

2010 Midwest Bat Working Group Meeting Minutes

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May 6, 2010

Welcome from President Bradley and John Whitaker

- Next meeting will be a joint meeting with MWBWG, Northeast Bat Working Group, and Southeastern Bat Diversity Network on February 23-25, 2011, in Louisville, KY.

Laura Hohman – update on MWBWG website

- Jo Garafalo created website and Laura put it live on the web.
- Laura gave an overview of the current website and offered her expertise as webmaster.

Brianne Walters – Treasurer’s Report

- Registration funds and sponsorships cover the meeting
- Dues from 2009 are \$1,025. Dues from 2010 are \$1,325
- Sponsorships from Illinois DNR Division of Natural Heritage (\$1500) and Organization for Bat Conservation (\$500) help cover the meeting costs
- Joe Kath secured more funding for future meetings from the Illinois DNR State Wildlife Preservation Fund Grant (\$2000)
- Contact Brianne or Tim Carter to update email addresses for listserv

Michael Baker – MWBWG Structure and Operations

- Overview of MWBWG and the statistics from last year’s meeting
 - 58 attendees from last year
- Review of proposed structure (as shown on worksheet in conference packet)
 - USFWS Region 3 will be the core states of MWBWG with adjacent states included if desired.
 - Will have a Board of Directors with elected representatives from each state or province plus 6 elected officers (president, vice-president, treasurer, secretary, listserv master, webmaster)
 - Elections will occur every 2 years.
 - Nominations and elections committee will submit a list of 3 nominees for each position which will be voted on by the paid membership. In future this will be complete before the meeting.
 - Board of directors meet at the end of annual meeting to plan next year’s meeting.
 - Overview of position descriptions – state representatives, president, vice-president, secretary, treasurer, webmaster, listserv master

- Mission statement – willing to revise/take suggestions from members about revisions
- Will meet biennially with a stand-alone 2-day meeting in early spring and a 1-day meeting in spring in conjunction with NASBR (now North American Society for Bat Research) in fall.
- Call for additional nominations, other than those included in the packet
- Comment – maybe we shouldn't allow any state into the group otherwise any person from any state would have to be that state's representative and that may not be desirable.
- Comment – maybe officers should not vote, especially if there is an individual who is an officer and state representative; then he/she would get 2 votes.
- Comment – maybe the president could be a tie break vote but normally does not have a vote.
- Question – what will the Board be doing? Answer – The Board will decide how to spend money, resolutions, what to do at meetings, etc.
- Proceed to vote on items (lead by Tim Carter and Michael Baker):
 - Motion 1: Elect Board of Directors from membership at large no matter what state he/she is from. MOTION PASSED.
 - Motion 2: 8 at large members on the Board; officers don't vote expect president who votes in a tie. MOTION FAILED.
 - Motion 3: Elect 4 officers and 7 at large members for the Board of Directors who vote and are elected by the entire membership. MOTION PASSED. Note: we can always make changes in the future. Nothing set in stone.
 - Motion 4: Entire paid membership should vote on changes in by-laws. This must be a majority vote at an annual meeting. Must have at least 2/3 of members present at meeting to allow for voting on changes in by-laws. 2/3 quorum can include absentee ballots. MOTION PASSED.
 - Motion 5: A member is person who has paid their annual dues. MOTION PASSED.
 - Motion 6: For the webmaster and listserv master positions, the president makes a recommendation for candidates (the members should provide their recommendations to president and then he/she puts the names forward formally) and the full Board of Directors votes by majority for those 2 positions. MOTION PASSED.
 - Motion 7: Committees- The president must put forward the name of the committee chair for a certain topic (the members should provide their opinion/recommendation on what the committee should be about and who the committee chair should be). The Board of Directors votes on the committee. The same process would apply for removing a committee. The elected chairperson populates the committee. MOTION PASSED.
 - Motion 8: Board of Directors can vote via email or conference call with their decisions being effective immediately but votes must be

ratified/confirmed at the next formal in-person meeting. MOTION PASSED.

- Motion 9: Move to accept the “Elections and Voting” structure as written on the “Midwestern Bat Working Group Board & Officer Positions and Election Description Sheet”. Changes to the Sheet include: 1) Replace state representatives with member-at-large. 2) Planning for next meeting should be allowed over the course of the 2 years. Final sentence of the paragraph is stuck. 3) Remove the requirement for 3 nominees for a position. The number 3 is struck from the sentence. 4) For the initial Board terms will be as follows: President will be a 3 year term and Vice-President will be a 2 year term. Treasurer will be a 3 year term and Secretary will be a 2 year term. There will be 3 at large members that are 3 year terms and 4 at large member that are 2 year terms. After these initial terms, it will be standard 2 year terms. There will be no term limits.

MOTION PASSED.

- Motion 10: Since the State Representative position is stuck then the 7 at large members on the board of directors position needs to be described. Changes include: keep original State Representatives description except strike all of part C, the end part B at the word members but keep the example in parentheses, change D to delete Board of Directors. MOTION PASSED.
- Voting and introductions for the 4 officers:
 - Removed Tim Carter from original nomination for President.
 - President nominations added: Joe Kath
 - Vice President nominations added: Gerda Nordquist
 - Each nominee gave a little overview of themselves. Voting will occur over lunch.

- ELECTED OFFICERS

- President – Rob Mies (Organization for Bat Conservation)
- Vice-President – Dave Redell (Wisconsin Department of Natural Resources)
- Secretary – Amy Halsall (V3 Companies)
- Treasurer – Brianne Walters (Indiana State University)

- Nominations for at-large members. The nominees are:

- Joe Kath
- Katrina Schultes
- Deanna Byrnes
- Joe Senulis
- John Whitaker
- Jennifer Schehr
- Kevin Murray
- Gerda Nordquist
- Tim Carter
- Michael Baker
- Al Kurta

- Bree McMurray
- Andy King
- Eric Britzke
- Rod McClannahan
- Diana Barber
- Jeff Brown
- Paul White

Tim Carter – Update on Listserv

- Tim started up the listserv through Ball State. He sends out information to the members. He could also send out more general information to people that are just generally interested in bats on a secondary list if the group wanted to create that.

Impromptu Award Presentation

- Rod McClannahan presented a plaque to Tim Carter for his cooperation/partnership with the Shawnee National Forest and his contributions to bat research in the Shawnee.

