

WHERE DO WE GO FROM HERE? PARTICIPANT RECOMMENDATIONS

The following are recommendations for future action made by the Participants at the conclusion of the forum.

1. The Office of Surface Mining (OSM) should consider becoming a clearing house for Abandoned Mine Land (AML) bat conservation information.
2. There needs to be an inventory, tracking, and monitoring of Bat friendly closures. This should include the development or adaptation and maintenance of a database.
3. Need Safety Training for individual States concerning habitat assessment for underground mines.
4. Return to sites closed with bat **unfriendly** closures and evaluate occupation or exclusion by bats.
5. Need to investigate additional or alternative Funding for non coal AML for the west from the Natural Resources Conservation Service, the Highway Department, and State “Fish and Game” agencies.
6. Need to convince OSM leadership that appropriate and needed bat friendly closures are a high priority in addition to the primary mission of Health and Safety.
7. Need to expand partnerships to include active mining operations.
8. OSM should explore a partnership with existing Federal Agency safety training programs that would make this training more available for OSM and coal State program staff.
9. States need to investigate their schedules and timing of closures to minimize potential conflicts with efforts to protect bats and their habitats.
10. Need more information on the strengths and weakness of working with volunteers and how to develop or expand on these programs.
11. Need better information on ventilation requirements (flow, temp inside and outside mines, etc.).
12. Investigate how to bring the U.S. Environmental Protection Agency in as a participants of bat conservation efforts, especially on Superfund sites.
13. Need an evaluation of alternatives for bat protection on re-mined areas. Does the potential exist to require bat friendly closures after mining is finished.

SURVEY RESULTS
BAT CONSERVATION AND MINING: A TECHNICAL INTERACTIVE FORUM
PARTICIPANT COMMENTS AND RECOMMENDATIONS

CATEGORY OF PARTICIPANTS	# OF REGISTRANTS	% OF REGISTRANTS
TOTAL REGISTRATION	118	100
TOTAL COMPLETING THE SURVEY	42	36
LEVEL OF SATISFACTION WITH THE FORUM		
EXTREMELY SATISFIED	22	52
VERY SATISFIED	16	38
SATISFIED	3	7
DISSATISFIED	1	2
VERY DISSATISFIED	0	0

COMPLIMENTS:

1. **Great forum! Both the level of information covered and the quality of people involved was greatly beneficial.**
2. **Rousing Success!**
3. **I have been to four technical meetings in the past year and this was by far the best one.**
4. **Great Job! I learned some do's and don'ts. I received good information, met knowledgeable people, and made some good contacts.**
5. **Very good job! I was afraid this would just be a repeat of similar conferences held in the past by other groups, but it was very interesting with great speakers and many new topics.**
6. **Great Job! A very good job of bringing people from a wide range of occupations and geographic locations.**
7. **Forum format was set up very well.**
8. **My time was well spent at this conference.**
9. **I liked the participant interactive discussion sessions.**
10. **Good collection of people and the informal exchanges were very worthwhile.**
11. **I really liked the interactive discussion of the last session, it was an excellent way to end the forum. Good discussions.**
12. **Nice to see such a diverse group come together to share information and find common goals towards bat conservation. Many thanks.**

**WHERE DID THE PARTICIPANTS COME FROM AND
WHO DID THEY REPRESENT?**

PARTICIPANT AFFILIATION	# OF REGISTRANTS	% OF REGISTRANTS
STATE REGULATORY	23	20
OSM	22	19
OTHER FEDERAL	21	18
WILDLIFE AGENCY	13	11
UNIVERSITY	12	10
CONSULTANT	11	10
MINING	5	4
CONSERVATION GROUP	3	3

REGIONAL REPRESENTATION	# OF REGISTRANTS	% OF REGISTRANTS
WEST	42	37
MID-CONTINENT	37	32
APPALACHIAN	36	31

PARTICIPANTS RESIDE IN THE FOLLOWING 29 STATES

AK	IN	NM	TX
AR	KS	NV	UT
AZ	KY	OH	VA
CA	MI	OK	WA
CO	MO	OR	WV
DC	MS	PA	
GA	MT	SD	
IL	NC	TN	

PARTICIPANT RATING ON USEFULNESS OF TALKS

4.0=EXCELLENT

3.0=GOOD

2.0=FAIR

1.0=POOR

SESSION 1 WHY BATS?

