

Happy Birthday



61 Years of Caving  
1951-2012

# Cascade Caver



## Cascade Grotto of the National Speleological Society

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## About the Cover...

Jake Earl designed the cover to be used for a 2011 issue of the *Cascade Caver* for its 60th Anniversary. However, due to a lack of an editor, only two issues were printed in 2011, and the cover design was never used. Happy belated 60th Birthday, Cascade Grotto!

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## From the New *Cascade Caver* Co-Editors...

**Welcome Back to the *Cascade Caver*:** It's been almost a full year since the last edition of the *Cascade Caver* (March 2011). After volunteering last November to take over editorship of the *Caver*, filling the shoes vacated by Edd Keudell (thanks Edd for all your past work and for helping us get started), we have been hard at work putting together a fabulous come-back issue, well deserving of y'all buying us a drink after a grotto meeting! Thanks especially to all those who made contributions to this issue! Keep those contributions coming (written, photographic, monetary, alcoholic, etc)! We would love to see trip reports with photographs; free beer; conservation and research articles; more beer; maps and exploration reports of new finds; some hard cider; book, movie, and equipment reviews; bottles of wine; and even letters to the editor (hey, we all like getting mail). If you have an idea, but don't have time to write it, contact us anyway. We'll help you get it written!

--James Mooreshire and Kat Wilson

James Mooreshire is a transplant from central Pennsylvania, where he grew up deep in the Appalachian limestone. His parents, both cavers, literally met one another on a caving trip! The Cascade Grotto has made James feel right at home here in Washington for which he's eternally grateful. James is a film maker who enjoys capturing moving images of speleological environments of all shapes and manufacture. He currently lives in Seattle.

Kat Wilson (see bio, page 34) got the writing bug at an early age, and the caving bug much later. With a young one at home and a husband that works long hours, she doesn't get to go caving much, but co-editing the *Cascade Caver* is one way she can contribute (via "keyboard caving") to the caving community.

### GROTTO MEMBERSHIP / SUBSCRIPTIONS:

Membership in the Cascade Grotto is \$20 per year (includes electronics copies of publications) or \$28 (includes printed copies of publications). Membership for each additional family member is \$5.00 per year. Non-member subscription to the *Cascade Caver* is \$15.00 per year. All fees dues Oct. 1 of each year (pro-rated for new members to next October).

### GROTTO ADDRESS:

Cascade Grotto , P.O. Box 66623, Seattle, WA 98166.

This post office box should be used for both the grotto and for the *Cascade Caver*.

Please keep in mind it is usually checked about once monthly.

### GROTTO OFFICERS:

President:	Vacant	No Phone	Email: Chair@cascadegrotto.org
Vice Chairman	Robert Mitchell	(206) 715-5315	Email: Vicechair@cascadegrotto.org
Secretary/ Treasurer:	Kat Wilson	(206) 484-3894	Email: Secretarytreasurer@cascadegrotto.org

### OTHER POSITIONS:

Trip Coordinator:	Vacant		
Librarian:	Michael McCormack	(425) 941-4619	
Program Chair:	Jake Earl	No phone	
Conservation Chair:	Hester Mallonée	(253) 838-6464	
Cascade Caver Co-Editors:	Kat Wilson and James Mooreshire	(206) 484-3894 (814) 769-6502	



# Delicate Work, Delicate Beauty: Join the 9th Annual Oregon Caves Cleanup

By Kathryn DiFoxfire Wilson with text excerpted or paraphrased from Hester Mallonee's post on Cascade Grotto's Yahoo group listserv.

The 9th Annual Oregon Caves Cleanup will be Friday-Monday, February 17-20, 2012 (President's day weekend) at Oregon Caves National Monument near cave Junction, OR. The project includes removing lint and hair and small debris from the upper portion of the cave, and possibly other conservation and restoration tasks (see next page for details).



**Lodging will be in the historic Visitors' Center pictured above. Photo by Gene Hancock.**

Since access to Oregon Caves is usually only on park-led tours, this is your chance to get up close and personal with this beautiful cave while at the same time helping to make it cleaner and healthier. It's also great fun and is a great way to get to know your fellow cavers.

The work will take place on or near the lighted .5 mile-long tourist trail. Helmets and headlamps are required. All participants must be conservation-minded, not claustrophobic, and physically able to climb the 1/4 mile trail to the cave entrance (elevation 4000 feet) and navigate several sets of steps inside the cave. Children must be at least age nine, accustomed to outdoor recreation, mature and respectful, and under the direct control of parents at all times. There is no child care. Medical care of any kind is at least an hour away with significant medical care closer to two hours away.

Registration to open to all cavers. Family members and friends may participate as well as long as they are sincere about working in the cave.

Free lodging will be provided in the historic building where the rangers live. There are one- and two-person rooms with beds; bring your own bedding, pillows and towels. The rooms have sinks and medicine cabinets and dressers as well as beds. Toilets and showers are down the hall. If the group is large, some participants may need to sleep on the floor, but most likely everyone will have a bed. First come, best chance!

The food plan is \$35 and includes Saturday breakfast to Monday take-away lunch. You are required to buy the food plan unless you have a medical condition that requires you to cook separate food (picky eating is not a medical condition). Payment (check or cash) needs to be given to Hester Mallonee by Monday, Feb.12, 2012. Contact her at [Hestermallonee@yahoo.com](mailto:Hestermallonee@yahoo.com).

Participants must also help with food prep and cleanup. A designated Food Coordinator will design the menu, receive a single check for all the food; buy the food and transport it; and assign two people to cook and two to clean up for each meal. Lots of sample menu options from previous events are available. Food Coordinators are ROYALTY and REWARDED with everybody's gratitude and appreciation!

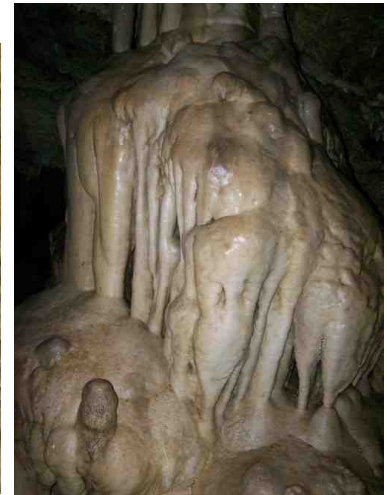


**Cascade Grotto at the 2011 Oregon Caves Cleanup. Photo by Gene Hancock.**

# Why Remove Lint From Caves?

The buildup of lint and hair in Oregon Caves comes from the clothes of approximately 50,000 visitors a year. Tourists can come by certain portions of the cave as often as every 15 minutes.

While some debris falls directly on the tourist trail,



air currents in the cave can also carry lint and hair onto formations. Such debris not only degrades cave formations, but if not removed, can become permanent ugly additions to the cave as calcite covers and hardens over the debris.

In addition, the organic matter in hair and lint can break down and provide an unnatural food source for millipedes and similar organisms in the cave, thus upsetting the delicate balance in the cave.



## Photos from 2011 Oregon Caves Cleanup Project

*Photos by Gene Hancock.*

*Top Left and Top Right: Dripstone and flowstone decorate much of Oregon Caves.*

*Middle Right and Middle Left: Lint pickers use tweezers, brushes, and other tools to restore cave walls and clean trail surfaces.*

*Bottom Left: Lane Holdcroft greets the winter snow.*

*Bottom Right: There's always time for fun.*

For a video of a past cave cleanup in Oregon Caves, type the following link into your web browser:  
<http://www.opb.org/programs/ofg/segments/view/1722>.

# Going Batty: First-Time Caver Helps Install WNS Signs at Four Caves

**By Frances Sauter**

I'm a 15 year old freshman at Lynden High School. I got really interested in bats in the Fall of 2010 when I wrote a research paper on White Nose Syndrome (WNS) for my English class. Then in January 2011 I met a lot of people passionate about bats while attending a Bats Northwest Ambassador Training class. Since then I have learned more about bats, and I thought it would be interesting to visit some bat hibernacula.

On a sunny and warm Saturday in late May 2011, my dad and I stepped out of our 1998 minivan into the parking lot of the Trail of Two Forests in Mt. St. Helens National Monument, Washington. We had driven south from our home in Lynden, Washington, for what I had hoped would be an invigorating, educational caving trip.

The main purpose of this weekend-long outing was to install WNS informational signs as part of the Western Washington Bat Working Group WNS education effort. It would also prove to be my first caving experience.

## **Frances meets the rest of the team**

I got involved with this project when Ella Rowan, a biologist with the Washington Department of Fish and Wildlife, had invited me to join her and some caver volunteers for a bat conservation project and caving trip weekend. I first corresponded with Ella when I did research on White Nose Syndrome for a 9th grade



*From left to right: Ron Zuber, Dave Sauter, Francis Sauter, Mitch Wainwright, Megan Files, Savanna Bigge, Edd Keudell, Emily Zuber, Jennifer Foote, and Ella Rowan (kneeling). Photo by Ron Zuber.*

English project and a newspaper article that I was writing. Ella is also the co-chair of the Washington State Bat Working Group. Since then we've shot emails back and forth, but I never expected to actually meet her in

person! I was pumped!

I immediately felt comfortable when a small dog, with white scruffy hair and a tan head, came up to

greet me. This was Ginger, Edd Keudell's Jack Russel terrier. Edd is an experienced caver who has surveyed hundreds of caves in the Pacific Northwest. Edd's license plate on his truck reads MAPPER for his cave mapping passion.

In a matter of seconds another dog came over to say hi. This was Maximus, Maximilian, or just plain Max, a

*"I immediately felt comfortable when a small dog, with white scruffy hair and a tan head, came up to greet me."*

friendly golden retriever owned by Emily Zuber, and soon I met Emily. Emily is just 23 years old, but is already an accomplished caver with lots of wilderness and deep cave exploration experience in Mexico and Montana.

I also met her father, Ron Zuber, a retired professor and caver of 40+ years, the mastermind behind the Mount Saint Helen weekend. Emily had inherited her father's caver-genes. Emily was accompanied by her friend, Megan Files, a caver from Texas, and Emily's life-long friend Savannah Bigge, who was about to visit her first cave, like me.

In addition, I met Mitch Wainwright, a field biologist with the U.S. Forest Service, who has done biology work in both Colorado and Washington and now works mainly around Mt. St. Helens and Mt. Adams in southwest Washington. Mitch was able to answer my questions throughout the day about elk and other wildlife.

Lastly, I met Jennifer Foote, a civil engineer and active caver from New Mexico is currently on temporary assignment at the Hanford site. She is working on radio active material clean-up. Jennifer is also the co-chair of the New Mexico Bat Working Group and a National Speleological Society director.

### **The WNS Sign Installation Project Begins**

After everyone had gotten acquainted, Ron Zuber conducted a short session at the trailhead on safety and the project we hoped to accomplish. Ron also suggested an informal and fun assignment for me. I was to talk with each person and ask what he or she had done to help prepare for his or her job. He asked each person to be free and open with information.



*Jennifer Foote and Savannah Bigge hold the WNS educational sign as Francis Sauter fastens it to the post near the entrance to Ole's Cave. Photo by Ron Zuber.*

We set off on a trail to our first destination. On the way my dad and I chatted with Mitch, and we learned a bit about his career in the Forest Service. When we reached the place on the trail, which is commonly used by cavers to access **Ole's Cave**, we stopped to post one of the signs. Ed and Mitch dug a hole with a post hole digger and a long steel bar, and Ron secured the post. Everyone was amazed that the hole being dug on the lava flow avoided all but one big rock that was easily bypassed.

Ron asked if I was a spectator or a participant. I replied "participant," so he asked me to mount the printed metal sign. Emily and Jennifer showed me how to use the driver/drill to drive in the screws. When the post was plumb and the hole backfilled, I drove the screws to fasten the sign to the post. In a small way I had contributed to a real-world bat conservation project.

We documented and photographed the sign installation and then walked toward a clearing in the forest. It was the right of way for high voltage, overhead power lines. Plant cover was short as if mowed because of elk and other animal grazing. We found an elk skeleton complete with hooves, ribs, scapula, vertebrae, skull, and the rest of the remains nearby. The wildlife biologists agreed that the largest bone was the left

scapula. Ron pointed out that due to the worn down teeth, it was an older animal. My dad, Dave, is a veterinarian, and he concurred.

