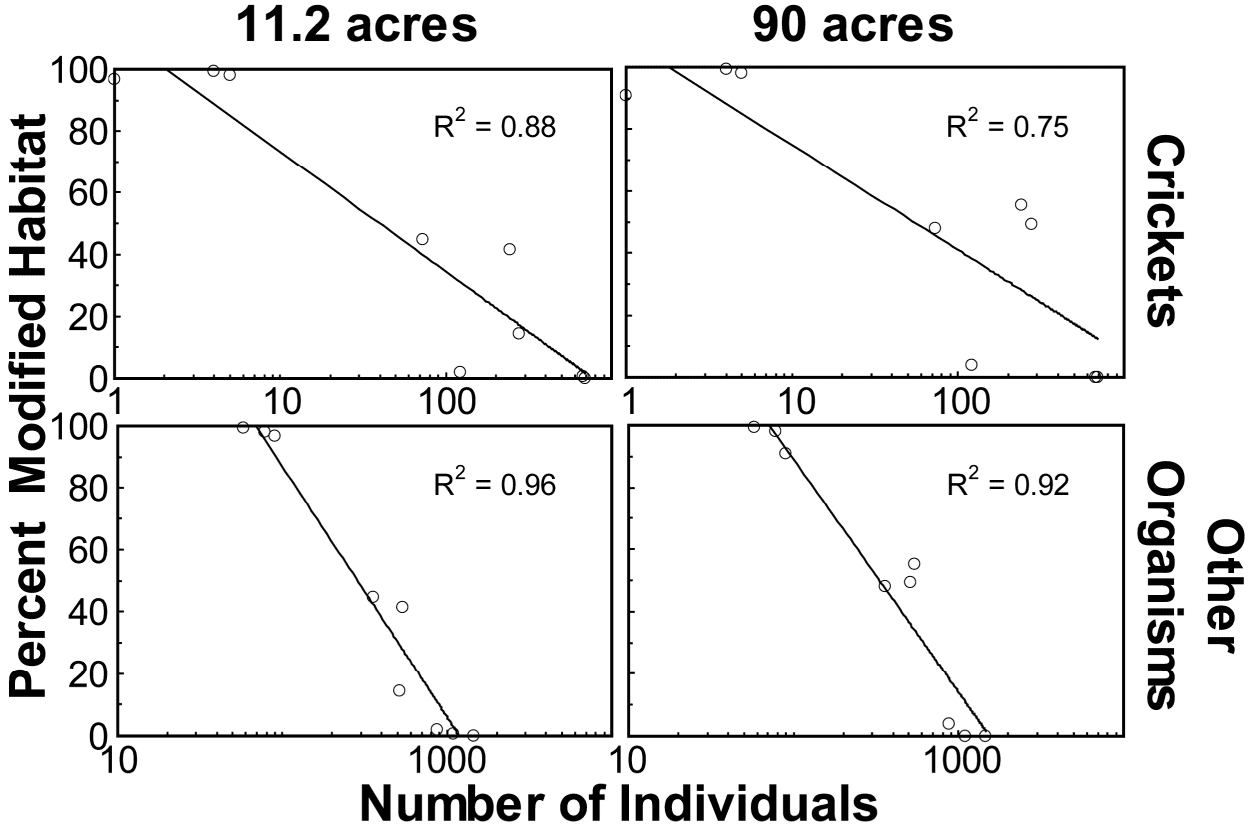

Figure 19. Percentage modified habitat (from ground-truthed aerial photography) in relation to total number of individuals (log_{10} scale) for cave crickets and other cave inhabitants at nine central Texas caves.

Conclusions & Recommendations

Both of the factors examined in this study, trophic position and population levels, were found to vary with level of impact around caves. Even at impact levels defined as 'medium' - places where the entrances themselves are in undisturbed woodlots varying from the size of several house lots to tens of acres in size but urbanization is nearby – there are noticeable differences in cavernicole population levels. For land managers faced with high land values in urbanizing areas, it is increasingly important to know the minimum size for a preserve, and to understand what characteristics are needed for a site to be considered suitable. Our results demonstrate that even though small areas within urban zones may support a cave community where troglobites are occasionally seen (e.g., Genesis Cave, Driskill Cave), these populations are significantly lower than expected when compared to more natural settings, and the trophic position of the high human impact cave ecosystem is altered. In short, when cricket (or, equivalently, cavernicole) numbers are low, this reflects elevated levels of human disturbance, and probably a reduction in food input (natural litter input, cricket guano) does not bode well for the endangered karst invertebrates. To clarify where that cutoff is between an unimpacted ecosystem and an impacted one, further study is needed, perhaps replicating portions of this study on a much larger scale, with a variety of caves across the entire range of levels of human impact. As we have demonstrated a strong correlation between the isotope results and the cave census results, considerable savings could be afforde by focusing primarily on in-cave census along with classification of levels of impact.

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Appendix A. Scoring of levels of human impact at nine caves based on overlay of points on aerial photographs.

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**Lost Oasis 120m**
7	4	0	1	0	0	2	0	0	0	0	
9	5	0	1	0	0	1	0	1	1	0	
11	1	0	3	0	0	4	3	0	0	0	
13	2	1	4	0	0	4	2	0	0	0	
13	3	3	4	0	0	3	0	0	0	0	
14	3	2	5	0	0	3	1	0	0	0	
14	4	3	4	0	0	3	0	0	0	0	
14	4	3	5	0	0	1	1	0	0	0	
13	3	1	6	0	0	3	0	0	0	0	
13	7	1	4	0	0	1	0	0	0	0	
11	7	0	3	0	0	1	0	0	0	0	
10	5	1	1	0	0	1	0	2	0	0	
7	0	4	0	1	0	1	0	1	0	0	
3	0	0	0	0	0	1	0	2	0	0	
Total											
152	48	19	41	1	0	29	7	6	1		
	31.6	12.5	27.0	0.7	0.0	19.1	4.6	3.9	0.7	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**Lost Oasis 340m**
7	2	4	0	0	0	0	1	0	0	0	
9	2	5	1	0	0	1	0	0	0	0	
11	3	1	1	2	0	2	1	1	0	0	
13	2	4	3	0	0	0	0	4	0	0	
13	2	4	3	0	0	1	0	3	0	0	
14	2	1	5	0	0	3	1	2	0	0	
14	6	4	2	0	0	2	0	0	0	0	
14	6	2	4	1	0	0	0	1	0	0	
13	2	4	4	3	0	0	0	0	0	0	
13	3	4	3	3	0	0	0	0	0	0	
11	3	3	2	1	0	0	0	2	0	0	
10	3	5	1	0	0	1	0	0	0	0	
7	2	1	1	1	0	0	0	2	0	0	
3	0	2	0	0	0	1	0	0	0	0	
Total											
152	38	44	30	11	0	11	3	15	0		
	25.0	28.9	19.7	7.2	0.0	7.2	2.0	9.9	0.0	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**Academy 120 m**
7	0	3	0	2	0	1	1	0	0	0	
9	0	4	0	0	0	1	1	3	0	0	
11	0	1	0	1	0	3	3	3	0	0	
13	0	3	0	1	0	4	1	4	0	0	
13	0	2	0	1	0	6	1	2	1	0	
14	0	1	0	2	1	5	2	2	1	0	
14	0	1	1	1	0	3	1	5	2	0	
14	0	3	1	1	0	4	2	3	0	0	
13	0	4	1	1	0	4	1	2	0	0	
13	0	3	0	6	0	1	1	2	0	0	
11	0	2	0	7	0	1	0	1	0	0	
10	0	0	0	8	0	2	0	0	0	0	
7	0	1	0	0	0	4	0	2	0	0	
3	0	1	0	0	0	2	0	0	0	0	
Total											
152	0	29	3	31	1	41	14	29	4		
	0.0	19.1	2.0	20.4	0.7	27.0	9.2	19.1	2.6	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**Academy 340 m**
7	0	0	0	0	1	6	0	0	0	0	
9	0	1	1	0	0	4	1	2	0	0	
11	0	1	0	0	0	2	1	7	0	0	
13	0	4	0	1	0	2	4	2	0	0	
13	0	5	0	2	0	2	2	2	0	0	
14	0	3	0	1	0	4	2	4	0	0	
14	0	2	1	1	0	6	1	3	0	0	
14	0	4	0	1	0	5	0	4	0	0	
13	0	1	0	4	0	4	0	4	0	0	
13	0	0	0	4	0	5	0	4	0	0	
11	0	3	1	1	0	3	0	3	0	0	
10	0	3	0	5	0	1	0	1	0	0	
7	0	1	0	1	0	5	0	0	0	0	
3	0	1	0	0	0	2	0	0	0	0	
Total											
152	0	29	3	21	1	51	11	36	0		
	0.0	19.1	2.0	13.8	0.7	33.6	7.2	23.7	0.0	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**LaCross 120m**
7	1	1	1	0	0	3	0	1	0	0	
9	1	1	3	0	0	3	0	1	0	0	
11	3	3	2	0	0	1	1	1	0	0	
13	2	1	4	1	0	3	1	1	0	0	
13	4	2	4	0	0	1	0	2	0	0	
14	2	4	6	0	0	0	0	1	1	0	
14	3	0	6	1	0	1	0	3	0	0	
14	4	1	5	1	0	2	0	1	0	0	
13	4	3	2	2	0	1	0	1	0	0	
13	5	3	2	1	0	1	0	1	0	0	
11	3	1	3	1	0	2	0	1	0	0	
10	3	0	4	0	0	3	0	0	0	0	
7	3	1	2	0	0	1	0	0	0	0	
3	2	0	0	0	1	0	0	0	0	0	
Total											
152	40	21	44	7	1	22	2	14	1		
	26.3	13.8	28.9	4.6	0.7	14.5	1.3	9.2	0.7	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**LaCross 340m**
7	1	2	1	1	0	0	0	2	0	0	
9	2	0	0	2	0	4	0	1	0	0	
11	0	4	0	1	0	3	0	3	0	0	
13	1	3	3	1	0	3	0	2	0	0	
13	1	3	4	1	0	4	0	0	0	0	
14	5	1	2	0	0	2	0	4	0	0	
14	2	3	4	0	0	0	0	5	0	0	
14	5	4	1	0	0	2	0	2	0	0	
13	6	2	2	0	1	0	0	2	0	0	
13	8	0	5	0	0	0	0	0	0	0	
11	3	0	6	0	1	1	0	0	0	0	
10	5	0	5	0	0	0	0	0	0	0	
7	3	0	2	0	0	2	0	0	0	0	
3	0	1	2	0	0	0	0	0	0	0	
Total											
152	42	23	37	6	2	21	0	21	0		
	27.6	15.1	24.3	3.9	1.3	13.8	0.0	13.8	0.0	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**SlaughterCrk 120 m**
7	3	0	4	0	0	0	0	0	0	0	
9	6	0	3	0	0	0	0	0	0	0	
11	3	0	8	0	0	0	0	0	0	0	
13	6	0	7	0	0	0	0	0	0	0	
13	2	0	11	0	0	0	0	0	0	0	
14	3	0	11	0	0	0	0	0	0	0	
14	5	0	9	0	0	0	0	0	0	0	
14	5	0	9	0	0	0	0	0	0	0	
13	4	0	9	0	0	0	0	0	0	0	
13	8	0	5	0	0	0	0	0	0	0	
11	3	2	6	0	0	0	0	0	0	0	
10	0	7	0	2	0	0	0	1	0	0	
7	0	2	0	1	0	0	0	4	0	0	
3	0	3	0	0	0	0	0	0	0	0	
Total											
152	48	14	82	3	0	0	0	5	0		
	31.6	9.2	53.9	2.0	0.0	0.0	0.0	3.3	0.0	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**SlaughterCrk 340 m**
7	6	0	0	0	0	0	0	0	1	0	
9	1	0	7	0	0	0	0	0	1	0	
11	3	1	7	0	0	0	0	0	0	0	
13	4	1	5	0	0	2	0	0	1	0	
13	4	0	8	0	0	0	1	0	0	0	
14	3	0	9	0	0	2	0	0	0	0	
14	4	4	5	1	0	0	0	0	0	0	
14	3	0	3	0	0	6	0	2	0	0	
13	0	6	2	1	0	3	0	1	0	0	
13	0	3	0	1	0	4	4	1	0	0	
11	0	1	2	1	0	2	0	5	0	0	
10	0	3	0	2	0	0	1	4	0	0	
7	0	5	0	1	0	1	0	0	0	0	
3	0	2	1	0	0	0	0	0	0	0	
Total											
152	28	26	49	7	0	20	6	13	3		
	18.4	17.1	32.2	4.6	0.0	13.2	3.9	8.6	2.0	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**Driskill 120 m**
7	0	3	0	0	0	1	0	0	3	0	
9	0	3	0	0	0	6	0	0	0	0	
11	0	4	0	0	0	7	0	0	0	0	
13	0	1	0	0	0	12	0	0	0	0	
13	0	0	0	0	0	13	0	0	0	0	
14	0	0	0	0	0	14	0	0	0	0	
14	0	6	4	0	0	3	0	0	1	0	
14	0	7	1	0	0	5	0	0	1	0	
13	0	1	0	0	0	12	0	0	0	0	
13	0	5	0	0	0	8	0	0	0	0	
11	0	3	0	1	0	7	0	0	0	0	
10	0	3	0	1	0	6	0	0	0	0	
7	0	0	0	0	0	7	0	0	0	0	
3	0	1	0	0	0	2	0	0	0	0	
Total											
152	0	37	5	2	0	103	0	0	5		
	0.0	24.3	3.3	1.3	0.0	67.8	0.0	0.0	3.3	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails		**Driskill 340 m**
7	0	2	5	0	0	0	0	0	0	0	
9	0	3	6	0	0	0	0	0	0	0	
11	0	3	2	1	0	3	1	1	0	0	
13	0	5	0	2	1	2	0	3	0	0	
13	0	2	0	2	1	3	1	3	1	0	
14	0	4	0	0	0	10	0	0	0	0	
14	0	4	1	0	0	9	0	0	0	0	
14	0	4	0	0	0	10	0	0	0	0	
13	0	5	0	0	0	8	0	0	0	0	
13	0	2	0	0	0	9	0	2	0	0	
11	0	1	0	0	0	8	0	2	0	0	
10	0	2	0	1	0	6	0	1	0	0	
7	0	0	0	0	0	7	0	0	0	0	
3	0	0	0	0	0	3	0	0	0	0	
Total											
152	0	37	14	6	2	78	2	12	1		
	0.0	24.3	9.2	3.9	1.3	51.3	1.3	7.9	0.7	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**Genesis 120 m**
7	0	1	0	1	0	1	0	4	0	0	
9	0	1	0	2	0	4	0	2	0	0	
11	0	2	0	1	0	5	0	3	0	0	
13	0	2	0	3	0	7	1	0	0	0	
13	0	1	0	1	0	10	1	0	0	0	
14	0	4	0	2	0	7	1	0	0	0	
14	0	6	0	2	0	4	0	0	2	0	
14	0	6	1	1	0	4	0	0	2	0	
13	0	4	0	1	0	5	0	0	3	0	
13	0	3	0	1	0	4	3	0	2	0	
11	0	0	0	0	0	4	0	3	4	0	
10	0	0	0	0	0	7	0	1	2	0	
7	0	0	0	0	0	5	0	2	0	0	
3	0	0	0	0	0	3	0	0	0	0	
Total											
152	0	30	1	15	0	70	6	15	15		
	0.0	19.7	0.7	9.9	0.0	46.1	3.9	9.9	9.9	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**Genesis 340 m**
7	0	0	0	3	0	4	0	0	0	0	
9	0	0	0	1	0	4	0	4	0	0	
11	0	0	0	2	0	6	0	3	0	0	
13	0	2	0	3	0	6	0	2	0	0	
13	0	3	0	1	0	3	1	5	0	0	
14	0	4	0	1	0	7	1	1	0	0	
14	0	3	0	2	0	8	0	1	0	0	
14	0	3	0	3	0	2	1	3	2	0	
13	0	3	0	0	1	2	2	4	1	0	
13	0	3	0	0	0	2	1	3	4	0	
11	0	4	0	0	0	2	1	3	1	0	
10	1	2	0	0	0	6	0	1	0	0	
7	0	2	0	2	0	3	0	0	0	0	
3	0	0	0	2	0	0	0	1	0	0	
Total											
152	1	29	0	20	1	55	7	31	8		
	0.7	19.1	0.0	13.2	0.7	36.2	4.6	20.4	5.3	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**BonePile120m**
7	2	0	5	0	0	0	0	0	0	0	
9	4	0	5	0	0	0	0	0	0	0	
11	3	0	8	0	0	0	0	0	0	0	
13	1	0	12	0	0	0	0	0	0	0	
13	1	0	12	0	0	0	0	0	0	0	
14	5	0	9	0	0	0	0	0	0	0	
14	8	0	6	0	0	0	0	0	0	0	
14	4	0	10	0	0	0	0	0	0	0	
13	0	0	13	0	0	0	0	0	0	0	
13	0	0	13	0	0	0	0	0	0	0	
11	0	0	11	0	0	0	0	0	0	0	
10	0	0	10	0	0	0	0	0	0	0	
7	0	0	7	0	0	0	0	0	0	0	
3	0	0	3	0	0	0	0	0	0	0	
Total											
152	28	0	124	0	0	0	0	0	0		
	18.4	0.0	81.6	0.0	0.0	0.0	0.0	0.0	0.0	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**BonePile340m**
7	4	0	3	0	0	0	0	0	0	0	
9	2	0	7	0	0	0	0	0	0	0	
11	2	0	9	0	0	0	0	0	0	0	
13	1	0	12	0	0	0	0	0	0	0	
13	4	0	9	0	0	0	0	0	0	0	
14	2	0	12	0	0	0	0	0	0	0	
14	2	0	12	0	0	0	0	0	0	0	
14	1	0	13	0	0	0	0	0	0	0	
13	0	0	13	0	0	0	0	0	0	0	
13	2	0	11	0	0	0	0	0	0	0	
11	1	0	10	0	0	0	0	0	0	0	
10	0	0	10	0	0	0	0	0	0	0	
7	0	0	7	0	0	0	0	0	0	0	
3	0	0	3	0	0	0	0	0	0	0	
Total											
152	21	0	131	0	0	0	0	0	0		
	13.8	0.0	86.2	0.0	0.0	0.0	0.0	0.0	0.0	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**Surprise120m**
7	4	0	3	0	0	0	0	0	0	0	
9	2	0	7	0	0	0	0	0	0	0	
11	3	0	7	0	1	0	0	0	0	0	
13	4	0	9	0	0	0	0	0	0	0	
13	1	0	12	0	0	0	0	0	0	0	
14	3	0	11	0	0	0	0	0	0	0	
14	4	0	10	0	0	0	0	0	0	0	
14	4	0	10	0	0	0	0	0	0	0	
13	2	0	11	0	0	0	0	0	0	0	
13	0	0	13	0	0	0	0	0	0	0	
11	2	0	9	0	0	0	0	0	0	0	
10	0	0	10	0	0	0	0	0	0	0	
7	0	0	7	0	0	0	0	0	0	0	
3	0	0	3	0	0	0	0	0	0	0	
Total											
152	29	0	122	0	1	0	0	0	0		
	19.1	0.0	80.3	0.0	0.7	0.0	0.0	0.0	0.0	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**Surprise 340m**
7	0	0	7	0	0	0	0	0	0	0	
9	1	0	8	0	0	0	0	0	0	0	
11	4	0	7	0	0	0	0	0	0	0	
13	2	0	11	0	0	0	0	0	0	0	
13	3	0	10	0	0	0	0	0	0	0	
14	3	0	11	0	0	0	0	0	0	0	
14	3	0	11	0	0	0	0	0	0	0	
14	4	0	10	0	0	0	0	0	0	0	
13	1	0	12	0	0	0	0	0	0	0	
13	3	0	10	0	0	0	0	0	0	0	
11	1	0	10	0	0	0	0	0	0	0	
10	1	0	9	0	0	0	0	0	0	0	
7	0	0	7	0	0	0	0	0	0	0	
3	0	0	3	0	0	0	0	0	0	0	
Total											
152	26	0	126	0	0	0	0	0	0		
	17.1	0.0	82.9	0.0	0.0	0.0	0.0	0.0	0.0	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**Blowing 120m**
7	2	0	5	0	0	0	0	0	0	0	
9	1	0	8	0	0	0	0	0	0	0	
11	0	0	11	0	0	0	0	0	0	0	
13	0	0	13	0	0	0	0	0	0	0	
13	2	0	11	0	0	0	0	0	0	0	
14	2	0	11	0	1	0	0	0	0	0	
14	3	0	10	0	1	0	0	0	0	0	
14	6	0	7	0	1	0	0	0	0	0	
13	5	0	8	0	0	0	0	0	0	0	
13	9	0	4	0	0	0	0	0	0	0	
11	7	0	4	0	0	0	0	0	0	0	
10	7	0	3	0	0	0	0	0	0	0	
7	6	0	1	0	0	0	0	0	0	0	
3	3	0	0	0	0	0	0	0	0	0	
Total											
152	53	0	96	0	3	0	0	0	0		
	34.9	0.0	63.2	0.0	2.0	0.0	0.0	0.0	0.0	100.0	

