



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

**Request for
 Quotation**

RFQ NUMBER
DNR80051

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF
BUYER 32 304-558-0492

RFQ COPY
 TYPE NAME/ADDRESS HERE

VENDOR

Zara Environmental LLC
 118 W Goforth Rd.
 Buda, Texas 78610

SHIP TO

DIVISION OF NATURAL RESOURCES
 PROCUREMENT OFFICE
 CAPITOL COMPLEX
 BUILDING 3, ROOM 630
 CHARLESTON, WV
 25305 304-558-3397

DATE PRINTED	TERMS OF SALE	SHIP VIA	FOB	FREIGHT TERMS
10/10/2006				
BID OPENING DATE: 10/26/2006		BID OPENING TIME 01:30PM		

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
REQUEST FOR QUOTATION						
THE PURCHASING DIVISION IS SOLICITING BIDS FOR THE DEPARTMENT OF NATURAL RESOURCES TO PROVIDE SIXTY (60) WEST VIRGINIA CAVE SURVEYS PER THE SPECIFICATIONS.						
ATTACHMENTS:						
1. SPECIFICATIONS						
2. AFFIDAVIT						
WORK IS TO BE COMPLETED UPON TWELVE (12) MONTHS OF AWARD.						
NOTE: AGREEMENT OPTION TO RENEW FOR ADDITIONAL TWO (2) TWELVE MONTH PERIODS.						
QUESTION PERIOD:						
QUESTIONS SHOULD BE DIRECTED TO:						
MR. CRAIG STIHLE						
WVDNR						
P.O. BOX 67						
ELKINS, WV 26241						
QUESTIONS DEADLINE: OCTOBER 23, 2006, 12:00 NOON						
0001	1	LS		968-77		
CONDUCT 60 WEST VIRGINIA CAVE SURVEYS						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE
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EXHIBIT 3						
LIFE OF CONTRACT: THIS CONTRACT BECOMES EFFECTIVE ON AND EXTENDS FOR A PERIOD OF ONE (1) YEAR OR UNTIL SUCH "REASONABLE TIME" THEREAFTER AS IS NECESSARY TO OBTAIN A NEW CONTRACT OR RENEW THE ORIGINAL CONTRACT. THE "REASONABLE TIME" PERIOD SHALL NOT EXCEED TWELVE (12) MONTHS. DURING THIS "REASONABLE TIME" THE VENDOR MAY TERMINATE THIS CONTRACT FOR ANY REASON UPON GIVING THE DIRECTOR OF PURCHASING 30 DAYS WRITTEN NOTICE.						
UNLESS SPECIFIC PROVISIONS ARE STIPULATED ELSEWHERE IN THIS CONTRACT DOCUMENT, THE TERMS, CONDITIONS AND PRICING SET HEREIN ARE FIRM FOR THE LIFE OF THE CONTRACT.						
RENEWAL: THIS CONTRACT MAY BE RENEWED UPON THE MUTUAL WRITTEN CONSENT OF THE SPENDING UNIT AND VENDOR, SUBMITTED TO THE DIRECTOR OF PURCHASING THIRTY (30) DAYS PRIOR TO THE EXPIRATION DATE. SUCH RENEWAL SHALL BE IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE ORIGINAL CONTRACT AND SHALL BE LIMITED TO TWO (2) ONE (1) YEAR PERIODS.						
CANCELLATION: THE DIRECTOR OF PURCHASING RESERVES THE RIGHT TO CANCEL THIS CONTRACT IMMEDIATELY UPON WRITTEN NOTICE TO THE VENDOR IF THE COMMODITIES AND/OR SERVICES SUPPLIED ARE OF AN INFERIOR QUALITY OR DO NOT CONFORM TO THE SPECIFICATIONS OF THE BID AND CONTRACT HEREIN.						
OPEN MARKET CLAUSE: THE DIRECTOR OF PURCHASING MAY AUTHORIZE A SPENDING UNIT TO PURCHASE ON THE OPEN MARKET, WITHOUT THE FILING OF A REQUISITION OR COST ESTIMATE, ITEMS SPECIFIED ON THIS CONTRACT FOR IMMEDIATE DELIVERY IN EMERGENCIES DUE TO UNFORESEEN						

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<p>CAUSES (INCLUDING BUT NOT LIMITED TO DELAYS IN TRANSPORTATION OR AN UNANTICIPATED INCREASE IN THE VOLUME OF WORK.)</p> <p>QUANTITIES: QUANTITIES LISTED IN THE REQUISITION ARE APPROXIMATIONS ONLY, BASED ON ESTIMATES SUPPLIED BY THE STATE SPENDING UNIT. IT IS UNDERSTOOD AND AGREED THAT THE CONTRACT SHALL COVER THE QUANTITIES ACTUALLY ORDERED FOR DELIVERY DURING THE TERM OF THE CONTRACT, WHETHER MORE OR LESS THAN THE QUANTITIES SHOWN.</p> <p>ORDERING PROCEDURE: SPENDING UNIT(S) SHALL ISSUE A WRITTEN STATE CONTRACT ORDER (FORM NUMBER WV-39) TO THE VENDOR FOR COMMODITIES COVERED BY THIS CONTRACT. THE ORIGINAL COPY OF THE WV-39 SHALL BE MAILED TO THE VENDOR AS AUTHORIZATION FOR SHIPMENT, A SECOND COPY MAILED TO THE PURCHASING DIVISION, AND A THIRD COPY RETAINED BY THE SPENDING UNIT.</p> <p>BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THIS CONTRACT IS AUTOMATICALLY NULL AND VOID, AND IS TERMINATED WITHOUT FURTHER ORDER.</p> <p>THE TERMS AND CONDITIONS CONTAINED IN THIS CONTRACT SHALL SUPERSEDE ANY AND ALL SUBSEQUENT TERMS AND CONDITIONS WHICH MAY APPEAR ON ANY ATTACHED PRINTED DOCUMENTS SUCH AS PRICE LISTS, ORDER FORMS, SALES AGREEMENTS OR MAINTENANCE AGREEMENTS, INCLUDING ANY ELECTRONIC MEDIUM SUCH AS CD-ROM.</p> <p>REV. 04/11/2001</p> <p>VENDOR PREFERENCE CERTIFICATE</p> <p>CERTIFICATION AND APPLICATION* IS HEREBY MADE FOR</p>						

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<p>PREFERENCE IN ACCORDANCE WITH WEST VIRGINIA CODE, 5A-3-37 (DOES NOT APPLY TO CONSTRUCTION CONTRACTS).</p> <p>A. APPLICATION IS MADE FOR 2.5% PREFERENCE FOR THE REASON CHECKED:</p> <p>() BIDDER IS AN INDIVIDUAL RESIDENT VENDOR AND HAS RESIDED CONTINUOUSLY IN WEST VIRGINIA FOR FOUR (4) YEARS IMMEDIATELY PRECEDING THE DATE OF THIS CERTIFICATION; OR</p> <p>() BIDDER IS A PARTNERSHIP, ASSOCIATION OR CORPORATION RESIDENT VENDOR AND HAS MAINTAINED ITS HEAD-QUARTERS OR PRINCIPAL PLACE OF BUSINESS CONTINUOUSLY IN WEST VIRGINIA FOR FOUR (4) YEARS IMMEDIATELY PRECEDING THE DATE OF THIS CERTIFICATION; OR 80% OF THE OWNERSHIP INTEREST OF BIDDER IS HELD BY ANOTHER INDIVIDUAL, PARTNERSHIP, ASSOCIATION OR CORPORATION RESIDENT VENDOR WHO HAS MAINTAINED ITS HEADQUARTERS OR PRINCIPAL PLACE OF BUSINESS CONTINUOUSLY IN WEST VIRGINIA FOR FOUR (4) YEARS IMMEDIATELY PRECEDING THE DATE OF THIS CERTIFICATION; OR</p> <p>() BIDDER IS A CORPORATION NONRESIDENT VENDOR WHICH HAS AN AFFILIATE OR SUBSIDIARY WHICH EMPLOYS A MINIMUM OF ONE HUNDRED STATE RESIDENTS AND WHICH HAS MAINTAINED ITS HEADQUARTERS OR PRINCIPAL PLACE OF BUSINESS WITHIN WEST VIRGINIA CONTINUOUSLY FOR THE FOUR (4) YEARS IMMEDIATELY PRECEDING THE DATE OF THIS CERTIFICATION.</p> <p>B. APPLICATION IS MADE FOR 2.5% PREFERENCE FOR THE REASON CHECKED:</p> <p>() BIDDER IS A RESIDENT VENDOR WHO CERTIFIES THAT, DURING THE LIFE OF THE CONTRACT, ON AVERAGE AT LEAST</p>						

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<p>75% OF THE EMPLOYEES WORKING ON THE PROJECT BEING BID ARE RESIDENTS OF WEST VIRGINIA WHO HAVE RESIDED IN THE STATE CONTINUOUSLY FOR THE TWO YEARS IMMEDIATELY PRECEDING SUBMISSION OF THIS BID; OR () BIDDER IS A NONRESIDENT VENDOR EMPLOYING A MINIMUM OF ONE HUNDRED STATE RESIDENTS OR IS A NONRESIDENT VENDOR WITH AN AFFILIATE OR SUBSIDIARY WHICH MAINTAINS ITS HEADQUARTERS OR PRINCIPAL PLACE OF BUSINESS WITHIN WEST VIRGINIA EMPLOYING A MINIMUM OF ONE HUNDRED STATE RESIDENTS WHO CERTIFIES THAT, DURING THE LIFE OF THE CONTRACT, ON AVERAGE AT LEAST 75% OF THE EMPLOYEES OR BIDDERS' AFFILIATE'S OR SUBSIDIARY'S EMPLOYEES ARE RESIDENTS OF WEST VIRGINIA WHO HAVE RESIDED IN THE STATE CONTINUOUSLY FOR THE TWO YEARS IMMEDIATELY PRECEDING SUBMISSION OF THIS BID.</p> <p>BIDDER UNDERSTANDS IF THE SECRETARY OF TAX & REVENUE DETERMINES THAT A BIDDER RECEIVING PREFERENCE HAS FAILED TO CONTINUE TO MEET THE REQUIREMENTS FOR SUCH PREFERENCE, THE SECRETARY MAY ORDER THE DIRECTOR OF PURCHASING TO: (A) RESCIND THE CONTRACT OR PURCHASE ORDER ISSUED; OR (B) ASSESS A PENALTY AGAINST SUCH BIDDER IN AN AMOUNT NOT TO EXCEED 5% OF THE BID AMOUNT AND THAT SUCH PENALTY WILL BE PAID TO THE CONTRACTING AGENCY OR DEDUCTED FROM ANY UNPAID BALANCE ON THE CONTRACT OR PURCHASE ORDER.</p> <p>BY SUBMISSION OF THIS CERTIFICATE, BIDDER AGREES TO DISCLOSE ANY REASONABLY REQUESTED INFORMATION TO THE PURCHASING DIVISION AND AUTHORIZES THE DEPARTMENT OF TAX AND REVENUE TO DISCLOSE TO THE DIRECTOR OF PURCHASING APPROPRIATE INFORMATION VERIFYING THAT BIDDER HAS PAID THE REQUIRED BUSINESS TAXES, PROVIDED THAT SUCH INFORMATION DOES NOT CONTAIN THE AMOUNTS OF TAXES PAID NOR ANY OTHER INFORMATION DEEMED BY THE TAX</p>						

