

Minutes of the Virginia Cave Board  
Saturday, February 11, 2012  
Grottoes Municipal Building, Grottoes, VA  
1:00 PM

Virginia Cave Board Members Present

Ms. Babs Bodin  
Dr. Daniel Doctor  
Mr. Roger Kirchen  
Mr. Steve Lindeman  
Ms. Judy Molnar  
Ms. Meredith Weberg

Virginia Cave Board Members Not Present

Dr. David Culver  
Mr. Drew Harrison  
Mr. Thomas Lera  
Mr. David Socky

Department of Conservation and Recreation Staff Present

Mr. Wil Orndorff  
Mr. Larry Smith

Guests Present

Mr. Rod Auwarter  
Mr. Ben Carr  
Mr. Scott Davis  
Ms. Martha Livek  
Mr. Trae Livek  
Mr. Charles Maus  
Mr. Lyall Steger  
Ms. Audrey Steger-Dreelin

Call to Order

Chairman Meredith Weberg called the meeting of the Virginia Cave Board (VCB) to order at 1:03 PM.

Introductions and Announcements

Ms. Weberg invited the meeting's attendees, members, and guests, to introduce themselves, which they did.

Ms. Weberg recommended perusing a website: [www.whitenosesyndrome.org](http://www.whitenosesyndrome.org).

Ms. Weberg mentioned *Caving News* included mention of the publication of the second edition of Dr. Culver's encyclopedia.

## Approval of Minutes From the Meeting of November 19, 2011.

MOTION: Mr. Lindeman moved that the minutes of the meeting of November 19, 2011, be accepted as amended by Ms. Molnar, Mr. Orndorff, and Mr. Fagan via email.

SECOND: Dr. Doctor seconded the motion.

DISCUSSION: None.

VOTE: The motion carried unanimously.

In order to expedite board members' timely revisions, edits, and changes to meeting minutes, Ms. Weberg and Ms. Molnar suggested that draft minutes be posted for members' use only on Google Docs previous to posting on the website. Mr. Smith agreed to look into the process.

### Treasurer's Report

Mr. Smith reported that the treasury contains the previous balance of \$1533 plus a \$75 contribution from the Blue Ridge Grotto, for a current balance of \$1608. A thank you letter will be sent to Blue Ridge Grotto for its contribution, which was not designated for a particular use.

### Committee Reports

#### Education and Outreach Committee Report

Committee Chairman Ms. Weberg reported on Virginia Cave Week, Karst Trail, and the *Virginia Cave Owners Newsletter*.

#### Cave Week

Ms. Weberg reminded the members that the next Cave Week will be celebrated April 22–28, 2012, to coincide with Earth Day. Committee members will contact Virginia show cave owners and ask them to offer discounts to the visiting public that week, and those doing so will have the names of their caves included in Cave Week press releases. The committee has decided to use the theme: *Hike the Karst Trail!* Ms. Bodin and Ms. Molnar will develop a lesson plan that will be posted on the Virginia Cave Week website for educators' use, adaptable for both classroom and non-classroom uses. Ms. Weberg will prepare and issue press releases in mid-March. The new Karst Trail logo will be used on Cave Week materials. An artist will develop the Committee's concept. Ms. Weberg and Mr. Smith will collaborate on a suggested governor's statement.

#### Virginia Cave Owners' Newsletter(VCON)

Ms. Weberg thanked Ms. Molnar for her submitted article and asked for articles from Ms. Bodin on the Virginia Cave and Karst Trail and Mr. Orndorff on white-nose syndrome (WNS). She also has an article by Dr. Doctor on dating speleothems and

Mr. Lera's final Chairman's Message. She asked the remaining board members to submit other articles of interest to cave owners.

Ms. Weberg explained that the VCON has been published for years while experiencing the high cost of postage and problems maintaining the mailing list, so the Board has decided to make future newsletters electronic. Transitioning to the e-newsletter, the Cave Board will be mailing a postcard to cave owners asking them to complete an online survey, which is almost ready.

The mailing list is being updated and new cave owners are being added, using GIS in counties where it is available.

Mr. Maus suggested that the Cave Board have a booth at the NSS summer convention where we urge other states to establish a cave board. Ms. Weberg agreed that we can definitely put out some materials on the function and activities of the Virginia Cave Board.