Tom Risch – Arkansas State Report

- Overview of habitat within Arkansas
- 16 species of bats in the state of which 3 are endangered species.
- *Myotis austroriparius* and *Corynorhinus rafinesquii* while rare, range wide they are abundant within the lowlands in Arkansas.
- Little brown bats are rare in the state.
- Gave an overview of major agencies and individuals that conduct bat work in Arkansas.
- Symposium on Conservation and Management of Big-eared Bats – representatives of Arkansas presented there
- They are working on preserving caves and mines for bats particularly *Myotis austroriparius* and *Corynorhinus rafinesquii* in 2009
- They will continue this work in 2010 including bat habitat in WWII bunkers and pathology work for WNS at Arkansas State. They feel the pressure of WNS closing in on Arkansas. There are 9 pre-wind projects in Arkansas but most of the state is poor to marginal for wind energy but projects are going through nonetheless.

Brooke Slack – Kentucky State Report

- Kentucky is doing a lot of WNS pre-surveillance and monitoring including acoustic transects, active monitoring of hibernacula for signs of WNS, Anabat deployment at 10 hibernacula, installing gatekeepers at 3 caves

- and will do a fourth this year, coordinating with Mammoth Cave National Park – working on WNS plan for the park and education
- Acoustic transects have shown mostly big brown bats and red bats with a small number of *Myotis*
 - Tier 1 and Tier 2 winter cave surveys were done (full survey and spot checks). Tier 3 entrance checks were done as well for WNS – no signs of WNS found.
 - They strictly followed decontamination procedures.
 - They found the typical results for Tier 1 surveys.
 - Mammoth Cave National Park is doing visitor screening (asking if they've been to other caves), doing foot baths, bagging jewelry, changing clothes. Mammoth Cave has the authority to deny access to a cave tour if you will not decontaminate. They have posters and videos up for visitors to learn about WNS.
 - They have continued the *Corynorhinus rafinesquii* project in KY for 3 years at Ballard WMA. They tracked CORA in day and at night locating roosts
 - Mammoth Cave National Park – tracked *Corynorhinus rafinesquii* and located roosts.
 - Did emergence counts on gray bat maternity caves and Virginia big-eared bat maternity sites to find populations are normal.
 - Indiana Bat Guidance Document for Kentucky provides guidance for bat researchers working on Indiana bats in Kentucky. They now require a permitted bat biologist (both federal and state) at EACH mist net site.
 - Kentucky has WNS Guidance document.
 - Kentucky has some grant money from USFWS for surveillance (cave surveys) and monitoring of bats (acoustic at hibernacula).
 - Winter entrance checks occurred November through late-April.
 - Kentucky did heavy surveillance along TN-KY state border throughout the winter and no signs of WNS.

David Blehert – An Overview of Bat White-nose Syndrome, 2010

- WNS was first detected 2006-2007 near Albany, NY. Now its in 10 states and 2 provinces.
- Six bat species are affected and it is characterized as a disease of hibernating bats seen mid-winter to end of hibernation season.
- Winter 2005-2006, WNS was in Howe's cave. A caver had a photo (taken Feb 2006) that showed a bat with WNS but did bring that photo forward until 2008.
- 07-08 expanded to 33 sites in four states
- 08-09 expanded to 900km from Albany County, NY, over 100 sites
- 09-10 expanded to Ontario and Quebec, moved across Appalachian Mountains, detected WNS in west, central, and eastern TN as well as Missouri

- Now there are new techniques for detecting the fungus which has allowed us to detect WNS earlier.
- Have not seen mortalities in areas in TN but detected the fungus through new molecular testing.
- WNS is within range of the Virginia big eared bat, Indiana bat, and gray bat.
- There is anecdotal evidence that WNS is more in humid/wetter sites and Indiana bats will often hibernate in drier sites. For example at Hellhole Cave, bats hibernating in drier sites are unaffected but little browns in wetter areas are affected.
- Little brown bats and big brown bats are continent wide and WNS is spread from bat to bat. These species may vector the fungus across the western US.
- No disease causing parasites, no known viral pathogens and no consistent findings in bacteriology found in association with WNS.
- They collected fungus samples from bats directly in the field to culture fungus. They were successful culturing fungus in cold temperatures but not at room temperature. The fungus is a new species *Geomyces destructans*.
- The fungus grows very well from 7-14 degrees C. It grows at 3 degrees C but does not grow at 20 degrees C.
- Diagnostic techniques used are fungal culture, histopathology, and *Geomyces destructans*-specific PCR.
- What the bats experience is not just a mild fungal infection, severe invasive fungal infection. The most critical damage is to the bat's wings used for heat dissipation, water control, gas exchange, and blood pressure regulation, and flight.
- The closest fungal infection in nature is chytrid fungus of amphibians. It was recently determined that it kills the amphibian by destroying their skin and they cannot regulate ion balance (animal dies of heart attack as a result of fungal skin infection).
- They have now proposed that the skin infection causes compromised physiology and abnormal behavior which leads to death.
- They conducted infection trials with 3 treatment groups of experimentally infected, control, and bat to bat transmission. They found bat to bat transmission does occur.
- Another project is the cave sediment sampling project where they collected sediment from caves in the eastern US and screened by PCR for *Geomyces destructans*. Fungi are highly diverse and abundant in soil. Other closely related *Geomyces* are detected in other states but only NH, MA, and CT have *Geomyces destructans* in the soil. However they are still working on samples.
- There is still the hypothesis of the European connection. See the recent paper on a bat from France infected with *Geomyces destructans*. Perhaps European bats coevolved with fungus and have some resistance.

- There are no European bat species in North America and no North American bats in Europe. It may be environmental differences.
- They are currently looking at differences between the European *Geomyces destructans* isolate and North American *Geomyces destructans* isolate.
 - There is no mortality south and west of Appalachian mountains due to WNS even though it has been detected. So the question is if *Geomyces destructans* is causing deaths in these areas. Western detections may represent early detections. Are environmental conditions west of the Appalachians conducive to WNS (shorter/warmer winters, compare to Europe)?
 - Environmental reservoirs may exist which could lead to healthy individuals entering infected areas and continue the death and declines.
 - There is no pathogen known that cannot be vectored by a human. So, the fungus can survive warmer temperatures without growing but can be transmitted via humans (e.g. on shoes).
 - Can we create conditions in mines that allow for areas for bats to persist that are not conducive to fungus?
 - In the future work will include sequencing the *Geomyces destructans* genome, phylogeography of *Geomyces destructans*, investigating mechanisms of WNS pathogenesis, development of PCR tests for environmental samples, video surveillance, and development of ISH detection.
 - Bats could disperse fungus in the summer but they are more likely to disperse it in the fall swarm and possibly if they move between hibernacula during winter.
 - Culture work shows that once bats are metabolically active (even if they are infected) they can recover. PCR work would be able to detect genetic material of the fungus even though it is not there growing on bats in summer. They have not been doing summer studies but the PCR technique would allow this.
 - They will be continuing to work on creating better tests to identify the *Geomyces destructans* fungus and having the full genome of the fungus would help.
 - It is believed that the spores can remain dormant in summer and when the bat returns to an environment in which the fungus can grow it will reinfect. They do not feel that it is possible for a bat to harbor infection in the skin while metabolically active.
 - Spores become dormant and dry and may be able to persist for years in this state but they will be doing studies on this.
 - Bats ingest spores when they groom and they collect in the intestine. Those spores in the intestine are viable as determined by a lab test. They are looking at fecal pellets in winter to look for spores that had been in intestinal tract.
 - Sites with the fungus longer are worse and higher death counts are seen.