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<p>COMMISSIONER TO BE CONFIDENTIAL.</p> <p>UNDER PENALTY OF LAW FOR FALSE SWEARING (WEST VIRGINIA CODE 61-5-3), BIDDER HEREBY CERTIFIES THAT THIS CERTIFICATE IS TRUE AND ACCURATE IN ALL RESPECTS; AND THAT IF A CONTRACT IS ISSUED TO BIDDER AND IF ANYTHING CONTAINED WITHIN THIS CERTIFICATE CHANGES DURING THE TERM OF THE CONTRACT, BIDDER WILL NOTIFY THE PURCHASING DIVISION IN WRITING IMMEDIATELY.</p> <p>BIDDER: <u>JEAN KREJCA</u></p> <p>DATE: <u>24 OCT 2006</u></p> <p>SIGNED: <u></u></p> <p>TITLE: <u>President, ZARA ENVIRONMENTAL</u></p> <p>* CHECK ANY COMBINATION OF PREFERENCE CONSIDERATION(S) IN EITHER "A" OR "B", OR BOTH "A" AND "B" WHICH YOU ARE ENTITLED TO RECEIVE. YOU MAY REQUEST UP TO THE MAXIMUM 5% PREFERENCE FOR BOTH "A" AND "B". (REV. 12/00)</p> <p>NOTICE</p> <p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p>DEPARTMENT OF ADMINISTRATION PURCHASING DIVISION BUILDING 15 2019 WASHINGTON STREET, EAST CHARLESTON, WV 25305-0130</p>						

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<p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER: _____ RON PRICE-----</p> <p>RFQ. NO.: _____ DNR80051-----</p> <p>BID OPENING DATE: _____ OCTOBER 26, 2006-----</p> <p>BID OPENING TIME: _____ 1:30 PM-----</p> <p>PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY TO CONTACT YOU REGARDING YOUR BID: _____ 512-295-5333 -----</p> <p>CONTACT PERSON (PLEASE PRINT CLEARLY): _____ JEAN KREJCA 512-294-8636 -----</p>						

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***** THIS IS THE END OF RFQ DNR80051 ***** TOTAL:						<u>240,840.00</u>

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DNR80051 - CAVE SURVEYS - BID OPENING 10/26/2006, 1:30 PM

Scope of Work

Conduct cave invertebrate surveys for terrestrial and aquatic invertebrates in the 60 caves listed below. Methods will include "hand collection" as well as the use of bait stations. Note: researchers must hold a US Fish and Wildlife Service permit to collect any federally listed species (i.e., Madison Cave isopod) and apply for and secure a WV Scientific Collecting permit.

Have the specimens collected and identified by taxonomic experts for each taxonomic group.

Deposit voucher specimens in a reputable museum collection (i.e., Smithsonian Institution).

Compile historic cave invertebrate data for WV caves from the literature, museum collections and other sources and compare historic and recent survey data to better understand the status of cave invertebrate populations.

Assist the WVDNR in populating its Biotics database with records of rare cave invertebrate species tracked by the Wildlife Diversity Program.

Provide the following deliverables.

For each cave surveyed:

- Cave name
- County
- Topographic quadrangle
- Coordinates
- Owner information (minimally to include name(s) and contact information)
- Dates surveyed
- Threats to invertebrate communities noted
- Previous invertebrate records for cave (if previous surveys were conducted).
- List of invertebrate species found in current survey
- Map of cave showing survey sites/areas of current survey
- Notes on any sign of Allegheny woodrats observed

Final report including:

- Description of field and laboratory methods used
- Curriculum vita for each person conducting field and lab work
- Curriculum vita for each expert who identified specimens in each taxonomic group.
- Discussion of findings including status of cave invertebrate populations, potential threats, changes in faunal communities where there are previous data and conservation needs.

Summary of cave invertebrate records for WV caves from literature, museum collections, and any other sources, by cave, including new records found during the contracted surveys.

Copies of all documents in hard copy and electronic formats including survey results presented in spreadsheet format.

List of caves to be surveyed:

Berkeley (Donaldson Cave)
Berkeley (Funnel Trap Cave)
Berkeley (Indian River Cave)
Berkeley (Jones Quarry Cave)
Berkeley (Key Hole Calamity Cave)
Berkeley (Whittings Neck Cave)
Grant (DeaheartCave)
Grant (Elkhorn Mountain Cave)
Grant (Indian Cave Most East)
Grant (Indian Cave East)
Grant (Klines Gap Cave)
Grant (Smokehole Caverns)
Hardy (Bob and Tim Cave)
Hardy (Dyers Cave)
Jefferson (Fruit Fly Cave)
Jefferson (George Washington Cave)
Jefferson (John Brown Cave)
Jefferson (Molers Cave)
Mercer (Arch Cave)
Mercer (Beacon Cave)
Mercer (Beaver Pond Cave)
Mercer (Big Spring Cave)
Mercer (Brickyard Ridge Cave)
Mercer (Caldwell Cave)
Mercer (Chris' Last Look Cave)
Mercer (Hole Cave)
Mercer (Honaker 2 Cave)
Mercer (Honaker Cave)
Mercer (Jones Cave)
Mercer (Lorton Lick Cave)
Mineral (Ridgeville Cave)
Monongalia (Coopers Rock Cave)
Monongalia (Lower Beaver Hole Cave)
Monongalia (Maiden Run Cave No. 2)
Ohio (Nickles Cave)
Pendleton (Big Root Cave)
Pendleton (Bill Hendricks Cave)

AFFIDAVIT

West Virginia Code §5A-3-10a states:

No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owned is an amount greater than one thousand dollars in the aggregate.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions.

"Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceeds five percent of the total contract amount.

EXCEPTION:

The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

LICENSING:

The vendor must be licensed in accordance with any and all state requirements to do business with the state of West Virginia.

CONFIDENTIALITY:

The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures and rules. Vendors should visit www.state.wv.us/admin/purchase/privacy for the Notice of Agency Confidentiality Policies.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), it is hereby certified that the vendor acknowledges the information in this said affidavit and are in compliance with the requirements as stated.

Vendor's Name: JEAN KREJCA, ZARA ENVIRONMENTAL LLC

Authorized Signature:  Date: 24 OCT 2006

ZARA

ENVIRONMENTAL LLC

118 W. Goforth Road, Buda, Texas 78610

www.zaraenvironmental.com

PROPOSAL TO INVENTORY SIXTY CAVES IN WEST VIRGINIA

Prepared for West Virginia Department of Natural Resources
RFQ number DNR80051
24 October 2006

Prepared by Jean K. Krejca, Ph.D.

Abstract

A comprehensive biological inventory of sixty West Virginia caves is proposed herein. This inventory will assist land managers in assessing the threats to a variety of extremely rare species that are endemic to the state, as well as documenting change that has happened since prior inventories were performed. Methods used are those most likely to encounter rare cave species and also consider the risk of over collecting or damaging the cave environment. Three visits of 4 hours per visit are proposed to each site, which will maximize the opportunity to encounter rare species, and also allow extensive recordkeeping regarding the population size, microhabitat, and distribution of the species within each cave. A focus on aquatic species may lead to new discoveries of localities for the endangered Madison Cave Isopod, *Antrolana lira*. The qualifications of the team proposing to do this work are extensive and highly specialized in the field of cave biology. Recent works by the principal investigator are highlighted, and these include a dissertation on cave adapted cirolanid isopods (*Cirolanides texensis*, a close relative to *Antrolana lira*), several cave inventories in other states that discovered up to 27 new species, and inventories of rare rats that used the same methods employed in surveying Allegheny woodrats (*Neotoma magister*).

Introduction

West Virginia contains at least 52 obligate cave dwellers, listed in Appendix 1, including a salamander, snails, worms, flatworms, crustaceans (isopods, amphipods and crayfish), spiders, mites, pseudoscorpions, millipedes and insects (springtails, diplurans, flies, beetles) (Hobbs et al. 2003). One of those species is federally endangered, the Madison Cave Isopod (*Antrolana lira*), and is at least known from one West Virginia county (Table 1).

Table 1. Range of *Antrolana lira* according to Hobbs et al. (2003).

Species	County	State	References
<i>Antrolana lira</i>	Augusta	VA	Bowman 1964, Holsinger <i>et al.</i> 1994
<i>Antrolana lira</i>	Rockingham	VA	Bowman 1964, Holsinger <i>et al.</i> 1994
<i>Antrolana lira</i>	Warren	VA	Bowman 1964, Holsinger <i>et al.</i> 1994
<i>Antrolana lira</i>	Jefferson	WV	Bowman 1964, Holsinger <i>et al.</i> 1994

West Virginia caves also are likely to contain Allegheny woodrats (*Neotoma magister*), which are federally listed as a species of concern. These woodrats are likely to play an important role in bringing energy into the cave, since cave species rely on external energy sources due to the lightless environment they live in that lacks primary production. Troglaxenes (=species that use caves but can not complete their entire life cycle underground) such as woodrats and bats are critical sources of energy for cave ecosystems. The scat from troglaxenes combined with seasonal floods that carry in organic debris are the major sources of energy for obligate cave dwellers (troglabites) that cannot exit the cave.

A key part of managing rare species, including the Madison Cave Isopod and Allegheny woodrat, involves field inventories of the sites where those species occur in order to assess the threats to those sites and the changes of land use and habitat condition. The following methods will most efficiently perform those tasks.

Methods

Each cave within the study area will be visited three times by a two person team. Each visit will be four hours, for a total of 8 person-hours of in-cave sampling time per visit, and 24 person-hours of in-cave sampling time per site through the duration of the project. This extensive in-cave time will increase the odds of encountering rare species, and allow a thorough description of each cave including in-cave locations of specimen collections, microhabitat description, and an assessment of threats.