#### Joint Technical Committee Report

Committee Chairman Dr. Doctor reported that the committee is following up on its initiative of formulating guidelines for development in karst areas. Consultant Bob Denton was unable to attend today's meeting but can possibly attend the next meeting. The committee reviewed several documents describing guidelines for development in karst regions that were used in other areas. Committee members debated whether or not to make comments on the Leesburg Limestone Overlay Ordinance. The Loudoun County Board of Supervisors has adopted the ordinance which may become a precedent in other areas of the state. The committee will conduct further research in the event that the ordinance is challenged and examine what the reaction is in other parts of the state. The committee will also review the model ordinance put forth by the Cave Conservancy of the Virginias, which former Cave Board member Jesse Richardson helped develop. Before developing or endorsing another document, the committee intends to review existing ordinances and guidelines documents. The committee will wait for more information before it makes a comment, but such comment will not necessarily be solely on the Leesburg Limestone Overlay District model.

Mr. Orndorff observed that the committee has a concern that too restrictive an ordinance could have unintended consequences affecting a wide variety of economic and cultural activities. The establishment of an ordinance in one jurisdiction can establish a precedent so care must be taken.

#### Karst Education Update

Mr. Orndorff presented a report submitted by Ms. Carol Zokaites, Department of Conservation and Recreation (DCR) Education Coordinator and Director of Project Underground, who was unable to attend the meeting. Ms. Zokaites reported that she is working on projects both through Virginia State Parks and also through the National Project Underground Program.

1. Projects through Virginia State Parks: Two Project Underground workshops will be held at Grand Caverns on February 22 and 23, reaching about 45 participants, mostly Master Naturalists. The workshops are being co-sponsored by the Department of Environmental Quality Office of Environmental Education.

A three-day Facilitator Training workshop for Project Underground will be held at Douthat State Park on March 13–15. Participants in this workshop will be able to lead workshops for other educators, training educators to lead their own PU workshops.

Science Teachers' Conference will be held in Roanoke March 14–15. Project Underground facilitator Ellen Reynolds will staff an exhibit on karst, demonstrating the activity *Sinkholes in a Cup*, and Jordan Kime will staff an exhibit on *Virginia Bats and WNS*. They will distribute information on the Project Underground program and Virginia karst, reaching about 150 teachers.

Ms. Zokaites continues to represent DCR on the National WNS Communication Team, helping with educational efforts; she is also representing DCR on the *Batslive* project, led by the Prince William County, Virginia, Public Schools Distance Learning section. (<http://batslive.pwnet.org>).

2. Projects through the National Project Underground Program: A day of bat and karst activities targeting the citizens in the Lewisburg West Virginia area is planned for Saturday, June 23, before the NSS Convention convenes on June 25. Project Underground workshops are planned for teachers from the surrounding counties this spring.

#### DCR Karst Program Report

Mr. Orndorff presented an update on white-nose syndrome (WNS), reporting that WNS continues to spread southwest through Virginia. The first possible sites from Scott and Lee Counties were identified the week of January 20, 2012. A tri-colored bat was observed hanging dead near the entrance to Surgener Cave. Similar "hanging dead" tri-colored bats have been observed during the early stages of WNS at several affected Virginia caves. Little brown bats with obvious fungus on their muzzles were observed in both Caines and Cathole Caves in Scott County. One individual was euthanized. Both bats are currently at the National Wildlife Health Center in Madison, Wisconsin, undergoing studies to verify WNS. Natural Heritage and Department of Game and Inland Fisheries (DGIF) staff are confident the Scott County site is WNS-positive. They are less certain about the tri-colored bat collected in Lee County.

The U.S. Geological Survey and U.S. Fish and Wildlife Service (USFWS) continue to recommend universal implementation of decontamination procedures, equipment restrictions, and site closures in effort to combat the spread of WNS (Sleeman, 2011). In contrast, Virginia DGIF and Natural Heritage staff are only implementing decontamination and equipment restrictions in counties unaffected by WNS.

Currently, Lee County remains the sole possible remaining WNS-free county in

Virginia's karst. With WNS present in neighboring Wise and Scott counties, not to mention counties in other states to the south, west, and north, the spread of WNS to Lee County would seem inevitable. Among several important papers in 2011, Lorch et al (2011) verified that the *Geomyces destructans* is the sole pathogen causing WNS.

Proposals to add additional bat species to endangered species lists are under consideration on both state and federal levels for several species, including little brown, Northern long-eared, and Eastern small-footed bats. No formal proposals for state listings in Virginia have yet been submitted.