It was easy to spot our first cave, **Powerline Cave**, because it had a special gate over the entrance. The gate was designed and built so that bats could get in and out of the cave, but humans could not enter the cave and disturb hibernating bats during the winter. Only an authorized person with a specific key/wrench could unlock the gate and enter the cave.

We found a smaller, second entrance nearby with a gate over it, but unfortunately someone had vandalized it by damaging some of the surrounding rock in order to create an opening around the gate. Now the bats are less protected.



***Dave and Francis pause to enjoy water and moss from a stream resurgence. Photo by Ron Zuber.***

Next, we hiked onto the lava flow and into the dense forest. We mostly relied on Edd's sense of direction gained from many trips to the area and his GPS. Most often we bushwhacked, but occasionally we followed an elk trail. There were numerous piles of elk droppings.

We walked through an ancient lava flow that was covered with a cushiony carpet of very green moss. The moss was so green it looked as if a snowfall of moss had settled on the ground. Someone joked that walking on the moss was probably better than walking on Superfeet!

There are so many interesting things to see and examine in this forested and moss covered landscape. Ron pointed out a mat of moss that had broken free from the vertical rock face it was growing on causing it to roll up like a roll of sod.

We visited **Bat Cave's** entrance to check and make sure that the WNS sign installed last November was still intact. It's still there and appears undisturbed. Yes, Bat Cave is a hibernacula! We wanted to enter the cave, but there was work to be done. For me, Bat Cave is there for a future visit.

Ron joked that we are all "part-owners" of these caves because as tax-paying Americans we pay to support, manage, and conserve these public lands. We were enjoying a very small part of the Gifford Pinchot National Forest.

After more bushwhacking we arrived at the south entrance of **Dollar and A Dime Cave**. It's a fairly large collapsed sink filled with moss covered breakdown.

After opinions were heard, and alternatives were considered, a location was selected for the sign. We posted a WNS sign near the entrance where it would be seen by all who entered the cave. Ron and Mitch drilled two holes into the volcanic rock. Ron had whittled wood plugs that would fill the holes that contain the screws that would hold the sign in place.

He made the plugs from old growth cedar that he had used as part of his home's remodel. He said that even the small scraps of this ancient wood are precious. Who knows, the ancient cedars had probably been harvested from Northwest Washington's vast forested region. It is a fitting use for this old and functional wood to be used for such a conservation purpose. Once again I was honored to install the sign.

### **A Chance for Exploration**

After our work was finished we all put on our helmets and headlamps and started to explore in Dollar and a Dime. We scrambled down a short vertical climb. To begin with I was a little apprehensive, but Jennifer



guided me by telling me where to put my hands and feet as I climbed down. I felt reassured and easily made the climb.

Once we had gone a little farther and had been in the cave a while, Ron asked everyone to stand or sit securely and turn off our headlamps. We were about to experience total darkness. It takes a while for our eyes to adjust to darkness but they never adjusted! We could not see, and we'd never be able to see. There was no light! This was, in fact, absolute darkness and human eyes would never adjust or adapt and be able to see.

It was amazing to realize that because the cave formed underground in the total absence of natural light, light had never illuminated this space until a person entered and brought light.

After a little while Ron lit a candle, and we witnessed the incredible amount of light one small flame can give off in otherwise total darkness. Besides seeing each other and the cave passage we could see the candle flame swaying in one direction. This was caused by air movement in the cave. Ron, Edd, and Jennifer told how and why this air movement occurs: air temperature and barometric pressure differences, multiple entrance induced chimney effects, and even "breathing caves."

I had hoped to learn things on my first caving weekend, and I found myself immersed in a deluge of information and experiences. In such a short time I had experienced and learned so much, and there was more still to come.

Eventually we got to a really tight spot in Dollar And A Dime Cave, a low and narrow crawlway. I was the smallest, so I went ahead. I had to crawl on my stomach using my hands to pull my body forward. The ground was bumpy and uncomfortable. Long skinny lava "stalactites" hung off the low ceiling and broken ones littered the floor.

Emily had crawled in behind me and explained that sometimes inexperienced cavers aren't careful and tend to brush their backs against these formations causing them to break. Even though they are made of rock, lava tube features are fragile. Once broken, they are gone.

Later, we visited **Prince Albert's Cave** to check its WNS sign and found it still in place. Prince Albert's has a cool, parallel-sided lava flow trench on its floor that had apparently "froze" on the floor and walls. Its surface texture was coarse, but the feature was so symmetrical. I could actually imagine the lava flowing right through! There is so much to experience, and I have so much to learn about these unique natural places.

It was getting late and sadly, Emily, Megan, Savannah, and Edd had to get going so they hiked out ahead. I



*Francis Sauter begins exploration of her first cave, "Dollar And A Dime," with her father Dave. Photo by Ron Zuber.*

trekked back through the forest with my dad, Ella, Jennifer, and Ron. We got a little lost, or at least I thought so, but we ended up right back on track. Ron told us about cognitive mapping and using the sun and other clues to help find one's way through any environment.

We took lots of pictures of the cool fungus we saw growing on fallen logs. I saw a couple of black millipedes with orange spots feeding on elk manure. We found a bunch of tiny flowers growing on the forest floor. Wow! This place is alive!

Just before we emerged from the forest near the power lines we heard the sound of running water. We discovered a beautiful, crystal clear creek streaming out of the side of a steep hill. This was a natural resurgence of ground water. Once on the surface the water ran over rounded rocks that were draped and covered with a most gorgeous, deep green moss. Everyone took a drink at this natural water source, and we all agreed - it was simply spectacular!

On the hike back to the trailhead we discussed everything from Click and Clack and their "Car Talk" show on National Public Radio, to hammer-headed bats, to the Minnesota state bird. Ella generously treated us to dinner at the R & B Restaurant in the small town of , but she had to leave soon after for her 9-hour drive back home. As I hugged her goodbye, I sincerely hoped that I would see her again.

I wanted badly to see some bats so, at around 9 p.m., I entered **Ape Cave**, along with Ron, Jennifer, and my dad. We had hoped to see some bats flying out of the cave that evening silhouetted against the evening sky, but it was a tad bit chilly, too dark, or for whatever reason we saw no bats. Jennifer heard some squeaky sounds that could have been bats, and I'd like to think they were.

We spent the night camped at an old quarry just outside of the Mt. S. Helens National Monument. We arrived well after dark, but no worries. . . Ron and Jennifer kindly helped us to set up our tent. The myriad stars

were simply amazing and we saw a satellite moving through the sky. Soon enough, we hit the sack.

## **Day Two: The Adventure Continues**

Early on Sunday morning Ron went to town and returned to the campsite with Chloe Harford and her friend Henry. Chloe is Ron's friend and is a fellow member of the Explorers Club. Chloe is a volcanologist with a PhD from Oxford in the UK. Henry had just arrived in Washington from the UK the night before, and here they were, joining us for caving. Henry is an aeronautical engineer who is currently designing kites.

After breakfast, we drove to the Trail of Two Forests parking lot, and we walked to **Lake Cave**. First things first: we posted a WNS sign inside the entrance to the cave.



*Francis enjoys the magnificent red lava flow in Lake Cave's upper section. Photo by Ron Zuber.*

Jennifer then told me about the slime we saw in the cave. The walls literally glittered with water droplets and multi-colored, living organisms called cave slime. Our favorite slime was the yellow-gold colored slime.

She also pointed out tree roots poking through the ceiling of the cave. She explained that the roots attract slime due to the extra nutrients they provide.

Suddenly, Jennifer called out that she had spotted a bat. In a fraction of a second my eyes were focused in the direction she was pointing. I had looked just in time to catch a glimpse of the bat crawling along a thin,

horizontal crack before it disappeared behind a rock formation. Wow! I saw a bat in a cave!

We explored the passage to the right as we entered Lake Cave. This four foot high passage was formed in awesome, bright red lava rock. The red rim of the floor lava flow was higher on one side than the other. The orange-red lava was from a more recent flow and the dark, maroon-red

lava was from an earlier lava flow. These were both secondary flows that occurred after the main lava tube had formed. I was fascinated by the pocket-like formations where the lava had left open spaces.

We also saw a small strand, like part of a web, evidence of some cave spider. It was covered with sparkly-dew that glistened in the light of our headlamps. We also saw small, rounded rocks that had washed into the cave and rested in pockets on the cave floor.

Ron explained that the rounded rocks had been tumbled or vibrated in flowing water. That motion, over time, had caused them to become rounded. I think it is amazing that someone can tell something about what those rocks have been through just by looking at them.

We then entered the main part of the cave, which opened into a cavernous, long passage. The sheer size of it was absolutely breathtaking! We had to climb down a ladder that had been attached to a cliff-like rock face. The drop was maybe 20 feet, but it looked a little scary to me! Luckily, Jennifer went right down, right below me, and was able to direct me. If there wasn't a ladder we would have had to use ropes and vertical gear to descend the rock face and enter the cave's lower level.

I spent a lot of time just looking up to the top of the huge tunnel-like passage. I tried to imagine the enormous lava flow rushing through and looked at the patterns in the rocks. It was though the lava had flowed like an underground river, boiling and tumbling as a stream just a split second ago, but this cave is actually 2,000 years old. I was looking at lava frozen in time!

We came upon some massive piles of rock called

breakdown, partially blocking our way forward. We had to climb up-and-down-and-over-and-around. A few places were easy though because there were so many hand and footholds. Ron gave me some climbing tips, like using my hands like feet as stabilizers for balance and to lower my body. I was amazed at how seeming effortlessly and efficiently the experienced cavers moved through the cave.

This cave was very drippy from the water percolating through the soil and rock above the cave. In

many places little holes had formed in the sand or rock floor under the same drip point, dripping in the same place for such a long time. These holes sometimes contained miniscule pebbles, which formed colorful circular patterns. In some areas holes had bored into sand. Ron explained that if people hadn't carelessly trampled over the sand we would see wondrous "sand castles" formed by countless water drops eroding the packed sand into vertical cones and canyon features.

Farther into the cave we started hearing water, first little trickles, then more, then we saw pools, which turned into tiny streams leading through sandbars and over the lava rock floor. Eventually we got to the point where the water was pooled and met the ceiling. I found out why it's called Lake Cave.

The last space we could see without walking in the water was a couple of feet high. We decided to stop there because we hadn't come prepared with the proper gear. Ron told us about the sump, where the passage was completely submerged in water.

This led to a story comparing cave sumps and about a cave diving expedition in Mexico where cavers explored far and deep into a huge mass of limestone thousands of feet thick. Ron's daughter, Emily, and son, Adam, are preparing to engage in some of this super-awesome Mexican cave exploring in 2012. The goal is to explore, survey, and map one of the deepest caves on Earth.

After enjoying some biscuits, courtesy of Chloe and Henry, Jennifer, my dad, and I washed off some of the graffiti on the walls of the cave. Jennifer knows a lot about cleaning up caves. We also picked up some beer cans that someone had left there. One of the cans was

*"It was though the lava had flowed like an underground river, boiling and tumbling as a stream just a split second ago..."*

still full so we had to make sure not to spill any inside the cave.

The trip back to the entrance seemed to go by really fast. We knew the terrain a little better and had no trouble getting up the ladder. It was pretty amazing seeing the

sunlight after just a couple of hours underground! The familiar source of light caused everyone to let out a sigh of relief. I had felt at home in the cave, but emerging into the light and familiar terrain was reassuring. I was glad that we had made it through safe and sound.

We walked the Trail of Two Forests after lunch. This area experienced lava flows over 2,000 years ago. Informational panels described events and the succession of new growth after the lava flowed. Ron asked if I had gotten the significance of the place's name. In a matter of seconds a light bulb went off, and I finally understood the name, "Trail of Two Forests." The ancient forest was inundated by the lava flow and now we were standing in the new forest, alive and green and growing.

The flow contained some giant tree casts! A tree cast is

a hole in the ground created by a tree trunk that was surrounded by molten lava causing the tree to burn away

leaving a "cast" or impression of the original trunk. Jennifer and I took the opportunity to crawl through a cave made by two overlapping tree casts. It was a dark, narrow tunnel, so we definitely needed a flashlight!

There were also places where the lava had pooled over the fallen

trees and had made cool ripples. I know these ripples have names and the process by which they form is understood. Some study of geology should provide me with the answers.

Before we headed home, Ron loaned me a package of caving books and magazines from his personal library. I can't wait to start reading! He has offered the use of his personal cave and bat book library.