Hand collection of invertebrates will be used when specific identification is not possible in the field. Hand collection methods include the use of aspirators, forceps, paintbrushes, eyedroppers, turkey basters and dipnets. A combination of all these tools will be used to maximize collection diversity and minimize damage to specimens during handling. To the extent practical in the field, all taxa will be examined using a 10x hand lens to assure that taxonomically useful adults are collected in order to avoid over-collecting of immature specimens that cannot be specifically identified.

Traps for terrestrial invertebrate species will include pitfall traps, baited funnel traps, baited rocks, and No-Pest strips placed where excessive individuals will not be killed. In some cases leaf litter will be collected and microarthropods will be extracted using a Berlese Funnel. Traps for aquatics will include substrate traps such as mop heads and inverse funnel traps baited with shrimp, a known attractant for the Madison Cave Isopod (USFWS 1996).

In an effort to quantify the number of different taxa that are found, search effort will be recorded as timed-area searches, and baits and traps will be placed in a comparable effort in each cave. This will provide numerical data that makes cave diversity and abundance comparable, facilitating future management recommendations and long term monitoring protocol.

Collecting effort will be focused on the twilight and dark zones of the caves, with relatively little effort in the entrance zone where a large diversity of less cave adapted species are found. This will increase the likelihood of surveying the rare, endemic species that are limited to caves. Cave entrance inventories will focus on evidence of Allegheny woodrats and other important troglodytes, such as bats. In the case of finding evidence of Allegheny woodrats, Sherman live traps may be placed at those sites to verify the presence of this species.

Invertebrate specimens will be field identified and noted in datasheets when possible, and collected into 80% ethanol when necessary. An effort will be made to create images of troglobite species that may be useful for education and monitoring efforts in the future (Figures 1-2). In the lab, these collections will be transferred into glass vials with labels printed with archival ink and paper. These collections will be sorted to an ordinal level and sent to taxonomic specialists for identification.

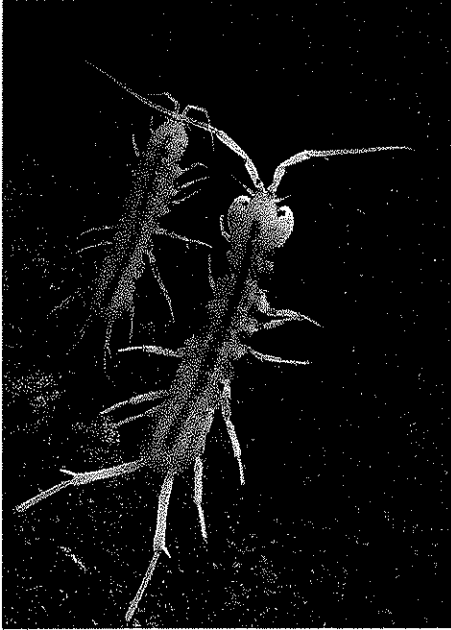


Figure 1. *Caecidotea reddelli* aquatic isopod from Texas, a close relative to the *Caecidotea* sp. found in West Virginia.



Figure 2. *Haplocampa* sp. dipluran from California, a close relative to *Litocampa* sp. from West Virginia.

Results

The following data, as requested by the West Virginia Department of Natural Resources, will be provided for each cave: cave name, county, topographic quadrangle, GPS coordinates, landowner information, dates surveyed, threats to invertebrate communities, previous records for each cave, list of species found in current survey, map of the cave showing survey sites, notes on Allegheny woodrats. In addition the final report will include detailed methodology, curriculum vitae for all involved, and a discussion of findings.

Beyond the scope as defined by the West Virginia Department of Natural Resources, an effort will be made to direct the future of cave species research in the state. This will include research on threats to cave fauna, and the design of a monitoring program for the rare cave species of the state.

Investigator qualifications

The principal investigator, Dr. Jean K. Krejca, completed her dissertation on the biogeography of cave adapted cirolanid isopods in Texas and Mexico (Krejca 2005). These are a very close relative to the Madison Cave Isopod, thus she already has extensive experience in the group. Additionally she has worked for the Illinois Natural History Survey on a radio tracking study of the endangered rice rat, *Orozymus palustris*, in southern Illinois. The techniques used in this study make her very qualified to survey for Allegheny woodrats.

In addition to taxon focused studies on relatives of endangered West Virginia organisms, she has performed extensive cave bioinventories for all species in U.S. states of Texas, Illinois, California, New Mexico and Nevada as well as central America (Czaplewski et al. 2003) and southeast Asia (Trajano et al. 2002). Undergraduate research on cave species (Burr et al. 2001) took her to other Midwestern states including Missouri, Kentucky and Indiana. Recent work in California was featured in national news because of the 27 new species that she discovered there (Krejca 2006). She is considered an expert in cave fauna and has a cave species named in her honor. She holds a USFWS endangered species permit (TE028652-0) and several state permits covering karst invertebrates and salamanders in Texas. There will be no problems meeting qualifications to amend this permit to include the Madison Cave Isopod. A full CV for all investigators is included in Appendix 2.

Additional field help will be provided by biologists trained in cave safety and biological collection methods. Much of this field assistance will be provided by personnel at Gress Engineering. Robert R. Kiser has extensive experience with working in caves conducting winter cave census counts for endangered bats (Indiana bat, *Myotis sodalis*, gray bat, *Myotis grisescens*, and Virginia big-eared bat, *Corynorhinus townsendii virginianus*). Mr. Kiser has worked on several projects conducting all taxa inventories. While taking part in these projects, he

has become familiar with methodologies, which will be implemented during the surveys. Additionally, he has worked throughout the state of West Virginia over the course of the past 14 years.

Budget

The budget for this project covers three sampling events for sixty caves. The breakdown for this budget is given in Table 2 in order to allow the funding entity to use a portion of this budget if only one sampling event is desired.

Table 2. Budget breakdown

Field Work

Per Round: Travel to each cave and sample for 8 person hours

<u>Quantity</u>	<u>Unit</u>	<u>Unit Rate</u>	<u>Sub-total</u>
480	Hours-Principal	\$ 60.00	\$ 28,800.00
480	Hours-Assistant	\$ 30.00	\$ 14,400.00
2	Plane tickets	\$ 300.00	\$ 600.00
4000	Miles	\$ 0.45	\$ 1,780.00
1	Equipment	\$ 600.00	\$ 600.00
60	Lodging	\$ 75.00	\$ 4,500.00
Subtotal			\$ 50,680.00
3	Rounds	\$ 50,680.00	\$ 152,040.00

Lab Work

Per Round: Identification, curation with archival labels, glass vials, museum deposition

<u>Quantity</u>	<u>Unit</u>	<u>Unit Rate</u>	<u>Sub-total</u>
60	identification	\$ 300.00	\$ 18,000.00
60	supplies	\$ 5.00	\$ 300.00
10	shipping	\$ 50.00	\$ 500.00
			\$ 18,800.00
3	Rounds	\$ 18,800.00	\$ 56,400.00

Historic Data

3 hours per cave

<u>Quantity</u>	<u>Unit</u>	<u>Unit Rate</u>	<u>Sub-total</u>
180	hrs	\$ 60.00	\$ 10,800.00

Biotics Data Base

1 hour per cave

<u>Quantity</u>	<u>Unit</u>	<u>Unit Rate</u>	<u>Sub-total</u>
60	hrs	\$ 60.00	\$ 3,600.00

Final Report

6 hours per cave

<u>Quantity</u>	<u>Unit</u>	<u>Unit Rate</u>	<u>Sub-total</u>
300	Hours	\$ 60.00	\$ 18,000.00

Total \$ 240,840.00

Literature Cited

- Bownman, T.E. 1964. *Antrolana lira*, a new genus and species of troglobitic cirolanid isopod from Madison Cave, Virginia. *International Journal of Speleology* 1:229-236.
- Burr, B.M., G.L. Adams, J. Krejca, R.J. Paul and M.L. Warren, Jr. 2001. Cavernicolous sculpins of the *Cottus carolinae* Species Group in Perry County, Missouri: Distribution, External Morphology, and Conservation Status Review. *Environmental Biology of Fishes* 62: 279-296.
- Czaplewski, N. J., J. Krejca, and T. E. Miller. 2003. Late quaternary bats from Cebada Cave, Chiquibul Cave system, Belize. *Caribbean Journal of Science* Vol 39(1):23-33.
- Hobbs, H.H., D.C. Culver, and W.R. Elliott. 2003. A list of cave-limited species in the United States and Canada. Downloadable excel file at website: <http://www.karstwaters.org/trogslis.htm> accessed on 24 October 2006.
- Holsinger, J.R., D.A. Hubbard, Jr., and T.E. Bowman. 1994. Biogeographic and ecological implications of newly discovered populations of the stygobiont isopod crustacean *Antrolana lira* Bowman (Cirolanidae). *Journal of Natural History* 28:1047-1058.
- Krejca, J.K. 2005. Stygobite phylogenetics as a tool for determining aquifer evolution. Dissertation published at the University of Texas at Austin, pp. xvi + 1-99.
- Krejca, J.K. 2006. Final report for inventory of karst fauna in Sequoia, Kings Canyon and Yosemite National Parks. Report prepared for National Park Service, 4 August 2006. 156 pp.
- Trajano, E., N. Mague, J. K. Krejca, C. Vidthayanon, D. Smart and R. Borowsky. 2002. Habitat, distribution, ecology and behavior of cave balitorids from Thailand (Teleostei: Cypriniformes). *Ichthyological Exploration of Freshwaters* 13(2):169-184.
- U.S. Fish and Wildlife Service. 1996. Madison Cave Isopod (*Antrolana lira*) Recovery Plan. Hadley, Massachusetts. 36 pp.

Appendix 1. List of obligate cave dwellers of West Virginia, excerpted from Hobbs et al. (2003).