Points Per Line	Grass /Herb	Yard	Trees/ Shrubs Natural	Trees/Shurbs Cultivated	Dirt/ gravel road	Paved Road	Cement Sidwald	Building/ Structure	Bare Ground/ dirt trails	Total Check	**Blowing 340 m**
7	2	0	5	0	0	0	0	0	0	0	
9	1	0	8	0	0	0	0	0	0	0	
11	1	0	10	0	0	0	0	0	0	0	
13	3	0	10	0	0	0	0	0	0	0	
13	3	0	10	0	0	0	0	0	0	0	
14	5	0	8	0	1	0	0	0	0	0	
14	5	0	8	0	1	0	0	0	0	0	
14	9	0	4	0	1	0	0	0	0	0	
13	7	0	6	0	0	0	0	0	0	0	
13	8	0	4	0	1	0	0	0	0	0	
11	5	0	4	0	2	0	0	0	0	0	
10	6	0	4	0	0	0	0	0	0	0	
7	5	0	2	0	0	0	0	0	0	0	
3	1	0	2	0	0	0	0	0	0	0	
Total											
152	61	0	85	0	6	0	0	0	0		
	40.1	0.0	55.9	0.0	3.9	0.0	0.0	0.0	0.0	100.0	

Appendix B. Summary of stable isotope data analyzed in this report.

Date	Cave	Sample	Scientific Name	Common Name	Family	Order	Parts sampled	δ15N	%N	δ13C	%C
15-May-06	Blowing Sink	1907	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	4.383	11.329	-23.324	42.656
6-Nov-05	Blowing Sink	1251	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	6.148	12.395	-21.266	44.503
15-May-06	Blowing Sink	1896	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	6.474	11.743	-22.882	42.909
30-May-06	Surprise Sink	1860	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	6.555	13.160	-23.115	40.270
15-May-06	Blowing Sink	1908	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.328	11.438	-21.913	40.123
15-Nov-05	Surprise Sink	1313	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.384	12.770	-21.952	
30-May-06	Surprise Sink	1858	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.390	10.490	-22.872	47.740
30-May-06	Surprise Sink	1858	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.431	10.320	-22.935	47.530
14-Feb-06	Surprise Sink	1563	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.814	11.010	-22.632	49.600
30-May-06	Surprise Sink	1856	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.843	12.230	-22.090	42.120
14-Feb-06	Bone Pile	1504	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	9.269	11.620	-22.254	48.930
30-May-06	Surprise Sink	1853	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	9.393	12.350	-22.830	46.550
30-May-06	Surprise Sink	1859	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	9.567	12.930	-22.260	43.680
14-Feb-06	Surprise Sink	1562	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	9.823	11.300	-21.802	44.310
15-Nov-05	Surprise Sink	1312	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	9.863	12.430	-21.630	
15-Nov-05	Surprise Sink	1314	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	9.938	11.470	-22.045	
31-Aug-05	Blowing Sink	1202	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	9.975	11.220	-21.641	45.010
15-Nov-05	Surprise Sink	1311	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	10.056	12.520	-22.473	
14-Feb-06	Surprise Sink	1561	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	10.232	12.220	-22.100	46.330
30-May-06	Surprise Sink	1855	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	10.341	13.500	-21.725	46.740
14-Feb-06	Surprise Sink	1561	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	10.419	11.450	-22.296	44.540
14-Feb-06	Surprise Sink	1564	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	11.510	11.650	-22.352	44.270
15-May-06	Blowing Sink	1898	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism			-7.768	13.215
30-May-06	Surprise Sink	1857	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism			-23.053	53.550
30-May-06	Surprise Sink	1854	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism			-22.935	47.440
24-May-06	Slaughter Creek	1729	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	6.193	10.390	-22.881	42.020
24-May-06	Slaughter Creek	1739	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	6.291	9.250	-22.130	39.390
24-May-06	Slaughter Creek	1732	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	6.653	9.250	-22.304	47.900
29-Nov-05	Slaughter Creek	1416	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	7.065	11.400	-22.486	39.200
24-May-06	Slaughter Creek	1736	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	7.498	10.510	-21.926	46.870
22-May-06	Lost Oasis	1656	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	7.804	11.730	-22.581	42.450
24-May-06	Slaughter Creek	1734	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	7.953	9.000	-21.545	39.730
22-May-06	Lost Oasis	1655	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.486	10.360	-22.898	44.390
29-Nov-05	Slaughter Creek	1415	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.529	12.240	-21.082	46.730
29-Nov-05	Slaughter Creek	1415	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.572	11.540	-21.293	44.870
24-May-06	Slaughter Creek	1738	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.692	12.140	-21.682	48.260
22-May-06	Lost Oasis	1659	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.780	9.650	-21.732	45.790
22-May-06	Lost Oasis	1655	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.835	8.280	-22.608	32.580
28-Feb-06	Lost Oasis	1625	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.966	11.410	-22.542	43.570
24-May-06	La Crosse	1699	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	9.142	11.870	-20.956	46.770
22-May-06	Lost Oasis	1660	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	9.236	9.890	-22.293	41.090
24-May-06	Slaughter Creek	1731	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	9.367	11.600	-20.990	44.480
28-Feb-06	Lost Oasis	1624	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	9.781	11.430	-22.367	46.470
28-Feb-06	Lost Oasis	1627	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	9.958	11.900	-22.312	42.680
28-Feb-06	Lost Oasis	1626	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	10.000	9.770	-22.432	40.630
29-Nov-05	Slaughter Creek	1418	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	10.304	12.430	-22.914	43.370
22-May-06	Lost Oasis	1658	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	10.371	9.670	-22.485	37.230
24-May-06	La Crosse	1698	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	10.422	8.520	-20.380	35.400
22-May-06	Lost Oasis	1657	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	10.678	10.500	-21.937	43.020
24-May-06	La Crosse	1694	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	11.057	11.760	-20.206	44.300
22-May-06	Lost Oasis	1654	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	11.064	11.620	-21.719	42.790
24-May-06	La Crosse	1696	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	11.185	11.160	-20.178	46.090
29-Nov-05	Slaughter Creek	1417	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	11.716	11.210	-23.270	39.930