<u>PRESENTER</u>	<u>AVERAGE RATING</u>	<u>RATING RANGE</u>
Sheryl Ducummon	3.3	4-2
Len Meier	3.3	4-2
Homer Milford	3.1	4-2
Dr. Michael Harvey	3.6	4-2
Dr. Mike Bogan	3.4	4-2
Robert Currie	3.2	4-2

SESSION 2 INTEREST GROUP PERSPECTIVES

<u>PRESENTER</u>	<u>AVERAGE RATING</u>	<u>RATING RANGE</u>
Mark Mesch	3.0	4-1
Dr. Richard Wahrer	2.9	4-1
Homer Milford	2.6	4-1
Stephen Cawood	2.1	4-1
Bob Currie	2.4	4-1
John Burghardt	2.9	4-2
Laurie Fenwood	3.5	4-2
Mike Herder	2.6	3-1
Terry Johnson	3.6	4-1

SESSION 3 METHODS FOR PROTECTING BATS/UNDERGROUND MINES

<u>PRESENTER</u>	<u>AVERAGE RATING</u>	<u>RATING RANGE</u>
Dr. Scott Altenbach	3.8	4-3
Richard Sherwin	3.7	4-2
Robert Currie	3.5	4-2
John Kretzmann	3.4	4-2
Kirk Navo	3.3	4-2
Tom Posluszny	2.5	4-1
Robert Currie	3.2	4-2
Dr. Patricia Brown	3.5	4-2
Dr. Kate Grandison	3.5	4-2

SESSION 4 PROTECTING BAT HABITATS/SURFACE MINING

<u>PRESENTER</u>	<u>AVERAGE RATING</u>	<u>RATING RANGE</u>
Dr. Alan Kurta	3.6	4-2
Dr. Tom O'Shea	3.1	4-1
Chris Yde	3.2	4-1
Sally Imhof	2.9	4-2
Dr. Richard Wahrer	3.2	4-2

SESSION 5 PROGRAM DEVELOPMENT

<u>PRESENTER</u>	<u>AVERAGE RATING</u>	<u>RATING RANGE</u>
Dave Bucknam	3.0	4-2
Dean Enderlin	3.4	4-1
John Burghardt	3.3	4-2
Richard Clawson	2.9	4-2

SUGGESTIONS FOR IMPROVEMENT

FUTURE DETAILED WORKSHOP

- on safety concerns related to mine assessment and installation of bat friendly closures
- on techniques for conducting bat surveys
- on gate designs and information for managers on costs
- on mitigation of bat habitat other than caves and mines
- on protection of streams and riparian vegetation useful to bats
- on NEPA permitting related to bats
- a consistent protocol on survey methods and data collection when doing fall and winter bat surveys at mines and caves
- in depth discussions of specific aspects of bats and mining with summary and recommendations by a working group

FORUM IMPROVEMENTS

- more industry participation
- a talk from Roy Powers on bat gate construction
- more time for participant interaction
- more case studies, exhibits, and displays
- more discussion on long term maintenance of AML installed bat gates on private property
- more discussion on issues from the Eastern U.S.
- more information on funding options for program implementation.
- more involvement with MSHA
- More information on successes and failures of surveying and monitoring techniques
- better representation from more States with reports on their status and needs related to protecting bat habitat
- a field trip
- what is the mining industry doing to plan for mitigation of bat habitat

APPENDIX 1: RECORDED DISCUSSIONS

Edited by
Kimery C. Vories
USDI Office of Surface Mining
Alton, Illinois

The following are the edited discussions that took place at the end of each speaker presentation and at the end of each topic session. The actual comments have been edited to translate the verbal discussion into a format that more effectively and efficiently communicates the information exchange into a written format. The organization of the discussion follows the same progression as that which took place at the forum. A topical outline has been developed to aid in accessing the information brought out in the discussions.

The topic of each question is shown in alphabetical order in **bold**. The individual speaker questions are listed in outline format under the appropriate topic session and presentation title. Questions during the twenty minute interactive discussion are listed at the end of the session in the following format:

SESSION # AND TOPIC AREA

1. Presentation Title
 - **Subject of Question or Comment**

SESSION # INTERACTIVE DISCUSSION

Subject of Question or Comment

OUTLINE OF DISCUSSION TOPICS

SESSION 1: WHY BATS?