I want to tell everyone who reads this how much these people have done for me. All the bat biologists, engineers, bat enthusiasts, and cavers I have met have been willing to share their expansive knowledge. They are kind, incredibly generous, and even willing to sacrifice their free time to teach a 9th grader about bats and caves. Thanks, you guys! This has been the time of my life!

*"In a matter of seconds a light bulb went off, and I finally understood the name, "Trail of Two Forests."*

## 41st Kentucky Speleofest

May 25-28, 2012, Memorial Day Weekend

### "Get'n Down Yonder in the Bluegrass"

Hosted by The Louisville Grotto at the Lone Star Preserve, Bonnieville, KY.

Camping with warm showers and a party area • Food vendor • On Rope 1 "Moonpie Welcome Party" • Banquet • Guest speaker "Mud Puppy" • door prizes "Hillbilly Bat Bonfire" • DJ and a live band • bluegrass music Wine and Cheese Social • guided hikes • kayaking • orienteering • geocaching • vertical class • Children activities • and, of course, caving (with several new caves)!

*All caving will be based on the most current information from the KY Fish and Wildlife. For more information check out our website: [louisville.caves.org](http://louisville.caves.org)*

# Single Rope Technique (SRT) and Rope Rescue Annotated Bibliography: Update #1

By Thomas Evans, NSS# 57831

[Note: A shorter version of this bibliography was previously published in the NSS News 68(6):14-15. This update includes a few more citations and updates the web addresses of the web based resources.]

Single Rope Technique (SRT) and rope rescue are complicated subjects that involve elements of common sense, material properties, statistics, testing, and chance. Like most human endeavors, they evolve rapidly with increases in safety and ease of use for its practitioners. Increased safety is wonderful since continual updates yield greater safety, while simultaneously making it difficult to keep up with the latest developments.

As lay people we are often five to fifteen years behind learning new information since we do not have the time to read or find it all. It is also difficult to know where to look for information since it is not our full time job. It is particularly daunting for a novice when learning SRT skills since everyone has a strong opinion that usually oppose the views of others. Where do we find information about SRT? Who do we trust?

Unfortunately there are many places to learn about rope work; however, not all information will work safely in caves.

Unfortunately there are many places to learn about rope work; however, not all information will work safely in caves.

Below is a list of good starting references that can help improve your

vertical skills, particularly in relation to cave rope work, as well as rescue skills since both may be needed while engaging in vertical caving. Below each reference is a brief opinion concerning the usefulness of the resource, as well as some additional comments as I see fit. Keep in mind these are the opinions of the author alone and are subject to change as I learn and study more.

## Seven Single Rope Technique Books:

1. Elliot, D. (1986). *Single Rope Technique: A Training Manual*. Oldham: Troll Safety Equipment

Good book, clearly and simply written with mid-level text but unnecessary for the competent vertical caver who already owns and understands *On Rope* (#6 below) and *Alpine Caving Techniques* (#3 below).

2. Frank, J.A. & Patterson, D. E. (1997). *CMC Rappel Manual* (2nd Ed.). Santa Barbara, CA: CMC Rescue, Inc.

Do not waste your money. This book is simplistic, written for firefighters, and is generally insulting to your intelligence. You would be better to read any of the other six books on this list a second time than to read this book.

3. Marbach, G., & Tourte, B. (2002). *Alpine Caving Techniques: A Complete Guide to Safe and Efficient Caving* (1st English Ed.). Switzerland: Urs Widmer

Buy this book. It is a standard work in Europe covering SRT and small party rescue techniques. It provides a different and valuable perspective on rigging than that found in *On Rope*. This should also be part of all vertical cavers' libraries.

4. Meredith, M., & Martinez, D. (1986). *Vertical Caving* (2nd. ed.). Dent, United Kingdom: Lyon Equipment

Buy this book. While a small publication, it is practical and provides sound advice given the time it was written. It also provides a student with perspective of where SRT was and where it is headed.

5. Montgomery, N. R. (1977). *Single Rope Techniques: A Guide for Vertical Cavers*. Sydney, Australia: Sydney Speleological Society.

Buy this book. While this is book is out-of-date, it gives the student a perspective of where SRT used to be and how problems can be solved with minimal equipment.

6. Smith, B. & Padgett, A. (1996). *On Rope: North American Vertical Rope Techniques* (New Revised Ed.). Huntsville, AL: National Speleological Society,

Buy this book. It is a standard work covering most techniques in SRT and rescue and should be a part of all vertical cavers' libraries.

7. Warild, A. (2007). *Vertical: A Technical Manual for Cavers* (5th Ed.). Newtown, Australia: Alan Warild

Buy this book. This book is the Australian equivalent to *On Rope* and *Alpine Caving Techniques*. It is practical, well written, and covers a different rigging philosophy to that in *On Rope*.

### Twelve Rope Rescue Books:

1. Brennan, K. (1999). *Rope Rescue for Firefighting*. Fire Engineering Books

Good book, but not necessary to own. It is a great reference for those individuals in the fire service and on professional rope rescue teams. It covers many topics related to fire service, but not applicable to cavers.

2. Brown, M.G. (2000). *Engineering Practical Rope Rescue Systems*. United States: Delmar, Thompson Learning.

Good book, but not necessary to own. I found this book a great read, but it was also geared to those in the fire service. If you plan on spending copious time rigging, this is a good addition to your library; however, if you are not a rescuer, it will be of little value.

3. CMC Rescue (1997). *Rope Rescue Manual Field Guide* (3rd Ed.). Santa Barbara, CA: CMC Rescue Inc.,

Good small spiral-bound pamphlet, but not necessary to own. This is the field guide companion to the next book (#4). If you need a field guide to help you perform rope rescues, you should not be attempting a rescue.

4. Frank, J.A. (1998). *CMC Rope Rescue Manual* (3rd Ed.), Santa Barbara, CA: CMC Rescue Inc.,

Do not waste your money. If you plan on rigging for the rest of your life, this rescue manual will be an okay addition to your library, but it is of lesser quality than the others.

5. Gurwood, A. & Thorpe, J. (to be published

- 10/12013). *Fundamentals of Technical Rope Rescue Levels I & II*. Jones and Bartlett Learning.

This book is intended for those riggers in the fire service. I will withhold judgment until I read it once published.

6. Lipke, R. (1997). *Technical Rescue Riggers Guide* (Revised Ed.). Bellingham, WA: Conterra Technical Systems Inc.,

Good small spiral-bound pamphlet and worth owning. Of the rope rescue field guides, this is the best. Again, if you need a field guide. you should not be performing a rescue; however, this guide works well as a set of flashcards for use as a study guide.

7. Matthews, J. (2009). *Technical Rescuer: Rope Levels I and II*. Clifton Park, NY: Delmar, Cengage Learning,

This book is intended as a training manual for members of the fire service, and as such, it has learning objectives, hypothetical examples, self test questions, etc. Generally the information covered was simplistic and formulaic with the author presenting only one or two ways of solving a rescue-related problem. Other technical rescue guides are better.

8. Merchant, D. (2007). *Life On A Line: The Underground Rope Rescue Manual* (2nd. ed.). Published by Lulu.com.

Buy this book. This book is exceptionally well written, funny, technically accurate, engaging, and all around a fantastic read. This should be on all cavers shelves since it covers both SRT and rescue topics well and walks through how to think about rigging problems.

9. Pendley, R. (2003). *The Essential Technical Rescue Field Operations Guide* (3rd Ed.). AZ: Desert Rescue Research,

Good small spiral-bound pamphlet, but not necessary to own. This pamphlet covers many rescue topics outside of rope rescue, and as such is a good resource, but only to a professional rescuer. Again, if you need a field guide to help perform rope rescues, you should not be attempting a rescue.

10. Roop, M. (1998). *Confined Space and Structural Rope Rescue*. Mosby Inc.

Good book, but not necessary to own. This book is a great reference for those individuals in the fire service and on professional rope rescue teams. It covers many

topics related to structural and industrial confined spaces that are not applicable to caving scenarios.

11. Vines, T. & Hudson, S. (2004). *High Angle Rescue Techniques* (3rd Ed.) St. Louis, MO: Elsevier Mosby,

Good book, but not necessary to own. This book is a great reference for those individuals in the fire service and on professional rope rescue teams. Some topics are not covered well (mostly SRT), while others are not much use to a caver.

12. Vines, T. & Hudson, S. (2004). *Field Guide to Accompany: High Angle Rescue Techniques* (3rd Ed/). St. Louis, MO: Elsevier Mosby

Good small-spiral bound pamphlet, but not necessary to own. This is the field guide companion to the previous book. Again, if you need a field guide to perform these skills, you should not be doing them in cave.

### Five Online Resources:

1. *International Technical Rescue Symposium Papers and Presentations* (2011 and previous years). Retrieved from <http://itrsonline.org/papers/> (and also from <http://itrsonline.org/archives/>)

ITRS is an annual meeting where individuals and research groups present their observational, empirical, and experimental research related to technical rescue. The annual proceedings are a collection of the most recent research regarding rope rescue and should be browsed through annually at a minimum. Fortunately ITRS archives abstracts, papers, presentations, and some data presented by some authors, so the archives are a goldmine of useful articles, data, and citations. The "papers" page has material presented at the last ITRS meeting, and the "archive" page has material from some previous meetings.

2. *The Nylon Highway*

Retrieved from [www.caves.org/section/vertical/nylhi.html](http://www.caves.org/section/vertical/nylhi.html)

The Nylon Highway is the official publication of the National Speleological Society's Vertical Section. Read as many issues of it as you can. It covers the development of equipment, personal SRT systems, rescue topics, and accident reports. It will help you learn how to think about problems and respect those that developed equipment and techniques in the past.

3. Laidlaw, K.N. (2002). *Considerations For Rope Rescue in 2002*. Retrieved from <http://www.scribd.com/doc/41314344/Rope-Rescue-2002>

Read it. This is a classic work in rope rescue and should be studied.

4. Laidlaw, K.N. (2008). *Considerations for Rope Rescue in 2009*. Retrieved from: <http://www.basarc.org/articles/considerationsforrope-rescuein2008/view-as-pdf>

Read it. This will become a classic work in rope rescue covering all the basics and why certain techniques should be used. A must have in the library.

5. Merchant, D. F., 2002/2003, *Life on a Line: A manual of modern cave rescue ropework techniques* (1st. ed.). Retrieved from [www.speleo.no/redning/Life%20on%20a%20line%20part1.pdf](http://www.speleo.no/redning/Life%20on%20a%20line%20part1.pdf) (and [www.speleo.no/redning/Life%20on%20a%20line%20part2.pdf](http://www.speleo.no/redning/Life%20on%20a%20line%20part2.pdf) (and [www.speleo.no/redning/Life%20on%20a%20line%20part3.pdf](http://www.speleo.no/redning/Life%20on%20a%20line%20part3.pdf))

Read it. This is the first edition of Life on a Line, (published in three parts), and it is well worth the read. The second edition is far better than the first; however, it is instructive to see the progression in thought the author experienced between the two drafts.

### Conclusion

The above references will provide any student with enough education to form intelligent informed opinions about rigging and rope work in general. Studying these sources is no substitute for instruction and practice; however, they will prepare the mind to learn as much as possible from training and practices and will serve as a long-term reference for when one inevitably forgets information.

This list of rope rescue and SRT references is a work in progress, so if any reader has additional resources, this author would love to hear about them. I can be contacted at: [cavertevans@gmail.com](mailto:cavertevans@gmail.com). All additions to the bibliography are welcome and appreciated. The list will be updated and periodically published so others can benefit from the communal library development. Good luck studying SRT and rope rescue, and as always, safe caving!

# Have Paintbrush, Will Travel

**By Kathryn DiFoxfire Wilson**

From desert to canyon to cave, 55-year-old Hester Mallonee feels right at home even when she's on the road as long as she's able to paint. From September to December, 2011, Mallonee traveled to Oregon Caves to do some cave restoration, participated the Plein Air outdoor painting festival in Utah, spent a weekend helping with a cave cleanup in the backcountry in Arizona, visited the Grand Canyon, and spent an amazing two weeks painting inside Carlsbad Caverns in New Mexico. She also enjoyed spending time with relatives in the Southwest before returning home to Federal Way, WA just before Christmas.