24-May-06	Slaughter Creek	1735	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	12.237	10.680	-22.156	46.880
24-May-06	La Crosse	1695	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	15.386	9.050	-17.796	52.890
24-May-06	La Crosse	1697	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism			-20.757	49.780
24-May-06	Slaughter Creek	1730	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism			-22.695	47.210
24-May-06	Slaughter Creek	1733	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism			-22.601	44.060
23-Aug-05	Genesis	1084	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	7.310	12.194	-20.300	44.523
23-Aug-05	Genesis	1085	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.190	11.473	-22.040	42.207
30-May-06	Genesis	1837	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	8.283	11.030	-22.367	46.330
30-May-06	Genesis	1836	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	10.546	12.650	-17.992	45.570
31-Aug-05	Driskill	1227	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	12.115	10.830	-22.625	44.860
25-May-06	Academy	1767	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	12.453	11.040	-23.388	44.330
25-May-06	Academy	1768	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	13.869	12.260	-22.034	43.520
26-Aug-05	Academy	1193	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	14.421	11.520	-22.257	47.760
25-May-06	Academy	1765	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	14.464	11.570	-21.881	42.180
25-May-06	Academy	1766	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	15.356	11.410	-20.824	45.860
26-Aug-05	Academy	1192	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	15.417	9.960	-22.004	40.400
30-Nov-05	Academy	1426	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism	15.925	12.050	-20.099	42.850
30-May-06	Genesis	1838	Cicurina sp.	TP or TB Spider	Dictynidae	Araneae	Organism			-22.543	47.260
30-May-06	Surprise Sink	1852	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	7.978	9.390	-21.263	34.620
30-May-06	Bone Pile	1795	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	9.158	10.260	-23.280	46.770
30-May-06	Bone Pile	1794	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	9.739	11.230	-22.411	43.520
30-May-06	Bone Pile	1794	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	9.780	11.170	-22.400	43.730
14-Feb-06	Surprise Sink	1565	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	10.748	12.030	-21.723	46.570
23-Nov-05	La Crosse	1387	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	7.310	11.370	-23.227	42.590
23-Nov-05	La Crosse	1386	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	7.352	11.830	-23.388	44.570
8-Nov-05	Lost Oasis	1278	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	7.954	11.339	-23.693	44.134
8-Nov-05	Lost Oasis	1273	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	8.764	11.650	-23.347	38.903
8-Nov-05	Lost Oasis	1274	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	8.773	12.883	-23.265	43.188
31-Aug-05	Slaughter Creek	1164	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	8.917	10.710	-21.862	51.640
8-Nov-05	Lost Oasis	1276	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	9.110	12.111	-22.262	41.771
26-Aug-05	La Crosse	1128	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	9.660	12.253	-22.500	45.348
16-Feb-06	Slaughter Creek	1580	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	9.856	9.380	-22.171	33.190
8-Nov-05	Lost Oasis	1277	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	9.878	12.680	-21.902	44.288
31-Aug-05	Slaughter Creek	1163	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	9.907	11.440	-21.530	49.340
16-Feb-06	Slaughter Creek	1582	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	10.221	10.840	-22.655	38.490
31-Aug-05	Slaughter Creek	1165	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	10.410	11.800	-22.330	48.150
16-Feb-06	Slaughter Creek	1581	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	10.625	10.960	-21.336	38.960
8-Nov-05	Lost Oasis	1275	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	10.785	12.036	-22.396	42.081
26-Aug-05	La Crosse	1129	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	11.060	10.695	-22.110	47.664
26-Aug-05	La Crosse	1129	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	11.280	11.286	-21.890	48.224
16-Feb-06	Slaughter Creek	1581	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	11.436	10.160	-21.380	36.260
26-Aug-05	La Crosse	1127	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	11.730	12.154	-20.920	46.616
26-Aug-05	La Crosse	1131	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	12.250	11.906	-20.570	47.734
26-Aug-05	La Crosse	1130	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	12.900	12.473	-19.710	46.517
31-Aug-05	Slaughter Creek	1162	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	12.923	12.940	-20.494	49.730
23-Nov-05	La Crosse	1385	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	15.925	12.270	-18.749	40.950
23-Nov-05	La Crosse	1383	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	15.961	11.460	-18.807	46.450
23-Feb-06	La Crosse	1599	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	16.993	11.350	-17.916	38.900
21-Nov-05	Genesis	1363	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	7.976	11.640	-22.675	43.200
21-Nov-05	Genesis	1363	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	7.979	11.680	-22.529	43.380
21-Nov-05	Genesis	1362	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	7.999	10.430	-22.106	37.110
21-Nov-05	Genesis	1358	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	8.246	9.980	-21.504	38.980
21-Nov-05	Genesis	1361	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	8.586	8.440	-20.303	31.730
21-Nov-05	Genesis	1359	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	9.718	10.930	-20.593	44.400
21-Nov-05	Genesis	1360	Cicurina varians	TP Spider	Dictynidae	Araneae	Organism	9.914	11.980	-18.970	43.640
28-Jul-05	Surprise Sink	1022	unidentified spider	TP Spider	unidentified spider	Araneae	Organism	8.190	12.300	-22.930	46.350
28-Jul-05	Surprise Sink	1024	unidentified spider	TP Spider	unidentified spider	Araneae	Organism	9.260	12.670		
28-Jul-05	Surprise Sink	1021	unidentified spider	TP Spider	unidentified spider	Araneae	Organism	10.380	12.790	-22.760	47.860
17-Aug-05	Lost Oasis	1047	unidentified spider	TP Spider	unidentified spider	Araneae	Organism	8.170	11.900	-22.750	44.970
17-Aug-05	Lost Oasis	1048	unidentified spider	TP Spider	unidentified spider	Araneae	Organism	8.210	9.910	-22.970	41.350

17-Aug-05	Lost Oasis	1045	unidentified spider	TP Spider	unidentified spider	Araneae	Organism	9.820	12.400	-23.430	43.960
17-Aug-05	Lost Oasis	1046	unidentified spider	TP Spider	unidentified spider	Araneae	Organism	10.090	12.350	-22.710	43.390
17-Aug-05	Lost Oasis	1049	unidentified spider	TP Spider	unidentified spider	Araneae	Organism	10.830	11.030	-22.870	39.620
29-Nov-05	Driskill	1409	unidentified Blatteria	Cockroach	unidentified Blatteria	Blatteria	Organism	4.471	14.040	-22.682	43.370
30-Nov-05	Academy	1428	unidentified Blatteria	Cockroach	unidentified Blatteria	Blatteria	Organism	7.950	11.360	-22.796	43.140
15-May-06	Blowing Sink	1914	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	0.341	10.677	-24.711	41.754
6-Nov-05	Blowing Sink	1252	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	3.005	10.411	-23.608	45.856
30-May-06	Bone Pile	1812	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	4.300	9.080	-22.067	48.980
23-Aug-05	Bone Pile	1102	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	4.840	9.828	-24.020	50.911
30-May-06	Surprise Sink	1887	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	4.953	9.030	-22.264	37.589
28-Jul-05	Surprise Sink	1033	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	5.540	8.660	-24.280	52.680
28-Jul-05	Surprise Sink	1030	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	6.070	8.090	-24.240	50.660
28-Jul-05	Surprise Sink	1031	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	6.340	8.320	-24.360	53.500
28-Jul-05	Surprise Sink	1034	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	6.380	8.200	-24.310	51.950
15-Nov-05	Bone Pile	1322	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	6.815	10.550	-21.560	39.210
14-Feb-06	Surprise Sink	1568	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	7.029	12.920	-21.940	41.970
28-Jul-05	Surprise Sink	1032	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	7.700	9.450	-23.800	54.010
15-Nov-05	Surprise Sink	1315	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	8.616	12.860	-22.027	
31-Aug-05	Blowing Sink	1215	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism			-23.720	43.290
23-Nov-05	La Crosse	1398	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	3.654	6.780	-24.868	35.880
22-May-06	Lost Oasis	1675	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	6.036	5.470	-22.096	30.500
8-Nov-05	Lost Oasis	1272	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	6.383	13.577	-22.246	40.322
23-Nov-05	La Crosse	1399	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism			-19.400	34.620
17-Aug-05	Lost Oasis	1065	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism			-24.800	39.100
17-Aug-05	Lost Oasis	1068	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism			-24.530	26.135
17-Aug-05	Lost Oasis	1067	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism			-24.300	62.531
28-Feb-06	Lost Oasis	1633	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism			-24.225	46.250
17-Aug-05	Lost Oasis	1069	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism			-24.170	24.721
17-Aug-05	Lost Oasis	1066	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism			-23.840	119.274
24-May-06	Slaughter Creek	1740	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism			-23.858	53.410
29-Nov-05	Slaughter Creek	1420	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism			-14.164	6.670
31-Aug-05	Driskill	1228	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	2.023	12.950	-26.644	46.400
23-Aug-05	Genesis	1086	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	2.880	10.981	-22.350	38.775
30-May-06	Genesis	1839	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism	7.747	12.620	-21.537	47.470
21-Nov-05	Genesis	1364	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism			-23.387	41.870

21-Nov-05	Genesis	1365	unidentified Collembolan	Springtail	unidentified Collembolan	Collembola	Organism			-22.065	20.510
30-May-06	Surprise Sink	1893	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	2.761	9.494	-22.670	49.129
6-Nov-05	Blowing Sink	1250	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	2.855	9.359	-21.566	48.728
14-Feb-06	Surprise Sink	1566	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	3.603	10.500	-17.778	52.960
15-Nov-05	Surprise Sink	1316	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	3.664	10.970	-22.928	
8-Sep-05	Surprise Sink	1246	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	3.784	8.421	-20.973	52.578
15-Nov-05	Surprise Sink	1316	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	3.905	11.210	-22.311	
8-Sep-05	Surprise Sink	1247	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.013	9.348	-20.959	52.459
8-Sep-05	Surprise Sink	1249	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.013	9.425	-21.157	51.918
8-Sep-05	Surprise Sink	1248	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.127	9.893	-20.948	52.672
8-Sep-05	Surprise Sink	1245	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.262	10.009	-20.992	52.309
2-Feb-06	Blowing Sink	1473	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.653	11.020	-18.146	56.620
15-May-06	Blowing Sink	1927	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.845	10.872	-23.975	49.024
16-Nov-05	Bone Pile	1338	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.105	10.220	-22.416	49.050
8-Sep-05	Bone Pile	1234	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.106	8.860	-24.983	52.620
8-Sep-05	Bone Pile	1233	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.275	8.970	-23.414	51.310
8-Sep-05	Bone Pile	1235	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.310	8.660	-25.076	51.210
8-Sep-05	Blowing Sink	1230	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.317	9.790	-21.750	51.890
8-Sep-05	Bone Pile	1232	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.372	9.640	-24.537	47.030
8-Sep-05	Blowing Sink	1230	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.476	9.650	-21.741	50.790
8-Sep-05	Bone Pile	1231	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.610	9.790	-19.041	47.560
30-May-06	Bone Pile	1818	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.878	9.610	-23.182	51.740
14-Feb-06	Bone Pile	1505	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	6.496	11.040	-23.639	59.050
14-Feb-06	Bone Pile	1505	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	6.553	10.770	-23.551	56.430
24-May-06	Slaughter Creek	1746	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	3.719	10.340	-23.665	49.190
24-May-06	Slaughter Creek	1746	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	3.762	10.970	-23.701	50.810
22-May-06	Lost Oasis	1674	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	3.773	11.100	-21.524	55.760
29-Nov-05	Slaughter Creek	1419	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.045	10.780	-20.580	54.180
24-May-06	La Crosse	1706	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.435	9.340	-23.768	56.050
8-Sep-05	Lost Oasis	1243	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.692	11.050	-21.119	49.980
28-Feb-06	Lost Oasis	1628	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.724	10.550	-17.809	48.960
23-Nov-05	La Crosse	1397	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.793	7.650	-15.115	45.720
16-Feb-06	Slaughter Creek	1583	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.824	10.920	-21.858	49.280
8-Sep-05	Slaughter Creek	1244	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.922	10.010	-19.464	49.040
23-Nov-05	La Crosse	1397	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	4.924	9.230	-15.171	49.560
28-Feb-06	Lost Oasis	1628	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.070	11.120	-18.116	50.590
8-Sep-05	La Crosse	1242	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.298	8.540	-22.898	51.510
8-Nov-05	Lost Oasis	1284	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.353	11.300	-18.744	
23-Feb-06	La Crosse	1600	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.398	9.700	-20.348	47.250
8-Sep-05	Genesis	1239	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.501	7.100	-17.926	37.750
8-Sep-05	Genesis	1237	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.560	9.000	-17.887	46.190
8-Sep-05	Genesis	1238	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.698	7.630	-18.218	39.270
8-Sep-05	Genesis	1240	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.744	9.460	-17.923	50.020
8-Sep-05	Genesis	1241	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.752	8.470	-17.641	45.130
14-Feb-06	Genesis	1526	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	5.841	9.900	-14.637	52.870
30-May-06	Genesis	1840	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	6.156	10.590	-22.879	51.190
30-May-06	Genesis	1840	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	6.259	11.040	-22.832	50.030
25-May-06	Driskill	1782	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	7.305	7.870	-21.077	61.360
23-Feb-06	Driskill	1592	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	8.098	9.090	-22.896	52.950
28-Feb-06	Academy	1606	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	8.427	9.830	-19.217	48.890
30-Nov-05	Academy	1427	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	8.487	10.040	-	-
8-Sep-05	Driskill	1236	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism	8.495	9.120	-18.356	53.570
8-Sep-05	Academy	1229	Solenopsis invicta	Red Imported Fire Ant	Formicidae	Hymenoptera	Organism			-21.487	30.560
23-Nov-05	La Crosse	1391	Porcellio sp.	woodlouse	Porcellionidae	Isopoda	Organism	6.164	5.970	-21.191	34.930
23-Nov-05	La Crosse	1393	Porcellio sp.	woodlouse	Porcellionidae	Isopoda	Organism	6.898	5.760	-20.437	28.210
23-Nov-05	La Crosse	1392	Porcellio sp.	woodlouse	Porcellionidae	Isopoda	Organism	7.582	6.070	-22.970	36.480
15-Nov-05	Surprise Sink	1291	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	5.040	7.730	-21.265	
16-Nov-05	Bone Pile	1329	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	5.336	6.500	-22.337	35.440
16-Nov-05	Bone Pile	1327	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	5.412	6.740	-22.386	31.650

16-Nov-05	Bone Pile	1328	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	5.666	6.250	-21.189	31.410
16-Nov-05	Bone Pile	1326	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	5.961	5.430	-22.566	34.040
16-Nov-05	Bone Pile	1330	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	5.983	7.150	-22.316	37.910
15-Nov-05	Surprise Sink	1290	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	7.001	6.850	-21.301	
16-Nov-05	Bone Pile	1331	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	7.180	5.900	-21.283	29.710
14-Feb-06	Surprise Sink	1532	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	7.246	6.540	-22.862	34.140
21-Nov-05	Genesis	1349	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	3.817	6.150	-21.001	31.040
14-Feb-06	Genesis	1517	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	4.078	5.280	-21.324	26.690
23-Aug-05	Genesis	1075	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	4.100	6.528	-21.010	35.061
21-Nov-05	Genesis	1347	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	4.489	5.570	-20.646	31.350
21-Nov-05	Genesis	1348	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	4.659	6.040	-20.105	34.460
23-Aug-05	Genesis	1076	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	5.650	6.723	-20.720	32.516
25-May-06	Academy	1758	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	6.530	6.190	-19.994	35.690
25-May-06	Academy	1757	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	7.460	6.060	-19.582	33.000
21-Nov-05	Genesis	1350	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	7.925	5.330	-22.431	37.860
25-May-06	Academy	1760	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	9.103	5.800	-22.228	37.820
26-Aug-05	Academy	1191	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism	9.722	5.700	-20.204	36.460
25-May-06	Academy	1759	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism			-20.458	36.710
14-Feb-06	Genesis	1516	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism			-22.617	27.680
21-Nov-05	Genesis	1352	Brackenridgia sp.	terrestrial cave isopod	Trichoniscidae	Isopoda	Organism			-20.503	27.890
26-Aug-05	La Crosse	1140	unidentified isopod	unidentified isopod	unidentified isopod	Isopoda	Organism	11.796	6.000	-19.808	30.600
26-Aug-05	La Crosse	1138	unidentified isopod	unidentified isopod	unidentified isopod	Isopoda	Organism	12.228	6.810	-20.167	33.550
26-Aug-05	La Crosse	1137	unidentified isopod	unidentified isopod	unidentified isopod	Isopoda	Organism	12.949	6.000	-19.284	30.670
26-Aug-05	La Crosse	1136	unidentified isopod	unidentified isopod	unidentified isopod	Isopoda	Organism	13.201	6.520	-16.975	30.820
26-Aug-05	La Crosse	1139	unidentified isopod	unidentified isopod	unidentified isopod	Isopoda	Organism			-20.862	23.280
23-Aug-05	Bone Pile	1117	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	-0.010	9.284	-24.760	51.207
30-May-06	Surprise Sink	1888	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	0.685	9.962	-23.660	46.702
30-May-06	Bone Pile	1815	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	0.845	8.350	-23.996	49.600
30-May-06	Surprise Sink	1888	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	0.849	9.912	-23.744	47.380
30-May-06	Surprise Sink	1891	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	1.185	8.189	-24.132	46.611
30-May-06	Bone Pile	1814	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	1.372	7.290	-24.558	53.290
23-Aug-05	Bone Pile	1118	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	1.440	9.103	-24.670	48.775
30-May-06	Bone Pile	1817	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	1.475	10.270	-23.790	50.440
23-Aug-05	Bone Pile	1119	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	1.490	9.960	-24.830	52.595
23-Aug-05	Bone Pile	1119	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	1.700	9.680	-24.910	52.838
30-May-06	Surprise Sink	1892	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	1.742	9.287	-24.487	52.381
30-May-06	Bone Pile	1813	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	1.768	8.130	-24.538	55.230
30-May-06	Surprise Sink	1889	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	1.816	9.428	-23.985	47.677
30-May-06	Bone Pile	1813	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	1.934	8.250	-24.574	56.870
23-Aug-05	Bone Pile	1116	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	2.420	10.515	-25.040	51.499
16-Nov-05	Bone Pile	1337	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	2.470	9.180	-24.489	46.980
15-May-06	Blowing Sink	1911	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	2.805	8.512	-25.021	49.423
15-May-06	Blowing Sink	1905	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.030	8.822	-24.663	50.956
30-May-06	Surprise Sink	1890	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.170	7.277	-25.285	52.976
15-May-06	Blowing Sink	1901	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.304	10.000	-24.588	44.789
30-May-06	Bone Pile	1816	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.515	9.580	-24.435	46.630
15-May-06	Blowing Sink	1902	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.642	8.228	-24.980	49.858
15-May-06	Blowing Sink	1906	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.961	8.359	-24.971	53.326
31-Aug-05	Blowing Sink	1216	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.072	8.220	-25.555	54.190
31-Aug-05	Blowing Sink	1218	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.175	9.090	-25.284	49.170
31-Aug-05	Blowing Sink	1217	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.485	8.880	-25.060	50.810
31-Aug-05	Blowing Sink	1220	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.593	15.660		
31-Aug-05	Blowing Sink	1219	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.904	6.870	-26.035	51.990
24-May-06	Slaughter Creek	1749	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	2.571	9.080	-24.335	49.180
24-May-06	Slaughter Creek	1748	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	2.825	9.510	-24.196	49.380
24-May-06	Slaughter Creek	1748	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	2.957	9.300	-24.074	47.630
24-May-06	Slaughter Creek	1747	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.012	10.570	-23.759	48.960
24-May-06	La Crosse	1702	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.289	8.330	-24.696	50.970
24-May-06	Slaughter Creek	1751	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.364	7.120	-25.519	52.270
22-May-06	Lost Oasis	1672	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.385	9.610	-23.935	51.810