1. Ecological and Economic Importance of Bats
 - **Presence of Bats in Each State**
2. Importance of Mines for Bat Conservation
 - **Extent of Survey**
 - **OSM Oversight Responsibility**
 - **OSM Protection of Bat Species**
 - **Rates of Reclamation**
3. Challenges in Protecting Bats
 - **Consequences of Settling Out of Court**
 - **Monitoring of Subsidence at Backfilled Mine Openings**
 - **The Purpose of Bat Gate Warning Signs**
4. Eastern Bat Species of Concern to Mining
5. Western Bats and Mining
6. Federally Listed Threatened and Endangered Species of Concern to Mining

SESSION 1 INTERACTIVE DISCUSSION

Effect of Remining on Bat Habitat Loss

Effect of Toxic Gases

Post Installation Monitoring of Gates

The Importance of Air Movement

What is the Relationship of Western Bats to Open Water Sources

SESSION 2: INTEREST GROUP PERSPECTIVES ON CONSTRAINTS, EXPERIENCES, TRENDS, AND NEEDS (No Questions after speakers due to lack of time)

1. National Association of Abandoned Mine Land Programs
2. Perspective of the Interstate Mining Compact Commission/Eastern Regulatory Authority States on Bat Conservation and Mining
3. Bat Conservation in Mine Reclamation in Eleven Western States and the Western Interstate Energy Board Perspective on Habitat Preservation
4. Kentucky Coal Industry Perspective on Bat Conservation and Mining
5. The U.S. Fish and Wildlife Service's Perspective on Bats and Mining
6. Bat-Compatible Closures of Abandoned Underground Mines in National Park System Units
7. Sex, Lies, and Videotape: My Views on the Evolution of Federal Policy and Practice to Conserve Bats on Lands Managed by the Forest Service
8. The Role of the Bureau of Land Management in Bat Conservation
9. International Association of Fish and Wildlife Agencies

SESSION 2 INTERACTIVE DISCUSSION

Cross Boundary Species Protection Planning for Indiana Bat

Department of Defense Activity with Bat Gates

Interagency Cooperation between OSM and USFWS on Bats

Lead Agency of Bat Conservation on Mines

Positive Benefits of Litigation

Protection of non listed Species

SESSION 3: METHODS FOR PROTECTING BAT HABITAT ASSOCIATED WITH UNDERGROUND MINES

1. Methods for Determining Local Mine Characteristics of Importance to Bats
 - **Rate at which Bats Occupy Mines**
2. Pre-Mine Closure Bat Survey and Inventory Techniques
 - **Underground Mine Safety Training**
3. An Evaluation of Alternative Methods for Constructing Bat Gates at Mine Closures
 - **Merits of Manganal Steel Gates**
 - **Predators at Gates**
4. New Mexico Experience with Bat Grates at Abandoned Mines
5. A Colorado Case Study to Secure an Underground Mine for Bat Habitat
 - **Volunteer Access to Private Property**

6. Pennsylvania Case Studies to Secure Underground Mine Workings for Bat Habitat
7. A Midwestern Case Study to Secure an Underground Mine for Bat Habitat: The Unimin A Magazine Mine in Alexander County, Illinois
8. An Overview of the Response of Bats to Protection Efforts
9. Evicting Bats when Gates will not work: Unstable Mines and Renewed Mining
10. Monitoring and Evaluating Results of Bat Protection Efforts

SESSION 3 INTERACTIVE DISCUSSION

- Highest Elevation for Bat Hibernation**
- Life Expectancy of Gates**
- Prioritizing Bat Closures due to Time Constraints**
- Protecting Gates from Clutter**
- Quiet Bats not Detectable by Anabat**
- Volunteer Program**

SESSION 4: PROTECTING BAT HABITAT ASSOCIATED WITH SURFACE MINING AND RECLAMATION

1. Bats at the Surface: The Need for Shelter, Food, and Water
2. Impacts of Mine Related Contaminants on Bats
3. Surface Habitat Disturbance, Protection, and Enhancement Associated with Active Surface Mining and Reclamation
4. Endangered Species Habitat Replacement
5. Surface Mining Case Study from Kentucky