Traveling alone in her van, armed with her paints, canvas and other tools of the trade, Mallonee began her four-month journey to the Southwest and back just after attending the Northwest Caving Association's regional event at Trout Lake in Washington last fall.



**"Moonrise, Canyon Lands" Canyonlands National Park. Artwork © by Hester C. Mallonee, 2011-2012.**



**"The Hall of Giants, Carlsbad Caverns." Artwork © by Hester C. Mallonee, 2011-2012.**

## Visiting Oregon Caves National Monument

She began with a stop at Oregon Caves in Cave Junction, OR (near the California border). Mallonee describes Oregon Caves as the most individual beautiful cave she's ever seen. Her purpose on this trip was to continue an on-going cave restoration project restoring damaged rimstone (a project she's been working on for an average of several months per year since 2003). That project stemmed from after she began creating cave paintings in Oregon Caves a decade or so ago and wanted to give something back.

For many people, the term "cave painting" probably brings up an image of Paleolithic artwork: prehistoric humans using charcoal or pigments made of red and yellow ochre to draw mostly wild animals on cave walls. Mallonee's work is far different. She creates acrylic-on-canvas paintings of the cave formations and landscapes.

"I've been intrigued," says Mallonee on her website, "by the low-light landscape, places where the temporal becomes spiritual. In moonlight, the land loses contour



and color, but gains radiance and resonance: a sense of magic. In a cave, formations and life-forms protected for aeons by profound darkness are made visible, and therefore vulnerable, by our human act of lighting the cave."

### **Growing Up to Be an Artist**

For those unfamiliar with Mallonee and/or her work, a brief history is in order. Mallonee, 55, has not always been a painter or a caver, but her love for natural resources began at an early age. She grew up in New Mexico but moved to Washington when her father took a job with Boeing. Her parents never really took to Washington State and would drive to New Mexico every chance they got, visiting parks along the way.

"My parents were nuts about natural resources, and I got introduced to caves via parks," said Mallonee. She also developed a love for desert scenery.

"I thought I was going to be a painter of desert landscapes until I discovered painting in caves," admitted Mallonee.

When she decided to make a career change from law to painting, she remembered Oregon Caves near Cave Junction, OR near the California border. Since public



**"The Double Arch." Arches National Park. Artwork © by Hester C. Mallonee, 2011-2012.**

access to Oregon Caves is generally permitted only on park-led tours, she had to convince the park service that she was trustworthy enough to sit unsupervised in the cave between cave tours. She soon became a regular visitor, creating scores of paintings inside the cave.

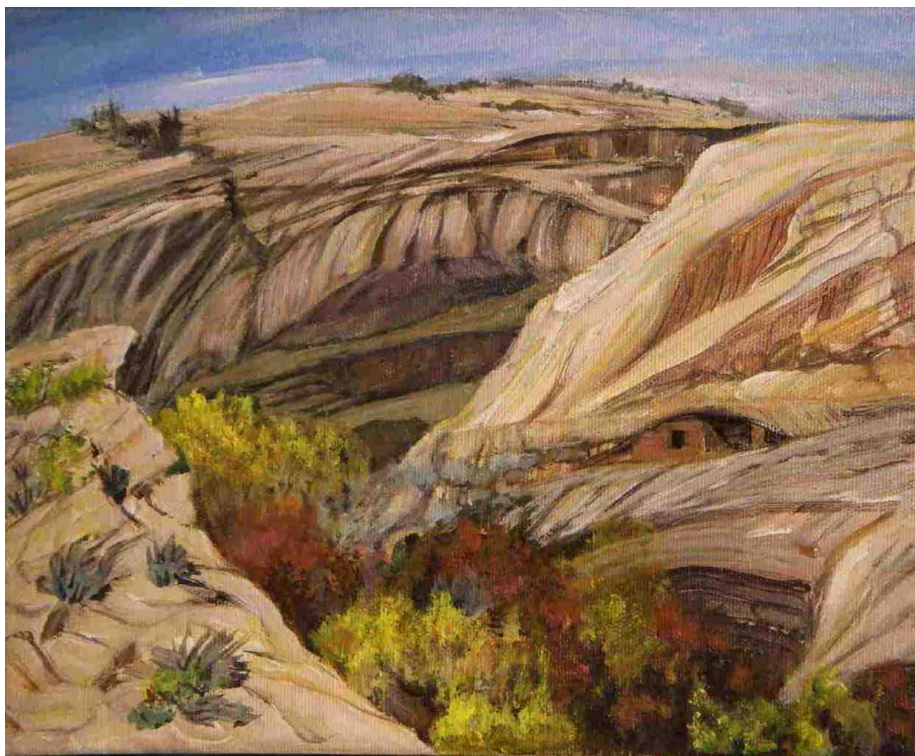
Painting in Oregon Caves made her want to help restore the cave back to its natural beauty, so in 2003 she helped organize a cave conservation project to help remove lint from the caves (*see article, page 1*). She is

also working on other restoration projects within the cave and is currently Cascade Grotto's Conservation chair.

### **Painting at Plein Air Festival, Moab UT**

After leaving Oregon Caves on this trip, Mallonee then traveled to east central Utah to attend the Plein Air painting festival in Moab, UT October 8-15, 2011. "Plein air" painting is by definition a minimum of 80% of a painting done in the field, on location, and "in the moment." The Moab festival draws artists from around the world who come to paint what Mallonee describes as "staggering world class red rock scenery."

Directly north of Moab is Arches



**"Butler Indian Wash Ruins" Southern Utah. Artwork © by Hester C. Mallonee, 2011-2012.**

National Park. Canyonlands National Park is about 30 miles to the southwest. An abundance of side canyons, valleys and beautiful alpine scenery decorate the area.

"You can spend your entire life painting based in the center of Moab," said Mallonee. "[If you have] any color of warm tones paints, you're going to use it and use plenty of it."

Although Mallonee has many connections with the Southwest, she also felt overwhelmed during her visit.

"In Utah I discovered emotional confusion," she said. "An overabundance of resources made it difficult to chose painting topics."

On the other hand, it was also very nourishing.

"I felt as though these great big desert lands actually have a lot in common with cave forms: very powerful, very graphic, even when most detailed and each has the exquisite power of natural forces behind them. I realized I had gotten a little too disconnected with [ the desert] resources." She says it will help with her work painting underground.

"Desert and cave," said Mallonee. "I used to think of them as parallel tracks." Now she views them as more yin-yang or two sides of the same coin.

### **Cave Restoration Weekend in Arizona**

Her next adventuresome stop included a cave restoration weekend project which she had learned about via the Western Region website. Three cavers from California and Arizona had purchased property outside of Flagstaff specifically to preserve two caves on the property: Cathedral Cave and Indian Cave.

According to Mallonee, "Following his directions to get out there was an adventure in itself. Have you ever had the experience of receiving directions from someone familiar with an area? Elements that would need to be important to a newcomer are often left out."

She found herself near midnight in "gnarlier territory than he had described" and decided to turn around and back track while she could still remember how to get out.

Unfortunately, upon backtracking, she happened upon an intersection she hadn't noticed on the way in. Should she veer left or veer right? She had a guess, but just to be sure, she got out of her van and looked at her tire



*"In the Dolores River Canyon" Fifty miles east of Moab, UT across the La Sal Mountains. Artwork © by Hester C. Mallonee, 2011-2012.*

tread via the light from her headlamp, hoping to see evidence of which way she had come. It was lucky she did so, because she had guessed wrong. Not wanting to get too far off track, she ended up sleeping in the van that night and hoped that some cavers would come

along eventually on route to the same destination. Luckily that was exactly what happened.

The two caves have had a troubled past, having been heavily vandalized by locals for many years. The new owners

had bought the property to protect the caves. Property rights in the rural Southwest, however, are double-edged. On one hand, property owners are so adamant about their own property rights that trespassers are more likely than not to be greeted with a shotgun. On the other hand, if you have any shred of a road across your property, no matter how poor the condition, people will assume there's a community right-of-way. According to Mallonee, both points of view were active players in the cave's history.

**"It was one of those things where you say 'I am woman. I am strong.'"**

Some locals resented the gating of the property and continued to access the cave. The landowners' cave conservation project was primarily an act of serious earth-moving: blocking an unauthorized road access from the rear of the property with the help of a backhoe, placing culverts and digging berms.

Mallonee wanted a chance to paint as it was a working trip and not a vacation, but it didn't happen. The Saturday involved a sport trip into the cave to do some exploration, and not knowing the condition or layout of the cave, she didn't take in her painting gear. Instead, later that day she helped moved some dirt and help build a culvert.



**"Grand Canyon, Moonrise, Snow" Southern Rim, Grand Canyon. Artwork © by Hester C. Mallonee, 2011-2012.**

"It was one of those things where you say 'I am woman. I am strong,'" said Mallonee.

She didn't visit Indian Cave at all. First, the access was kind of vertical which makes it harder to take in painting gear. More importantly, she was told it might contain javalinas (hairy southwestern wild pigs). When she expressed her concern about the javalinas, the landowner's response was "They're pretty stupid. They might not slash you with their tusks. They might just slash you with their hooves." It was not a reassuring enough response to convince Mallonee to try her luck.

On the second day, she was hoping to paint in Cathedral Cave in the afternoon after the work session, but the whole gathering ended up breaking up right after lunch.

**"Every artist has what is called the vein of gold."**

"Folks in those hard scramble places...assume if you're there, you know what you're doing," said Mallonee. And given the difficulty

she had of finding the place, she wanted to follow someone on the way out, so she took such an opportunity and left.

### **A Brief Stop at the Grand Canyon**

Her next painting destination was the Grand Canyon which was covered in snow that time of year. For some artists, the Grand Canyon is their "vein of gold."

"Every artist has what is called the vein of gold," said Mallonee. The term is frequently used when actors are cast in their best roles, but it also applies to artists.

"Stilllife, figure work, portraiture are not my vein of gold, not what makes my heart sing, not an instantaneous feeling of rightness...it's the physically demanding stuff that gives me that feeling," said Mallonee.

While some famous artists such as Bruce Aiken and Curt Walters have devoted their entire lives to painting the Grand Canyon, Mallonee spent only a brief time there as she was anxious to get to the real crown jewel of her trip: Carlsbad Caverns. She was also a little nervous about her upcoming visit.

### **The Crown Jewel: Carlsbad Caverns**

Carlsbad Caverns holds a special place in Mallonee's heart as it was not only the first cave she had ever visited on her family's many cross-country trips, but it also played a pivotal role in convincing Mallonee to retire from her first career and elevate art from a hobby to a full profession.

Mallonee first starting painting at the age of 31, but it wasn't until she painted in Carlsbad Caverns eleven years ago that she became a caver. She said painting in Carlsbad was a life-changing experience. She knew

in her heart that upon returning to Carlsbad this time, the experience would not be the same.

To gear herself up mentally for the project, Mallonee approached her painting trip with the attitude that it would not be so much a revelation this time, but rather a continuation or followup from her previous experience. She went with intention of getting her work done, and said it took a lot of the pressure off.

That proved to be a good strategy. Carlsbad Caverns has so much visual content that it was actually a little intimidating. There was no way that anyone in a mere two weeks come close to completely depicting the essence of the cave.

In fact, very few artists have taken a crack at Carlsbad. The first such artist was Will Schuster who in 1924 lowered himself in with bucket, worked hard to get some sketches, than painted off-site using his sketches. The famous photographer Ansel Adams took photos of Carlsbad for a Works Projects Administration (WPA) project during the Great Depression of the 1930s, although he admitted hating trying to photograph in such inhospitable darkness.

Mallonee knew she was only get to scratch the surface, so her goal was to create one or two really excellent paintings and a smaller number of other "good" category. Why not strive for excellence in all the paintings?

"It's the dynamic of painting. It's just a fact that you have to push quantity if you want quality," said Mallonee.

She created two large paintings, one 2'x4' and one 3' x 3' diamond-shaped painting. Each were based on smaller studies. In artists' terms, a "study" may be a practice piece, a quick painting to capture the essence of a subject or scene. It may focus on just a portion of the subject or may be the whole thing on a smaller scale, both in preparation for a larger painting.



**"The Bell" Carlsbad Caverns. Artwork © by Hester C. Mallonee, 2011-2012.**

### **What's it like to paint in a cave?**

Whether she's painting underground or on the surface, Mallonee strives in all cases to be what she calls "direct and authentic."