31-Aug-05	Slaughter Creek	1176	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.428	10.680	-24.693	51.450
31-Aug-05	Slaughter Creek	1178	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.464	11.040	-24.138	53.060
24-May-06	Slaughter Creek	1750	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.475	9.380	-24.671	49.430
22-May-06	Lost Oasis	1672	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.486	9.380	-23.893	51.810
31-Aug-05	Slaughter Creek	1179	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.661	10.990	-24.289	52.010
22-May-06	Lost Oasis	1670	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.785	7.750	-25.633	56.500
22-May-06	Lost Oasis	1671	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.885	8.260	-24.410	53.560
26-Aug-05	La Crosse	1143	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.966	10.850	-26.972	52.850
26-Aug-05	La Crosse	1144	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	3.990	10.030	-25.830	53.240
24-May-06	La Crosse	1704	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.107	8.310	-25.442	57.440
24-May-06	La Crosse	1703	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.125	8.690	-25.355	55.370
22-May-06	Lost Oasis	1673	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.209	15.460	-23.824	71.930
24-May-06	La Crosse	1703	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.263	8.570	-25.434	54.520
26-Aug-05	La Crosse	1141	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.396	8.470	-26.995	55.670
24-May-06	La Crosse	1705	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.452	8.290	-25.043	56.270
22-May-06	Lost Oasis	1669	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.669	7.640	-25.827	55.400
24-May-06	La Crosse	1701	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.790	8.960	-25.182	60.690
31-Aug-05	Slaughter Creek	1177	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.798	10.040	-24.624	52.700
31-Aug-05	Slaughter Creek	1175	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.841	10.280	-25.298	55.240
31-Aug-05	Slaughter Creek	1175	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.921	10.180	-25.136	54.700
26-Aug-05	La Crosse	1145	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	5.075	8.280	-26.621	57.740
23-Nov-05	La Crosse	1390	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	5.651	10.770	-24.505	48.190
23-Nov-05	La Crosse	1390	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	5.874	10.580	-24.400	47.580
23-Aug-05	Genesis	1093	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.920	10.166	-24.740	49.364
23-Aug-05	Genesis	1094	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	4.980	10.501	-24.400	48.699
23-Aug-05	Genesis	1091	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	5.620	10.810	-25.050	48.952
23-Aug-05	Genesis	1090	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	6.130	9.596	-24.620	47.878
23-Aug-05	Genesis	1092	Leiobunum townsendii	DaddyLong-Legs	Phalangiidae	Opiliones	Organism	6.273	10.808	-23.935	48.913
28-Jul-05	Surprise Sink	1025	unidentified harvestman	unidentified harvestman	unidentified harvestman	Opiliones	Organism	1.600	9.400	-25.530	46.780
28-Jul-05	Surprise Sink	1027	unidentified harvestman	unidentified harvestman	unidentified harvestman	Opiliones	Organism	1.700	9.160	-25.450	49.750
28-Jul-05	Surprise Sink	1028	unidentified harvestman	unidentified harvestman	unidentified harvestman	Opiliones	Organism	2.200	8.950	-25.550	52.900
28-Jul-05	Surprise Sink	1026	unidentified harvestman	unidentified harvestman	unidentified harvestman	Opiliones	Organism	2.500	9.010	-25.570	49.540
28-Jul-05	Surprise Sink	1029	unidentified harvestman	unidentified harvestman	unidentified harvestman	Opiliones	Organism	3.120	7.890	-25.310	51.540
17-Aug-05	Lost Oasis	1070	unidentified harvestman	unidentified harvestman	unidentified harvestman	Opiliones	Organism	4.430	9.928	-25.420	47.236
23-Nov-05	La Crosse	1388	unidentified harvestman	unidentified harvestman	unidentified harvestman	Opiliones	Organism	5.477	9.270	-25.156	50.320
23-Nov-05	La Crosse	1389	unidentified harvestman	unidentified harvestman	unidentified harvestman	Opiliones	Organism			-24.595	48.350
14-Feb-06	Bone Pile	1484	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.755	12.280	-22.216	50.890
15-Nov-05	Surprise Sink	1295	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.241	9.730	-21.089	
23-Aug-05	Bone Pile	1107	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.700	11.011	-24.060	47.120
23-Aug-05	Bone Pile	1110	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.740	10.762	-23.890	46.134
23-Aug-05	Bone Pile	1106	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.980	11.854	-23.570	46.680
23-Aug-05	Bone Pile	1103	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.080	10.837	-24.390	53.713
23-Aug-05	Bone Pile	1104	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.180	11.835	-24.220	51.609
23-Aug-05	Bone Pile	1108	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.320	11.905	-23.900	48.444
23-Aug-05	Bone Pile	1105	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.390	11.205	-23.750	46.454
6-Nov-05	Blowing Sink	1257	Ceuthophilus (G.)	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.529	11.658	-22.051	43.789

			cunicularis								
23-Aug-05	Bone Pile	1109	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.020	10.006	-24.750	54.801
15-Nov-05	Surprise Sink	1296	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.073	10.580	-22.681	
15-Nov-05	Surprise Sink	1298	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.141	11.310	-22.620	
6-Nov-05	Blowing Sink	1261	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.292	10.360	-22.812	43.327
6-Nov-05	Blowing Sink	1260	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.296	9.984	-23.381	44.386
6-Nov-05	Blowing Sink	1258	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.367	11.414	-22.246	46.417
16-Nov-05	Bone Pile	1448	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.387	10.920	-23.319	47.170
31-Aug-05	Blowing Sink	1210	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.453	10.630	-22.381	45.550
15-Nov-05	Surprise Sink	1299	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.455	10.120	-23.244	
15-Nov-05	Surprise Sink	1297	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.526	11.500	-22.698	
16-Nov-05	Bone Pile	1446	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.662	9.930	-23.168	45.820
16-Nov-05	Bone Pile	1444	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.684	10.330	-23.485	47.770
16-Nov-05	Bone Pile	1445	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.730	10.590	-23.255	47.090
16-Nov-05	Bone Pile	1444	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.777	9.750	-23.318	45.050
15-Nov-05	Surprise Sink	1297	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.792	11.330	-22.715	
16-Nov-05	Bone Pile	1447	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.907	11.840	-23.089	50.730
6-Nov-05	Blowing Sink	1259	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.305	10.685	-21.776	47.295
31-Aug-05	Blowing Sink	1209	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.649	10.320	-22.380	52.320
2-Feb-06	Blowing Sink	1465	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.825	10.410	-21.662	41.860
31-Aug-05	Blowing Sink	1208	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	6.445	11.930	-23.241	50.500
28-Feb-06	Lost Oasis	1616	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.761	6.880	-24.927	49.330
28-Feb-06	Lost Oasis	1617	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.138	13.210	-21.419	44.870
8-Nov-05	Lost Oasis	1436	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.180	9.250	-23.353	43.620
29-Nov-05	Slaughter Creek	1459	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.264	10.370	-22.299	47.130
28-Feb-06	Lost Oasis	1617	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.268	13.120	-21.541	44.760
8-Nov-05	Lost Oasis	1438	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.569	12.000	-22.556	46.760
8-Nov-05	Lost Oasis	1437	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.581	10.870	-22.856	46.850
8-Nov-05	Lost Oasis	1435	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.614	10.270	-22.996	47.280
8-Nov-05	Lost Oasis	1434	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.622	10.410	-23.255	45.600
31-Aug-05	Slaughter Creek	1169	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.730	12.140	-21.567	48.660
16-Feb-06	Slaughter Creek	1575	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	6.276	10.060	-22.574	49.990
23-Nov-05	La Crosse	1373	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	6.437	10.630	-22.399	44.270

23-Nov-05	La Crosse	1373	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	6.504	10.920	-22.007	44.350
31-Aug-05	Slaughter Creek	1168	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	6.556	11.250	-22.927	50.220
31-Aug-05	Slaughter Creek	1167	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	6.858	10.530	-21.084	48.980
23-Nov-05	La Crosse	1371	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	7.058	11.200	-21.686	43.440
31-Aug-05	Slaughter Creek	1166	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	7.297	12.470	-22.373	48.570
31-Aug-05	Slaughter Creek	1166	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	7.421	12.310	-22.301	48.330
23-Nov-05	La Crosse	1372	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	13.052	11.370	-18.674	40.280
21-Nov-05	Genesis	1642	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.123	10.060	-23.622	46.460
21-Nov-05	Genesis	1641	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.221	11.150	-21.873	46.540
23-Aug-05	Genesis	1087	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.800	10.337	-22.680	45.693
14-Feb-06	Genesis	1523	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.010	10.620	-22.656	44.350
23-Aug-05	Genesis	1089	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.430	11.153	-23.510	44.758
21-Nov-05	Genesis	1639	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	6.282	10.590	-22.118	47.000
21-Nov-05	Genesis	1640	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	7.137	11.180	-21.074	45.490
23-Aug-05	Genesis	1088	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	8.110	8.859	-23.850	42.211
26-Aug-05	Academy	1196	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	9.508	10.210	-21.500	46.120
26-Aug-05	Academy	1195	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	10.406	10.340	-22.146	50.780
26-Aug-05	Academy	1195	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	10.999	10.450	-21.887	50.590
30-May-06	Surprise Sink	1865	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.660	7.990	-23.273	47.540
30-May-06	Surprise Sink	1863	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.030	12.640	-22.357	43.540
30-May-06	Bone Pile	1796	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.149	9.520	-22.260	47.600
14-Feb-06	Surprise Sink	1537	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.526	10.840	-22.228	44.480
30-May-06	Surprise Sink	1866	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.746	12.020	-22.759	45.670
30-May-06	Surprise Sink	1861	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.858	11.670	-22.280	41.380
30-May-06	Surprise Sink	1864	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.913	12.140	-21.983	43.740
15-May-06	Blowing Sink	1909	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.179	11.909	-23.173	43.574
30-May-06	Surprise Sink	1862	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.209	11.950	-22.367	43.130
30-May-06	Bone Pile	1798	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.335	10.890	-22.156	47.430
30-May-06	Bone Pile	1797	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.535	10.550	-21.514	46.470
15-May-06	Blowing Sink	1916	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.326	9.984	-23.192	42.932
15-May-06	Blowing Sink	1916	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.335	9.762	-23.235	41.919
15-May-06	Blowing Sink	1917	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.656	11.210	-21.809	43.466
15-May-06	Blowing Sink	1910	Ceuthophilus (G.)	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.933	9.105	-22.804	38.937

			cunicularis								
15-May-06	Blowing Sink	1909	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	6.934	10.766	-21.731	36.778
24-May-06	Slaughter Creek	1715	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.429	6.860	-22.244	42.760
24-May-06	Slaughter Creek	1716	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.976	10.170	-22.491	49.820
25-May-06	Driskill	1778	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	8.682	10.440	-23.093	43.690
25-May-06	Driskill	1778	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	8.901	10.610	-22.939	45.230
25-May-06	Academy	1762	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	9.854	9.200	-23.936	49.460
25-May-06	Academy	1763	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	10.211	11.130	-22.863	45.960
25-May-06	Academy	1761	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	12.592	8.630	-22.765	43.040
25-May-06	Academy	1761	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	12.773	8.570	-22.738	42.890
14-Feb-06	Surprise Sink	1540	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	-0.153	8.020	-22.495	53.600
30-May-06	Surprise Sink	1870	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.021	13.690	-22.242	44.350
30-May-06	Bone Pile	1799	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.189	8.860	-22.950	49.490
30-May-06	Surprise Sink	1871	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.453	13.770	-22.040	45.180
14-Feb-06	Surprise Sink	1539	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.495	9.610	-22.346	42.550
14-Feb-06	Surprise Sink	1541	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.527	10.340	-22.528	45.560
30-May-06	Surprise Sink	1868	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.557	15.030	-21.624	44.870
30-May-06	Surprise Sink	1868	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.652	14.450	-21.720	44.230
15-May-06	Blowing Sink	1903	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.993	9.966	-22.072	41.033
14-Feb-06	Surprise Sink	1538	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.039	10.810	-22.918	46.290
30-May-06	Bone Pile	1801	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.134	10.960	-21.838	46.280
30-May-06	Surprise Sink	1869	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.440	13.110	-21.577	42.630
30-May-06	Bone Pile	1800	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.450	11.111	-21.927	44.450
30-May-06	Surprise Sink	1867	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.633	12.380	-22.049	42.200
14-Feb-06	Bone Pile	1483	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.948	11.580	-22.958	51.790
15-May-06	Blowing Sink	1920	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.364	11.114	-22.255	42.989
24-May-06	La Crosse	1685	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.881	5.290	-27.371	49.070
24-May-06	Slaughter Creek	1717	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.161	9.140	-22.117	45.730
24-May-06	Slaughter Creek	1718	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.395	9.820	-21.939	49.860
24-May-06	Slaughter Creek	1719	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	7.586	10.860	-21.922	47.790
24-May-06	Slaughter Creek	1719	Ceuthophilus (G.) cunicularis	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	7.875	10.320	-22.088	45.810
23-Aug-05	Bone Pile	1114	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.490	10.405	-24.820	52.551
15-Nov-05	Surprise Sink	1301	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.868	7.320	-22.511	