- Could we treat sites, such as mines without natural cave flora and fauna to get rid of fungus? Mines have a diverse fungi too within them to and if using universal destruction agent we don't know how that would affect things.

Cassandra Miller-Butterworth – Pennsylvania State Beaver – Applications of Genetics to Study & Management of Bats

- Molecular studies allow for results to be obtained quickly and easily and provide answers to questions previously not possible.
- Conservation genetics can be analyzed at individual, population, and species levels.
- Overview of basic genetics – cells, DNA, sources of DNA
- Extract DNA from bats from wing or tail membrane punches. Then sequence the DNA, also look at microsatellites to find an individual “DNA fingerprint” and look at variation in and among populations
- Cassandra has done PhD research on South African *Miniopterus natalensis* which has similar behavior to our Midwestern bats with hibernation in winter and maternity roosts in summer.
- She has observed bat colonies that remain in particular biomes even though there are summer and winter hibernacula in closer biomes. They do not migrate to closer roosts and will go further to remain in the same biomes. There is no physical barrier but bat populations remain in the same biome in summer and winter.
- She is collaborating with American researchers to look at little brown bat DNA. She has found that subspecies of little brown bats are more closely related to other *Myotis* species than to *Myotis lucifugus lucifugus*.
- For her new little brown bat project she wants to look at the connection between little brown bat populations and the potential long term impact WNS will have on genetic diversity of little brown bat populations. Perhaps we could predict WNS spread by knowing connection between little brown populations.
- Cassandra needs samples from little brown bats for research in the Midwest for a range wide study (maternity colonies). She wants wing punches/tissue samples. The samples should be put in lysis buffer of 70-90% ethanol and stored at room temperature. She needs at least 20 samples per colony and will send instructions for sampling and the equipment you need to collect the samples if you contact her.
- She may also apply the samples to another project with wind farms.
- You can talk with Cassandra Butterworth, Amy Russell, or Maarten Vonhof about assisting with sampling.

Evan Pankuk – Fungal Metabolism of Chiropteran Integument – Arkansas State

- Studying big brown bat – need lots of tissue
- They have microscopic evidence of *Geomyces destructans* attaching to the hair. It can degrade hair and skin.
- He showed photos of fungus on the hair and how it will destroy hair (*Geomyces pannorum* – most common fungus).
- The goal of the research is to gain a better understanding of the host/disease ecology of WNS.
- They hypothesize that *Geomyces destructans* is getting into hair and skin and destroying it.
- First they must digest the tissue sample then take to protein lab for further analysis.
- They test the hairs and skin for tensile strength by breaking apart hair and skin to see how strong it is (toughness and elasticity).
- They took the hairs to the microscopy lab to test hairs of different bat species. Each has a unique hair morphology.
- They also did a lipid analysis. The fungus is attracted to lipids and use it as a carbon source and work toward it.
- They looked at the top half of the hair, bottom half, and skin of euthanized red bats (using red bats because they are not threatened by WNS an, abundant species, have lots of hair).
- They want to understand optimal growth conditions of *Geomyces* and how to stop the growth.
- They want to use models to explain how fungal spores attach to bat skin.
- They used *G. pannorum* because it is the most closely related species to *G. destructans*. They chose to use it instead to start work right away but are also using *G. destructans*.

John Whitaker – Food Habits Analysis

- Included a chapter about the following in the meeting packet for more detail
- For food analysis use stomachs if possible to identify food remains.
- You can also look at guano because insect chitin is not digested. Look at the bigger pieces or identifying characteristics of insects found in the sample to ID the species
- Bats do not eat many mosquitoes probably because of their small size (unless mosquitoes are swarming or as in Alaska – large, abundant, not many other food sources).
- Showed an example data sheet and summary table including % volume and % frequency.
- They have also done work and found fungal spores in stomach samples but only larger species of fungi.
- The thought is that potentially WNS could be spread through guano.

- They are looking at chitinase producing bacteria in WNS affected bats and non-WNS affected bats for differences. Maybe WNS bats do not have chitinase producing bacteria and cannot take advantage of leftover food in intestine for winter energy

Joe Caudell – Planning for WNS

- They have a good first draft of WNS plan for USFWS Region 3, which is currently under review.
- A national plan is being developed for WNS.
- State plans are being and have been developed.
- Essential components for a plan include goals and objectives, response, communication, surveillance, education.
- Determine the cooperators – stakeholders, other agencies
- Determine who will do what – lead agency, responsibilities/duties, logistics, money, plan prep and maintenance of the plan
- Practice the plan if possible which will allow you to identify issues with the plan. You can do this in classroom and/or field.
- WNS has its unique issues. It is a new disease, rapidly moving, free living in wildlife, and there is no clear cut response.
- Meet with involved groups in person to discuss the plan.
- Perhaps we should look at other examples of disease in domestic or free living wildlife populations.

Rich Geboy – Region 3 White Nose Syndrome coordination for USFWS Region 3

- Rich will assist and coordinate at various levels, maintain/streamline communication regarding WNS.
- They are working on a Region 3 response plan.
- They have a structured decision making initiative to determine how to minimize spread and impact of WNS NATIONALLY – 3 areas of epicenter, leading edge, susceptible.
- Most of the focus is on the susceptible area.
- They have decided to prohibit access to hibernacula (Cave Advisory) and released decontamination protocols (currently being reviewed).
- The cave advisory is being reviewed as well.
- The purpose of a national plan is to provide structure and guide efforts of all agencies involved.
- They have a list of national research priorities, in particular the persistence of *Geomyces destructans* and susceptibility of bats.
 1. Timing and dynamics of *Geomyces destructans* transmission
 2. Persistence of *Geomyces destructans* on bats or in environment
 3. Susceptibility of bat species, migrating and European

- RFP will be sent out and closing date is June 4, 2010, with an estimated \$2 million and will fund projects between \$5,000 and \$750,000. Projects selected by July. Projects must start September 1, 2010, and be completed by September 30, 2012.
- If you are going to submit a proposal then contact state natural resource agencies to prevent project duplication, early permit coordination, get DUNS number, follow proposal requirements, format, review process.
- http://www.fws.gov/northeast/white_nose.html is where the RFP will be posted
- A comment from the audience was made that waiting until 2012 for results may be too late.