Order	Family	Genus	Species	WV County	G rank
Urodela	Plethodontidae	<i>Gyrinophilus</i>	<i>subterraneus</i>	Greenbrier	G1
Acari	Rhagidiidae	<i>Poecilophysis</i>	<i>wolmsdorfensis</i>	Greenbrier	G3
Acari	Rhagidiidae	<i>Poecilophysis</i>	<i>wolmsdorfensis</i>	Randolph	G3
Acari	Rhagidiidae	<i>Rhagidia</i>	<i>varia</i>	Grant	G5
Acari	Rhagidiidae	<i>Rhagidia</i>	<i>varia</i>	Greenbrier	G5
Acari	Rhagidiidae	<i>Rhagidia</i>	<i>varia</i>	Mercer	G5
Acari	Rhagidiidae	<i>Rhagidia</i>	<i>varia</i>	Monroe	G5
Acari	Rhagidiidae	<i>Rhagidia</i>	<i>varia</i>	Pocahontas	G5
Acari	Rhagidiidae	<i>Rhagidia</i>	<i>varia</i>	Preston	G5
Acari	Rhagidiidae	<i>Rhagidia</i>	<i>varia</i>	Randolph	G5
Acari	Rhagidiidae	<i>Rhagidia</i>	<i>varia</i>	Tucker	G5
Araneae	Linyphiidae	<i>Anthrobia</i>	<i>mammouthia</i>	Greenbrier	G5
Araneae	Linyphiidae	<i>Anthrobia</i>	<i>mammouthia</i>	Mercer	G5
Araneae	Linyphiidae	<i>Anthrobia</i>	<i>mammouthia</i>	Pocahontas	G5
Araneae	Linyphiidae	<i>Bathyphantes</i>	<i>weyeri</i>	Greenbrier	G4
Araneae	Linyphiidae	<i>Bathyphantes</i>	<i>weyeri</i>	Monroe	G4
Araneae	Linyphiidae	<i>Bathyphantes</i>	<i>weyeri</i>	Pendleton	G4
Araneae	Linyphiidae	<i>Islandiana</i>	<i>speophila</i>	Pendleton	G1
Araneae	Linyphiidae	<i>Phanetta</i>	<i>subterranea</i>	Grant	G5
Araneae	Linyphiidae	<i>Phanetta</i>	<i>subterranea</i>	Greenbrier	G5
Araneae	Linyphiidae	<i>Phanetta</i>	<i>subterranea</i>	Mercer	G5
Araneae	Linyphiidae	<i>Phanetta</i>	<i>subterranea</i>	Monroe	G5
Araneae	Linyphiidae	<i>Phanetta</i>	<i>subterranea</i>	Pendleton	G5
Araneae	Linyphiidae	<i>Phanetta</i>	<i>subterranea</i>	Pocahontas	G5
Araneae	Linyphiidae	<i>Phanetta</i>	<i>subterranea</i>	Preston	G5
Araneae	Linyphiidae	<i>Phanetta</i>	<i>subterranea</i>	Randolph	G5
Araneae	Linyphiidae	<i>Phanetta</i>	<i>subterranea</i>	Tucker	G5
Araneae	Linyphiidae	<i>Porrhomma</i>	<i>cavernicola</i>	Berkeley	G5
Araneae	Linyphiidae	<i>Porrhomma</i>	<i>cavernicola</i>	Grant	G5
Araneae	Linyphiidae	<i>Porrhomma</i>	<i>cavernicola</i>	Greenbrier	G5
Araneae	Linyphiidae	<i>Porrhomma</i>	<i>cavernicola</i>	Monroe	G5
Araneae	Linyphiidae	<i>Porrhomma</i>	<i>cavernicola</i>	Pendleton	G5
Araneae	Linyphiidae	<i>Porrhomma</i>	<i>cavernicola</i>	Pocahontas	G5
Araneae	Nesticidae	<i>Nesticus</i>	<i>tennesseensis</i>	Raleigh	G3G4
Pseudoscorpiones	Chthoniidae	<i>Apochthonius</i>	<i>paucispinosus</i>	Tucker	G1
Pseudoscorpiones	Chthoniidae	<i>Kleptochthonius</i>	<i>henroti</i>	Greenbrier	G3G4
Pseudoscorpiones	Chthoniidae	<i>Kleptochthonius</i>	<i>henroti</i>	Pocahontas	G3G4
Pseudoscorpiones	Chthoniidae	<i>Kleptochthonius</i>	<i>hetricki</i>	Greenbrier	G1
Pseudoscorpiones	Chthoniidae	<i>Kleptochthonius</i>	<i>orpheus</i>	Monroe	G1
Pseudoscorpiones	Chthoniidae	<i>Kleptochthonius</i>	<i>proserpinae</i>	Greenbrier	G1
Pseudoscorpiones	Syarinidae	<i>Chitrella</i>	<i>regina</i>	Greenbrier	G1G2
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>alleggheniensis</i>	Hardy	G5
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>alleggheniensis</i>	Jefferson	G5
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>alleggheniensis</i>	Morgan	G5
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>biggersi</i>	Jefferson	G2G4
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>cooperi</i>	Berkeley	G1G2

Appendix 1, continued.

Order	Family	Genus	Species	WV County	G rank
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>culveri</i>	Randolph	G1G2
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>culveri</i>	Tucker	G1G2
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>emarginatus</i>	Greenbrier	G3G4
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>emarginatus</i>	Monroe	G3G4
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>emarginatus</i>	Pendleton	G3G4
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>emarginatus</i>	Pocahontas	G3G4
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>emarginatus</i>	Randolph	G3G4
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>emarginatus</i>	Tucker	G3G4
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>franzi</i>	Mineral	G3G4
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>franzi</i>	Monongalia	G3G4
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>franzi</i>	Preston	G3G4
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>gracilipes</i>	Berkeley	G3G4
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>gracilipes</i>	Jefferson	G3G4
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>mackini</i>	Mercer	G5
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>mackini</i>	Monroe	G5
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>morrisoni</i>	Hardy	G2G3
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>morrisoni</i>	Pendleton	G2G3
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>nanus</i>	Pocahontas	G1G2
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>parvus</i>	Pocahontas	G2G3
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>parvus</i>	Randolph	G2G3
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>parvus</i>	Tucker	G2G3
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>pollostus</i>	Greenbrier	G2G3
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>pollostus</i>	Monroe	G2G3
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>pollostus</i>	Pocahontas	G2G3
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>redactus</i>	Monroe	G1
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>spinatus</i>	Greenbrier	G2G3
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>spinatus</i>	Monroe	G2G3
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>spinatus</i>	Pocahontas	G2G3
Amphipoda	Crangonyctidae	<i>Stygobromus</i>	<i>tenuis</i>	Jefferson	G4G4T4
Amphipoda	Gammaridae	<i>Gammarus</i>	<i>minus</i>	Greenbrier	G2G3
Decapoda	Cambaridae	<i>Cambarus</i>	<i>nerterius</i>	Greenbrier	G3G4
Decapoda	Cambaridae	<i>Cambarus</i>	<i>nerterius</i>	Pocahontas	G3G4
Isopoda	Asellidae	<i>Caecidotea</i>	<i>cannula</i>	Randolph	G2G3
Isopoda	Asellidae	<i>Caecidotea</i>	<i>cannula</i>	Tucker	G2G3
Isopoda	Asellidae	<i>Caecidotea</i>	<i>franzi</i>	Mineral	G2G4
Isopoda	Asellidae	<i>Caecidotea</i>	<i>holsingeri</i>	Greenbrier	G5
Isopoda	Asellidae	<i>Caecidotea</i>	<i>holsingeri</i>	Monroe	G5
Isopoda	Asellidae	<i>Caecidotea</i>	<i>holsingeri</i>	Pocahontas	G5
Isopoda	Asellidae	<i>Caecidotea</i>	<i>holsingeri</i>	Randolph	G5
Isopoda	Asellidae	<i>Caecidotea</i>	<i>pricei</i>	Berkeley	G5
Isopoda	Asellidae	<i>Caecidotea</i>	<i>pricei</i>	Jefferson	G5
Isopoda	Asellidae	<i>Caecidotea</i>	<i>simonini</i>	Randolph	G1G2
Isopoda	Asellidae	<i>Caecidotea</i>	<i>sinuncus</i>	Pendleton	G1G2
Isopoda	Cirolanidae	<i>Antrolana</i>	<i>lira</i>	Jefferson	G2G4
Podocopida	Entocytheridae	<i>Donnaldsoncythere</i>	<i>tuberosa</i>	Pocahontas	G2G3
Chordeumatida	Cleidogonidae	<i>Pseudotremia</i>	<i>fulgida</i>	Greenbrier	G4
Chordeumatida	Cleidogonidae	<i>Pseudotremia</i>	<i>fulgida</i>	Monroe	G4
Chordeumatida	Cleidogonidae	<i>Pseudotremia</i>	<i>fulgida</i>	Pocahontas	G4

Appendix 1, continued.

Order	Family	Genus	Species	WV County	G rank
Chordeumatida	Cleidogonidae	<i>Pseudotremia</i>	<i>lusciosa</i>	Pendleton	G1G2
Chordeumatida	Conotylidae	<i>Conotyla</i>	<i>vista</i>	Raleigh	G1G2
Chordeumatida	Trichopetalidae	<i>Trichopetalum</i>	<i>packardi</i>	Greenbrier	G4
Chordeumatida	Trichopetalidae	<i>Trichopetalum</i>	<i>packardi</i>	Mercer	G4
Chordeumatida	Trichopetalidae	<i>Trichopetalum</i>	<i>packardi</i>	Monroe	G4
Chordeumatida	Trichopetalidae	<i>Trichopetalum</i>	<i>weyeriensis</i>	Greenbrier	G3G4
Chordeumatida	Trichopetalidae	<i>Trichopetalum</i>	<i>weyeriensis</i>	Monroe	G3G4
Chordeumatida	Trichopetalidae	<i>Trichopetalum</i>	<i>weyeriensis</i>	Pendleton	G3G4
Chordeumatida	Trichopetalidae	<i>Trichopetalum</i>	<i>weyeriensis</i>	Pocahontas	G3G4
Chordeumatida	Trichopetalidae	<i>Trichopetalum</i>	<i>whitei</i>	Grant	G3G4
Chordeumatida	Trichopetalidae	<i>Trichopetalum</i>	<i>whitei</i>	Pendleton	G3G4
Chordeumatida	Trichopetalidae	<i>Trichopetalum</i>	<i>kekeleri</i>	Hardy	G4
Chordeumatida	Trichopetalidae	<i>Trichopetalum</i>	<i>kekeleri</i>	Randolph	G4
Chordeumatida	Trichopetalidae	<i>Trichopetalum</i>	<i>kekeleri</i>	Tucker	G4
Collembola	Entomobryidae	<i>Pseudosinella</i>	<i>certa</i>	Randolph	G1
Collembola	Entomobryidae	<i>Pseudosinella</i>	<i>christianseni</i>	Randolph	G5
Collembola	Entomobryidae	<i>Pseudosinella</i>	<i>gisini</i>	Greenbrier	G3G4T3
Collembola	Entomobryidae	<i>Pseudosinella</i>	<i>gisini</i>	Monroe	G3G4T3
Collembola	Entomobryidae	<i>Pseudosinella</i>	<i>gisini</i>	Pocahontas	G3G4T3
Collembola	Entomobryidae	<i>Pseudosinella</i>	<i>orba</i>	Mercer	G3G4
Collembola	Entomobryidae	<i>Pseudosinella</i>	<i>orba</i>	Mineral	G3G4
Collembola	Entomobryidae	<i>Pseudosinella</i>	<i>testa</i>	Mercer	G2G3
Collembola	Entomobryidae	<i>Pseudosinella</i>	<i>testa</i>	Mineral	G2G3
Collembola	Entomobryidae	<i>Sinella</i>	<i>agna</i>	Berkeley	G3G4
Collembola	Entomobryidae	<i>Sinella</i>	<i>agna</i>	Pocahontas	G3G4
Collembola	Entomobryidae	<i>Sinella</i>	<i>agna</i>	Preston	G3G4
Collembola	Entomobryidae	<i>Sinella</i>	<i>agna</i>	Randolph	G3G4
Collembola	Entomobryidae	<i>Sinella</i>	<i>agna</i>	Tucker	G3G4
Collembola	Entomobryidae	<i>Sinella</i>	<i>agna</i>	Tyler	G3G4
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Berkeley	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Grant	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Greenbrier	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Hampshire	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Mercer	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Mineral	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Monroe	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Morgan	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Pendleton	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Pleasants	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Pocahontas	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Preston	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Putnam	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Randolph	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>hoffmani</i>	Ritchie	G5
Collembola	Entomobryidae	<i>Sinella</i>	<i>kekeleri</i>	Randolph	G3G4
Collembola	Entomobryidae	<i>Sinella</i>	<i>kekeleri</i>	Tucker	G3G4
Collembola	Entomobryidae	<i>Sinella</i>	<i>kekeleri</i>	Tyler	G3G4
Collembola	Onychiuridae	<i>Onychiurus</i>	<i>janus</i>	Greenbrier	G2G3