SESSION 4 INTERACTIVE DISCUSSION

- **Acceptance of KY Bat Management Plan**
- **Bat Box Use by Indiana Bats**

SESSION 5: PROGRAM DEVELOPMENT

1. State Program/Colorado
 - **Mine Closure without Bat Surveys**
2. The McLaughlin Mine Bat Program: New Ideas in an Old Mining District
 - **Constraints to Bat Use of Tire Tunnel**
 - **Management Approval for Bat Structure**
3. Implementation of a Recovery Plan for the Endangered Indiana Bat
 - **Migratory pattern of Indiana Bats in Missouri**

SESSION 5 INTERACTIVE DISCUSSION

- Define Riparian Area for Indiana Bats**
- Double Standard of Safety during Bat Surveys**
- How Safe are Coal Mines for Bats**
- The Value of Bat Habitat at a Superfund Site**

SESSION 6: INTEREST GROUP RECOMMENDATIONS TO ENHANCE BAT
CONSERVATION ASSOCIATED WITH MINING

1. National Association of Abandoned Mine Land Programs
 - **National Bat Gate Information Database**
 - **Use of Additional AML Funds for Bat Gates**
2. Interstate Mining Compact Commission/Eastern Regulatory Authority States
3. Western Interstate Energy Board/Western Regulatory Authority States
4. The U.S. Fish and Wildlife Service
5. National Park Service
 - Safety Training Courses for Underground Mines**
 - Training for Abandoned Underground Mines**
6. International Association of Fish and Wildlife Agencies
7. Regional Bat Working Groups

SESSION 6 INTERACTIVE DISCUSSION

Are Conservation Agreements limited to non listed Species

Convincing Managers to Install Bat Gates

Funding for non coal States

Use of AML Funds for non coal

DISCUSSION BY SESSION

SESSION 1: WHY BATS?

1. Ecological and Economic Importance of Bats Sheryl Ducummon, Bat Conservation International, Austin, Texas

Question: (Presence of Bats in Each State) Are there bats present in every State in the U.S.?

Answer: Yes. Some have more species than others but they are found in every State.

2. Importance of Mines for Bat Conservation Len Meier, Office of Surface Mining, Alton, Illinois

Question: (Extent of Survey) Was your survey sent to all Federal and State agencies? I was surprised that there was only one bat closure reported in Arkansas.

Answer: It was sent to State Reclamation programs. When I could not get any answers there, I went to the State Fish and Wildlife agencies. Arkansas was a hard State to find information. These numbers probably do not reflect what the National Park Service or the Corp of Engineers have done in Arkansas. The paper provides documentation of the sources of all of my information.

Comment: Concerning what has been happening in Arkansas, at least for the National Park Service, at Buffalo National River we put 12 bat friendly closures up on three mine sites to date.

Question: (OSM Oversight Responsibility) In how many States does OSM have oversight responsibility?

Answer: 26 States. OSM has contacts in additional States where we promote technology transfer.

Question: (OSM Protection of Bat Species) Does OSM insure, in its review of documents, that all bats are protected or only Endangered Species?

Answer: I think that OSM is not consistent concerning the protection of all bats, but it is consistent with the protection of Endangered Species. This is definitely an area where OSM can improve the education of State programs on the protection of bats. OSM has very limited powers to protect species that are not threatened or endangered.

Question: (Rates of Reclamation) In terms of annual acres of land disturbed and reclaimed, why does the rate of reclamation lag so far behind the rate of disturbance?

Answer: First, let me clarify that the figure I provided of 9,000 acres or reclamation is strictly abandoned mine reclamation. These were lands mined before the passage of the Federal Surface

Mining Control and Reclamation Act (SMCRA) and are being reclaimed with funds from a tax on post SMCRA mined coal. After the passage of SMCRA, mines must, for the most part, reclaim their land contemporaneously with lands being mined. Eventually all of the 86,000 acres of SMCRA mined lands will have to be reclaimed consistent with the standards of SMCRA. Concerning the 6.6 billion tons of non coal minerals mined, those lands are not covered by Federal reclamation law but there are numerous State and local laws that govern the mining and reclamation. For lands not regulated under SMCRA, the final reclamation will be quite variable due to different requirements locally.

3. Challenges in Protecting Bats Homer Milford, New Mexico Mining and Minerals Division, Sante Fe, New Mexico

Question: (Consequences of Settling Out of Court) When an agency settles out of court, what will keep that same type of lawsuit from continually reappearing?

Answer: The fact is that they do just keep reappearing. Lawyers realize that, by adding a government agency to the lawsuit, they will find a “deep pocket.” The lawyers in the State are concerned about loss control and must make a determination of which cases are cost effective to fight and which are not. In New Mexico, at least, the State agency has no say in what the legal department decides concerning loss control.