Joe Kath – Illinois State Report

- Rod McClanahan has been instrumental in assisting the state with WNS coordination. He has trapped 6 hibernacula with no signs of WNS.
- The Forest Service and IDNR collected fungal samples using fungal tape on bats and sediment samples from southern Illinois. All samples were sent to Western Illinois University (Bob McCleary – new at Western Illinois).
- Joe was able to get the state of Illinois to close caves starting 2 weeks ago. There were difficulties due to so many politics and constituent issues. What drove the cave closure was the discovery of WNS in Missouri (Pike Co, MO). They have caves in Pike Co, IL that they want to protect.
- There are over 50 caves in IL with bats. Only 6 are managed or owned by state and 5 of the 6 are gated. The remaining cave is very difficult to access. The cave closure order can really only cover state owned caves. They are relying on private landowners to cooperate. Commercial caves exist in Illinois as well and all have been generally cooperative.
- Joe will be looking at caves in Pike County, IL, next week for WNS.
- He will continue summer and winter monitoring as usual.
- Commercial cave owners have given verbal compliance to close their caves and this is not their primary means of income.
- IDNR had to close down their state run education cave.
- Cave research will only be allowed if it is directly tied to WNS.
- Hibernacula surveys will continue as part of work tied to WNS.
- Be sure to see the photo of the bat in Missouri for an example of the fungus in a less obvious situation.

Amy Halsall – Iowa State Report

- This report is from Daryl Howell of the Iowa Department of Natural Resources. Due to travel restrictions he was unable to attend, but he provided the following information regarding his bat work in Iowa this year.

- They will be contracting for an acoustic and mist net survey in 5 western Iowa counties to determine if Indiana bats occur in that part of the state this summer. Funding for the work will be from the Midwest Region Wind Energy Multi-species HCP. They hope to start the survey in May if they can get all the federal aid documents approved. Daryl plans to be involved in some of the field work and will be administering the contract.
- He also plans to conduct a mist survey of several sites in eastern Iowa north of Interstate 80 to determine the northern extent of distribution of reproductively active female Indiana bats. He will also be looking for minimum amount of forest cover as most of these counties are very intense row crop agriculture.

Elected Members at Large

- 3 year term
 - John Whitaker
 - Al Kurta
 - Tim Carter
- 2 year term
 - Joe Kath
 - Gerda Nordquist
 - Katrina Schultes
 - Bree McMurray
- Suggestion to reach out to local people by asking for winter bat sightings via posting on the website.
- SBDN, NEBWG, MWBWG joint meeting Feb 23-25 (3 full days) in Louisville, KY

Greg Turner - Pennsylvania Cave Bat Management, Bureau of Wildlife Management

- Established opportunities for summer monitoring by putting up a bat condo and other bat boxes (aluminum shell bat boxes). They are getting Indiana bats in the boxes. Condos get 5,000 bats.
- Most hibernating bats are in mines. Many mines are inaccessible due to instability and gas.
- 800 hibernacula in Pennsylvania
- There are not many Indiana bats in the state.
- They have spent a lot of time and money gating hibernacula and have seen a rise in bat populations in the gated hibernacula.
- In one mine that was too warm for most bat species, they blasted rock and sand then added a gate in front of an entrance to create colder temperatures. There was a huge response in the bat population.
- They have been studying spring migration of Indiana bats since 2000. They captured female Indiana bats weighing 6.5 grams or more and radio

- tracked as they migrate. They tracked using vehicles. They tracked males and females until they lost them.
- New York started doing some Indiana bat migration studies as well. NY bats went to a valley and remained there. Pennsylvania bats were going long straight line distances.
 - Pennsylvania worked an airplane set-up to track bats at night (only about 6 hrs of fuel). So, they held bats until midnight and tracked them into Maryland.
 - They used plane and ground crews in conjunction to track bats some nights.
 - They were able to get money from the wind energy developers to study migration.
 - They tracked a male bat to and from cave and day roost in the fall.
 - There were problems with the no fly zone at Camp David while tracking.
 - They are tracking bats this spring and finding that the bats are staying near the cave for about 2 weeks.
 - Not all species of bats display WNS fungus the same (different amounts and places on their body). Bats may only have it on their wings, feet, or tail and you cannot see it there if they are in a cluster.
 - If taking a photo of the fungus, hold the bat at an angle and not flat. Take many pictures.
 - Shingle Mine is an example of the progression of WNS. They went into the mine in early December for an arousal study and came back mid-December to change batteries and the signs of WNS were there but minimal. They came back after Christmas and now 40% of bats had shifted their roost – moved to the front of the mine. By mid March 95% of the bats were gone and 123 bats remained. Six bats do not show fungus or roost shift. Eight weeks from documented signs of white nose to mortality. End of Oct 2009 only 6 bats are alive at this site. Spring 2010 had only 1 bat left in the mine.
 - They were wondering if we net/block WNS bats in and healthy bats out of the hibernacula to prevent spread. They did an experiment and did not have success. Bats were still getting out and around netting.
 - There was a caving moratorium in Pennsylvania but some people still did go into cave anyway.
 - The rate of spread may have been faster in NY because of open caving and biologists running around to caves to check for WNS without decontamination procedures. He thinks the large jumps may be from people rather than bats to bat which seems to go slower.
 - Mortality numbers in Pennsylvania with WNS infection for greater than 1 year: Shindle Iron Mine 1500 to 1 bat; Aitken Cave 600 bats 86% mortality; Dunmore Slope – 6 bats left alive this winter; Seawra Cave – 6 bats; Alexanders Caverns had 2500 bats with 4-5 species now has only 3 bats.
 - 4 out of 5 have 99% mortality.