Appendix 1, continued.

Order	Family	Genus	Species	WV County	G rank
Collembola	Onychiuridae	<i>Onychiurus</i>	<i>janus</i>	Hampshire	G2G3
Collembola	Sminthuridae	<i>Arrhopalites</i>	<i>clarus</i>	Greenbrier	G4
Collembola	Sminthuridae	<i>Arrhopalites</i>	<i>clarus</i>	Hampshire	G4
Diplura	Campodeidae	<i>Litocampa</i>	<i>fieldingi</i>	Greenbrier	G3G4
Diplura	Campodeidae	<i>Litocampa</i>	<i>fieldingi</i>	Monroe	G3G4
Diplura	Campodeidae	<i>Litocampa</i>	<i>fieldingi</i>	Pocahontas	G3G4
Coleoptera	Carabidae	<i>Horologion</i>	<i>speokoites</i>	Greenbrier	G1
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>fuscus</i>	Greenbrier	G4
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>fuscus</i>	Monroe	G4
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>fuscus</i>	Pocahontas	G4
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>grandis</i>	Greenbrier	G4
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>grandis</i>	Monroe	G4
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>grandis</i>	Pocahontas	G4
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>hadenoecus</i>	Pendleton	G1
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>higginbothami</i>	Greenbrier	G3G4
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>higginbothami</i>	Pocahontas	G3G4
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>hypertrichosis</i>	Greenbrier	G5
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>hypertrichosis</i>	Monroe	G5
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>hypertrichosis</i>	Pocahontas	G5
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>hypertrichosis</i>	Randolph	G5
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>kekeleri</i>	Randolph	G1
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>lallemani</i>	Greenbrier	G1
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>montanus</i>	Tucker	G1G2
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>potomaca</i>	Pendleton	G3G4
Coleoptera	Carabidae	<i>Pseudanopthalmus</i>	<i>potomaca</i>	Pendleton	G3G4
Coleoptera	Pselaphidae	<i>Batriasymmodes</i>	<i>parki</i>	Mercer	G1
Diptera	Sphaeroceridae	<i>Spelobia</i>	<i>tenebrarum</i>	Greenbrier	G5
Mesogastropoda	Hydrobiidae	<i>Fontigens</i>	<i>tartarea</i>	Greenbrier	G3G4
Mesogastropoda	Hydrobiidae	<i>Fontigens</i>	<i>tartarea</i>	Monroe	G3G4
Mesogastropoda	Hydrobiidae	<i>Fontigens</i>	<i>tartarea</i>	Pocahontas	G3G4
Mesogastropoda	Hydrobiidae	<i>Fontigens</i>	<i>tartarea</i>	Randolph	G3G4
Mesogastropoda	Hydrobiidae	<i>Fontigens</i>	<i>tartarea</i>	Tucker	G3G4
Mesogastropoda	Hydrobiidae	<i>Fontigens</i>	<i>turritella</i>	Greenbrier	G1G2
Stylommato phora	Zonitidae	<i>Glyphyalinia</i>	<i>specus</i>	Monroe	G3G4
Haplotaxida	Haplotaxidae	<i>Haplotaxis</i>	<i>brinkhursti</i>	Pocahontas	G1
Lumbriculida	Lumbriculidae	<i>Stylodrilus</i>	<i>beattiei</i>	Greenbrier	G2G3
Lumbriculida	Lumbriculidae	<i>Stylodrilus</i>	<i>beattiei</i>	Pocahontas	G2G3
Lumbriculida	Lumbriculidae	<i>Trichodrilus</i>	<i>culveri</i>	Pocahontas	G2G3
Alloeoceola	Prorhynchidae	<i>Geocentrophora</i>	<i>cavernicola</i>	Pendleton	G1G2

Appendix 1, continued.

Order	Family	Genus	Species	WV County	G rank
Tricladida	Kenkiidae	<i>Macrocotyla</i>	<i>hoffmasteri</i>	Greenbrier	G3G4
Tricladida	Kenkiidae	<i>Macrocotyla</i>	<i>hoffmasteri</i>	Pendleton	G3G4
Tricladida	Kenkiidae	<i>Macrocotyla</i>	<i>hoffmasteri</i>	Pocahontas	G3G4
Tricladida	Kenkiidae	<i>Macrocotyla</i>	<i>hoffmasteri</i>	Randolph	G3G4
Tricladida	Kenkiidae	<i>Macrocotyla</i>	<i>hoffmasteri</i>	Tucker	G3G4
Tricladida	Kenkiidae	<i>Sphalloplana</i>	<i>culveri</i>	Tucker	G1
Tricladida	Kenkiidae	<i>Sphalloplana</i>	<i>percoeca</i>	Pendleton	G5
Tricladida	Planariidae	<i>Phagocata</i>	<i>angusta</i>	Tucker	G1
Tricladida	Kenkiidae	<i>Macrocotyla</i>	<i>hoffmasteri</i>	Greenbrier	G3G4
Tricladida	Kenkiidae	<i>Macrocotyla</i>	<i>hoffmasteri</i>	Pendleton	G3G4
Tricladida	Kenkiidae	<i>Macrocotyla</i>	<i>hoffmasteri</i>	Pocahontas	G3G4
Tricladida	Kenkiidae	<i>Macrocotyla</i>	<i>hoffmasteri</i>	Randolph	G3G4
Tricladida	Kenkiidae	<i>Macrocotyla</i>	<i>hoffmasteri</i>	Tucker	G3G4
Tricladida	Kenkiidae	<i>Sphalloplana</i>	<i>culveri</i>	Tucker	G1
Tricladida	Kenkiidae	<i>Sphalloplana</i>	<i>percoeca</i>	Pendleton	G5
Tricladida	Planariidae	<i>Phagocata</i>	<i>angusta</i>	Tucker	G1

Appendix 2. Curriculum vitae for principal investigator.

CURRICULUM VITAE (June 2006) Jean K. Krejca, Ph.D.

Zara Environmental LLC
118 W. Goforth Road
Buda, Texas 78610
jean@zaraenvironmental.com

Office: (512) 295-5333
Cell: (512) 294-8636
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Education:

University of Texas at Austin (UT)
Graduated May 2005: Ph.D. in Ecology, Evolution and Behavior
Supervising professors: Dave Hillis and Dean Hendrickson
Research: Stygobite phylogenetics as a tool for determining aquifer evolution

Southern Illinois University at Carbondale (SIUC)
Graduated May 1995: BS with honors in Zoology, minor in Chemistry
GPA: 3.872/4.0, magna cum laude

Honors and Awards:

P.E.O. Presidential endowed Scholar, \$8,000, Academic year 2002-2003, awarded summer 2002
Fellow Award of the National Speleological Society, summer 2001
UT Environmental Studies Institute Graduate Fellowship, \$3,000, summer 2001
Ralph Stone Award of the National Speleological Society, \$1,500, spring 2001
UT Continuing Tuition Fellowship, \$3,000, fall 2001-spring 2002
North American Native Fishes Association research award, \$1,000, spring 2001
Sigma Xi, Grants in Aid, \$750, Jan 2001
National Speleological Society, Research Advisory Council, \$750, 2000
Karst Research Grant from Cave Research Foundation \$1,000, 1999
UT Institute for Latin American Studies, Tinker fellowship, \$1575, summer 1999
UT Departmental fellowship, fall 1998 (\$580) spring 1999 (\$780), fall 2000 (\$1,000), spring 2002 (\$1,230)
Phi Kappa Phi national (\$7,000) and regional (\$1,000) fellowship, spring 1997
Among top 5 Graduating Seniors in College of Science, SIUC, spring 1995
Among 25 Most Distinguished Seniors at SIUC, spring 1995
Mitchell Award for best paper presented by an undergraduate at National Speleological Society meeting
Zoology Alumni Scholarship, SIUC, spring 1993
Academic Scholarship, SIUC, fall and spring 1990 and 1991 (covered tuition)

Professional employment:

Zara Environmental LLC: President. This company provides biological consulting and land management services, with a specialty in cave and karst systems. Consulting work includes systematic bio-inventories, rare and endangered species surveys and monitoring, as well as a variety of ecology and conservation research projects in four U.S. states and Mexico (TX, CA, NV, NM). Land management services include monitoring and maintenance of endangered species preserves, particularly related to safely controlling exotic species such as the red imported fire ant, and installation and maintenance of species-friendly cave gates. 6/03 – present.

Illinois Natural History Survey: Karst field services contractor. Performing research and field services for project entitled "Investigation of the potential for red imported fire ant (*Solenopsis invicta*) impacts on rare or endangered karst invertebrates at Fort Hood, Texas." This research also includes collecting and marking endemic *Plethodon* salamander that occurs on base. 8/01-5/03.

United States Fish and Wildlife Service: Ecologist/Cave Invertebrate Specialist. Provide technical expertise for maintenance of endangered cave species in Texas. Includes extensive work with landowners and developers regarding compliance with the Endangered Species Act. 11/00-5/03.