15-Nov-05	Surprise Sink	1305	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.101	11.960	-23.851	
15-Nov-05	Surprise Sink	1305	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.118	12.040	-23.475	
15-Nov-05	Surprise Sink	1304	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.309	10.280	-22.962	
15-Nov-05	Surprise Sink	1303	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.348	10.510	-24.172	
23-Aug-05	Bone Pile	1111	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.430	9.979	-25.300	50.345
23-Aug-05	Bone Pile	1113	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.440	10.926	-25.010	50.872
15-Nov-05	Surprise Sink	1306	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.505	11.070	-23.331	
23-Aug-05	Bone Pile	1111	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.540	9.912	-24.930	46.493
14-Feb-06	Bone Pile	1490	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.622	9.730	-19.095	55.540
6-Nov-05	Blowing Sink	1253	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.706	7.808	-23.506	52.522
15-Nov-05	Surprise Sink	1302	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.977	11.570	-23.303	
23-Aug-05	Bone Pile	1115	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.020	9.381	-24.400	51.780
14-Feb-06	Bone Pile	1491	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.054	10.600	-24.058	55.930
2-Feb-06	Blowing Sink	1467	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.105	10.280	-21.992	53.520
15-Nov-05	Surprise Sink	1300	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.157	10.500	-23.818	
2-Feb-06	Blowing Sink	1468	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.477	11.060	-20.784	52.490
23-Aug-05	Bone Pile	1112	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.520	9.859	-25.560	53.439
6-Nov-05	Blowing Sink	1255	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.614	9.717	-23.421	49.970
31-Aug-05	Blowing Sink	1212	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.726	5.740	-25.356	48.110
31-Aug-05	Blowing Sink	1213	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.890	9.210	-23.937	50.300
2-Feb-06	Blowing Sink	1469	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.900	10.150	-21.649	52.740
2-Feb-06	Blowing Sink	1470	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.161	9.380	-18.613	53.380
2-Feb-06	Blowing Sink	1466	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.421	11.430	-24.120	48.350
6-Nov-05	Blowing Sink	1256	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.432	11.129	-23.957	47.217
31-Aug-05	Blowing Sink	1211	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.466	9.480	-22.631	47.880
31-Aug-05	Blowing Sink	1214	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.043	11.020	-23.573	51.750
31-Aug-05	Blowing Sink	1214	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.067	10.860	-23.528	49.560
6-Nov-05	Blowing Sink	1254	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.245	11.261	-22.342	48.382
2-Feb-06	Blowing Sink	1471	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.680	12.880	-19.711	51.330
2-Feb-06	Blowing Sink	1471	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.695	12.540	-19.566	50.180
2-Feb-06	Blowing Sink	1472	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.466	13.060	-22.067	49.530
29-Nov-05	Slaughter Creek	1461	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.348	8.410	-21.725	46.230
16-Feb-06	Slaughter Creek	1578	Ceuthophilus (C.)	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.641	9.470	-24.134	47.570

			secretus								
16-Feb-06	Slaughter Creek	1576	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.669	6.470	-19.844	47.190
8-Nov-05	Lost Oasis	1439	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.722	9.670	-26.166	52.840
28-Feb-06	Lost Oasis	1623	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.868	7.500	-23.637	47.560
29-Nov-05	Slaughter Creek	1464	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.930	8.300	-15.614	44.580
8-Nov-05	Lost Oasis	1441	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.017	9.980	-25.808	50.710
28-Feb-06	Lost Oasis	1620	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.035	11.480	-21.368	48.700
29-Nov-05	Slaughter Creek	1460	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.096	9.610	-24.385	51.110
8-Nov-05	Lost Oasis	1443	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.190	9.770	-20.939	49.060
28-Feb-06	Lost Oasis	1618	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.317	9.510	-19.019	48.140
28-Feb-06	Lost Oasis	1621	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.346	8.400	-22.890	50.990
28-Feb-06	Lost Oasis	1619	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.439	11.550	-22.654	47.260
8-Nov-05	Lost Oasis	1442	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.443	8.640	-21.995	54.690
26-Aug-05	La Crosse	1132	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.580	13.049	-23.390	47.590
23-Feb-06	La Crosse	1598	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.865	11.340	-21.420	46.950
8-Nov-05	Lost Oasis	1440	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.898	11.950	-21.041	47.370
23-Feb-06	La Crosse	1598	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.916	11.280	-21.350	46.230
29-Nov-05	Slaughter Creek	1463	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.027	10.960	-23.105	48.750
31-Aug-05	Slaughter Creek	1170	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.441	8.820	-26.020	51.170
29-Nov-05	Slaughter Creek	1462	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.464	9.490	-21.890	49.850
29-Nov-05	Slaughter Creek	1462	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.727	9.730	-21.923	49.930
31-Aug-05	Slaughter Creek	1171	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.750	12.400	-23.590	54.240
26-Aug-05	La Crosse	1134	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.809	12.070	-23.998	50.620
26-Aug-05	La Crosse	1133	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.820	11.513	-25.130	50.145
31-Aug-05	Slaughter Creek	1172	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.871	11.180	-25.368	53.000
31-Aug-05	Slaughter Creek	1174	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.984	11.210	-23.966	51.990
16-Feb-06	Slaughter Creek	1577	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.161	9.160	-21.728	45.650
31-Aug-05	Slaughter Creek	1173	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.175	11.870	-24.488	52.190
28-Feb-06	Lost Oasis	1622	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.416	11.380	-23.449	50.780
14-Feb-06	Genesis	1525	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.773	9.500	-23.313	50.220
14-Feb-06	Genesis	1524	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.287	8.460	-22.435	52.930
14-Feb-06	Bone Pile	1486	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.118	6.530	-23.053	52.030
16-Nov-05	Bone Pile	1453	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.223	7.330	-24.367	58.710

14-Feb-06	Bone Pile	1486	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.281	6.700	-23.035	51.160
14-Feb-06	Surprise Sink	1545	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.561	7.680	-19.348	55.640
14-Feb-06	Surprise Sink	1546	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.673	6.970	-23.355	49.360
30-May-06	Surprise Sink	1873	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.742	6.989	-24.241	47.647
16-Nov-05	Bone Pile	1450	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.828	9.820	-24.104	51.340
14-Feb-06	Surprise Sink	1542	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.916	6.560	-22.635	52.130
30-May-06	Surprise Sink	1875	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.922	7.664	-25.194	48.774
16-Nov-05	Bone Pile	1449	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.015	11.280	-23.833	53.910
14-Feb-06	Surprise Sink	1547	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.127	8.260	-21.506	49.050
16-Nov-05	Bone Pile	1451	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.330	10.260	-23.985	55.190
30-May-06	Bone Pile	1806	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.340	8.690	-23.349	51.160
30-May-06	Surprise Sink	1872	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.342	11.470	-23.494	48.460
14-Feb-06	Surprise Sink	1544	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.414	9.490	-17.825	52.170
14-Feb-06	Bone Pile	1487	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.431	10.180	-21.544	57.120
30-May-06	Bone Pile	1805	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.781	11.190	-22.332	51.090
30-May-06	Bone Pile	1803	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.896	6.450	-23.476	52.390
15-May-06	Blowing Sink	1904	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.909	5.398	-23.877	46.933
14-Feb-06	Surprise Sink	1543	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.969	9.260	-21.695	51.590
14-Feb-06	Surprise Sink	1543	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.999	9.020	-21.792	50.580
30-May-06	Bone Pile	1802	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.012	9.350	-23.693	55.100
30-May-06	Surprise Sink	1874	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.150	9.942	-23.679	45.172
15-May-06	Blowing Sink	1900	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.242	9.450	-22.300	48.781
30-May-06	Bone Pile	1803	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.350	7.060	-23.388	49.330
16-Nov-05	Bone Pile	1452	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.440	9.650	-23.546	57.960
16-Nov-05	Bone Pile	1452	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.501	10.340	-22.973	62.050
14-Feb-06	Bone Pile	1485	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.748	11.750	-23.989	52.520
15-May-06	Blowing Sink	1921	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.774	6.064	-24.668	49.658
15-May-06	Blowing Sink	1899	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.798	6.259	-23.945	48.038
30-May-06	Bone Pile	1804	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.855	12.220	-22.888	47.720
15-May-06	Blowing Sink	1899	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.069	5.767	-23.961	44.950
15-May-06	Blowing Sink	1912	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.087	12.292	-23.130	43.222
24-May-06	La Crosse	1688	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.564	4.840	-23.167	49.990
24-May-06	Slaughter Creek	1721	Ceuthophilus (C.)	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.306	8.190	-24.562	58.470

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24-May-06	Slaughter Creek	1725	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.411	6.610	-23.913	47.940
24-May-06	Slaughter Creek	1720	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.486	8.410	-23.630	53.510
24-May-06	Slaughter Creek	1726	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.504	10.070	-23.300	51.740
24-May-06	La Crosse	1691	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.542	8.670	-23.863	56.730
24-May-06	Slaughter Creek	1723	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.560	8.270	-22.891	54.950
22-May-06	Lost Oasis	1663	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.646	10.490	-23.568	47.260
24-May-06	Slaughter Creek	1724	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.754	8.770	-23.955	52.190
24-May-06	Slaughter Creek	1722	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.895	7.730	-21.359	53.820
22-May-06	Lost Oasis	1662	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.286	8.670	-21.750	52.810
24-May-06	La Crosse	1690	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.341	7.830	-24.108	51.080
24-May-06	La Crosse	1692	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.544	9.390	-24.091	56.650
22-May-06	Lost Oasis	1661	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.781	9.100	-24.038	55.960
24-May-06	La Crosse	1689	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.963	10.220	-21.656	47.870
24-May-06	La Crosse	1693	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.057	12.220	-21.922	52.960
24-May-06	La Crosse	1693	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.142	11.720	-21.868	51.210
30-May-06	Bone Pile	1808	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	-0.227	7.700	-23.384	54.860
30-May-06	Surprise Sink	1878	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.116	7.667	-24.775	48.127
30-May-06	Surprise Sink	1877	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.543	6.344	-23.625	47.162
30-May-06	Surprise Sink	1877	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.666	5.619	-23.639	45.674
30-May-06	Surprise Sink	1881	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.865	8.017	-24.122	51.681
30-May-06	Surprise Sink	1880	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.098	6.228	-23.599	48.005
30-May-06	Bone Pile	1809	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.320	8.310	-23.995	51.640
14-Feb-06	Bone Pile	1489	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.513	11.280	-22.299	55.900
30-May-06	Bone Pile	1810	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.673	8.260	-24.129	53.840
30-May-06	Surprise Sink	1879	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.717	7.770	-23.772	49.341
30-May-06	Bone Pile	1807	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.896	10.990	-23.298	50.130
14-Feb-06	Bone Pile	1488	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.110	8.880	-23.459	55.530
15-May-06	Blowing Sink	1918	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.155	8.401	-24.203	54.245
30-May-06	Bone Pile	1811	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.328	9.510	-23.251	47.720
15-May-06	Blowing Sink	1915	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.029	11.635	-22.972	47.166
15-May-06	Blowing Sink	1919	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.449	5.675	-25.523	43.731
15-May-06	Blowing Sink	1913	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.875	10.860	-22.518	43.029

24-May-06	Slaughter Creek	1728	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.189	8.740	-23.454	54.590
24-May-06	Slaughter Creek	1727	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.232	9.160	-24.216	49.450
24-May-06	Slaughter Creek	1728	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.334	7.760	-23.739	52.730
22-May-06	Lost Oasis	1664	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.695	7.920	-23.827	52.070
24-May-06	La Crosse	1686	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.758	10.370	-23.636	50.880
22-May-06	Lost Oasis	1666	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.067	10.660	-23.329	61.160
22-May-06	Lost Oasis	1664	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.079	8.040	-23.823	48.740
22-May-06	Lost Oasis	1668	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.336	10.690	-24.060	52.770
22-May-06	Lost Oasis	1667	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.480	10.450	-23.810	51.440
22-May-06	Lost Oasis	1665	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.573	10.710	-23.594	56.310
24-May-06	La Crosse	1687	Ceuthophilus (C.) secretus	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.597	9.280	-20.966	52.270
16-Nov-05	Bone Pile	1454	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.034	8.820	-23.832	53.910
14-Feb-06	Bone Pile	1503	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.044	10.350	-20.494	55.820
16-Nov-05	Bone Pile	1457	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.393	9.490	-21.748	51.230
15-Nov-05	Surprise Sink	1309	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.486	9.230	-22.219	
15-Nov-05	Surprise Sink	1308	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.538	8.550	-21.970	
16-Nov-05	Bone Pile	1458	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.702	8.220	-24.156	52.620
15-Nov-05	Surprise Sink	1310	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.716	10.540	-22.428	
16-Nov-05	Bone Pile	1455	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.860	8.810	-24.348	50.520
15-Nov-05	Surprise Sink	1307	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.167	10.720	-22.710	
16-Nov-05	Bone Pile	1456	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.669	10.840	-23.907	49.460
31-Aug-05	Blowing Sink	1207	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.853	9.160	-23.401	54.280
31-Aug-05	Blowing Sink	1205	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.113	12.060	-23.259	54.280
31-Aug-05	Blowing Sink	1204	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.150	9.250	-23.222	54.910
31-Aug-05	Blowing Sink	1205	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.224	12.040	-23.152	52.590
31-Aug-05	Blowing Sink	1203	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.680	9.870	-24.430	55.500
31-Aug-05	Blowing Sink	1206	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.947	11.300	-21.325	55.160
23-Nov-05	La Crosse	1376	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.634	9.630	-23.416	47.530
16-Feb-06	Slaughter Creek	1579	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.043	7.290	-22.784	45.380
23-Nov-05	La Crosse	1380	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.660	8.160	-23.879	42.330
23-Nov-05	La Crosse	1374	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.684	9.730	-23.620	46.470
23-Nov-05	La Crosse	1378	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.810	9.700	-23.561	46.740
23-Nov-05	La Crosse	1379	Ceuthophilus (C.) species	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.054	9.970	-22.624	50.700