**"Painting in a cave  
is like the best of both worlds."**

"It doesn't matter whether the painting is rough or smooth," said Mallonee. "It is my honest, powerfully engaged response to what's in front of me. I couldn't be less interested in how anybody else might paint

it, and I choose my subjects because they're worth my time. I don't paint to make witty academic references or to do cultural/political commentary."

Still, painting in a cave is definitely not your average nine to five job.

First, since she was going to be in the area for about two weeks, she elected to stay at a hotel in White's City,

New Mexico, named not for Jim White who discovered Carlsbad Caverns in 1898, but rather for Charlie White, who was seeking a cure for his tuberculosis, and who in 1927 bought 320 acres at the mouth of the canyon leading to the caverns. The hotel belongs now to Joe Jenkins who is trying to restore it.

Luckily, since it was the off-season and the hotel was only partly full, mostly with oil and gas field workers employed by Halliburton (the world's second largest oilfield services corporation), she was able to barter artwork for accommodations.

Second, water is permitted in the cave but food is not so Mallonee would start each day by eating a large breakfast to sustain her for the day. She would enter the cave at about 8:30 a.m. when it opened for visitors and would exit with the last ranger at about 5 p.m.

Her work day would include hiking about a mile and a half along the trail to and from her painting location. She would carry in her compact folding easel, a compact folding stool, and her painting supplies in a small green square duffel that converts into a little service area containing paints, brushes, a water container for rinsing brushes, and such. Not only does the duffel keep everything looking tidy, and lets her work more cleanly, it also suggests respect for the resource. She usually likes to have a folding chair also, but it died from old age and long use earlier on this trip while at the Grand Canyon. Fortunately Carlsbad Caverns contains benches.

When she got into her work, she didn't always notice time passing. She would come out hungry but not distractingly so. A more pressing issue, since she was working alone and could not leave her belongings



***"The Chandelier, Carlsbad Caverns." Artwork © by Hester C. Mallonee, 2011-2012.***

unattended, was no bathroom breaks. As she would take the elevator back to the surface, some days she would think, "Thank God, it's taking me closer and closer to the bathroom."

Carlsbad Caverns has the single largest cave room in the western hemisphere, and unlike Mammoth Cave (longest cave in U.S.) almost all of it is richly decorated. There is very little base rock.

"Almost all of the formations are matchlessly beautiful, or perhaps matched in beauty by the formation next to it, and the one next to that. The flowstone, draperies and stalactites are beautiful from any angle," said Mallonee.

To keep from being overwhelmed with choices of what to paint, her plan of attack was to find the first feature that caught her eye and work from there. After choosing a formation to paint, she did two small studies from one angle, then decided that she wanted the draperies to fall more left to right so she changed her viewing angle. Unfortunately, the first location was quite comfortable

with a bench and plenty of space and room for her easel. Her second angle was half as narrow, and she had to strap her easel to a handrail.

“When I’m in physically rough conditions, the paintings tend to be physically rough, powerful and vigorous brush work on the surface of the canvas. When I’m more physically comfortable, the paintings may still be on the vigorous side but calmer, more detailed throughout, less overtly emotional. When I’m painting in the studio where I can grab a hot chocolate or a snack and everything is conducive to physical, mental and spiritual comfort, the paintings are more detailed.”

While technically qualifying as outdoor and landscape conditions, the cave climate is much more mild than open above-ground landscape.

“Painting in a cave is like the best of both worlds,” said Mallonee. At least it is most of the time. Painting outside also means sometimes interacting with visitors which can be both beneficial and distracting.

### Visual Politics

The most frequent question she received from visitors was “Are you painting?” While such an obvious question might seem ridiculous given that she is standing there with an easel and paint and paint brushes, Mallonee theorizes that it was more an expression of amazement. For many of these visitors, Mallonee is probably the first working artist they’ve ever seen, and almost certainly the first they’ve ever seen underground. It is also a statement of how little art seems to be valued in our fast-paced modern society.

As an artist working in a public

setting, Mallonee is automatically and inadvertently placed in the position of being an ambassador for art. Visitors to the cave are naturally going to be influenced by what they see. As such, Mallonee practices what she calls “visual politics.”

First, to protect the cave, Mallonee sets up her work station by laying out a clean white or yellow plastic tablecloth to keep a physical barrier between the painting activity and the cave surfaces and the path itself. This also helps convey respect for the cave

environment, and also respect for the artist’s work space (i.e. warning visitors “don’t step here.”) Using a new cloth for each cave also helps prevent contamination of caves, not just from White Nose Syndrome but also to prevent transferring microbiotic life from cave to cave. The art gear itself is contained in a big plastic bag and/or sits on the tarp.

Second, she uses high-grade professional acrylics. Since acrylics are water-based paints, they do not require toxic solvents or volatile chemicals or emit odors and are thus far more cave-friendly than oil paints. She also avoids pastels because they create dust. Watercolor might be acceptable, but she has not experimented with them yet.

The tourist light in Carlsbad was



*"Like a Figure, Waiting, Veiled" Carlsbad Caverns. Artwork © by Hester C. Mallonee, 2011-2012.*

generally good enough for her to see the formations, but she would occasionally need to use a headlamp to double check the canvas as the path was not always as well lit. Carlsbad Caverns is the process of converting to more LEDs as it is not only more energy efficient but produces less algae than traditional incandescent lighting.

While interacting with visitors has ups and downs, Mallonee felt far more at home with the park service personnel themselves. There was a great diversity of geographical background and culture.

"Every ranger I chatted with was an interesting and unique person, and all of them seemed to love working there," said Mallonee. "As I think over all the opportunities I've had to cave or paint underground, I've really moved by people in caves or public lands community. I feel really feel blessed by the number or people who understand the value of what I'm trying to do in depicting the underground and have been actively helpful."

### **Coming Home to Washington State**

The two weeks at Carlsbad, while enjoyable and productive, were barely long enough for Mallonee.

"I was so sorry to leave. Artistically, it felt like I had just begun to dip my spoon in the pudding when I had to walk away from the table," she said.

Still, it was almost Christmas, and Mallonee wanted to get home to her family. She also wanted to finish her works in the studio.

"I wanted to bring paintings home to the studio and let the colors mature and sink in, especially with the bigger



*"Castle Rock" Just outside Boise, ID. Artwork © by Hester C. Mallonee, 2011-2012.*

paintings. Color balance can change over a few months," said Mallonee.

"Color is just as important as composition, and thus, I use color not merely to embellish, but to convey information. The colors often wind up being very attractive, but they're there for much more than that: they define forms and spaces, and establish the climate of the picture. So: All of my works are part of a stylistic continuum that's unified by directness and by the use of color to accomplish substantive goals."

### **Other Accomplishments and Future Plans**

Over the years, Mallonee has won several awards for her work. She took first prize for painting in NSS Fine Arts 2005 for her painting of the "Paradise Lost" formation in Oregon Caves. More of her art was featured in the August 2006 issue of the National Speleological Society News. She also took 2nd prize in the 2009 International Cave Convention for a painting of Papoose Cave, She created from that one from photos, as straddling a chasm is not conducive to on-site painting. For most of 2009, the Oregon Caves Visitor Center exhibited Mallonee's artwork of her previous seven years of painting in the cave.

The Carlsbad Caverns Visitor Center now has a dedicated art space and rotates exhibits of current artists (mostly photographers) with exhibitions of older artwork, namely Ansel Adams and Will Schuster. Mallonee's artwork is scheduled to be exhibited there in Sept., 2012.

Perhaps the best accomplishment, however, is being able to sell her artwork. During her trip, Mallonee sold several pieces of art from more than one cave.

"It makes me feel like a million bucks," she said.

Mallonee's future plans include returning to both Oregon Caves and Carlsbad Caverns. She plans on creating a 8-foot tall painting of the "Paradise Lost" area of Oregon Caves. This will be a multi-year effort and will have to be completed from studies due to the size of the painting.

She also plans to stay physically fit enough to continue painting in rugged landscapes.

"Maintaining the physical fitness to do the things I love has to be more thought out," said Mallonee. "My generation is breaking the definition of aging. For the first time ever, there's a substantial number of older athletes, and cavers are a kind of athlete."

Mallonee joined Cascade Grotto in 2002 and has been a member for 10 years.

"It's been the most satisfying 10 years of my life. I wish so much that I had taken it (painting) as my original profession and taken up caving as a young person. I'm looking so forward to next decade," said Mallonee, not to repeat the previous decade but looking forward to whatever comes next.

Mallonee's work can be visited on her website at: [www.caves.org/cavestartart](http://www.caves.org/cavestartart)

All artwork in this article is copyrighted by Hester C. Mallonee, 2011-2012 and was used by permission.

## 2012 NCA Regional

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**Aug. 31- Sept. 3, 2012: Labor Day Weekend**

**Hosted by Oregon Grotto**

*www.oregongrotto.com*

**Camping near the Sand Cave Camp area and Little Red River Cave**

- 16 caves (trip leaders needed)
  - Hiking and biking (Ape Canyon, Butte Camp, June Lake Trail)
  - Mountain climbing (permit required)
  - Scenic drives and boardwalk caves
  - Cave clean-ups (Lake Cave and Ape cave)
  - Vertical workshops
  - Saturday dinner
- ...and more!

**Save  
the  
Date!**



# Empirically Derived Breaking Strengths for Basket Hitches and Wrap Three Pull Two Webbing Anchors

By Thomas Evans<sup>a</sup> and Aaron Stavens<sup>b</sup>,

<sup>a</sup>Montana State University, Department of Earth Sciences, PO Box 173480, Bozeman, MT 59717-3480, [cavertevans@gmail.com](mailto:cavertevans@gmail.com)  
<sup>b</sup>[aaron.stavens@caves.org](mailto:aaron.stavens@caves.org)

## Introduction and Background:

All rope rescue systems have an anchor, and if the system is designed conservatively, the anchor should be stronger than the rest of the system (ideally the rope is the weakest point in the system). Consequently it is important to know the strengths of our anchors, as well as the relative strength of the anchors in different configurations.

Copious pull tests and dynamic tests of anchors have been performed in the past. However, few of these testing programs have been published for a wider audience, and rarely are the conditions of the tests reported in sufficient detail for others to independently determine the validity and rigor of the testing programs. In addition, statistically significant numbers of tests are usually absent, meaning that the variability in anchor performance is nearly entirely unknown.

The research program presented here is designed to measure the absolute breaking strength of two anchor types (basket hitches and wrap three pull two anchors (W3P2)), observe their relative strengths, the variability in breaking strengths and breakage patterns, and ultimately to ascertain if both are acceptable rescue anchors as expected..

## Materials:

Two spools of new unused one inch PMI tubular webbing were used from lot number 45105 and loom 514. One of the two spools had a splice, and the splice point was not included in any of the anchors measured, though both sections of webbing on the full spool were given their own spool designation when sample numbers were

assigned to each anchor.

Measurements of breaking strengths were conducted on a Baldwin universal testing machine with DP41 digital load deflection upgrade electronics with an internal load cell range of 0 to 200,000 lbs, at the College of Engineering, Montana State University. The universal testing machine was last calibrated on 3/10/2011 and measurements took place on 6/23/2011–6/24/2011.

## Methods:

Eight feet of webbing was used to tie basket hitches, and nine feet was used for W3P2 anchors. To ensure no effect was observed due to the spool of webbing used, lengths of webbing were cut from each spool alternating between basket hitches and W3P2 anchors.

Samples were given a unique sample number consisting of four parts; the spool number the webbing came from; type of anchor tied; the number of the piece of webbing along the length of a spool, and finally the test number. For example 3-B-14-28 corresponds to webbing from spool number three, a basket hitch was tied with it, it was the fourteenth length of webbing cut from spool three, and it was the twenty-eighth measurement performed.

All anchors were tied by one person (A.S.) to retain consistency. Anchors were tied around a 4-inch diameter smooth steel pipe filled with concrete and the attachment point was a half-inch diameter, four inch tall steel screw link purchased from a hardware store. Basket hitch knots were placed behind the metal pipe while the W3P2 knots were placed on the front of the pipe facing the load.

Each anchor was built and quickly loaded up to ~8000 lbs (~82 lbs per second), then the rate of loading was decreased (~14 lbs per second) till breakage occurred. All trials were photographed prior to initiation and recorded to create a

permanent record of qualitative observations. The anchor internal angle was measured from anchor photographs. The number of breaks each anchor experienced, as well as the kind of break (clean or a fray) was recorded in addition to any notes or abnormalities observed during measurement.