Professional employment (cont.):

George Veni and Associates: Karst field services contractor. Performed faunal inventories of caves for endangered species monitoring in Texas. 9/98-5/03.

Peter Sprouse, Contractor: Karst field services contractor. Monitored three mitigation caves on a quarterly basis for endangered invertebrates in compliance with USFWS requirements for the Habitat Conservation Plan developed for Lakeline Mall in Williamson Co., TX. 98-5/03.

Macmillan Reference USA (Gale Group), MacGillivray Freeman Films, and Discovery Channel: freelance biology writing, editing, and underground/underwater videography. Projects include dictionary-style reference writing, coffee-table style research descriptions for IMAX/National Geographic book *Caves: Exploring Hidden Realms*, and cave SCUBA video for a TV special entitled: "Gene Hunters: aliens among us". 11/00-11/01

Texas Memorial Museum: Collections Manager and Technical Assistant. Curation of ichthyology and mammalogy collections. 10/97-5/98 and 5/00-8/00

Kentucky Dept. of Fish and Wildlife Resources: Grouse and deer trapper. Studied the life history of the Ruffed Grouse, *Bonasa umbellus*, using trapping, telemetry, and habitat assessment. Also trapped, transported and relocated White-Tail Deer, *Odocoileus virginianus*, for management purposes. 9/96-1/97

North Carolina State Museum: Bat biologist. Performed an inventory of bats using mistnetting and telemetry, with emphasis on Rafinesque's Big-eared Bat, *Plecotus rafinesquii*, and the Southeastern Bat, *Myotis austroriparius*. 8/96

3D/Environmental: Bat biologist, field team leader. Systematically sampled riparian corridors and woodlots for bats. Methods included daytime monitoring of artificial structures, classification of habitat, mistnetting and telemetry. Project sites included habitat mitigation for the Indianapolis International Airport and a natural gas pipeline through Iowa and northern Illinois. 5/96-8/96

Southern Illinois University: Wildlife biologist. Trapped, radio collared, and tracked bobcats in Southern Illinois. Studied home ranges, habitat, and seasonal and daily movement patterns. Prepared data for integration into a GIS system. 4/96-5/96

Southern Illinois University: Fisheries research lab technician. Curation of ichthyology collection. Concurrent with position as Environmental Studies Program secretary, performing database creation and management. 8/95-3/96

Parsons Engineering Science, Inc.: Scientist. Investigated a proposed highway bypass north of Nashville, TN for presence of federally endangered bats for an environmental impact statement. 4/94-5/94

Illinois Natural History Survey: Biologist. Conducted an inventory of cave amphipods, *Gammarus acherondytes*, for a status survey for the U.S. Fish and Wildlife Service. 11/93.

Illinois Natural History Survey: Mammalogist. Conducted a comprehensive faunal inventory of Illinois caves. Organized and designed the inventory, and sampled 98 sites for a wide spectrum of fauna (including aquatic and terrestrial invertebrates, fish, herps, birds and mammals) and water quality. Made liaisons with federal, state, and regional organizations to get assistance and permission with many sites. Collaborated on development and maintenance of database and issuance of final publication (see below). 2/92 - 10/93

Illinois Natural History Survey: Mammalogist. Researching distribution of state endangered Southeastern Bat, *Myotis austroriparius*, using mistnetting radio tracking, and cave and mine exploration methods. 5/90 - 8/90

Pollution Control, SIUC: Project manager. Performed the field and laboratory aspects of environmental monitoring of drinking water, storm runoff, groundwater, and industrial and municipal waste. Became certified as an Illinois Environmental Protection Agency Class IV Wastewater Treatment Works Operator. 8/90-1/92

Grants awarded:

2005. A biological assessment of ten caves in Lava Beds National Monument. Steven J. Taylor and Jean K. Krejca (Co-Principal Investigators). Agency: Lava Beds National Monument, National Park Service, Tulelake, California. Amount Requested: \$18,800 for 1 year (ends April 30, 2006).

2005. Examining possible foraging differences in urban and rural cave cricket populations: Preliminary study of carbon and nitrogen isotope ratios (d13C, d15N) as indicators of trophic level. Steven J. Taylor, Jean K. Krejca, and Keith C. Hackley (Co-Principal Investigators). Agency: Texas Parks and Wildlife Department. \$42,944 for 2.5 years (ends December 1, 2007).

Grants awarded (continued):

2005. Phylogeography of cave crickets (*Ceuthophilus* spp.) in central Texas: A keystone taxon for the conservation and management of federally endangered cave arthropods. Steven J. Taylor, Jason D. Weckstein, Jean K. Krejca, George Veni, Kevin P. Johnson, and James R. Reddell (Co-Principal Investigators). Agency: Texas Parks and Wildlife Department. \$19,720 for 2.5 years (ends December 1, 2007).

2005. Assessing the Status of *Eurycea* Salamanders and Aquifer Invertebrates in Northern Hays County, Texas. Zara Environmental. Agency: Texas Parks and Wildlife Department. \$9,720.00.

2005. Proposal for a Mark- Recapture study of *Eurycea rathbuni* at three sites in San Marcos, Texas. Zara Environmental. Texas Parks and Wildlife Department. \$9,720.00.

2003. Examining the role of cave crickets (Rhaphidophoridae) in cave ecosystems: Preliminary studies of isotope ratios ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$) and radio tracking. Steven J. Taylor, Keith C. Hackley and Jean K. Krejca. Agency: U. S. Army Engineer Research and Development Center, Champaign, Illinois. \$80,847 for 1 year (ends September 30, 2004).

2002. Inventory of Karst Fauna in Sequoia, Kings Canyon and Yosemite National Parks. Awarded to: Jean K. Krejca. Agency: National Park Service. \$80,892 for 2 years. November, 2002 to March 15, 2005.

2002. A Biological Inventory of Eight Caves in Great Basin National Park. Awarded to: Steven J. Taylor and Jean K. Krejca. Agency: National Park Service. \$15,147 for 8 months. January 2, 2003 to September 30, 2003.

2002. A Biological Assessment of Ten Caves in Lava Beds National Monument. Submitted by: Steven J. Taylor and Jean K. Krejca. Agency: National Park Service. Submitted on 12 November, 2002.

Grants submitted:

2004. Proposal for taxonomic and systematic study of cave salamanders (Plethodontidae: Hemidactyliini: *Eurycea*) and invertebrates in Blowing Sink Cave and other sites in the Barton Spring Segment off the Edwards Aquifer, Texas. Proposal in progress to submit to Austin Community Foundation.

2004. Proposal for phase I of taxonomic and systematic study of cave salamanders (Plethodontidae: Hemidactyliini: *Eurycea*) and invertebrates in Blowing Sink Cave and other sites in the Barton Spring Segment off the Edwards Aquifer, Texas. Submitted to Save Our Springs Foundation, June 2004.

Grant supported/volunteer projects:

Earthwatch student mentor at CuatroCiénegas, Coahuila, Mexico (grant participant) Supervising and teaching high school students field biology techniques in a protected natural area in Mexico. Two weeks duration during each of two visits, August of 2001 and 2002.

Texas Parks and Wildlife Department, Austin, Texas (grant participant) Using funds from Section 6 of the Endangered Species Act to create an educational field guide to the karst invertebrates of central Texas, providing images and editing for the guide. October 2002.

U.S. Fish and Wildlife Service, Austin, Texas (Recovery Team member, volunteer) Serving on the technical subcommittee that is tasked to form a recovery plan for 9 species of cave adapted invertebrates in Bexar County, Texas. January 2002 – present.

Gene mapping of eye development in *Astyanax*, the Mexican Cave tetra (grant participant): Vertical expert. Provided rigging and sampling expertise necessary to collect specimens at remote cave sites. 1/02.

Tongass Cave Project, Kosciusko Island, Southeast Alaska (grant participant and volunteer): Karst specialist. Inventoried karst features on tracts of land slated for timber cutting in order to remove sensitive areas from the sale. June 2001, April-May 2002.

Gunung Buda Project, Sarawak, Malaysia (volunteer): Expedition biologist. Inventoried the biology of caves on a large tract of land owned by the Forestry Department in anticipation of development into a national park with caving as the primary attraction. 1/00 – 3/00

National Park Service, Carlsbad Caverns, New Mexico (volunteer): Cave surveyor and trail maintenance. Performed mapping and maintenance for remote sections of Lechugilla Cave and Carlsbad Caverns. 1998 to present.

Evolution of the eye in *Astyanax*, the Mexican Cave tetra (grant participant): Vertical expert. Provided rigging and sampling expertise necessary to collect specimens at remote cave sites. 10/00.

Population estimates of cave loaches in Thailand (grant participant): Performed mark/recapture techniques on rare blind fishes to determine their population sizes. 1/99

Grant supported/volunteer projects (continued):

National Geographic Society, Belize (grant participant): Cave Biologist. Performed faunal inventories, surveying, and geological sampling of caves in Belize. 5/98, 1/99 and 5/99. See feature in National Geographic Magazine, April 2000, "Chiquibul Cave".

US/Mexico Foundation for Science, Mexico (grant participant): Vertical expert. Provided technical ropework assistance to geologists, divers and biologists in faunal studies of Mexican caves. 3/97

Fish Diversity Inventory, Peru (volunteer): Assisted ichthyologists in Peru, Universidad Nacional de la Amazonia Peruana, and from SIUC. 7/95

Publications in peer reviewed journals:

Baird, A.B., J.K. Krejca, J.R. Reddell, C.E. Peden, M.J. Mahoney, and D.M. Hillis. 2005. Evolution of the Isolated Populations of the *Plethodon glutinosus* Complex On the Edwards Plateau of Central Texas: Phylogenetic Relationships and Systematic Status. In prep.

Burr, B.M., G.L. Adams, J. Krejca, R.J. Paul and M.L. Warren, Jr. 2001. Cavernicolous sculpins of the *Cottus carolinae* Species Group in Perry County, Missouri: Distribution, External Morphology, and Conservation Status Review. *Environmental Biology of Fishes* 62: 279-296.

Czaplewski, N. J., J. Krejca, and T. E. Miller. 2003. Late quaternary bats from Cebada Cave, Chiquibul Cave system, Belize. *Caribbean Journal of Science* Vol 39(1):23-33.

Feldhamer, G.A., J.O. Whittaker, J.K. Krejca and S.J. Taylor. 1995. Food of the Evening Bat (*Nycticeius humeralis*) and Red Bat (*Lasiurus borealis*) from Southern Illinois. *Transactions of the Illinois State Academy of Science*. Vol. 88:3 and 4, pp. 139-143.