Question: (Monitoring of Subsidence at Backfilled Mine Openings) A number of the mines we have observed in Nevada have been backfilled but the backfill has experienced significant subsidence. This may have created hazards that didn’t exist prior to backfilling. Do you monitor areas that have been backfilled for subsidence as well as those openings that are gated?

Answer: Yes. It is a requirement of most SMCRA programs. Nevada does not have a SMCRA program and has no requirement for monitoring. The Nevada State agency, however, does nothing but fencing so that the backfilled areas you observed must have been done by the mine or the landowner.

Question: (The Purpose of Bat Gate Warning Signs) Oklahoma is in the process of designing a gate and warning sign. Since you should be eliminating the danger of entering a mine with the gate, what should your warning sign say?

Answer: You should warn about any dangers associated with the mine. The National Park Service worked with Bat Conservation International to put out bat gate warning signs. In it they tried to explain the importance of bats and the dangers of abandoned mines in case someone breached the gate. It is basically designed to discourage vandalism. In addition, if the gate is breached, you have the legal concern that you have warned the vandals about the dangers of the mine in case someone gets hurt and the penalties involved with harming the bats, especially endangered species.

4. Eastern Bat Species of Concern to Mining Dr. Michael Harvey, Tennessee Technological University, Cookeville, Tennessee

5. Western Bats and Mining Dr. Michael A. Bogan, USGS Biological Research Division, Albuquerque, New Mexico
6. Federally Listed Threatened and Endangered Species of Concern to Mining Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina

SESSION 1 INTERACTIVE DISCUSSION

Question: (Effect of Remining on Bat Habitat Loss) What is the potential for habitat loss from renewed surface mining over abandoned mines?

Answer: With the movement of colonies of bats into abandoned underground mines, these sites have become critical to some bat populations. With the change of mining methods that now favors open pit mining, I have seen situations where an abandoned underground mine that was being extensively used by bats was destroyed because the area was remined. In this type of situation, we want to ensure that appropriate surveys are conducted to identify existing bat habitat and then apply appropriate exclusion techniques to ensure that the bats are not trapped and killed by the remining activity.

Question: (Effect of Toxic Gases) What is the effect of methane and carbon dioxide coming out of coal mines on bats?

Answer: An atmosphere that has high levels of gases that are toxic for other mammals will also affect bats. We have no evidence that bats can tolerate the presence of toxic gases but we do have evidence of bats being killed by carbon monoxide that has been drawn into an area where they are present.

Question: (Post Installation Monitoring of Gates) Is anyone monitoring the bats reaction to the installation of gates in addition to whether or not the gate has been breached?

Answer: Not all gates are being monitored. OSM does not have a requirement for annual gate monitoring. Monitoring of gates will vary across the country. Also many gates that have been installed at mines are not involved with OSM oversight. Most of the Western States have some type of monitoring program.

Question: (The Importance of Air Movement) In underground abandoned coal mines how important is air movement?

Answer: Air movement is critical in underground mines in terms of temperature control. If there is no significant air movement underground and air is not being exchanged with surface air the resulting temperatures will be the mean annual temperature which is too cold for maternity use and too warm for hibernation. In general, I have found that better sites have some type of air exchange.

Answer: In Michigan, if we have a mine with an upper and lower entrance, this will produce a chimney effect in winter and there will be no bats hibernating in this mine because the air temperature will be too cold. It is important to keep in mind that concerning air flow, different parts of the country may have a different physical environment that yields different effects on bats.

Question: (What is the Relationship of Western Bats to Open Water Sources) In many mine surveys that I have been involved with in the arid southwest, bats were not looked at because of the lack of water nearby. During radiotelemetry studies of some western species, I have found that some species will bypass water sources and have also found bat roosts that were over 25 miles from surface water. Dr. Bogan have you found similar situations in your telemetry studies?

Answer: I probably do not work in as arid areas as you do Dr. Brown and do not have significant observations in that area. A lot of the bats we have been tracking in New Mexico and Utah are bats from montane areas. I have not seen them fly past a water area but we know from the literature that many bats are capable of quite long distance flights. There are examples of spotted bats that roost in a day roost in the Grand Canyon and fly into the Kayabab plateau at night to forage. We have frequently observed these bats to fly 20 kilometers one way to get to a particular site. I do not think that they fly these distances for water but rather for a particularly productive foraging site. I do agree with you that some bats can exist a great distance from surface water sites.