- Disturbance in these caves (high or low) does not make a difference in bat survival.
- Treatment studies: They brought WNS infected bats into the lab to test. They also did field treatment tests. They put gas shown to kill *Geomyces destructans* in the lab into a chamber of the hibernacula that would mist on the bats but bats escaped around the netting installed to keep them in. Lab treatment trials used pharmaceutical products – treated in lab and released in field and recaptured later. Lamisil (only find in Europe for fungal infection) and aromatic treatment Agent C were used to treat bats. Both treatments failed and bats died.
- They have also been working on an arousal study which is a multistate effort. Arousal patterns are highly variable and it will be difficult to detect a change. They hypothesized that bats are arousing more frequently causing them to die. They used temperature sensitive data loggers and temperature sensitive radio transmitters. They have 13 field sites in 6 states. They are continuing in Pennsylvania and Michigan.
- Transmitter – temperature data is not recorded as frequently (10-30 minutes) but they are lighter and researchers can find bats again.
- Data loggers gave a better picture. They can get decent recovery sometimes and the data loggers take temperature data more frequently (used iBBATs and custom made data loggers on back of bats).
- There was a significant difference. Bats with WNS aroused twice as frequently. They found frequent arousals and that some bats were freezing to death when temperatures plummet during the arousal.
- They started using white light and long wave UV (368 nm) light to determine if WNS positive and negative bats.
- Looked at clean and affected sites for affected and unaffected bats. They used lights to look at wings. Healthy bats had some spots of bones, collagen elastin-fiber bundles and areas that are evidence of healing wound/scar tissue. WNS bats had yellow fluorescence when under the light. They wanted to know if the pattern seen with the light is consistent with the visible fungus. UV light may be an indicator of where the fungus will be before you can even see it on the bat. They drew on infected bat where the yellow fluorescence was observed but no fungus seen. They found that there was fungus in the tissue that fluoresced but no fungus in normal non-fluorescent tissue. Yellow fluorescent is non reproductive fungus and cannot be seen as white on wings. Blue florescent (white light and UV light together) is reproductive fungus.
- Layton Fire Clay Mine is a site clinically negative but PCR positive. They used light to look at the bat wings at this site and saw that it looks like there are bats with small spots of fungus. Psuedomonad, a bacteria species, grows on immune compromised animals and was found on WNS infected bats. They found that almost every bat with yellow fluorescence has small blue dots scattered around. This may be the earliest sign possible.

- During a rehabilitation experiment they found more blue dots. The blue dots grow and multiply and deterioration occurs in wings. Deterioration occurs very quickly.
- Healthy sites do not have bats with blue dots on wings.
- Future work: They don't expect to have many cave bats left in another year or so in Pennsylvania. They will continue rehab experiments, full UV cycle – summer and winter photography, survivors of rehab experiments, examine all species with UV, examine blue dots more, prevention experiment.
- Advice to Midwestern groups:
 - Focus research on transmission and actual cause of mortality
 - the recovery phase (translocation, winter banding)
 - research potential for sites for mitigation or reservoirs, does timing on site confirmation really matter given PCR positive results? – the site is already infected
 - bats that are leaving caves in winter are going to maternity site in the middle of winter – maybe heated boxes should be placed at maternity sites
 - establish summer roost monitoring now
 - video/photo document the best sites now
 - collect genetic material now on multiple species and locations – punch wing or uropatagium
 - establish protocol to coordinate research and have all proposals submitted by September 1, try all research possible (bats in infected sites are going to die anyway)
 - educated cavers on decontamination – try to self police because people will be going in anyway
- Expect to be overwhelmed with work when this hits but give it everything you have.
- Once WNS has been documented at a site you cannot keep bats in or from spreading it, so cave closure may not prevent it at all but it will prevent human spread.
- He has changed his view that disturbance increases the impact of WNS. Disturbance doesn't seem to have a big impact on deaths from WNS, so it may be ok to go in and do research.
- How to coordinate avoiding overlap of doing same projects? There is nothing formal in the Northeast and it has been a problem. Need a research coordinator to prevent the overlap. For now, talk to those who have been doing research. Tell people you are doing a project! There is the issue with dissemination of information because you cannot have data published elsewhere if you want to publish in a higher caliber journal.
- You can use 50 LED flashlight to just look for WNS in field but its not good for photos.
- You can detect WNS using PCR before visible/clinical signs. PCR is the best tool available for detection of WNS.
- Don't think that summer transmission is more than minor.

- UV flashlights – get larger head (50) not the smaller (8). You could probably get this from outdoors store or purplepassion.com; Way Too Cool, Bill Gardner.
- Don't just give up on the projects involving keeping WNS infected bats in. It's worth a try again. Start putting up a structure in summer then put netting up in winter. www.usnetting.com bird netting heavy duty ¼ inch square but must plug all escapes.
- Feel free to contact Greg at any time for advice.

May 7, 2010

Ryan Brown – Horizon Wind Energy – Development of Wind Farms

- Horizon Wind Energy develops, constructs, owns, and operates wind farms in North America. Mike is out of the Indiana office which covers Indiana and Ohio.
- Meadow Lake Wind Farm was completed in October north of Lafayette and just east of Route 65 in White County.
- Development can take 2-10 years. The actual construction is 1-2 years but generally 1 year or less. Turbines have a 20-25 year life span.
- Development takes up a lot of land and it is a lot of work to acquire land rights, conduct studies, and secure permits. Must partner/cooperate with local landowners.
- Developers look for good wind resources, transmission, terrain, existing land use, community acceptance (sometimes lack of this causes developers to walk away), and market attractiveness (who can they sell energy to, how much can they sell it for). They focus on rural farm areas.
- They use meteorological towers to assess wind characteristics at the specific site and like to get several years of data before going through with the development.
- Indiana has local and county regulations. Ohio has a state-wide permitting process.
- They usually hire consultants to do site characterization studies before the project really gets going.
- As the project moves forward they do more studies including baseline wildlife studies. Horizon feels they are an industry leader in wildlife studies. Avian and raptor site use, raptor nest counts, habitat mapping using GIS, bat acoustic monitoring, etc. They have reduced scope or walked away from projects due to wildlife concerns.
- They have to carefully analyze the transmission connection to see if it is possible to get their wind energy out.
- They are starting to manufacture turbines in the US due to the difficulty of transporting the turbine parts, particularly from overseas.

- Once a project is constructed it must be actively monitored.
- Wind provides 2% of the nation's energy and could end up being up to 20% of the nation's energy at some point.