The measured raw breaking strengths were multiplied by the force multiplier determined by the internal angle of the anchor to calculate the load experienced by the anchor. This scaled data was used for all statistics. Descriptive statistics (average, maximum, minimum, range, and standard deviation) were calculated for all trials as well as a subset of those trials in which no abnormalities were observed. To test the null hypothesis that the two anchors had the same breaking strength a two-tailed Z-test was performed for all the data as well as the subset of tests in which no abnormalities were observed.

All anchors broken were saved and archived for later study and can be accessed by contacting the authors. In addition, copies of the electronic data (photographs, videos, and Excel files) can be provided upon request.

### **Results:**

Basket hitches were tied with an internal angle of 15 degrees, yielding a force multiplier of 0.008628961, while W3P2 anchors had an internal angle of 12.5 degrees, yielding a force multiplier of 0.005979200. *Figure 1* (p. 24) displays the raw breaking strengths, scaled breaking strengths, number of breaks, breakage types (clean or fray), and notes and observations made during measurements.

Basket hitches (N=34) broke at an average load of 9943.2 lbs with a standard deviation of 642.4 lbs, with a maximum load of 11244.2 lbs, and a minimum of 8902.2 lbs. W3P2 anchors (N=35) broke at an average load of 9167.3 lbs with a standard deviation of 1075.4 lbs, with a maximum load of 11695.5 lbs, and a minimum of 7445.3 lbs.

To test the null hypothesis that the two anchors broke at the same average strength, a two-tailed Z-test was performed yielding a P-value of .000212

( $\alpha=.05$ , critical value 1.959964), suggesting there is a statistically significant difference between the breaking strengths of the two anchor types.

*Figure 1* shows the breaking strengths of both basket hitches and W3P2 anchors versus rank order (lowest breaking strength to highest). The difference between the average breaking strengths between the two anchor types is visually observed through the gap between the two trends in breaking strengths.

All measurements shaded in grey in *Figure 1* had some abnormality during measurement, and were omitted to remove any effect the abnormalities may have had during data analysis. The same general trends were observed with this truncated (more conservative) data set.

Basket hitches (N=27) broke at an average load of 9928.3 lbs with a standard deviation of 627.7 lbs, with a maximum load of 11208.9 lbs, and a minimum of 8902.2 lbs. W3P2 anchors (N=33) broke at an average load of 9221.6 lbs with a standard deviation of 1064.4 lbs, with a maximum load of 11695.5 lbs, and a minimum of 7455.3 lbs.

The two-tailed Z-test yielded a P-value of .001494 ( $\alpha=.05$ , critical value 1.959964), also suggesting there is a statistically significant difference between the breaking strengths of the two anchor types.

*Figure 2* (p. 24) shows the breaking strengths of both basket hitches and W3P2 anchors versus rank order (lowest breaking strength to highest). The difference between the average breaking strengths between the two anchor types is visually observed through the gap between the two trends in breaking strengths. Both *Figures 1 and 2* show basically the same trends.

### **Observations:**

In all trials the anchors broke at the screw link and not at the knot, suggesting that the knots are not the weak point in the anchors in the configuration tested. Basket hitches tended to break at two locations simultaneously (24 times or 71%), while W3P2 anchors broke in two locations less frequently (8 times or 23%). In 4 trials (11%) one strand of a W3P2 anchor broke; however, the anchor held until pulled further since the loaded

webbing held the anchor in place even with the severed strand. In addition, the W3P2 anchors made many more noises during loading than the basket hitches.

*Figures 3 and 4* (p. 25) depict the breaking strengths of both basket hitches and W3P2 anchors versus rank order (lowest breaking strength to highest) with the spool of origin indicated for each test.

Basket hitches show a roughly even distribution of spools throughout the rank order breaking strengths suggesting there is no effect due to the spool of origin in the breaking strengths. The opposite is true of W3P2 anchors with spool 3 anchors breaking at lower strengths than spool 1 anchors.

Since statistically significant numbers of anchors of both types could not be made with each spool of webbing it is impossible to determine if this effect is real or a function of chance. Here we simply note that there appears to be a difference in the breaking strengths of W3P2 anchors between spools and acknowledge an insufficient sample size to determine if this effect is a function of chance or not.

#### **Sources of Error:**

All measurements have an associated error. In this case the error inherent in the Baldwin universal testing machine was as low as can be expected since it had been recently calibrated. More importantly, the error is on the order of plus or minus a few pounds. The error in cutting the lengths of webbing was on the order of a millimeter or two. The variability in tying hitches and their internal angles are the largest source of error in this suite of measurements. This variability was small enough that, when measured, the internal angles for each anchor type (basket hitch or W3P2) were consistently the same. Internal angle measurement error was on the order of half a degree. In total the sources of error are small enough that the conclusions reached are not affected by their inherent uncertainty in measurement (error bar).

#### **Conclusions:**

- Webbing anchors broke at lower strengths than

expected. Assuming a ~4000 lb breaking strength for each strand, a 16,000 lb breaking strength estimate was generated.

- As tied the weakest point in the anchors is not the knot but the webbing itself.
- Webbing anchors can break in more than one location simultaneously during failure.
- Basket hitches break, on average, at a higher strength and with less variability (smaller standard deviation) than W3P2 anchors.
- Basket hitches appear to be between 705 to 775 lbs stronger than W3P2 anchors in the configuration tested.
- The most common failure mechanism of basket hitches is breaking of webbing at two locations simultaneously while the most common failure mode of W3P2 anchors is the failure of one strand.
- There is variability in the breaking strength of anchors between spools of webbing as well as within a spool of webbing.
- Both basket hitches and W3P2 anchors are stronger than 11mm nylon rope (~6000 lbs) so both are acceptable rescue anchors when tied in the configuration tested here.
- Developing and implementing a testing program is easier than expected and is possible for many individuals who live in proximity to a university with testing facilities.

#### **Discussion:**

When interpreting the findings presented here it is important to keep in mind that these results apply to anchors tied in the configuration tested. Our results have no bearing on basket hitches and W3P2 anchors with knots located in different places, a variable that should be investigated in the future.

Both anchor types demonstrated they are adequate for rescue systems; however, both have strengths and weaknesses. Basket hitches are stronger, are tied faster, and use less webbing; however, they

slip and move around more easily than a W3P2 anchor. W3P2 anchors are weaker (but strong enough), are slower to tie, use more webbing, but stay in place far better than basket hitches.

Ultimately both anchor types are effective and useful in a rigger's tool belt of techniques to apply to different problems. Both should be used in rescue systems when their strengths are needed and their weaknesses can be mitigated.

The observations and measurements presented here are consistent with an inference of the mechanism of loading and failure that explains the relative strength difference between the two anchor types.

This inference forms the core of a hypothesis (testable causal explanation) of how anchors load and break; however, this inference should be tested prior to being used as an explanation of how anchors work.

Inference of loading and breakage mechanism: As anchors are loaded each limb takes weight more or less equally until the material starts to stretch. At this point the limbs are weighted unequally since some limbs were shorter than others (even if it is only a small difference). If the difference between the forces applied to limbs is greater than the static friction of the webbing against the object it is wrapped around the anchor will slip and equalize the force on the limbs.

Basket hitches have far less friction between the webbing and the object it is wrapped around since there is less contact between the two objects. Consequently basket hitches are able to distribute the load faster and at a lower threshold than W3P2 anchors. When basket hitches finally fail they fail simultaneously at two locations since the breaking strength of the webbing has been reached at essentially the same time throughout the anchor since it is approximately equally loaded.

W3P2 anchors have far more friction between the webbing and the object they are wrapped around making it harder for the limbs to equalize. This creates an anchor that has unequally weighted limbs, and the limb with the greatest loading fails

first, creating a break in only one place. This causal mechanism also explains the observation of hearing more sounds from W3P2 anchors during loading. The greater friction caused the W3P2 anchors to shift small distances more frequently during loading producing noises, ultimately yielding an anchor that was probably not fully equalized.

To test this hypothesis the same suite of measurements could be performed; however, the steel pipe used could be covered with a coarse sand paper introducing more friction to the system.

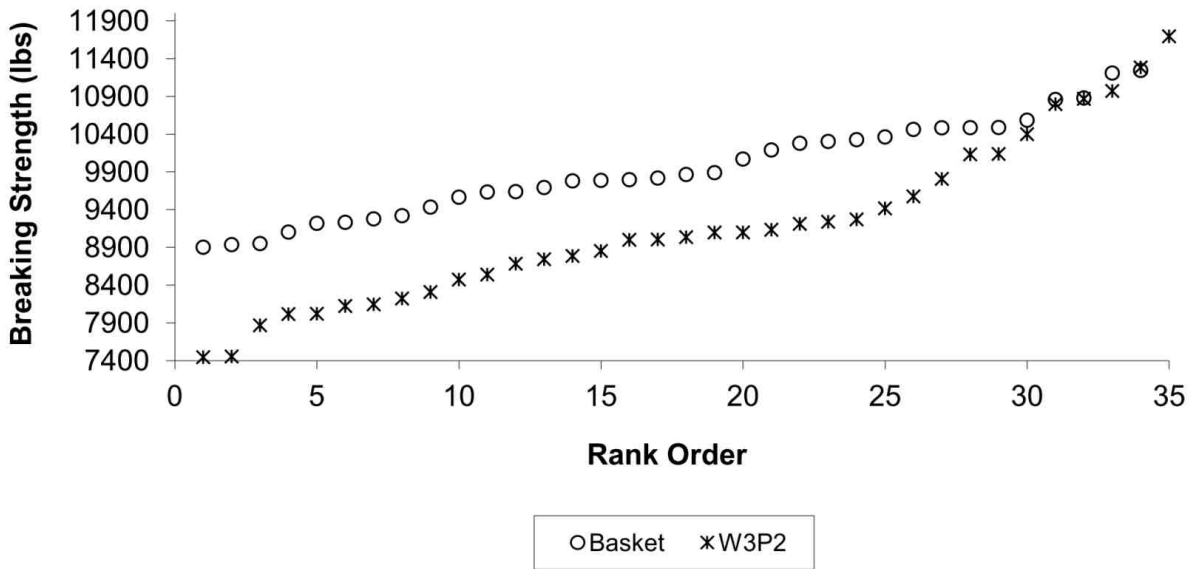
If this causal mechanism is correct, the breaking strengths of the basket hitches should be reduced, and we would expect to see basket hitches breaking more frequently at one location and not two. W3P2 anchors should also break at a lower value, though the loss should be smaller than basket hitches, and they should fail at one location more frequently. In addition W3P2 anchors should make less noise during measurements than when broken using a smooth pipe.

This research program has demonstrated the value of utilizing statistically significant samples since the variability in breaking behavior and strength has suggested properties of how the materials are behaving during use. This information directly suggests hypotheses that can be tested in the future, as well as provides users with information that can be used to select anchors more appropriately for the rigging challenges they face.