Answer: Bats definitely need water. In the Arkansas Ozarks, there are many small wildlife ponds and road cuts with water. We have captured large numbers of bats over these small bodies of water. I have come up with an estimate of 400,000 northern long eared bats in a 400 square mile area using these small bodies of water. I don't think these bats were in this area prior to the construction of the small water bodies. What I am alluding to is that in a mining situation, the creation of small water bodies promotes bats as well as other wildlife.

For those working in the arid southwest, the lack of open water sources should not be used as an indicator of the lack of bats.

SESSION 2: INTEREST GROUP PERSPECTIVES ON CONSTRAINTS, EXPERIENCES, TRENDS, AND NEEDS

1. National Association of Abandoned Mine Land Programs Mark Mesch, Utah Division of Oil, Gas, and Mining, Salt Lake City, Utah
2. Perspective of the Interstate Mining Compact Commission/Eastern Regulatory Authority States on Bat Conservation and Mining Dr. Richard Wahrer, Kentucky Department for Surface Mining Reclamation and Enforcement, Frankfort, Kentucky
3. Bat Conservation in Mine Reclamation in Eleven Western States and the Western Interstate Energy Board Perspective on Habitat Preservation Homer Milford, New Mexico Mining and Minerals Division, Santa Fe, New Mexico

4. Kentucky Coal Industry Perspective on Bat Conservation and Mining Stephen Cawood, McBrayer, McGinnis, Leslie, and Kirkland, PLLC, Lexington, Kentucky
5. The U.S. Fish and Wildlife Service's Perspective on Bats and Mining Dave Flemming, U.S. Fish and Wildlife Service, Atlanta, Georgia
6. Bat-Compatible Closures of Abandoned Underground Mines in National Park System Units John Burghardt, National Park Service, Denver, Colorado
7. Sex, Lies, and Videotape: My Views on the Evolution of Federal Policy and Practice to Conserve Bats on Lands Managed by the Forest Service Laurie Fenwood, U.S. Forest Service, Vallejo, California
8. The Role of the Bureau of Land Management in Bat Conservation Fred Stabler, Bureau of Land Management, Washington, D.C.
9. International Association of Fish and Wildlife Agencies Terry Johnson, Arizona Department of Game and Fish, Phoenix, Arizona

SESSION 2 INTERACTIVE DISCUSSION

Question: (Cross Boundary Species Protection Planning for Indiana Bat) Three of the speakers mentioned the need for some cross boundary issues, in particular with the Indiana Bat. Is the U.S. Fish and Wildlife Service considering species wide decision making for how to do management plans for Indiana Bats?

Answer: The U.S. Fish and Wildlife Service (USFWS) has raised the issue of consistency in the handling of the Indiana Bat within the three USFWS regions that deal with it but no decision has been reached.

Question: (Department of Defense Activity with Bat Gates) Mr. Milford, in your table listing States and agencies that had constructed bat gates, the Department of Defense was not included. I am aware of a number of bat gates that have been installed on installations in the West. Were they not included in your sample or did they not respond?

Answer: I included the Department of Defense under other because I could not get any good information except for Arizona.

Question: (Interagency Cooperation between OSM and USFWS on Bats) In thinking about a species wide conservation plan, because this is an issue in Mid-western mining, how can the mining regulatory agency like OSM work with the USFWS in beginning this process?

Answer: One of the difficulties that OSM may face in this situation is that the SMCRA function has been delegated to the States and the oversight that OSM has USFWS is concerned with exactly how oversight would take place on an annual basis particularly if there were any

problems or difficult situations that needed to be dealt with across the nation in a consistent fashion when you are dealing with so many individual State programs that actually implement SMCRA. Although this means there is so clear up front answer, it is actually a process of good communication between all of the agencies involved.

Question: (Lead Agency of Bat Conservation on Mines) Could you comment on the concept of who is the lead agency concerning bat conservation associated with mines?

Answer: (Laughter) I think that answers your question.

Answer: From the perspective of the National Association of Abandoned Mine programs, with Utah as an example, we are the only agency in the State authorized to undertake reclamation at abandoned mine sites whether it is private, State, or Federal lands. Through memorandum of understandings with each of these agencies we do the National Environmental Policy Act evaluations and seek appropriate comment from these agencies with final approval by the Office of Surface Mining.