Tim Carter - The Future of Bats and Wind (in collaboration with Dale Sparks)

- Preconstruction analysis can include basic desk top analysis, landscape analysis primarily from office, and field environmental surveys.
- Bats are generally not considered until the end of the preconstruction analysis and this can be a problem as the significance of bat concerns on a project can be underestimated. Recent court cases and the death of an Indiana bat at an Indiana wind farm may bring bat concerns to the forefront.
- We know that some wind farms kill lots of bats and quantifying the mortalities is difficult. More than 75% of the mortalities are tree bats. Cave bats are susceptible especially if the site is near caves. Bats are killed during low wind and in particular seasons.
- The probability of a single bat being killed is low but when considering other factors the probability increases.
- Fall and spring have higher mortalities due to migration and higher flight patterns. Summer mortalities are lower due to presence of resident animals which generally fly lower.
- Are turbines additive or compensatory mortality? That is, adding mortalities to a population vs. killing bats that would have died anyway.
- The occasional bat mortality does not have population level impacts (compensatory) and an incidental take permit cover this.
- With more bats moving through the area then there is more death and it becomes additive.
- We don't really know where bats migrate, let alone how high they fly in migration.
- Only 1 male Indiana bat in northwest Indiana has been killed that we know about. The thousands of other bats potentially killed are not protected. Now with WNS, previously common bats may become endangered and cause problems for wind developers.
- There is a lot we don't know in general about bats which can cause problems with trying to determine impact on bats from wind farms.

Mike Litwin – USFWS Indiana – USFWS role in wind power industry

- USFWS didn't think wind would come to Indiana but with new turbines that are higher, it has come.
- Currently there are 4 operating wind farms in northwestern Indiana surrounding an important bird area (900 turbines online with more to come on these projects).

- Many new proposals come through the USFWS.
- Typical wind turbines are about 400 ft high at top of blade sweep (1.5 MW) but newer European turbines are even larger.
- USFWS has some interim guidelines for wind power but it is more focused on birds. Now they realize bats may be a bigger issue.
- Wind Turbines Guidelines Advisory Committee provides only guidelines.
- There is nothing requiring developers to work with USFWS unless there are endangered species issues.
- Wind guidelines from USFWS are in the works but may take 2 years to become implemented.
- Beech Ridge court case in West Virginia. They have known hibernacula within 10 miles of project and known summer habitat. Court has halted the project and restricted when the current turbines can run (turbines off from April – November) until they get an incidental take permit.
- An Indiana bat was found dead in the fall in Indiana directly under the turbine and analyses point toward the turbine as the cause of mortality.
- BP and USFWS issued a joint statement to work on bat concerns together.
- They are now recommending that every wind project get an incidental take permit which includes a habitat conservation plan.
- USFWS is working on guidelines for minimizing impacts to the Indiana bat.
- WNS is throwing another issue into the mix.
- 40 bats/MW/year is the upper range of bat mortality which turns out to be thousands of bats dead each year across all of the wind farms in the nation.
- Hoary bats have been highly impacted and concerns that their populations may be severely impacted and may end up being federally listed.
- USFWS is concerned about mortality searches and the spread of WNS. That is, picking up dead bats with spores then picking up a live tree bat and transferring WNS spores to the tree bat then live releasing it. They may not allow live release of bats found on the ground under turbines in fear of the threat of transferring WNS to tree bats.
- They will be at the AWEA conference in Dallas, TX at the end of May

John Whitaker – Indiana State report

- ISU Bat Center is doing studies on weights of bats in winter at Copperhead, Rays, and Wyandotte Caves.
- They found *Myotis leibii* in Indiana as a result of the bat weight studies
- There is good rabies lab data from Indiana.
- They are now contacting other states to get rabies lab data and looking for early indicators of WNS with increased submissions.
- Indianapolis International Airport studies are ongoing. It is the longest Indiana bat study anywhere.

- The Bat Center is starting into acoustic work. John suggests that we need some protocols for acoustic work.
- Tim Carter has been doing good work in Indiana on bats. He has been doing education and recently found a new Indiana bat maternity colony.
- The gray bat colony has been growing since the 1980s and still doing well.
- The Hoosier National Forest has a cave closure order for next 3 years.

Al Kurta – Michigan State Report

- The rabies lab in Michigan had a spike in 2007 which pushed the lab to have bats identified.
- Most *Myotis* are in northern forested areas where not very many people live. Big brown bats are common in lower areas where people live.
- Silver haired bats were found far north in winter from rabies lab records.
- Most mines are in the western upper peninsula.
- Al surveyed mines this past winter at 15 sites.
- Tippy Dam, a hydroelectric dam, has a large hibernating population of bats. They count this every 2 years. Bats have no disturbance. There are a few Indiana bats. The population is steady at 17,500 bats inside the spillway.
- In MI most bats are not found in large clusters except in this dam.
- Al thinks WNS may come into Michigan from Canada. Hendire River Water Cave is in this path and should be monitored.
- There is an abandoned limestone quarry, surge tunnel, which may be able to make a good hibernaculum. They have tricolored bats due to man made hibernacula and have now found them in the eastern part of the state.
- They have done very little summer monitoring due to lack of funds.
- Some WNS studies are being conducted with temperature sensitive data loggers. They took wing punches to look at relationship of populations.
- A DNR spokesperson said “Frankly...we have bigger fish to fry at the state level.” There is no support from DNR; their focus is on hunted species.
- Bat biologists sent a letter to DNR urging them to do something about WNS. Now there is a WNS planning team in the DNR. Their position is that there isn’t much we can do and are focusing on habitat conservation.
- Michigan *Myotis* hibernate in Indiana and Kentucky so WNS may come from the south but it looks like it may come from the north (Canada) before that.

Gerda Nordquist – Minnesota State Report

- Increasing requests for new permits with respect to wind farms.
- Minnesota is the 4th in the nation for generating wind energy. The west and southwest are the areas of highest wind development.

- One turbine was placed right next to a hibernaculum. They can only encourage studies or to move turbines out of these sensitive areas but they have no clout to stop the development in these areas.
- Wind power is coming to Lake Superior.
- They are working on Minnesota DNR Guidance for Wind Energy Projects.
- Minnesota is within dispersal distance of WNS.
- They need to develop a state response plan, expand monitoring and surveillance, and enhance public education and cooperation.
- Acoustic surveys are being done and gaining local assistance to continue these projects.
- Annual bat counts are conducted in northern Minnesota.
- The cliffs along the north shore of Lake Superior have bats. They cannot get into this area to figure out how many bats are there but suspect they are hibernating along the cliff.
- There are 2 important hibernacula that are on state land but they have tours.
- The Minnesota Speleological Survey is trying to cooperate with them to minimize impacts to caves/mines.
- An official cave closure would likely be ignored by many of the area's cavers.
- They have observed bats (mostly male) congregating in the mine in spring and early summer. They put a camera on this cluster of bats to try to figure out why these bats are grouping together at this time (not much guano beneath them so not really feeding).