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23-Nov-05	La Crosse	1381	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.258	12.400	-22.137	47.380
23-Nov-05	La Crosse	1381	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.319	12.680	-22.131	48.680
23-Nov-05	La Crosse	1375	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.365	12.200	-23.366	46.690
23-Nov-05	La Crosse	1377	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.818	11.600	-22.707	48.060
23-Nov-05	La Crosse	1382	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.776	11.940	-20.414	48.590
14-Feb-06	Surprise Sink	1549	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.501	11.800	-21.395	52.500
14-Feb-06	Surprise Sink	1555	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.999	8.990	-19.939	57.600
14-Feb-06	Bone Pile	1496	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.036	11.730	-22.526	56.310
14-Feb-06	Bone Pile	1493	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.096	11.590	-22.086	54.610
30-May-06	Surprise Sink	1884	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.252	6.706	-25.014	56.822
14-Feb-06	Bone Pile	1498	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.264	8.620	-21.066	55.620
14-Feb-06	Surprise Sink	1559	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.301	10.240	-20.955	52.600
30-May-06	Surprise Sink	1885	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.417	6.335	-24.296	53.834
14-Feb-06	Bone Pile	1492	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.424	10.250	-23.310	55.680
30-May-06	Surprise Sink	1883	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.530	7.022	-23.674	49.929
14-Feb-06	Surprise Sink	1556	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.542	10.250	-21.549	51.080
14-Feb-06	Surprise Sink	1553	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.572	8.230	-17.681	49.890
30-May-06	Surprise Sink	1882	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.578	9.658	-20.343	46.894
14-Feb-06	Bone Pile	1497	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.581	9.100	-23.545	57.730
14-Feb-06	Surprise Sink	1553	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.643	8.370	-18.132	50.990
14-Feb-06	Surprise Sink	1554	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.722	7.660	-21.443	56.290
14-Feb-06	Surprise Sink	1551	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.800	11.500	-21.350	51.530
14-Feb-06	Surprise Sink	1558	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.893	8.520	-20.849	56.300
14-Feb-06	Bone Pile	1495	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.895	12.300	-22.284	52.770
30-May-06	Surprise Sink	1886	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.939	10.924	-21.572	44.986
14-Feb-06	Bone Pile	1499	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.013	8.900	-23.182	56.020
14-Feb-06	Surprise Sink	1557	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.083	9.420	-19.628	58.200
14-Feb-06	Surprise Sink	1560	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.308	9.550	-23.400	56.326
14-Feb-06	Bone Pile	1494	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.357	8.200	-23.873	61.300
14-Feb-06	Surprise Sink	1552	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.404	12.800	-21.707	49.910
14-Feb-06	Surprise Sink	1548	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.539	8.770	-23.439	35.670
14-Feb-06	Bone Pile	1494	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.596	8.580	-23.687	61.290

14-Feb-06	Surprise Sink	1550	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.657	10.900	-23.165	50.950
24-May-06	Slaughter Creek	1713	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.403	10.100	-22.119	56.010
24-May-06	Slaughter Creek	1712	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.563	9.060	-22.284	54.750
24-May-06	Slaughter Creek	1714	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.690	7.010	-22.545	52.470
14-Feb-06	Bone Pile	1501	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.053	10.580	-22.108	56.920
14-Feb-06	Bone Pile	1500	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.374	11.060	-23.404	57.700
14-Feb-06	Bone Pile	1502	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.787	10.640	-22.405	50.680
24-May-06	La Crosse	1681	Ceuthophilus (C.) species B	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.563	10.490	-23.085	52.110
28-Jul-05	Surprise Sink	1015	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.300	7.600	-23.330	45.440
28-Jul-05	Surprise Sink	1016	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	0.530	9.090	-24.570	51.970
28-Jul-05	Surprise Sink	1018	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.090	9.890	-24.890	52.560
28-Jul-05	Surprise Sink	1019	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.330	8.730	-25.850	48.110
28-Jul-05	Surprise Sink	1017	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.330	9.400	-25.080	57.190
28-Jul-05	Surprise Sink	1014	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.360	8.405	-24.885	52.745
28-Jul-05	Surprise Sink	1010	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.060	9.850	-24.620	52.020
28-Jul-05	Surprise Sink	1013	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.920	10.600	-24.390	52.980
28-Jul-05	Surprise Sink	1011	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.100	8.620	-24.680	54.200
28-Jul-05	Surprise Sink	1012	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.350	10.760	-26.140	49.870
17-Aug-05	Lost Oasis	1055	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.920	9.820	-25.300	51.430
17-Aug-05	Lost Oasis	1058	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.000	8.750	-26.130	50.380
17-Aug-05	Lost Oasis	1056	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.140	7.530	-25.710	35.410
17-Aug-05	Lost Oasis	1055	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.350	11.580	-24.860	50.600
17-Aug-05	Lost Oasis	1057	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.770	11.420	-23.940	46.380
17-Aug-05	Lost Oasis	1059	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.010	10.040	-25.520	46.860
26-Aug-05	La Crosse	1125	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.510	10.501	-26.660	53.323
17-Aug-05	Lost Oasis	1053	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.540	8.680	-25.120	50.970
17-Aug-05	Lost Oasis	1051	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.560	9.670	-24.300	47.320
26-Aug-05	La Crosse	1126	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.650	12.371	-24.440	49.997
17-Aug-05	Lost Oasis	1054	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.660	9.810	-24.480	42.430
17-Aug-05	Lost Oasis	1050	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.080	8.850	-25.230	48.070
17-Aug-05	Lost Oasis	1050	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.220	8.760	-25.480	49.600
17-Aug-05	Lost Oasis	1052	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.510	9.640	-24.260	42.400
23-Aug-05	Genesis	1083	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.130	9.573	-23.000	44.773
23-Aug-05	Genesis	1082	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	4.735	10.245	-24.545	46.494
24-May-06	La Crosse	1684	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.650	9.510	-23.231	51.590
24-May-06	La Crosse	1682	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.892	6.790	-24.604	45.950
24-May-06	La Crosse	1682	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	3.123	7.310	-24.377	45.500
24-May-06	La Crosse	1683	Ceuthphilus sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	5.812	12.180	-20.743	46.040
21-Nov-05	Genesis	1644	Ceuthophilus (C.) sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	1.917	9.750	-25.343	47.990
21-Nov-05	Genesis	1643	Ceuthophilus (C.) sp.	Cave Cricket	Rhaphidophoridae	Orthoptera	Organism	2.168	11.920	-23.851	48.500
16-Nov-05	Bone Pile	1343	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	0.480	5.160	-21.205	22.400
16-Nov-05	Bone Pile	1343	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	1.018	5.300	-21.990	23.820
30-May-06	Bone Pile	1819	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	1.576	5.810	-21.693	24.600
14-Feb-06	Bone Pile	1509	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	1.675	4.940	-22.019	22.590
16-Nov-05	Bone Pile	1339	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	1.785	4.080	-21.282	21.870
30-May-06	Bone Pile	1822	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.222	4.640	-22.090	25.450
16-Nov-05	Bone Pile	1342	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.225	5.320	-21.811	27.150
30-May-06	Bone Pile	1823	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.234	5.710	-21.824	26.360
14-Feb-06	Bone Pile	1508	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.416	5.060	-21.146	24.770
30-May-06	Bone Pile	1820	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.749	5.090	-21.827	25.020
14-Feb-06	Surprise Sink	1567	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.758	4.660	-20.648	20.570
16-Nov-05	Bone Pile	1341	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.883	5.020	-21.491	24.920
30-May-06	Bone Pile	1821	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.953	5.620	-21.307	25.580

16-Nov-05	Bone Pile	1340	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.966	4.240	-21.693	24.720
30-May-06	Bone Pile	1821	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	3.093	5.890	-21.764	27.600
16-Nov-05	Bone Pile	1344	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	3.196	4.490	-22.561	27.140
14-Feb-06	Bone Pile	1507	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	3.558	5.250	-22.117	27.320
14-Feb-06	Bone Pile	1506	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	3.683	7.230	-21.793	33.110
14-Feb-06	Bone Pile	1510	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	4.180	4.900	-23.035	29.250
16-Feb-06	Slaughter Creek	1585	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	1.297	3.990	-19.625	18.200
8-Nov-05	Lost Oasis	1280	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.450	5.775	-20.338	21.114
31-Aug-05	Slaughter Creek	1181	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.518	5.820	-20.766	28.500
26-Aug-05	La Crosse	1146	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.762	5.020	-18.789	20.800
8-Nov-05	Lost Oasis	1281	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.854	4.860	-20.390	20.817
16-Feb-06	Slaughter Creek	1586	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.895	4.870	-19.872	20.490
8-Nov-05	Lost Oasis	1282	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	3.154	3.910	-19.067	19.010
31-Aug-05	Slaughter Creek	1180	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	3.259	4.150	-19.895	23.550
8-Nov-05	Lost Oasis	1279	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	3.463	3.933	-22.544	21.611
24-May-06	Slaughter Creek	1745	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	3.927	3.380	-21.717	18.170
24-May-06	Slaughter Creek	1742	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	4.021	4.930	-20.430	23.620
8-Nov-05	Lost Oasis	1283	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	4.392	5.280	-19.662	
24-May-06	Slaughter Creek	1741	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	4.514	4.210	-20.630	24.270
26-Aug-05	La Crosse	1147	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	4.657	4.700	-19.374	20.762
24-May-06	Slaughter Creek	1743	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	4.794	4.040	-21.608	23.060
31-Aug-05	Slaughter Creek	1182	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	5.344	4.650	-19.930	27.620
28-Feb-06	Lost Oasis	1632	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	5.557	2.950	-19.911	16.860
31-Aug-05	Slaughter Creek	1183	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	7.203	4.900	-20.017	25.640
28-Feb-06	Lost Oasis	1629	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	7.271	4.770	-20.184	24.360
31-Aug-05	Slaughter Creek	1184	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	7.563	4.190	-16.885	22.450
16-Feb-06	Slaughter Creek	1584	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	7.792	4.420	-20.741	22.880
31-Aug-05	Slaughter Creek	1185	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	8.884	4.230	-18.000	20.820
28-Feb-06	Lost Oasis	1631	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism			-20.864	23.490
28-Feb-06	Lost Oasis	1630	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism			-20.830	22.610
24-May-06	Slaughter Creek	1744	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism			-21.322	26.530
25-May-06	Driskill	1783	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	2.586	4.430	-22.244	22.230
25-May-06	Academy	1772	Speodesmus sp.	Cave Milliped	Polydesmidae	Polydesmida	Organism	6.121	5.240	-21.242	25.290
23-Nov-05	La Crosse	1395	Pseudouroctonus reddelli	Scorpion	Vaejovidae	Scorpiones	Organism	6.665	11.720	-21.747	47.820
23-Nov-05	La Crosse	1396	Pseudouroctonus reddelli	Scorpion	Vaejovidae	Scorpiones	Organism	7.122	10.500	-21.685	47.610
23-Nov-05	La Crosse	1394	Pseudouroctonus reddelli	Scorpion	Vaejovidae	Scorpiones	Organism	9.448	11.460	-20.561	48.040
30-May-06	Surprise Sink	1851	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.133	3.030	-22.528	16.560
14-Feb-06	Surprise Sink	1533	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.189	2.500	-22.181	15.950
30-May-06	Surprise Sink	1848	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.195	3.080	-23.072	20.000
30-May-06	Bone Pile	1793	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.349	3.530	-24.665	32.420
14-Feb-06	Surprise Sink	1535	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.357	2.750	-22.588	18.170
14-Feb-06	Surprise Sink	1533	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.430	2.660	-22.139	16.980
14-Feb-06	Surprise Sink	1534	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.627	2.890	-23.160	26.250
30-May-06	Bone Pile	1790	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.660	3.270	-24.330	27.150
14-Feb-06	Bone Pile	1482	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.670	3.920	-21.968	25.820
14-Feb-06	Surprise Sink	1536	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.742	3.060	-23.276	21.710
16-Nov-05	Bone Pile	1336	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.759	3.620	-23.338	31.320
30-May-06	Surprise Sink	1851	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.788	3.200	-22.621	17.550
16-Nov-05	Bone Pile	1334	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.792	3.750	-23.138	24.020
30-May-06	Bone Pile	1792	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.862	3.880	-24.502	31.700
15-Nov-05	Surprise Sink	1294	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.945	3.350	-23.479	
15-Nov-05	Surprise Sink	1292	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.105	3.700	-23.399	
30-May-06	Surprise Sink	1849	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.125	3.540	-22.189	22.690
30-May-06	Bone Pile	1789	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.194	3.350	-24.690	29.390
30-May-06	Surprise Sink	1847	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.311	3.430	-22.642	20.690
30-May-06	Bone Pile	1791	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.404	3.470	-24.577	28.980
15-Nov-05	Surprise Sink	1293	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.561	3.070	-23.212	
16-Nov-05	Bone Pile	1333	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.579	3.920	-23.534	28.290
16-Nov-05	Bone Pile	1335	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.010	3.340	-23.691	28.420
16-Nov-05	Bone Pile	1335	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.011	3.830	-23.881	32.740