In January at the Northeast Bat Working Group meeting in Pittsburgh, Rick Reynolds of Virginia DGIF presented a summary of collaborative efforts with the Virginia DCR Natural Heritage Program, Radford University, and National Speleological Society (NSS) volunteers to study the impacts of WNS on Virginia's bat populations. To date, approximately 4,000 bats of three WNS-susceptible species have been banded to track movement, survivorship, and disease progression (little brown ~ 2,600, Northern long-eared ~ 400, and tri-colored bats ~ 850). Fall swarm capture rates for these species at entrances to known affected hibernacula have fallen 70%, 90%, and 80% respectively since 2009. Declines in hibernating little brown bat populations where WNS has been documented for more than one year generally exceeded 90% over the same period. Populations of hibernating tri-colored bats show a highly variable degree of decline, with highest declines observed in caves with large little brown bat populations. The effect of WNS on Indiana bats in Virginia has been minimal to date. Hibernation counts of Indiana bats in several WNS-positive caves were consistent with pre-WNS level, and fungus has only been observed on Indiana bats in a single Virginia cave. Indiana bats have also appeared in a handful of Virginia caves where they had not previously been documented or in higher than normal numbers. However, high mortality of Indiana bats due to WNS has been reported from New York. There is no indication WNS is affecting big brown bat populations in Virginia. Virginia big-eared bats show no evidence of susceptibility to WNS. Finally, we have banded over 1,600 gray bats, a species that has not yet proven to be susceptible to WNS, but that is closely related to many susceptible species. Presence of *Geomyces destructans* on gray bats was first documented in 2010, but associated pathology has yet to be observed.

(Lorch, J. M., C. U. Meteyer, M. J. Behr, J. G. Boyles, P. M. Cryan, A. C. Hicks, A. E. Ballmann, J. T.H. Coleman, D. N. Redell, D. M. Reeder, D. S. Blehert, 2011, Experimental infection of bats with *Geomyces destructans* causes white-nose syndrome: Nature 480, p. 376-378.)

Mr. Orndorff also reported that Fountain Cave was closed for the season for evaluation and that researchers found significantly more hibernating bats than had been previously reported. Fountain Cave will open back up in April.

#### Cave Hill Water Line Easement Update: Augusta County, Cave Hill LLC Property

Mr. Orndorff reported that during the summer of 2011, the Town of Grottoes began pursuit of an easement agreement to run a potable water line south from Route 256 along

the west bank of the South River to Grand Caverns Park, now owned and managed by the Town. The water line would be installed within ~50 feet of the entrance to Steger's Fissure, the site with by far the highest known population of the federally listed threatened Madison cave isopod (*Antrolana lira*). It would also pass within a couple of hundred feet of the entrance to Madison Saltpetre Cave, the type locality for the same species. Madison Saltpetre Cave is also home to the Madison Cave amphipod (*Stygobromus stegerorum*), listed as threatened under the Virginia Endangered Species Act.

In the fall of 2011, the Cave Board submitted a letter to the Town of Grottoes expressing concern over the proposed water line route due to the potential for impacts to the rare karst groundwater species on the Cave Hill, LLC property. During this time, Virginia DCR Natural Heritage and USFWS provided comments to the Town. Concerns were expressed over possible use of the easement for purposes other than for a water line, and the concern that leaks in a pipe with chlorinated water might pose a risk to the two rare, legally protected species found there.

The Cave Hill LLC has to date refused to sell or grant the utility easement to the Town. The Town will likely have to obtain the easement by condemnation should it continue to pursue the route for the water line. Cave Hill LLC members attended the November 2011, Cave Board meeting and requested continued assistance from the Cave Board in addressing the water line issue.

USFWS and DCR staff met with Town of Grottoes staff in January 2012 to discuss the project and alternatives. The Town Staff stated that cost was the driving factor behind the choice of route. USFWS staff informed the Town staff that they advised obtaining an "incidental take" permit for *Antrolana lira*, via development of a Habitat Conservation Plan (HCP). This would shield the Town from liability should take of a listed species occur. The USFWS take is likely should the proposed route across the Cave Hill LLC be constructed. USFWS also explained that the cost of the project could increase greatly with the development of an HCP and the costs of associated mitigation, protection, and conservation efforts designed to offset any impacts from the project. Such costs could potentially eliminate the cost saving of the Cave Hill route over other possible routes for the water line. USFWS requested an estimate of cost of the different routes under consideration so that the increase in cost to the Town if an alternate route were used could be determined. USFWS is looking into possible sources of assistance to the Town in making up the cost differential. The next Town of Grottoes Council Meeting is Monday, February 13. Staff from the USFWS and VA DCR are planning to attend.