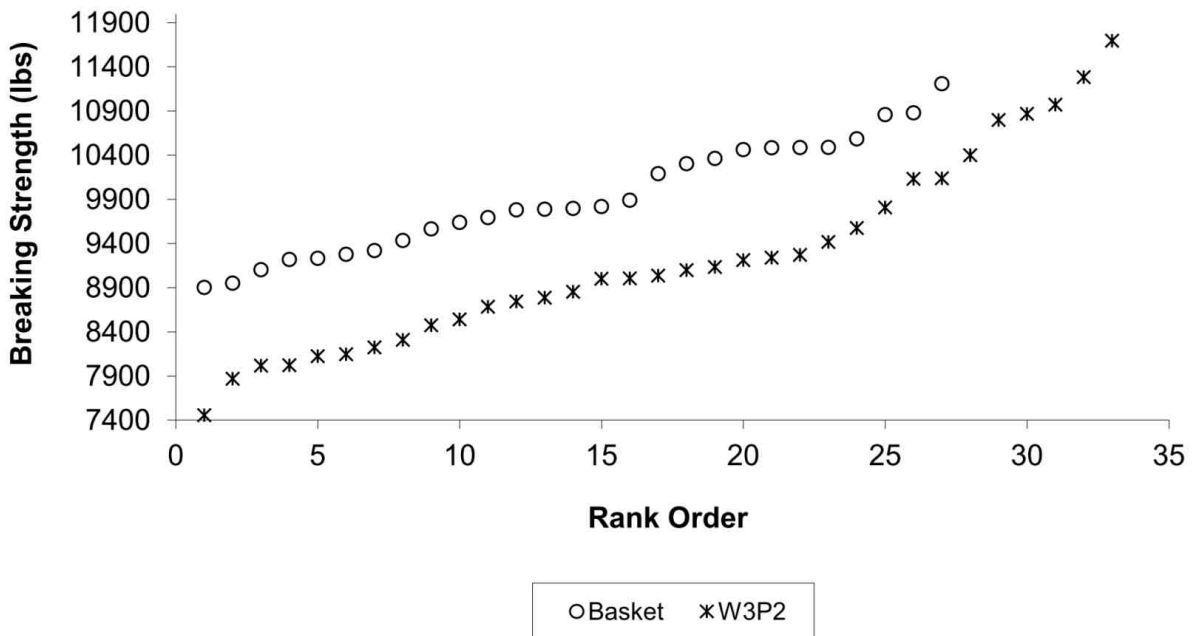
#### **Acknowledgements:**

Dr. Mike Berry, College of Engineering, Montana State University provided access to the testing equipment and lab space necessary to complete this work. In addition Kate McDevitt demonstrated the setup and of the machinery. Cathy Lash provided invaluable help in cutting and labeling webbing strands, as well as providing food during and after testing.

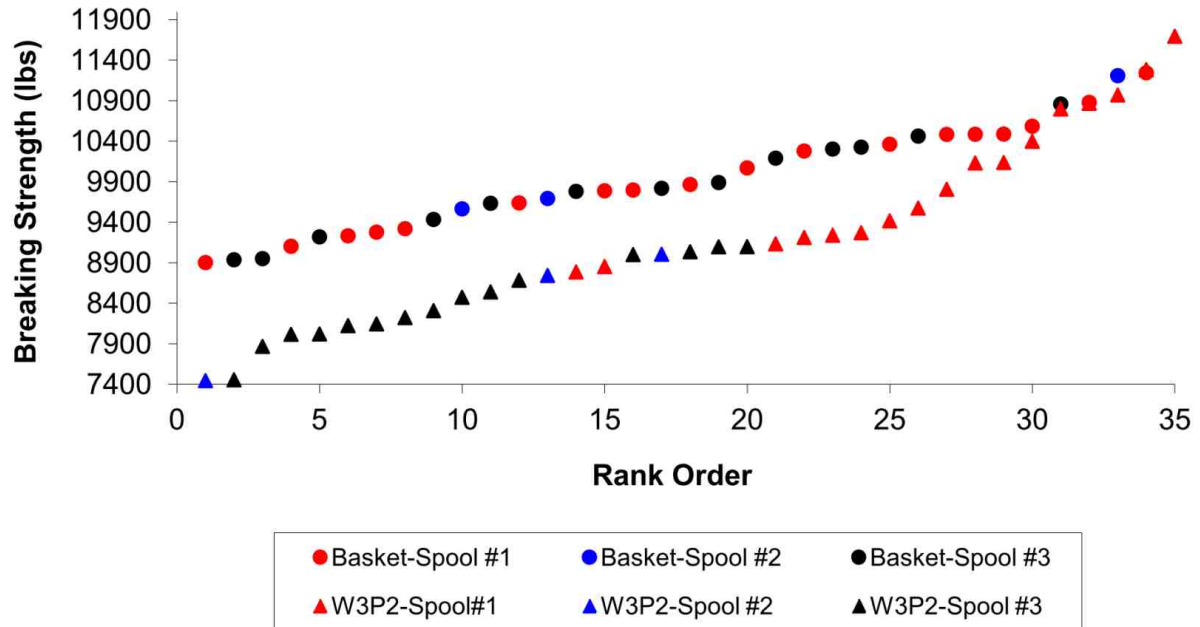
**Figure 1: Breaking Strength vs Rank Order for Basket Hitches and W3P2 Anchors (All Data)**



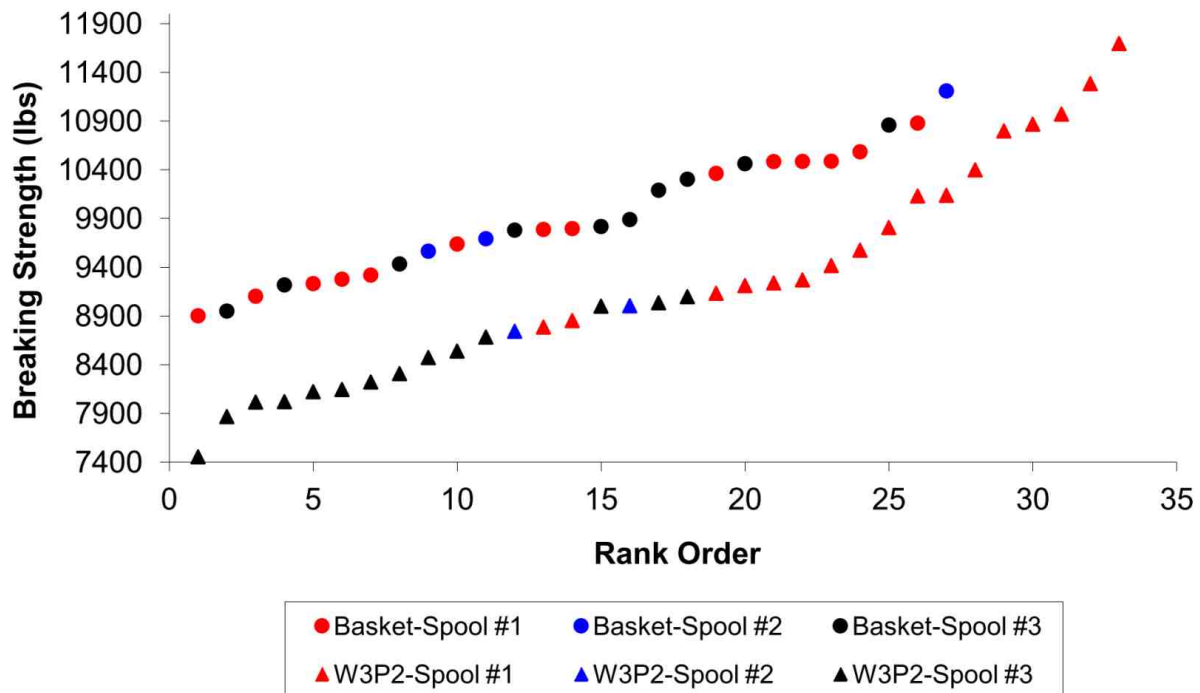
**Figure 2: Breaking Strength vs Rank Order for Basket Hitches and W3P2 Anchors (Minus Abnormalities)**



**Figure 3: Breaking Strength vs Rank Order for Basket Hitches and W3P2 Anchors (All Data, Spools Colored)**



**Figure 4: Breaking Strength vs Rank Order for Basket Hitches and W3P2 Anchors (Minus Abnormalities, Spools Colored)**



# Retina Burning Recipes

Cavers the world over report solar retinopathy symptoms!

**By James Mooreshire**

LED technology has been advancing at a truly staggering rate. Arrays of familiar-looking 5mm bulbous diodes are being replaced by low-profile high-output units mounted on ever more complex circuitry and shining through ever improving focusing and/or diffusing optics. While some cavers embrace combined flood and spot configurations and politely utilize battery-saving dimming options, others ensure their social isolation with absurdly powerful lamps requiring exotic high amperage battery chemistry (the ores for which are mined at great environmental ruin by warlords in central Africa).

## **Off the shelf solutions**

A simple (\$20) drop-in upgrade kit can boost your trusty 2AA Mini-Mag to a modern 100+ lumen output, while any properly rugged and water-resistant headlamp boasting a 1-to-3 Watt spotlight LED with some floodlight options on the side (\$35-\$150) should be sufficiently luxurious in all but the blackest walled lava tube.

For the caver with an especially bad sense of cave etiquette enjoying their bloated hedgefund management severance package, a powerful bicycle light with helmet mount or fanciful headlamps (\$90-\$300 and up) boasting name brand diode manufacturers and specially crafted optics can combine with several spare nickel or lithium based rechargeables to pack a punch in the face that no co-caver will forget.

Be careful though: at their highest settings many new ultrabright LEDs can drain through a whole battery pack in less than an hour!

## **Custom application DIY LED geekiness**

A thrifty tinkerer confident in the quality of their soldering or a budget-minded cinematographer or photographer seeking to produce powerful customized lighting solutions would first stumble

upon the issues of power draw and heat generation.

While the LEDs themselves are easy enough to procure, and there is compact pre-assembled driving circuitry available for all sorts of applications, high power LEDs can easily pull more amperage than a typical arrangement of alkaline batteries can provide, and in such configurations they produce quite a lot of heat which must be safely dissipated away from the diode and its printed circuitry before it can do itself damage.

One must also remember that harsh caving environments and sensitive electronics don't mix without being isolated by properly strong enclosures with sufficient consideration towards moisture.

## **Reuse, Reduce, Recycle!**

An old headlamp sporting a quality separated battery case but an antiquated incandescent and round-mirrored reflector might be upgraded by hollowing out the reflector/bulb housing in a way that maintains the lamp's water resistance. A waterproof in-line rocker switch inserted along the length of the battery cable can replace a twist-on arrangement if there is no useful existing waterproof switch.

Replacing the bulb and its socket with a compact LED driver and some PCB-mounted LEDs with their appropriate matching optics can prove to be by no means simple. An old computer destined for the landfill will provide several sized heatsinks that might be used for dissipation, but a heatsink sealed within a plastic housing may prove insufficient for high output arrangements.

Scavenged waterproof light enclosures with convenient standard battery holders might, depending on their ability to dissipate heat, be able to house a single 1-to-3 Watt diode with its matching spot optic, and a lower power

supplemental diode set up to serve as a nearfield diffused floodlight. Such a design can stand up to all but the most costly modern designs for half the price of the commercially available counterparts. Beyond that, custom designed heat dissipating yet electrically-sealed aluminum or copper enclosures are required along with battery packs capable of sustained high output.

### **Build!**

For the most demanding needs it is possible to assemble lamps closer to *streetlight* than *headlight* in intensity. Photographic issues such as washout and harsh shadows become an issue at these levels, and bouncing or diffusing techniques may prove essential.

Multiple units and traditional multiple point lighting approaches can be utilized to turn any chamber into a vividly lit studio. Various optics are available for the most popular and efficient diodes, allowing equipment to be optimized to the task at hand.

Looking directly at such arrangements can be downright dangerous and living photo/video subjects will usually protest. Diode manufacturers with names like Cree\* and Luxion\* rule supreme in the world of high output LEDs.

In designing a custom LED arrangement, one must consider not only the housing and its thermal properties and waterproof-ness, but also careful electrical component selection. Groups of high-draw constant-output diodes might make more sense in a photography situation, while less powerful single diodes balancing flood and spot light with dimming options is surely preferable for a main headlamp configuration.

A sharply white 6500k frequency diode is no problem when working with a video camera that can be easily white-balanced, but might seem to reduce color intensity for a still camera which would prefer a warmer-white diode frequency. (So-called RGB diode arrangements can be utilized to combine primary colors into a bizarre but rich off-white, or perhaps a dance party underground.)

Similarly: the human eye might not be able to discern the difference between some diodes

drawing 750mAh versus the same arrangement drawing 1010mAh (and one would therefore prefer to save battery life), but this minute difference in light intensity might allow a video camera to pick up detail for several more yards down a tunnel.



***This modern lithium-iron-phosphate battery holds more power than a sizable pile of AA cells!***

### **Spend!**

Customized caving-ready solutions do exist. One excellent example of such technology being put to use underground is the work of Mr. Bif across the pond at [www.littlemonkeycaving.co.uk](http://www.littlemonkeycaving.co.uk).\* For a little over a half grand (\$US), he'll ship you a stupendously sexy custom-built caving lamp with polished gunmetal screw-heads and an extra Lithium-ion battery pack that makes the most homely caver look pornographic. He'll also empower you to recycle with cleverly designed affordable upgrades for common round lens mining/hunting lamps and a full line for retrofitting the once popular Petzl Duo lamps.