30-May-06	Surprise Sink	1850	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.074	3.780	-21.790	22.160
14-Feb-06	Bone Pile	1479	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.121	3.870	-23.628	31.700
14-Feb-06	Bone Pile	1480	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.765	3.800	-21.154	24.300
16-Nov-05	Bone Pile	1332	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.789	3.690	-22.987	25.760
14-Feb-06	Bone Pile	1481	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	6.073	4.060	-21.561	27.860
23-Aug-05	Bone Pile	1101	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism			-22.670	24.170
23-Aug-05	Bone Pile	1101	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism			-21.930	22.945
22-May-06	Lost Oasis	1652	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	2.845	4.040	-19.701	18.510
8-Nov-05	Lost Oasis	1269	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.125	3.155	-24.271	25.790
8-Nov-05	Lost Oasis	1270	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.525	3.669	-22.925	21.084
28-Feb-06	Lost Oasis	1611	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.564	3.470	-23.066	21.400
8-Nov-05	Lost Oasis	1268	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.677	3.783	-23.681	26.296
8-Nov-05	Lost Oasis	1271	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.741	3.679	-23.831	23.719
26-Aug-05	La Crosse	1121	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.940	3.324	-20.450	20.806
22-May-06	Lost Oasis	1650	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.030	2.990	-23.187	22.110
26-Aug-05	La Crosse	1120	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.230	4.099	-21.900	30.084
28-Feb-06	Lost Oasis	1615	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.312	4.320	-22.626	25.940
26-Aug-05	La Crosse	1122	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.320	3.184	-21.360	28.639
8-Nov-05	Lost Oasis	1267	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.388	4.010	-24.509	28.341
28-Feb-06	Lost Oasis	1614	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.511	3.610	-22.145	22.430
31-Aug-05	Slaughter Creek	1159	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.552	3.840	-24.193	29.490
22-May-06	Lost Oasis	1651	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.585	3.680	-22.951	24.760
31-Aug-05	Slaughter Creek	1160	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.622	4.210	-23.494	29.820
28-Feb-06	Lost Oasis	1613	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.705	3.520	-21.836	22.250
28-Feb-06	Lost Oasis	1612	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.727	3.130	-23.466	24.420
31-Aug-05	Slaughter Creek	1158	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.051	2.970	-22.954	21.810
31-Aug-05	Slaughter Creek	1161	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.150	3.660	-24.497	31.850
22-May-06	Lost Oasis	1653	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.155	3.540	-22.096	24.540
26-Aug-05	La Crosse	1123	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.790	4.010	-22.140	27.577
26-Aug-05	La Crosse	1124	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	6.060	3.335	-19.270	23.865
16-Feb-06	Slaughter Creek	1574	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	6.988	3.110	-23.461	24.450
21-Nov-05	Genesis	1355	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	2.870	3.120	-22.368	21.290
23-Aug-05	Genesis	1077	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.160	3.471	-22.860	26.089
14-Feb-06	Genesis	1521	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.181	2.440	-20.806	17.800
21-Nov-05	Genesis	1353	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	3.943	2.620	-20.571	18.380
21-Nov-05	Genesis	1353	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.025	2.820	-20.694	18.840
30-May-06	Genesis	1835	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.146	2.760	-23.944	27.100
23-Aug-05	Genesis	1079	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.330	3.721	-23.470	25.805
30-May-06	Genesis	1830	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.366	2.890	-22.066	19.600
14-Feb-06	Genesis	1520	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.536	2.910	-22.690	19.680
23-Aug-05	Genesis	1081	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.560	3.526	-23.320	27.663
21-Nov-05	Genesis	1356	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.569	3.620	-24.269	22.250
14-Feb-06	Genesis	1522	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.582	2.640	-21.835	20.090
30-May-06	Genesis	1832	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	4.719	2.750	-20.547	17.900
30-May-06	Genesis	1833	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.068	3.240	-21.899	26.860
14-Feb-06	Genesis	1519	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.152	2.670	-22.414	17.600
23-Aug-05	Genesis	1078	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.210	3.668	-21.680	22.458
23-Aug-05	Genesis	1080	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.350	4.095	-21.830	24.886
14-Feb-06	Genesis	1518	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.556	2.560	-21.488	17.080
30-May-06	Genesis	1831	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	5.685	2.660	-20.795	19.720
30-May-06	Genesis	1831	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	6.005	2.860	-21.086	20.930
21-Nov-05	Genesis	1354	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	6.067	3.010	-19.603	21.150
21-Nov-05	Genesis	1357	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	6.507	3.030	-23.733	28.160
29-Nov-05	Driskill	1405	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	6.806	3.900	-22.496	24.420
29-Nov-05	Driskill	1408	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	7.230	4.410	-22.891	27.190
29-Nov-05	Driskill	1406	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism	7.546	3.130	-22.925	21.610
29-Nov-05	Driskill	1407	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism			-22.316	17.760
29-Nov-05	Driskill	1407	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism			-21.862	17.190
14-Feb-06	Genesis	1518	Cambala sp.	Cave Milliped	Cambalidae	Spirostreptida	Organism			-21.305	15.330
28-Jul-05	Surprise Sink	1009	unidentified Diplopoda	Milliped	unidentified	unidentified	Organism	3.350	3.170	-24.220	29.300

					Diplopoda	Diplopoda					
28-Jul-05	Surprise Sink	1008	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism	3.350	3.490	-23.240	28.040
28-Jul-05	Surprise Sink	1005	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism	4.060	3.580	-23.940	26.830
28-Jul-05	Surprise Sink	1007	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism	4.060	3.940	-23.820	32.730
28-Jul-05	Surprise Sink	1006	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism	4.390	3.910	-23.490	29.200
17-Aug-05	Lost Oasis	1062	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism	1.510	5.322	-17.910	20.201
17-Aug-05	Lost Oasis	1063	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism	2.150	6.087	-21.370	25.013
17-Aug-05	Lost Oasis	1060	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism	2.340	5.734	-19.660	22.273
17-Aug-05	Lost Oasis	1064	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism	2.520	5.378	-20.025	22.889
17-Aug-05	Lost Oasis	1044	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism	2.800	4.410	-22.570	22.660
17-Aug-05	Lost Oasis	1041	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism	2.940	4.290	-23.600	26.890
17-Aug-05	Lost Oasis	1061	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism	5.140	5.083	-19.600	22.858
17-Aug-05	Lost Oasis	1042	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism			-24.630	27.740
17-Aug-05	Lost Oasis	1040	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism			-23.680	25.300
17-Aug-05	Lost Oasis	1043	unidentified Diplopoda	Milliped	unidentified Diplopoda	unidentified Diplopoda	Organism			-23.610	26.230
30-May-06	Bone Pile	1824	Texoreddellia sp.	Bristletail	Nicoletiidae	Zygentoma	Organism	4.526	8.970	-22.876	44.000
23-Aug-05	Bone Pile	1096	Eupatorium ?	Boneset ?	Asteraceae ?	Asterale	Leaves	-1.034	2.284	-32.150	44.082
15-May-06	Blowing Sink	1924	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	-0.409	1.273	-12.964	35.936
31-Aug-05	Blowing Sink	1201	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	-0.150	1.458	-13.581	37.980
15-Nov-05	Surprise Sink	1321	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	0.612	0.614	-10.702	30.930
30-May-06	Bone Pile	1786	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	1.868	1.725	-14.501	38.030
6-Nov-05	Blowing Sink	1266	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	2.348	0.863	-12.487	37.259
30-May-06	Surprise Sink	1844	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	2.427	0.876	-9.979	35.330
14-Feb-06	Surprise Sink	1572	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	3.713	0.623	-12.305	37.350
14-Feb-06	Bone Pile	1514	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	4.833	0.963	-11.857	38.640
2-Feb-06	Blowing Sink	1477	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes			-13.444	37.460
16-Nov-05	Bone Pile	1346	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes			-12.247	37.760
28-Jul-05	Surprise Sink	1003	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladode			-12.670	34.980
28-Feb-06	Lost Oasis	1637	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	-0.941	0.690	-12.195	36.850
22-May-06	Lost Oasis	1647	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	-0.477		-12.352	36.610
8-Nov-05	Lost Oasis	1289	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	0.330	0.548	-12.941	
16-Feb-06	Slaughter Creek	1590	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	0.361	1.045	-11.976	31.605
23-Feb-06	La Crosse	1603	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	1.878	0.706	-12.889	36.310
24-May-06	La Crosse	1679	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes			-12.445	43.270

23-Nov-05	La Crosse	1403	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes			-11.283	39.940
17-Aug-05	Lost Oasis	1038	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes			-13.290	35.620
29-Nov-05	Slaughter Creek	1424	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes			-12.357	34.870
24-May-06	Slaughter Creek	1708	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes			-11.050	41.290
30-May-06	Genesis	1827	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	1.900	0.744	-11.320	36.120
23-Aug-05	Genesis	1074	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes & Fruit	2.365	0.926	-12.555	38.337
25-May-06	Driskill	1777	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Leaves	2.993	0.662	-11.057	35.600
23-Feb-06	Driskill	1596	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	3.341		-11.274	30.430
14-Feb-06	Genesis	1529	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	3.472	1.125	-12.949	37.135
31-Aug-05	Driskill	1226	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	3.944	1.523	-11.461	32.540
29-Nov-05	Driskill	1413	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes	5.139	1.349	-10.926	29.140
21-Nov-05	Genesis	1369	Opuntia cf. phaecantha Engelm.	Engelmann's Prickly-Pear	Cactaceae	Caryophyllales	Cladodes & fruit			-12.293	36.460
29-Nov-05	Driskill	1414	Ilex decidua Walter	Possumhaw	Aquifoliaceae	Celastrales	Leaves	0.685	0.951	-29.235	45.720
2-Feb-06	Blowing Sink	1478	Ilex vomitoria Sol.	Yaupon	Aquifoliaceae	Celastrales	Leaves	-0.360	2.399	-30.713	48.130
16-Feb-06	Slaughter Creek	1588	Ilex vomitoria Sol.	Yaupon	Aquifoliaceae	Celastrales	Leaves	-0.715	1.542	-30.058	46.852
24-May-06	Slaughter Creek	1711	Ilex vomitoria Sol.	Yaupon	Aquifoliaceae	Celastrales	Leaves	-0.241	1.557	-27.948	55.915
29-Nov-05	Slaughter Creek	1425	Ilex vomitoria Sol.	Yaupon	Aquifoliaceae	Celastrales	Leaves			-29.470	49.160
14-Feb-06	Bone Pile	1511	Garrya ovata Benth. subsp. lindheimeri (Torr.) Dahling	Lindheimer's Silktassel	Garryaceae	Cornales	Leaves	1.130	1.303	-28.846	48.480
14-Feb-06	Surprise Sink	1570	Carex planostachys Kuntze	Cedar sedge	Cyperaceae	Cyperales	Leaves	2.233	1.258	-29.853	45.670
15-Nov-05	Surprise Sink	1318	Carex planostachys Kuntze	Cedar sedge	Cyperaceae	Cyperales	Leaves			-27.082	
31-Aug-05	Slaughter Creek	1155	Carex planostachys Kuntze	Cedar sedge	Cyperaceae	Cyperales	Leaves	0.409	1.244	-28.030	45.830
16-Feb-06	Slaughter Creek	1589	Carex planostachys Kuntze	Cedar sedge	Cyperaceae	Cyperales	Leaves	0.436	1.311	-31.737	40.650
23-Feb-06	La Crosse	1602	Carex planostachys Kuntze	Cedar sedge	Cyperaceae	Cyperales	Leaves	2.224		-31.754	40.200
14-Feb-06	Genesis	1528	Carex planostachys Kuntze	Cedar sedge	Cyperaceae	Cyperales	Leaves			-29.283	43.550
24-May-06	La Crosse	1677	Bouteloua rigidiseta (Steud.) A.S. Hitchc.	Texas Grama	Poaceae	Cyperales	Leaves			-29.099	44.900
25-May-06	Academy	1754	Bromus catharticus Vahl	Rescue Grass	Poaceae	Cyperales	Leaves	2.741	1.995	-29.167	42.750
6-Nov-05	Blowing Sink	1264	Nassella leucotricha (Trin. & Rupr.) Barkworth	Texas Winter Grass	Poaceae	Cyperales	Leaves	0.284	0.980	-27.586	41.325
31-Aug-05	Blowing Sink	1199	Nassella leucotricha (Trin. & Rupr.) Barkworth	Texas Winter Grass	Poaceae	Cyperales	Leaves	1.226	1.206	-31.197	42.640
2-Feb-06	Blowing Sink	1475	Nassella leucotricha (Trin. & Rupr.) Barkworth	Texas Winter Grass	Poaceae	Cyperales	Leaves			-28.912	42.100
23-Nov-05	La Crosse	1401	Nassella leucotricha (Trin. & Rupr.) Barkworth	Texas Winter Grass	Poaceae	Cyperales	Leaves			-30.866	42.080
28-Feb-06	Lost Oasis	1635	Nassella leucotricha (Trin. & Rupr.) Barkworth	Texas Winter Grass	Poaceae	Cyperales	Leaves			-29.186	43.800
29-Nov-05	Driskill	1411	Panicum cf. aciculare Desv. ex Poir.	Needleleaf Rosette Grass	Poaceae	Cyperales	Leaves			-28.289	43.720
14-Feb-06	Bone Pile	1512	unidentified Poaceae	Unknown grass	Poaceae	Cyperales	Leaves	0.635	1.629	-27.028	44.240
24-May-06	Slaughter Creek	1709	Bothriochloa ischaemum (L.) Keng var. songarica (Rupr. ex Fisch. & C.A. Mey.) Celarier & Harlan	King Ranch Bluestem	Poaceae	Cyperales	Leaves			-11.972	46.900

21-Nov-05	Genesis	1367	cf. Bothriochloa ischaemum (L.) Keng	King Ranch Bluestem	Poaceae	Cyperales	Leaves			-12.554	39.740
25-May-06	Driskill	1774	Bouteloua curtipendula (Michx.) Torr.	Side-oats Grama	Poaceae	Cyperales	Leaves	1.071	1.656	-14.454	42.440
28-Jul-05	Surprise Sink	1002	cf. Eragrostis	Love Grass?	Poaceae	Cyperales	Grass Blades	-0.651	1.215	-12.640	39.060
26-Aug-05	La Crosse	1150	cf. Eragrostis	Love Grass?	Poaceae	Cyperales	Leaves	2.166	1.608	-13.033	44.800
23-Feb-06	Driskill	1593	cf. Eragrostis	Love Grass?	Poaceae	Cyperales	Leaves	2.894		-12.736	40.950
23-Aug-05	Genesis	1071	cf. Eragrostis	Love Grass?	Poaceae	Cyperales	Leaves	3.036	1.558	-14.350	41.905
30-Nov-05	Academy	1431	Cynodon dactylon (L.) Pers.	Bermuda Grass	Poaceae	Cyperales	Leaves			-14.890	42.520
8-Nov-05	Lost Oasis	1285	Buchloe dactyloides (Nutt.) Engelm.	Buffalo Grass	Poaceae	Cyperales	Leaves	-0.317	1.155	-14.331	
16-Nov-05	Bone Pile	1345	Eragrostis intermedia Hitchc.	Plains Love Grass	Poaceae	Cyperales	Leaves	0.326	1.375	-14.031	43.250
30-May-06	Bone Pile	1785	unidentified, grass-like C3 plant	unidentified, grass-like C3 plant	unidentified, grass-like C3 plant	Cyperales	Leaves	1.794	2.805	-30.236	44.320
30-May-06	Surprise Sink	1843	unidentified, grass-like C3 plant	unidentified, grass-like C3 plant	unidentified, grass-like C3 plant	Cyperales	Leaves	2.143	1.414	-27.624	37.460
31-Aug-05	Driskill	1224	unidentified, grass-like C3 plant	unidentified, grass-like C3 plant	unidentified, grass-like C3 plant	Cyperales	Leaves	-0.946	0.786	-31.908	37.075
31-Aug-05	Driskill	1225	unidentified, grass-like C3 plant	unidentified, grass-like C3 plant	unidentified, grass-like C3 plant	Cyperales	Leaves	0.112	1.310	-31.970	37.580
30-May-06	Genesis	1825	unidentified, grass-like C4 plant	unidentified, grass-like C4 plant	unidentified, grass-like C4 plant	Cyperales	Leaves	0.962	1.539	-13.612	43.100
30-May-06	Surprise Sink	1845	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	-0.347	1.915	-28.177	44.850
15-Nov-05	Bone Pile	1323	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	-0.069	1.536	-28.857	46.330
15-Nov-05	Surprise Sink	1320	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	0.061	1.516	-28.950	46.550
14-Feb-06	Surprise Sink	1573	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	0.499	1.377	-27.937	48.770
2-Feb-06	Blowing Sink	1476	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves			-29.375	40.960
2-Feb-06	Blowing Sink	1476	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves			-29.014	41.070
31-Aug-05	Slaughter Creek	1156	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	-0.896	1.648	-28.644	48.155
23-Feb-06	La Crosse	1605	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	-0.246	1.416	-30.003	45.190
24-May-06	Slaughter Creek	1710	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	0.289	1.796	-27.727	50.230
8-Nov-05	Lost Oasis	1288	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	0.731	1.369	-29.474	
22-May-06	Lost Oasis	1649	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	1.348		-29.135	49.620
26-Aug-05	La Crosse	1152	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	1.420	1.763	-30.241	47.320
23-Nov-05	La Crosse	1404	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves			-29.392	46.500
24-May-06	La Crosse	1680	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves			-28.700	47.320
16-Feb-06	Slaughter Creek	1591	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves			-30.013	44.140
21-Nov-05	Genesis	1370	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	0.269	1.440	-27.669	44.800
23-Aug-05	Genesis	1073	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	0.453	1.999	-27.810	46.037
14-Feb-06	Genesis	1531	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	0.587	1.558	-27.466	48.760
30-May-06	Genesis	1829	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	0.950	2.266	-27.165	45.260
23-Feb-06	Driskill	1597	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	2.747		-28.377	45.190