Hendrickson, D.A. and J. K. Krejca. 2000. Cavefish and subterranean freshwater biodiversity in northeastern Mexico and Texas. In: *Freshwater Ecoregions of North America: A Conservation Assessment*, edited by R. A. Abell, D. M. Olson, E. Dinerstein, P. T. Hurley, J. T Diggs, W. Eichbaum, S. Walters, W. Wetengel, T. Allnutt, C. J. Loucks, and P. Hedao, Washington, D.C.: Island Press, p. 41-43.

Hendrickson, D.A., J.K. Krejca and J.M.R. Martinez. 2001. Mexican Blindcats, genus *Prietella* (Siluriformes: Ictaluridae): an overview of recent explorations. *Environmental Biology of Fishes* 62: 315-337.

Hofmann, J.E., J.E. Gardner, J.K. Krejca, and J.D. Garner. 1999. Summer records and a Maternity Roost of the Southeastern Myotis (*Myotis austroriparius*) in Illinois. *Transactions of the Illinois State Academy of Science*, Volume 92, 1 and 2, pp. 95-107.

Krejca, J.K. 2005. Stygobite phylogenetics as a tool for determining aquifer evolution. Dissertation published at the University of Texas at Austin, pp. xvi + 1-99.

Phillips, C.A., S.J. Taylor, J.M. Mui, J.K. Krejca, and M.L. Denight. 2004. Slimy Salamanders (Caudata: Plethodontidae) from karst features of South-Central Texas. *Southwestern Naturalist*. In prep.

Taylor, S.J., J.K. Krejca, and M.L. Denight. 2005. Foraging range and habitat use of *Ceuthophilus secretus* (Orthoptera: Rhaphidophoridae), a key troglodene in central Texas cave communities. *American Midland Naturalist* 154:97-114.

Taylor, S.J. and J.K. Krejca. 1994. Geographic Distribution. *Notophthalmus viridescens louisianensis*. *Herpetological Review* 25(2).

Taylor, S.J. and J.K. Krejca. 1994. Geographic Distribution. *Pseudacris triseriata*. *Herpetological Review* 25(2).

Taylor, S.J. and J.K. Krejca. 1994. Geographic Distribution. *Rana catesbiana*. *Herpetological Review* 25(2).

Taylor, S. J., J. K. Krejca, and B. Churchwell. 1998. Geographic distribution. *Rana clamitans*. *Herpetological Review* 29(2):108.

Taylor, S. J., J. K. Krejca, and B. Churchwell. 1998. Geographic distribution. *Nerodia sipedon pleuralis*. *Herpetological Review* 29(2):115.

Taylor, S. J., J. K. Krejca, and B. Churchwell. 1998. Geographic distribution. *Thamnophis sirtalis sirtalis*. *Herpetological Review* 29(2):116.

Trajano, E., N. Mugue, J. K. Krejca, C. Vidthayanon, D. Smart and R. Borowsky. 2002. Habitat, distribution, ecology and behavior of cave balitorids from Thailand (Teleostei: Cypriniformes). *Ichthyological Exploration of Freshwaters* 13(2):169-184.

Webb, D. W., L. M. Page, S. J. Taylor, and J. K. Krejca. 1998. The current status and habitats of the Illinois Cave Amphipod, *Gammarus archerondytes* Hubricht and Makin (Crustacea: Amphipoda). *Journal of Cave and Karst Studies* 60(3):172-178.

Technical Reports:

Gardner, J.E., S.J. Taylor and J.K. Krejca. 1992. Cave Dwellers. Illinois Natural History Survey Reports No. 318:2-3.

Gluesenkamp, A.G., J.K. Krejca and P.S. Sprouse. 2004. Cave management at Camp Bullis 22 September 2003 – 21 March 2004. Report prepared for Texas Cave Management Association. pp. 1-23.

Gluesenkamp, A.G., J.K. Krejca and P.S. Sprouse. 2005. Further investigation of Jensen Cave, Williamson County, Texas. Report prepared for Horizon Environmental Services, Inc., 21 September 2005. 10 pp.

Krejca, J.K. 2003. Inventory of karst fauna in Sequoia, Kings Canyon and Yosemite National Parks, first progress report. Prepared for contract number: P8558602608, September 2003. 4 pp.

Krejca, J.K. 2004. Inventory of karst fauna in Sequoia, Kings Canyon and Yosemite National Parks, second progress report. Prepared for contract number: P8558602608, January 2004. 8 pp.

Krejca, J.K. 2004. Inventory of karst fauna in Sequoia, Kings Canyon and Yosemite National Parks, third progress report. Prepared for contract number: P8558602608, 4 July 2004. 8 pp.

Krejca, J.K. 2004. Invertebrate inventory in Carlsbad Cavern, first progress report. Prepared for contract number: P7170040039, 7 December 2004. 10 pp.

Krejca, J.K. 2005. Diversion Spring Cave. Report prepared for Edwards Aquifer Authority, 17 August 2005. 12 pp.

Krejca, J.K. 2005. Invertebrate inventory in Carlsbad Cavern, second progress report. Prepared for contract number: P7170040039, 3 June 2005. 10 pp.

Krejca, J. K. 2005. Report of biological investigations of Brushy Creek Road Cave, Williamson County, Texas, Highway 183A project. Report prepared for Hicks & Company, 27 November 2005. 21 pp.

Krejca, J.K. 2005. Report of investigations of S-790.53 boring, Highway 183A project. Report prepared for Hicks & Company, 28 February 2005. 7 pp.

Krejca, J.K. 2006. Final report for inventory of karst fauna in Sequoia, Kings Canyon and Yosemite National Parks. Report prepared for National Park Service, 4 August 2006. 156 pp.

Krejca, J.K. and A.G. Gluesenkamp. 2006. Report of Biological Investigations of Abrams Cave (KF11), Highway 183A Project. Report prepared for Hicks & Company, 31 March 2006. 28 pp.

Krejca, J.K. and G.R. Myers, III. 2005. Impact of commercial activities on macroinvertebrate distribution and foraging in Carlsbad Cavern. Report prepared for Carlsbad Caverns National Park. 39 pp.

Krejca, J.K. and P.S. Sprouse. 2003. Aquatic invertebrate fauna survey at Hueco Springs Creek, Comal County, Texas. Report prepared for Paul Price & Associates. pp. 1-18.

Krejca, J.K. and P. Sprouse. 2005. Biological Investigation of Karst Feature 183A-01, Highway 183A project. Report prepared for Hicks & Company, 28 March 2005. 4 pp.

Krejca, J.K. and S. J. Taylor. 2003. A biological inventory of eight caves in Great Basin National Park. Illinois Natural History Survey, Center for Biodiversity Technical Report 2003(27):1-72.

Myers, G. R., III, J. K. Krejca. 2006. Cumulative impacts on Golden-cheeked Warblers in Bexar County, Recovery Region 6, Texas. Report prepared for Myfe White Moore and Christopher C. Hill on 3 February 2006. 11 pp.

Myers, R., J. Krejca, P. Sprouse. 2004. Cave management at Camp Bullis 22 March 2004 – 21 September 2004. Report prepared for Texas Cave Management Association. pp. 1-14.

Myers, G. R., III, P. Sprouse and J. K. Krejca. 2004 Annual Report: Community Ecology of Three Caves in Central Texas. Technical report. 30 pp.

Myers, R., P. Sprouse and J. K. Krejca. 2005. Community Ecology of Three Caves in Williamson County, Texas: 2000-2003. Technical report, 22 April 2005. 29 pp.

Myers, R., P. Sprouse, J. Krejca. 2005. Cave management at Camp Bullis 22 March 2005-22 Sept 2005. Report prepared for Texas Cave Management Association. pp. 1-17.

Sprouse, P. and J. Krejca. 2006. Summary of eleven environmental studies in the San Geronimo Valley, Bexar County, Texas. Report prepared for Myfe White Moore and Christopher C. Hill on 22 May 2006. 17 pp.

Taylor, S. J., Keith Hackley, J.K. Krejca, Michael J. Dreslik, Sallie E. Greenberg, and Erin L. Raboin. 2004. Examining the Role of Cave Crickets (Rhaphidophoridae) in Central Texas Cave Ecosystems: Isotope Ratios ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$) and Radio Tracking. Illinois Natural History Survey, Center for Biodiversity Technical Report 2004(9):1-128.

Technical Reports (continued):

Taylor, S. J., J. K. Krejca, J. E. Smith, V. R. Block, and F. Hutto. 2003. Investigation of the potential for Red Imported Fire Ant (*Solenopsis invicta*) impacts on rare karst invertebrates at Fort Hood, Texas: a field study. Illinois Natural History Survey, Center for Biodiversity Technical Report 2003(28):1-153.

Taylor, S. J., C. A. Phillips, and J. K. Krejca. 2005. Population estimates and age class structure of the salamander *Plethodon albagula* (Plethodontidae) at Fort Hood, Texas. Illinois Natural History Survey, Center for Biodiversity Technical Report 2005(19):1-43.

Veni, G., B.L. Shade, J.K. Krejca, J.R. Reddell, P. Pagoulatos, and P. Sprouse. 2004. Hydrogeological, biological, paleontological, and archeological karst investigations, Camp Bullis, Texas, 2003-2004. Report prepared for Fort Sam Houston. pp. 1-175.

Webb, D.W., S.J. Taylor, and J.K. Krejca. 1994. The Biological Resources of Illinois Caves and Other Subterranean Environments. Technical Report ILENR/RE-EH-94/06, Illinois Natural History Survey, Center for Biodiversity. ix + 157 pages.

Published abstracts from presentations given:

Hendrickson, D.A. and J.K. Krejca. 1997. Notes on Biogeography, Ecology and Behavior of Mexican Blind Catfish, Genus *Prietella* (Ictaluridae). Selected Abstracts from the 1997 National Speleological Society Convention in Sullivan, Missouri. Journal of Cave and karst Studies, Dec 1997, 59:4, p 166.

Krejca, J.K. 2002. Genetic relatedness of aquifer organisms as a tool for determining aquifer connectedness. In: Martin, J.B., C.M. Wicks and L.D. Sasowsky, eds. Hydrogeology and Biology of Post-Paleozoic Carbonate Aquifers. Proceedings of the symposium Karst Frontiers: Florida and Related Environments, March 6 – 10, 2002, Gainesville, Florida. Special Publication 7 of the Karst Waters Institute, Charlestown, West Virginia, p 157 - 161.

Krejca, J.K., D.A. Hendrickson and S.J. Taylor. 2000. Using *Prietella phreatophila* (Ictaluridae) and other cave organisms to follow groundwater in Texas and México. Proceedings of the Desert Fishes Council. Volume XXXI (1999 Symposium), p 42.