Bree McMurray – Missouri State Report

- There is a loosely formed Missouri Bat Working Group.
- Positive ID of *Geomyces destructans* identified on a little brown bat in Pike County (PCR positive for fungus, negative histopathology). Very small amounts on the tips of forearm.
- Missouri Department of Conservation has a WNS plan mdc.mo.gov/news/images/fullsize/20100416-2.jpg
- Missouri Department of Conservation (MDC) is closing caves due to finding WNS.
- They will be closing caves for 3 years will not allow work during that time.
- The Pike County cave is near cave resources in Illinois.
- WNS is probably in areas between TN and MO but we just don't know about it yet.
- Missouri has over 6000 caves with $\frac{3}{4}$ being private.
- MDC manages 290 caves and 80 are known bat resources.
- They have grants for bat work.
- There are gray bat summer and winter resources in Missouri in large numbers.

- They have wind farms in Missouri and are receiving many applications and are working on doing habitat conservation plans.
- There was a SBDN bat blitz in southeastern Missouri where they caught a record number of bats. They found a new Indiana bat maternity roost and found the northernmost Rafinesques big eared bats. They found southeastern bats.
- MDC has days of volunteers and cooperation to put up gates on caves.
- They were going to lead the cause to downgrade the listing of gray bats but because of WNS that never went out and is on hold.

Scott Johnson – A Brief Announcement

- There are 190,000 Indiana bats throughout Indiana from 230,000 in 2007
- They are monitoring visitor levels in select caves.
- The state acquired a significant cave resource with about 1,000 Indiana bats. The bats responded well when they closed cave to visitors.
- This winter they just did entrance surveys because it was not a census year.
- They are planning on installing a beam break system at Wyandotte this summer.

Keith Lott – Ohio state report

- Have been doing Indiana bat surveys and radio tracking.
- Lewisburg Mine is Ohio's only Priority 2 hibernaculum in southwestern Ohio. It's a privately owned, gated site.
- Band recovery data – found bats from Ohio in Kentucky (about 160-200 miles from summer to winter hibernacula).
- There are over 50 proposed wind projects and that is how they have found Indiana bats.
- They have conducted home range studies and radio tracked bats to roosts. They are also looking at maximum foraging distances for set-backs and using GIS to analyze bat data compared to landscape data.
- They finalized pre and post construction monitoring guidelines for the state including details such as how to set your Anabat sensitivity.
- They have characterized the entire state based on habitat for how extensive the surveys must be for wind projects.
- Wind developers often wait until the end to consult with DNR which can cause issues if there are wildlife concerns.
- Developers will look at the state map and will try to work around more sensitive areas.
- They have funding from NOAA for bat migration along Lake Erie. Ohio State has receivers permanently set up and scanning for tagged tree bats then recording locations as they are detected.
- Ohio just started a bat working group for communication and collaboration.

- There are not many cave resources in Ohio.
- The forest service will be closing mines within Wayne National Forest. These are permanent closures in coal and limestone mines

Dave Redell – Wisconsin State Report

- Currently there are 3 wind sites with pre and post construction studies. One site is operational and located two miles from Neda Mine. This site has yet to be studied.
- Wisconsin bats have been used as control animals to see if they became infected with WNS in Vermont.
- Bringing Wisconsin bats into the lab and inoculating with fungus to study transmission.
- They are trying to reach out to neighboring states for a WNS response plan and work with USFWS Region 3 WNS coordinator to communicate.
- Wisconsin is doing baseline work and wants to ramp up effort by cataloguing known and possible hibernacula, identifying landowners, doing preliminary site assessments, prioritizing sites for surveillance and monitoring.
- There are 779 known and potentially suitable caves/mines in state.
- 300,000 bats is largest known hibernacula in Wisconsin
- <http://wiatri.net/inventory/bats> is the state bat website
- They have a citizen based bat acoustic monitoring group to help with bat work. They promote training of others so they can help each other. These citizen surveys are growing.
- They are going to look for summer roosts by using “bats wanted” posters and packets to help people get involved with monitoring local roosts.
- Wisconsin has website reporting system for citizens to report sick/dead bats.
- MWBWG conference video is up on Wisconsin’s website.
- Bat surveys conducted along the lower Wisconsin River were by boat using the Anabat.

Miscellaneous Items

- Eric Britzke is working on models with limited funding but hoping to have stuff to share with others to streamline acoustic ID.
- Formal meeting and workshops (WNS session, wind energy section, workshop on tagging bats) in Louisville, KY, for 3 bat working groups in February 2011. We could potentially add a short private meeting of MWBWG only people. Members voted to attend this meeting and have it replace the annual MWBWG meeting.

- Vote on acronym: Michigan Bat Working Group is MBWG so we should change our acronym. Motion to change acronym to MWBWG. MOTION PASSED.

Rich Geboy FWS WNS coordinator and Dave Reddell

- Review of worksheet in the packet: Recurring issues relative to the management of WNS as defined in the letter of USFWS Nov. 2009 – Defined and Explained
- On the phone – USFWS National WNS Coordinator Jeremy Coleman; Noelle Rayman
- It will still be a couple of weeks yet to refine the WNS protocol then conduct a short internal review.
- USFWS feels they still need to have research of summer WNS transmission. They will lay out concerns for mist-netting and harp trapping. They encourage use of acoustic surveys when possible.
- For the Pittsburg meeting they have computer feeds that can tap into a system to allow meeting participation, so try to group up to minimize the lines but they are mostly concerned with getting the meeting organized and scheduled.
- RFP is now up on grants.gov for WNS research. There will be a link on the Northeast FWS website for actual RFP posting. FDA #15.657 Funding opportunity number FWS-R5-ES-10-049
- Updates on National WNS Plan: working on base plan from technical reviews and based on meeting in Kentucky. They will have a draft of the base plan out in advance of the Pittsburg Symposium. It will be going out for public comment on the Federal Register. The national plan is a guide for the state response across the nation. Most states are still in the planning process and FWS can give a basic template through the national plan, saving states time and effort in basic development. National plans will not trump state plans but will provide overarching guidance. Use other existing state plans as a guide to get started on your state plan. Don't delay planning while waiting for national plan. The implementation aspect of the national plan will be constantly changing and updating as work is being done.
- A revision to the cave advisory will be coming out soon. The recommendation will not change much but will reinforce information/justification that was lacking in the first cave advisory.
- Decontamination protocol – some new products that will be coming out in next protocol are Lysol wipes/409 wipes.