25-May-06	Academy	1756	Diospyros texana Scheele	Texas Persimmon	Ebenaceae	Ebenales	Leaves	2.857	2.294	-25.532	43.090
30-May-06	Bone Pile	1788	Cercis canadensis L. var. texensis (S. Wats.) M. Hopkins	Texas Redbud	Fabaceae	Fabales	Leaves	0.420	1.657	-28.946	47.010
23-Aug-05	Bone Pile	1098	Cercis canadensis L. var. texensis (S. Wats.) M. Hopkins	Texas Redbud	Fabaceae	Fabales	Leaves	1.217	1.747	-31.880	46.410
15-Nov-05	Bone Pile	1324	Cercis canadensis L. var. texensis (S. Wats.) M. Hopkins	Texas Redbud	Fabaceae	Fabales	Leaves			-30.689	45.010
14-Feb-06	Surprise Sink	1571	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves	-0.885	1.393	-27.466	50.465
28-Jul-05	Surprise Sink	1000	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves	0.190	2.184	-27.490	43.880
29-Nov-05	Slaughter Creek	1423	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves	-0.440	1.982	-29.149	49.100
22-May-06	Lost Oasis	1648	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves	0.220		-27.930	48.070
8-Nov-05	Lost Oasis	1287	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves	0.227	1.431	-29.010	
23-Feb-06	La Crosse	1604	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves	0.278	1.248	-28.753	44.860
28-Feb-06	Lost Oasis	1638	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves	0.304	1.610	-29.209	48.670
23-Nov-05	La Crosse	1402	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves			-30.939	47.920
17-Aug-05	Lost Oasis	1037	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves			-29.550	46.000
14-Feb-06	Genesis	1530	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves	0.330	1.087	-28.033	48.100
23-Feb-06	Driskill	1595	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves	1.588		-27.651	46.000
30-May-06	Genesis	1828	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves	1.608	1.352	-24.110	48.340
21-Nov-05	Genesis	1368	Quercus fusiformis Small	Plateau Live Oak	Fagaceae	Fagales	Leaves			-27.099	45.880
30-May-06	Bone Pile	1787	Quercus shumardii Buckley	Shumard's Oak	Fagaceae	Fagales	Leaves	0.467	1.967	-28.307	47.770
23-Aug-05	Bone Pile	1099	Quercus shumardii Buckley	Shumard's Oak	Fagaceae	Fagales	Leaves	1.632	1.607	-30.230	48.973
15-Nov-05	Bone Pile	1325	Quercus shumardii Buckley	Shumard's Oak	Fagaceae	Fagales	Leaves			-30.034	48.030
23-Aug-05	Bone Pile	1095	Smilax bona-nox L.	Saw Greenbrier	Smilacaceae	Liliales	Leaves	1.311	1.971	-30.730	46.183
26-Aug-05	La Crosse	1151	Smilax bona-nox L.	Saw Greenbrier	Smilacaceae	Liliales	Leaves	1.512	1.729	-26.891	48.350
17-Aug-05	Lost Oasis	1039	Smilax bona-nox L.	Saw Greenbrier	Smilacaceae	Liliales	Leaves			-33.400	45.970
28-Jul-05	Surprise Sink	1001	Juniperus ashei J. Buchholz	Ashe's juniper	Cupressaceae	Pinales	Leaves	-0.651	1.215	-26.860	41.870
15-Nov-05	Surprise Sink	1317	Juniperus ashei J. Buchholz	Ashe's juniper	Cupressaceae	Pinales	Leaves	-0.436	0.963	-25.968	
14-Feb-06	Bone Pile	1513	Juniperus ashei J. Buchholz	Ashe's juniper	Cupressaceae	Pinales	Leaves	-0.062	0.997	-27.597	48.990
2-Feb-06	Blowing Sink	1474	Juniperus ashei J. Buchholz	Ashe's juniper	Cupressaceae	Pinales	Leaves			-26.807	46.630
31-Aug-05	Slaughter Creek	1153	Juniperus ashei J. Buchholz	Ashe's juniper	Cupressaceae	Pinales	Leaves	0.113	0.982	-28.657	50.300
31-Aug-05	Driskill	1221	Juniperus ashei J. Buchholz	Ashe's juniper	Cupressaceae	Pinales	Leaves	-0.119	1.151	-29.267	34.800
29-Nov-05	Driskill	1410	Juniperus ashei J. Buchholz	Ashe's juniper	Cupressaceae	Pinales	Leaves			-26.516	48.900
14-Feb-06	Surprise Sink	1569	Berberis trifoliolata Moric.	Algarita	Berberidaceae	Ranunculales	Leaves	-0.558	1.244	-26.703	50.830
23-Feb-06	La Crosse	1601	Berberis trifoliolata Moric.	Algarita	Berberidaceae	Ranunculales	Leaves	-0.040		-29.619	48.120
16-Feb-06	Slaughter Creek	1587	Berberis trifoliolata Moric.	Algarita	Berberidaceae	Ranunculales	Leaves	0.231	1.683	-30.463	43.610
26-Aug-05	La Crosse	1148	Berberis trifoliolata Moric.	Algarita	Berberidaceae	Ranunculales	Leaves	0.831	1.654	-28.821	49.330
28-Feb-06	Lost Oasis	1634	Berberis trifoliolata Moric.	Algarita	Berberidaceae	Ranunculales	Leaves	1.903	1.652	-27.390	41.400
14-Feb-06	Genesis	1527	Berberis trifoliolata Moric.	Algarita	Berberidaceae	Ranunculales	Leaves	-0.629	1.610	-26.859	48.470
28-Feb-06	Academy	1607	Berberis trifoliolata Moric.	Algarita	Berberidaceae	Ranunculales	Leaves	3.899	1.747	-27.290	46.360
30-May-06	Bone Pile	1784	Prunus sp	Cherry	Rosaceae	Rosales	Leaves		1.605	-26.788	49.335
23-Aug-05	Bone Pile	1097	Ungnadia speciosa Endl.	Mexican-Buckeye	Sapindaceae	Sapindales	Leaves	0.606	2.006	-29.030	47.018
28-Jul-05	Surprise Sink	1004	Forestiera pubescens Nutt. var. pubescens	Spring-Herald, Elbow-Bush, Stretchberry	Oleaceae	Scrophulariales	Leaves	-0.500	1.315	-24.840	46.105
30-May-06	Surprise Sink	1842	Forestiera pubescens Nutt. var. pubescens	Spring-Herald, Elbow-Bush, Stretchberry	Oleaceae	Scrophulariales	Leaves	-0.370	1.895	-27.451	44.710
15-May-06	Blowing Sink	1925	Forestiera pubescens Nutt. var. pubescens	Spring-Herald, Elbow-Bush, Stretchberry	Oleaceae	Scrophulariales	Leaves	0.594	2.139	-30.470	41.782
6-Nov-05	Blowing Sink	1263	Forestiera pubescens	Spring-Herald, Elbow-	Oleaceae	Scrophulariales	Leaves	1.937	1.315	-30.801	41.408

			Nutt. var. pubescens	Bush, Stretchberry							
31-Aug-05	Blowing Sink	1198	Forestiera pubescens Nutt. var. pubescens	Spring-Herald, Elbow-Bush, Stretchberry	Oleaceae	Scrophulariales	Leaves	2.544	1.758	-28.985	49.440
31-Aug-05	Driskill	1223	Forestiera pubescens Nutt. var. pubescens	Spring-Herald, Elbow-Bush, Stretchberry	Oleaceae	Scrophulariales	Leaves	0.017	1.796	-27.702	47.440
25-May-06	Driskill	1776	Ligustrum japonicum Thunb.	Japanese Privet	Oleaceae	Scrophulariales	Leaves	0.129	2.124	-27.612	47.700
23-Feb-06	Driskill	1594	Ligustrum japonicum Thunb.	Japanese Privet	Oleaceae	Scrophulariales	Leaves	0.163		-28.735	41.820
26-Aug-05	Academy	1189	Ligustrum japonicum Thunb.	Japanese Privet	Oleaceae	Scrophulariales	Leaves	3.001	2.070	-29.401	42.950
28-Feb-06	Academy	1608	Ligustrum japonicum Thunb.	Japanese Privet	Oleaceae	Scrophulariales	Leaves	4.157	2.442	-27.383	41.635
29-Nov-05	Driskill	1412	Ligustrum japonicum Thunb.	Japanese Privet	Oleaceae	Scrophulariales	Leaves			-27.445	45.570
25-May-06	Academy	1753	Capsicum annuum L. var. glabriusculum (Dunal) Heiser & Pickersgill	Chilitepin, Chile Piquin, Bird Pepper	Solanaceae	Solanales	Leaves	3.948	5.278	-26.641	43.950
26-Aug-05	Academy	1186	Capsicum annuum L. var. glabriusculum (Dunal) Heiser & Pickersgill	Chilitepin, Chile Piquin, Bird Pepper	Solanaceae	Solanales	Leaves	4.325	2.708	-27.183	49.275
30-Nov-05	Academy	1430	Capsicum annuum L. var. glabriusculum (Dunal) Heiser & Pickersgill	Chilitepin, Chile Piquin, Bird Pepper	Solanaceae	Solanales	Leaves			-28.246	42.360
15-Nov-05	Surprise Sink	1319	Celtis laevigata Willd. var. reticulata (Torr.) L. Benson	Netleaf Hackberry	Ulmaceae	Urticales	Leaves	-0.967	0.905	-27.927	
31-Aug-05	Blowing Sink	1200	Celtis laevigata Willd. var. reticulata (Torr.) L. Benson	Netleaf Hackberry	Ulmaceae	Urticales	Leaves	-0.337	2.197	-28.378	40.320
6-Nov-05	Blowing Sink	1265	Celtis laevigata Willd. var. reticulata (Torr.) L. Benson	Netleaf Hackberry	Ulmaceae	Urticales	Leaves	0.360	1.434	-28.632	38.441
15-May-06	Blowing Sink	1922	Celtis laevigata Willd. var. reticulata (Torr.) L. Benson	Netleaf Hackberry	Ulmaceae	Urticales	Leaves	0.477	2.423	-29.242	37.081
22-May-06	Lost Oasis	1646	Celtis laevigata Willd. var. reticulata (Torr.) L. Benson	Netleaf Hackberry	Ulmaceae	Urticales	Leaves	0.251	2.200	-31.010	40.140
8-Nov-05	Lost Oasis	1286	Celtis laevigata Willd. var. reticulata (Torr.) L. Benson	Netleaf Hackberry	Ulmaceae	Urticales	Leaves	3.108	1.135	-26.110	
17-Aug-05	Lost Oasis	1036	Celtis laevigata Willd. var. reticulata (Torr.) L. Benson	Netleaf Hackberry	Ulmaceae	Urticales	Leaves			-27.050	36.440
23-Aug-05	Genesis	1072	Celtis laevigata Willd. var. reticulata (Torr.) L. Benson	Netleaf Hackberry	Ulmaceae	Urticales	Leaves	-0.640	1.565	-26.440	45.097
30-May-06	Genesis	1826	Celtis laevigata Willd. var. reticulata (Torr.) L. Benson	Netleaf Hackberry	Ulmaceae	Urticales	Leaves	1.278	2.043	-25.044	44.600
25-May-06	Driskill	1775	Celtis laevigata Willd. var. reticulata (Torr.) L. Benson	Netleaf Hackberry	Ulmaceae	Urticales	Leaves	1.450	1.964	-26.645	42.180
21-Nov-05	Genesis	1366	Celtis laevigata Willd. var. reticulata (Torr.) L. Benson	Netleaf Hackberry	Ulmaceae	Urticales	Leaves			-26.751	42.770
24-May-06	La Crosse	1678	Celtis laevigata Willd. var. texana (Scheele) Sarg.	Texas Sugarberry	Ulmaceae	Urticales	Leaves			-29.897	40.830
25-May-06	Academy	1755	Celtis laevigata Willd. var. texana (Scheele) Sarg.	Texas Sugarberry	Ulmaceae	Urticales	Leaves	2.886	2.018	-27.767	41.740
30-Nov-05	Academy	1432	Celtis laevigata Willd. var. texana (Scheele) Sarg.	Texas Sugarberry	Ulmaceae	Urticales	Leaves			-28.740	36.750
15-May-06	Blowing Sink	1923	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves	-0.187	2.595	-28.225	38.024
6-Nov-05	Blowing Sink	1262	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves	0.292	1.616	-26.527	43.209

31-Aug-05	Blowing Sink	1197	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves	0.350	2.372	-28.585	45.660
30-May-06	Surprise Sink	1841	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves	0.547	2.187	-27.151	43.350
29-Nov-05	Slaughter Creek	1421	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves	-1.315	0.935	-29.448	39.720
31-Aug-05	Slaughter Creek	1154	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves	0.339	1.545	-27.799	47.280
26-Aug-05	La Crosse	1149	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves	0.905	1.686	-30.205	45.770
23-Nov-05	La Crosse	1400	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves			-30.476	45.500
22-May-06	La Crosse	1676	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves			-29.732	44.940
24-May-06	Slaughter Creek	1707	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves			-26.312	48.100
31-Aug-05	Driskill	1222	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves	0.551	1.594	-28.228	42.740
25-May-06	Driskill	1773	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves	0.696	1.772	-28.542	42.600
25-May-06	Academy	1752	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves	4.567	1.790	-26.699	47.070
30-Nov-05	Academy	1429	Ulmus crassifolia Nutt.	Cedar Elm	Ulmaceae	Urticales	Leaves			-28.719	42.300