Krejca, J.K., D.A. Hendrickson and S.J. Taylor. 2000. Using Stygobites to Follow Groundwater in Texas and Mexico. In: Selected Abstracts from the 2000 National Speleological Society Convention in Elkins, West Virginia. Journal of Cave and karst Studies, Dec 2000, 62:3, p 187.

Krejca, J.K., S.J. Taylor and L.D. Bertoni. 2000. Exploration in the Sao Vicente System, Goias, Brazil. In: Selected Abstracts from the 2000 National Speleological Society Convention in Elkins, West Virginia. Journal of Cave and karst Studies, Dec 2000, 62:3, p 191.

Krejca, J.K., J.R. Reddell, G. Veni, T. Miller. 2000. Fauna of the Chiquibul Caves, Belize. In: Selected Abstracts from the 1999 National Speleological Society Convention in Filer, Idaho. Journal of Cave and Karst Studies 62:1, p 32.

Krejca, J.K. 1998. Recent Exploration in the Purificación Karst. Journal of Cave and Karst Studies, Dec 1998, 60:3, p 186.

Krejca, J.K. and B.M. Burr. 1994. Cavernicolous sculpins of the *Cottus carolinae* species group (Pisces: Cottidae) from Perry County, MO. In: Abstracts of the National Speleological Society, N. D. Peacock (ed.). Journal of Cave and karst Studies, Dec 1994, 56:2, p 106.

Webb, D.W., S.J. Taylor and J.K. Krejca. A biological inventory and water quality analysis of Illinois caves and other subterranean environments. Missouri Academy of Science annual meeting, Cape Girardeau, MO, April 1994 and National Speleological Society annual meeting, Pendleton, OR, August 1993.

Articles in popular journals and books:

Krejca, J.K., S.J. Taylor and D.A. Hendrickson. 2000. The Mexican Blindcat Research Team. National Speleological Society News, June 2000, 58:6, 165-171.

Krejca, J.K. 2003. Biology of caves on Coronation Island, Alaska. National Speleological Society News, April 2003, 61:4, p 91.

Krejca, J.K. 2003. The Mexican Blindcat (*Prietella phreatophila*): Research and Exploration in the Groundwater. American Currents, Summer (Aug.) 2003, 29:3, 5-11.

Krejca, J.K. 2000. Caving for Trogllobites. Page 115 In: Taylor, M.R. Caves: exploring hidden realms. National Geographic Society, pp 1- 216.

Presentations at scientific meetings; invited talks at other institutions:

- S. J. Taylor (presenter), J. K. Krejca, and J. Jacoby. 2006. A Biological Assessment of Caves in Lava Beds National Monument, California. National Speleological Society annual meeting (7-11 August, Bellingham, Washington).
- Krejca, J.K. 2006. "Karst Invertebrates". Seminar at Austin Butterfly Forum, Zilker Botanical Garden Center, 24 April 2006, Austin, TX.
- Krejca, J.K. 2005. Cave Biology. Public education seminar at Lady Bird Johnson Wildflower Center, 15 October 2005, Austin, TX.
- Krejca, J.K. 2005. Stygobite phylogenetics as a tool for determining aquifer evolution. National Speleological Society annual meeting (4-8 July, Huntsville, Alabama).
- Krejca, J.K. 2005. Bioinventory of Sequoia, King's Canyon and Yosemite National Park Caves. National Speleological Society annual meeting (4-8 July, Huntsville, Alabama).
- Krejca, J.K., and G. Veni. 2005. Recent discoveries in Sorcerer's Cave, Terrell County, Texas. National Speleological Society annual meeting (4-8 July, Huntsville, Alabama).
- Krejca, J.K., S.J. Taylor, C.A. Phillips and M. Denight. 2005. Management concerns for cave ecosystems in central Texas. Technical Symposium & Workshop: Threatened, Endangered, and At-Risk Species on DoD and Adjacent Lands (7-9 June, Baltimore, Maryland).
- Taylor, S. J. (presenter), J. K. Krejca, M. L. Denight, and V. Block. 2002. Preliminary report on investigations of Red Imported Fire Ant (*Solenopsis invicta*) impacts on karst invertebrate communities at Fort Hood, Texas. National Speleological Society Convention (24-28 June, Camden, Maine) and Entomological Society of America meeting (17-20 November, Ft. Lauderdale, Florida).
- Taylor, S. J. (presenter), J. K. Krejca, and M. L. Denight. 2003. The foraging range of a central Texas cave cricket, *Ceuthophilus secretus* (Orthoptera: Rhaphidophoridae). National Cave and Karst Management Symposium (13-17 October, Gainesville, Florida).
- Taylor, S. J. (presenter), J. K. Krejca, M. L. Denight, K. Hackley, S. E. Greenberg, M. J. Dreslik, J. E. Smith, and M. Muyot. 2005. Structure of cave communities and cave cricket foraging behavior at Fort Hood, Texas. Department of Defense Natural Resources Training Workshop, National Military Fish and Wildlife Association Meeting, (14-17 March, Arlington, Virginia).
- "Genetic relatedness of aquifer organisms as a tool for determining aquifer connectedness." Karst Waters Institute conference entitled: Karst Frontiers: Florida and Related Environments, Gainesville, Florida, March 6-10, 2002.
- "How Much Surface Habitat is Enough? Preserve Design and Application for Cave-Limited Species." National Cave and Karst Management Symposium, Tucson, AZ, October 2001.
- "Cave Biology." As part of "Speleology for Cavers" course taught at National Speleological Society annual meeting, Elkins, WV, June 2000.
- "Belize Caving." National Speleological Society annual meeting, Elkins, WV, June 2000.
- "Using *Prietella phreatophila* (Ictaluridae) and other cave organisms to follow groundwater in Texas and México." XXXI International meeting of the Desert Fishes Council, Cd. Victoria, Tamaulipas, México, November, 1999, and National Speleological Society annual meeting, Elkins, WV, June 2000.
- "Cave Creatures." Invited talk at Amistad National Recreation Area. Del Rio, TX, February, 1999.
- "Filogenia de los bagres ciegos del genero *Prietella* e invertebrados troglobiotas como indicadores de conexión de acuíferos subterráneos entre México y USA y como herramientas de impacto ambiental." VI Congreso Nacional de Ictiología, Tuxpam, Veracruz, Mexico, October 1998.
- "Notes on Biogeography, Ecology and Behavior of Mexican Blind Catfish, Genus *Prietella* (Ictaluridae)." National Speleological Society annual meeting, Sullivan, MO, August 1997.
- "Bats: dispelling myths." Herrin City Library, Herrin, IL, June 1995.
- "Cavernicolous sculpins of the *Cottus carolinae* species group (Pisces: Cottidae) from Perry County, MO." Missouri Academy of Science annual meeting, Cape Girardeau, MO, April 1994 and National Speleological Society annual meeting, Pendleton, OR, August 1993.
- "Caves and Bats: fragile resources of the Cache River basin." Cache River Workshop, Carbondale, IL 1993.
- "The fauna of Illinois caves" Mississippi Karst Tour, Waterloo, IL, April 1993.
- "Mistnetting and bat handling." University of Illinois, October 1992
- "Illinois caves and cave life." World of Science Lecture Series, Staerkel Planetarium, Champaign, IL, April 1992.

Activities:

Bicycle touring: AIDS, Cancer, and MS Society charities, and transcontinental tour for alternative energy

Martial Arts: 2nd Dan Blackbelt, Tae Kwon Do, and Aikido Schools of Ueshiba

Diving: Advanced Open Water and Full Cave certified

Caving: National Speleological Society, UT Grotto president (98, 99), Little Egypt Grotto president (91)

Climbing: Sport, Traditional, beginner Aid routes and Alpine

Flying: Ultralight pilot (powered paraglider, US Hang Gliding Assoc. "P2" rating, powered parachute)

Photography: Adventure sport and macro invertebrate specialty

Gress Engineering

RESUME
Robert R. Kiser

EDUCATION

1995-1996, Eastern Kentucky University, (courses for biology degree)
1992-1995, Morehead State University, (courses for biology degree)

PROFESSIONAL EXPERIENCE

Senior Biologist - Gress Engineering, PC, Appalachia, Virginia
(April 2004-Present)
Staff Biologist – Environmental Solutions & Innovations, Inc. (ESI), Neon, Kentucky
(July 2001 - March 2004)
Staff Biologist – Appalachian Technical Services, Inc. (ATS), Whitesburg, Kentucky
(April 1999 – July 2001)
Biological Technician – Eco-Tech, Inc., Frankfort, Kentucky
(May 1993 – April 1999)
Field Zoologist – Kentucky State Nature Preserves Commission, Frankfort, Kentucky
(May 1996 – September 1996)
Aquatic Biologist – U. S. Forest Service, Daniel Boone National Forest, Winchester,
Kentucky
(May 1995 – December 1995)
Contract Zoologist – The Nature Conservancy (Kentucky Chapter), Lexington, Kentucky
(June 1992 – December 1992)

SUMMARY OF QUALIFICATIONS AND EXPERIENCE

I have over twelve years of experience in the ecological and environmental services field. I have spent most of my career conducting field investigations for aquatic biological assessments and performing surveys for the federally endangered Indiana bat (*Myotis sodalis*). I have assisted with conducting winter cave census counts Indiana bats, gray bats (*Myotis grisescens*), and Virginia big-eared bats (*Corynorhinus townsendii virginianus*). I have also conducted aquatic biological assessments, watershed monitoring, and assisted with jurisdictional water determinations in Indiana, Kentucky, Tennessee, and Virginia. I have participated in federally endangered species surveys in Kentucky, Virginia, West Virginia, Tennessee, North Carolina, Alabama, Ohio, Pennsylvania, New York, New Jersey, and Vermont. As a seasonal employee for the Forest Service on the Daniel Boone National Forest (DBNF), I sampled aquatic macro-invertebrates and fish. I also collected information on the riparian vegetation and physical characters (substrate, fish habitat, canopy cover, flow, etc.) of streams so an aquatic resource database could be established for the DBNF. I also assisted the DBNF in a watershed survey of Beaver Creek in McCreary County to determine the effects of rainbow trout (*Salmo gairdneri*) on the federally threatened blackside dace (*Phoxinus*

cumberlandensis) population. While at ATS, I conducted watershed monitoring for the Colliers Creek Drainage in Letcher County, Kentucky as a prerequisite for a mining permit. The Colliers Creek drainage is designated as an "Outstanding Resource Water" by Kentucky Division of Water. I also assisted with water supply inventories for mining permits.