END CALL WITH JEREMEY & NOELLE

RETURN TO WORKSHEET IN PACKET FOR DISCUSSION:

- *Item 1 – Culling: Killing bats with WNS (or all bats in hibernacula with WNS)*

- Killing animals will not prevent spread since the fungus is in the soil and environment. If you kill the individuals they won't contribute to spread. Culling may slow but not stop it. Fungus can be spread by other animals and you cannot seal off the cave entirely. Other animals will still be able to get out and sealing off prevents bats from ever using it again.
- If you get an early indicator of WNS in a cave (PCR positive but clinically negative like the Missouri site) determine if culling would work based on how many bats are infected. Look at adjacent sites and take samples. Submit animals for PCR. How much has it spread from jump site? Culling may be pointless if the disease has already spread. Could there be individuals that have the fungus on them but do not have it growing into the integument of the skin (like in Europe)? Europeans do not track bats like we do and say they don't see mass mortality but maybe they just don't see it due to lack of research.
- There is still time to collect samples around the Missouri site and get new information. Try to determine the spread. We need to find a geneticist in the region that can take the primer from the National Wildlife Health Center and get tests done more rapidly. The problem is you need money to run the PCR tests and labs won't do it without getting paid. There are field based PCR kits and you could potentially get a field-based yes or no. This would be very expensive - \$10,000 per kit that can be used multiple times. You don't need a special lab to confirm/do PCR test for low cost, but labs that will do it need to be identified. The draft national plan has 4-5 labs/places accepting samples that we know have experience with identifying the *Geomyces destructans* fungus. Send samples in NOW to determine spread of WNS around the Missouri site. The window is closing as bats are leaving the caves. Missouri is a member state of SQUIDA. The problem is now if you don't find it you cannot be sure that it is not there because so many animals have left. Know that if you get a negative it is not a concrete negative. You will probably be able to analyze only 2-3 bats/per site. Check protocol for the lab that you will be sending your samples to.
- The Midwest needs to get information out from lessons learned out east. FWS will be coordinating this and help everybody get on the same page.
- We need to look at animals now to learn more about the beginning of the life cycle of the disease. Learn more about the epidemiology of a new disease and that could help others down the line. May also help learn if any management action is possible. Start forming hypotheses for experiments in what actions could be taken other than just study the disease. If the Missouri site has not spread then

start trying experiments such as treatment rather try to jump to culling.

- *Item 2 – Closing the caves*
 - In Missouri the cave closure is an administrative closure. Blasting the cave in Missouri closed is not even being discussed (only discussing gating or administrative closure). They are just restricting access which prevents disturbance to bats.
 - Are we just sitting by and letting it spread or are we going to do something about it? Studies are teaching us what our options may be. Right now we don't know enough and do not have the means of stopping it.
 - Research area and management: There are a lot of research questions but not a management strategy. Don't close out research opportunities because that may buy us time and provide more information. Do research on management questions. That should be your response to WNS hitting your area or prior to hitting your area.
 - You can still look at males that may be left in the caves in the late spring/summer so it may not be too late to analyze WNS in the cave environment.
 - Need to continue to conduct studies to answer questions about what is going on with the disease. We don't have option to contain or stop the spread but we may be able to slow.
 - Unofficial thoughts and advice from Paul Cryan were read to the group by Dave Reddell.
 - The Kentucky WNS plan is freely distributed, just ask Brooke Slack.
 - We are assuming that the Missouri site is a jump. Maybe we need to check areas in between.
 - New confirmations in Tennessee fill gaps from Dunbar so there may be gaps now but we may just not know about the infected areas in those "gaps" yet.
 - Make sure that everybody is doing PCR and testing bats next year for non-visual WNS. Find maternity colonies and test for WNS; look at males in caves for WNS now.
 - You can get viable samples from frozen specimens that are even a year old.
 - You can look under a microscope to find chlamydia in fecal pellets. We don't know how long the chlamydia persist in the guano.
 - Where can we send pre-WNS samples? Labs are overwhelmed with dead and infected bats and won't look at pre-WNS samples.
 - We need to share how to identify *Geomyces destructans* in guano so that anybody with a high powered microscope can look for it.
 - We need to consider that there are other scientists interested in research in caves that is being impacted by cave closures (i.e. hydrologists looking at water contamination for drinking water).

They need to make a case that the research is critical even though it is not WNS related.

- We need to start building capacity for at least initial screening locally. Rich should help coordinate sample protocol and a list of labs. Maybe APHIS could help. Joe Caudell said people at Purdue University are willing to help. University labs could be a good place for testing locally.
 - We need guidance to help people to know what they have to do to get testing for WNS and moving forward with appropriate research.
 - Collect samples now and keep in the freezer even if you are not certain where to send them.
 - Issue with private landowners that do not want people in their cave and studying this (i.e. Missouri cave). Need to put in state response plans on how you will deal with this when landowners do not allow access. Need to have a plan to get as much data as possible with minimal visits if landowners allow minimal access.
- *ITEM 3 Disturbance*
 - In Pennsylvania they found that researchers going into the cave did not severely disturb infected bats. But more disturbance to healthy bats and too much disturbance could cause them to die. But if the site is already impacted by WNS maybe additional research disturbance doesn't matter.
 - We must coordinate research going into sites to minimize disturbance. Submit research plans at end of summer and coordinate what research will be allowed. Look at research on a site-by-site basis to minimize disturbance. Maybe do the majority of the research to less important sites.
 - First year of WNS in a hibernaculum – don't know before December if it is present.
 - Second year – seeing visible fungus as early as beginning of November.
 - As soon as you see visible WNS signs, then roost shifts and bats exiting the hibernacula. At first they thought bats were shifting because they are looking for better conditions in hibernacula to minimize arousals. Maybe its actually bats that already flew out, realized its too cold, then settled back at the entrance to wait for warmer days.
 - You must have action plan in place so that you can act as soon as you know about WNS in your hibernacula. Get research going right away. February is better to survey to document signs of WNS especially in sites with WNS in its first year. In your hibernacula surveys look closely for WNS signs. Look at bats in the center of clusters rather than the outer bats since inner bats more likely to have fungus.

- It was suggested to try treatment in the fall swarm of infected and clean sites. Rather than just go straight into culling or other more drastic measures such as culling or spraying sites. This won't treat clinical animals but it would prevent those clinical signs from occurring. Do some of this along with regular Indiana bat surveys – band and treat.
- There is a general feeling that bats that are PCR positive will be dead but not proven via research.
- Air samples of infected sites have been taken but don't know of any results.
- Fall swarming is a pretty long period of time but try to treat at the peak of fall swarming. Need to start treatment in November.

Final Items

- Will put out mission statement for approval to the group through the listserv.
- Next meeting Feb 23-25, 2011 in Louisville, KY.
- Anybody who did a state report - Bree McMurray is asking for a brief summary for the website. She will be in touch and wants to get up by the end of May.

Meeting adjourned at 3:15 PM.