Mr. Orndorff further observed that USFWS would have to mandate an iterative process to stave off the bad results, pointing out that mitigation costs would probably result in cost overruns. The Grottoes Town Mayor wants direct communication with USFWS, not secondhand reports; USFWS can come back for additional expert findings and advice later in the negotiation process. Mr. Orndorff projected a Google Maps display of the route under consideration, as well as two other possible routes.

Mr. Kirchen observed that if an incidental take permit results, the project would be subject to a whole new battery of federal impact regulations, which would result in another rise in costs; the contentious issue will go well beyond considering the endangered species if a permit results, and costs would be passed along to the town.

Mr. Steger observed that the proposed water line route would traverse a beautiful piece of land and river habitat that contains a number of caves.

#### Preliminary Results of Age-Dating of Speleothems in Grand Caverns

Dr. Doctor stated that the purpose of the study is to see how climate has been changing for thousands of years through proxy information recorded in the growth of speleothems. He began by presenting a brief overview of the geology of Cave Hill. The geologic structure of the Cave Hill locale contains folding throughout, as well as local igneous intrusions. Some of the caves extend beneath South River, and researchers are investigating how these caves formed.

The paleoclimate research focuses on calcite speleothems. These include stalagmites, flowstones, and pool coatings. Calcite rafts on the water surface in Madison's Saltpeter Cave shows modern re-precipitation of calcite in the cave. In Grand Caverns, ancient pool levels are indicated by calcite coatings along the walls and distinct, thicker calcite accumulation at old stable water levels. Exposed rock above the water line shows no calcite deposits. Researchers drilled cores from pool coatings and got dates ranging from 274,000–440,000 years before present and some older than the range of the dating method used. In the new section of Grand Caverns, there are collections of fallen speleothems. Researchers dated the top and the bottom of several stalagmites, some spanning 55,000 years across the time interval of their growth. Researchers have collected 30 samples so far and have obtained multiple ages from individual samples. An overlapping distribution of dates provides a full chronology, so researchers can fill in gaps that may exist in individual samples.

In order to determine what the past climate was like, the oxygen isotopic composition of the calcite is examined within the growth layers of the speleothems. Water falling as rain varies in isotopic composition (how heavy or light the water is). That composition is incorporated into the mineral, and so researchers can analyze the sample and compare it with other oxygen isotope records across the globe that cover the same time period, such as ice cores or ocean sediment cores. Thereby, researchers can see shifts in oxygen isotope values which indicate changing relative climate conditions (wetter or drier, cooler or warmer).

Findings in Grand Caverns include: 1) speleothem ages less than 120,000 years are most common, 2) several stalagmites show overlapping growth periods extending back more than 300,000 years, 3) certain pool coatings interpreted to be phreatic water levels have been found to be older than most of the speleothems dated so far, and some are older than the limit of the dating method (600,000 years). Magnetic minerals in the sediments indicate a magnetic reversal, showing an age of the sediments of at least 780,000 years. Younger sediments appear to occur at a lower elevation in the cave than older

sediments. Absolute dating of the sediments needs to be done to confirm this relation. Calcite embedded in sediments dated using the U/Th method yields better results than does magnetic dating.

#### Speleothem Cleaning in Grand Caverns

Ms. Weberg reported that the Virginia Cave Board sent a letter to the Grand Caverns management advising proper cleaning methods for speleothems. However, they have decided against our recommendation and decided instead to continue using Clorox because other show caves use the product and decided against using peroxide because of its possible danger to limestone, which is miniscule compared to the potential dangers of using Clorox.

The Board proposed sending a gratis copy of the NSS publication, *Cave Conservation and Restoration*, Culver's encyclopedia of caves, which includes a discussion of best cleaning practices and recommended that an article on best practices should be included in the newsletter.

Ms. Molnar reported that Grand Caverns has received a small grant for LED lighting, which will start the lighting replacement project.

#### Public Comment Period

Mr. Davis reported that the Virginia Region is beginning a conservation project in Melrose Caverns in Rockingham County, consisting of removing old lighting and modern graffiti, but leaving Civil War graffiti in place.

#### Announcements

Mr. Smith announced that Virginia will host the Natural Areas National Conference in Norfolk in, October 9-12. He invited the Cave Board to suggest topics for concurrent sessions.

The next meeting of the VCB will be determined by Doodle Poll.

#### Adjournment

Ms. Weberg adjourned the meeting at 3:02 PM.