Between designing satellite payloads for the U.S. Navy and smart circuitry for enthusiast/educational rocketry projects, the folks over at The StenSat Group found time to design the coveted (and US-built) Stenlight\* caving lamp, available from various caving gear retailers for a mere \$300.

The readily available waterproof Princeton Tec\* Apex series headlamp (\$70) gives even the latest Petzl\* offerings and the aforementioned caver-made monsters a run for their value, sporting a well designed heatsink and optic and offering a high spot mode capable of going through AA batteries nearly as fast as you can reload them.

Aside from selling you all the components you need



to assemble your own project, the folks over at [ledsupply.com](http://ledsupply.com)\* will sell you an up-to-9 Watt array with optic and driver able to fit into one their tripod mountable aluminum camera light housings (\$80) requiring only battery selection, perhaps a glass lens if you need total waterproofing, some cable/plugs, and a switch to complete.

Power dense Lithium-polymer batteries sold for use in r/c aircraft can potentially burst into a ferocious lithium fire if punctured or charged/discharged improperly - so avoid Li-Po batteries in favor of Nickle (Ni-Cad or Ni-MH)-based chemistry available in waterproofed packs sold for bike lights, the safer Lithium-ion battery packs (as found in laptops and mobile phones), or even the coveted new Lithium-Phosphate (Li-FePO4) technology designed for electric cars.

Ultimately, however, all once-new technology quickly becomes available for significantly less money as an imported generic.

A quick eBay\* search for "3W mining light" currently reveals an allegedly waterproof \$50 unit with belt-mounted Li-ion battery claiming to be capable of maintaining 250 lumen of light output for 16 hours per charge or 30 lumen for 30 hours in low mode.

An Amazon\* search for "1W headlamp" produces compact units for \$14, claiming only water-resistance and citing 80 lumen of output for five hours from three AAA batteries.

You might have to allow 14-20 days for delivery... but without breaking the bank it is possible to cave with lights brighter than conceivably possible just a few years ago, while a crafty Do-It-Yourself'er might assemble a compact 18+ Watt array out of readily available components which can out-power the spotlights that get mounted on police cars.

Extra-hot 35 Watt Halogen lamps sold as bike lights or scalding 30 Watt HID assemblies for mounting on the front of your ATV are among the only brighter portable lighting options available, and many of them are only to be mounted where there is constant airflow. Underground, the LED has truly become king.

*\* Cascade Grotto doesn't endorse any manufacturers or distributors of gear, nor did we even so much as bother to ask permission to mention any companies' or products' names.*



***Removed from their enclosure, a blinding 19 Watts of diodes (arranged on two boards with three LEDs each) have been attached to an old computer heatsink. Foreground module is sporting a focusing optic while the background board is bare.***

# From the Photo Gallery of James Jones

Page 29: Top Left: **Waterfall-carved marble wall in Hellhole Cave.**

Page 29: Top right: **A caver from below in Hellhole Cave.**

Page 29: Bottom left: **This Red Allophane formation gives Red Cave its name.**

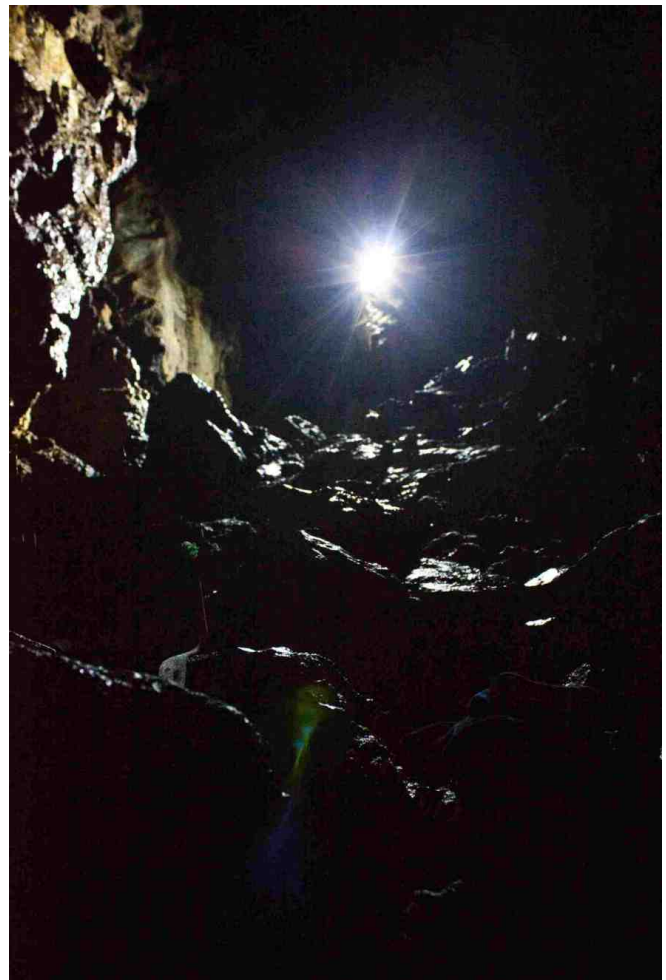
Page 29: Bottom right: **A pitted rock in Dynamited Cave.**

Page 30: **The Attic in Red Cave.**

Page 31: **Waterfall in Dynamited Cave**

James Jones is a Federal Way/Tacoma native and a college student currently pursuing a geology degree at Shoreline Community College.

He is also an avid climber who the rest of us regularly opt to send across dangerous traverses first.







# Meet the New Cascade Grotto Officers

No Photo Available

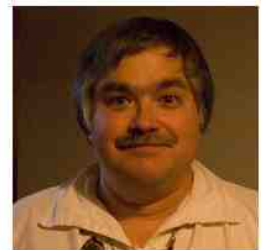
## President

I.M. Vacant hails from the lovely state of NOWHERE. Interests include NOT MUCH AT ALL. Favorite color: INVISIBLE. Favority activity: Fill in the BLANK. No photo available but often wears a VACANT expression. Worst fear: PUBLIC SPEAKING.

*Editor's Note: Members interested in filling this position should contact one of the current officers immediately. Surely in a grotto with 60 years of caving history, there is at least one person foolish enough, wait, we mean brave enough, to step forward and lead. You don't even have to have any affiliations with the state of Missouri (if you're thinking "huh?" see the bios below).*

## Vice-President

Robert Mitchell was born in the state of Missouri about a half century ago, and had his first "wild cave" experience at about five years old. After moving to St. Louis, Missouri, he joined the Middle Mississippi Valley Grotto (MMV) in 1986 and began caving more heavily, especially in Perry County MO, mostly in Berome Moore Cave. In 1991, employment moved him out to the Pacific Northwest, where he then joined the Cascade Grotto and the Willamette Valley Grotto.



He is a bit of a caving dilettante and likes exploration, mapping (usually on the "dumb" end of the tape), cave restoration, ridge walking, vertical, and more. He's made several trips into the crater of Mt. St. Helens to help explore and study the glacial caves forming between the crater walls and the lava dome. He is also a private pilot, a certified medical first responder (one level below a basic EMT), and a member of a historical re-creationist group. He hopes to get into SCUBA some day so no place on earth will be safe from him.

When people ask him why he goes caving, he tells them, "I will never stand on another planet, walk the bottom of the ocean, or stand on the tops of the highest mountains. But when I am underground, there is a very good chance that I can be the first human to put first light on something unique and wonderful."

## Secretary/Treasurer

Kathryn DiFoxfire Wilson, who goes by "Kat," recently moved back to the land of little limestone (i.e., Washington State) after a 20-year-hiatus. Her first wild cave experience was 11 years ago as part of a job interview: a six-hour tour involving canoeing, portaging, and caving inside Devil's Icebox Cave in Rock Bridge Memorial State Park in Columbia, Missouri. After being hired full-time by the park, she led wild cave tours and research trips through the 6.5-mile-long Devil's Icebox and led school programs through the much smaller Connor's Cave in the same park (among many other duties as a park interpreter).



She joined Chouteau Grotto (Columbia, MO) in 2000 and served several terms on the board, most recently as president from 2008-2010. Through Chouteau, she also met, fell in love and married her husband, Jeff Wilson in a true caver's wedding (about a mile underground). Coincidentally, Jeff is also originally from Washington State and a former (and now renewed) member of Cascade Grotto. Kat and Jeff live with their 2-year-old son, Derek, also an avid caver and bike-rider, in Gig Harbor, WA. When not caving or being a full-time mom, Kat enjoys hiking, camping, writing, reading or teaching traditional dance.

# Cascade Grotto Monthly Meetings

The Cascade Grotto meets at 7:00 p.m. on the third Friday of each month (except December) alternating between the Shoreline Community Center north of Seattle, WA and the Milton Tavern south of Federal Way. Meetings consist of grotto business, followed by trip reports and scheduling of future cave trips. Some meetings also contain a program. After meetings in Shoreline, we usually drive to Spiro's Pizza for food, drinks and socializing. At the Milton Tavern, we stay at the Tavern for socializing afterwards. Meetings are open to all members of the public except that the Milton Tavern does not permit kids in the building after 4 p.m.

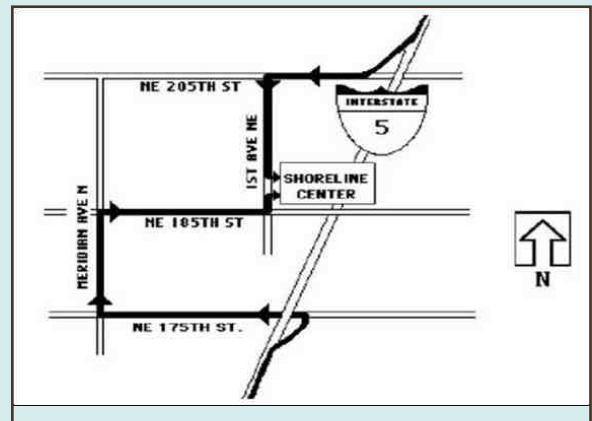
## WHY TWO DIFFERENT MEETING LOCATIONS?

Cascade Grotto used to meet monthly at Shoreline, but due to our limited budget and the cost of the meeting room, members voted to reduce meetings to bi-monthly at Shoreline with meetings in the off-months elsewhere. When we discovered a free meeting room in Milton, we elected to meet there in the even months because a) it was more stable than bouncing between many multiple locations, b) many of our members live in the south Puget Sound area and c) it's free and has great food and free parking!

## DIRECTIONS:

The **Shoreline Community Center** is located at 18560, 1st Ave NE in Shoreline. It's a large quiet conference room with easy access, free parking and full AV capability,

*Directions from Seattle:* Take Interstate 5 north to Exit 176 (175th St. N), and turn left at the light at the bottom of the off ramp. At the next traffic light (Meridian Ave. N) turn right. Turn right at 185th St. N (the next light). Turn left on 1st NE, which again is the next light. The Community Center is on the right. Don't get confused with the Senior Center, which is on the end of the building. Enter the building on the southwest corner and find the Hamlin Room.



The **Milton Tavern** is located at 7320 Pacific Highway East Milton, WA 98354, 253-922-3340. We meet in the upstairs meeting room. It's smaller and noisier than Shoreline, with no AV capabilities, but the tavern has great food and a wide selection of adult beverages. See <http://www.themiltontavern.com/> for menu. We encourage members and guest to support the tavern since they are supporting us by providing a free meeting room.

*Directions from Seattle or Federal Way:*

Take I-5 South. Take exit 142B. Merge onto S 348TH ST / WA-18 W. Cross over 16th Avenue S (Enchanted Pkwy). Get into left turn lane, onto Hwy 99. Go 2.9 miles (thru one traffic light), Turn left at the traffic light onto Porter Way, and make an immediate right into the parking lot.

*Directions from Tacoma or Olympia:*

Take I-5 North. Take exit 137 toward FIFE / WA-99 N / MILTON. Take the 54 Ave. E. North ramp toward FIFE / WA-99 N / MILTON. At the corner of 54th & Hwy-99 turn right, heading north. Go 1.3 miles (thru two traffic lights). At the traffic light at Porter Way, turn right, & make an immediate right into the parking lot.

## Quick Tip:

### How To Remember Where to Meet Which Month?

SHORELINE has an ODD number of letters.

MILTON (and TAVERN) has an EVEN number of letters.

Thus, in odd-numbered months we meet at Shoreline,  
in even-numbered months, we meet in Milton.