Answer: The Park Service has about a dozen cooperative agreements with about a dozen State abandoned mine programs that includes States covered by SMCRA and some that aren't. It is very much a collaborative effort. But if you asked who was in charge of a park service program it would be the superintendent of the individual park involved.

Question: (Positive Benefits of Litigation) Concerning the positive benefits of litigation, do you think we have reached the limit of those positive benefits?

Answer: I don't think we have seen all of the positive benefits because within my agency we are still saying that we are committed to conservation yet we are not doing what we need to do. Generally, these lawsuits are about the fact that we are saying one thing and getting caught not doing it. In some cases litigation may have gone overboard but those are the exceptions.

Question: (Protection of non listed Species) One thing that bats and mines in the East don't have that bats and mines in the West do, is the lack of bats listed under the Endangered Species Act which directly involves the USFWS. Those of us who have worked with Townsend's Big Eared Bat realize that it is hit and miss as to whether or not they receive protection. Is there an other alternative for dealing with species before they become listed especially when dealing with private land owners?

Answer: We do have the opportunity to address that with a candidate conservation agreement. We have done a few in our region in the Southeast and it usually involves developing something similar to a habitat recovery plan. When you deal with private land owners we developed a safe harbor program that has worked well in this area. Another option would be through section 6 of the Endangered Species Act where you have a listed species and you can acquire land for protection of the species. We have the private landowner "sign up program." This is where corporate land owners can provide the funds for protection of a species.

SESSION 3: METHODS FOR PROTECTING BAT HABITAT ASSOCIATED WITH UNDERGROUND MINES

1. Methods for Determining Local Mine Characteristics of Importance to Bats Richard Sherwin, University of New Mexico, Albuquerque, New Mexico

Question: (Rate at which Bats Occupy Mines) Do you have any idea of the amount of time it would take before bats start to occupy a mine after it is abandoned?

Answer: I believe many species are going through a range expansion currently because of the opportunity to occupy abandoned mines. I have no idea of the population dynamics of any individual species. It may be that some of the low densities of individuals we see in many mines is due to the abundance of mines to choose from. There are many reports of bats moving into a mine while they are still being worked. In some abandoned mines the bats continue to use the mine even after it has been reopened.

Answer: I have done about 6 to 7 thousand underground surveys and less than 5 percent contained no bats.

2. Pre-Mine Closure Bat Survey and Inventory Techniques Dr. J. Scott Altenbach, University of New Mexico, Albuquerque, New Mexico

Question: (Underground Mine Safety Training) Have you developed a mine safety protocol that is available?

Answer: No. The reason I haven't is because I am afraid that "Grindstone and Flint Attorneys at Law" will pursue me. I am a little too afraid of a lawsuit to attempt that. There are programs that are available through the Forest Service and BLM. You need to be cautious about what that type of training will prepare you for. It is better than no training, but you can't get a certificate in that course and then pretend that you are prepared to enter an underground abandoned mine.

3. An Evaluation of Alternative Methods for Constructing Bat Gates at Mine Closures Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina

Question: (Merits of Manganal Steel Gates) Concerning the Manganal gates being used in Utah, you have mentioned that the material is much more expensive than the angle iron but they require less material. Can you address relative costs including the ease of installation?

Answer: I have some 2 year old data that compares the costs of using angle iron with one and one half inch Manganal. The Manganal cost was \$12.00/foot compared to \$12.57 for angle iron with stiffeners. Concerning strength, the angle iron with stiffeners is a little less than twice as strong as the Manganal.

Answer: In Utah, our experience has been that when we used the angle iron gates they are soon vandalized. Then we applied stainless steel facing on the gates and the vandals attacked the lock

box. With the Manganal gates the more a person tries to use a hack saw on the steel the harder it becomes. It will actually break the saw blades.

Question: (Predators at Gates) How do predators respond to these gates? I have noticed that two days after installation of a gate, I started finding half eaten bat carcasses around the gate.

Answer: Predation is a problem around any bat closures especially if it is a domestic predator like a cat. Then you need to deal with that problem. House cats belong in the house.

4. New Mexico Experience with Bat Grates at Abandoned Mines John Kretzmann, New Mexico Mining and Minerals Division, Sante Fe, New Mexico
5. A Colorado Case Study to Secure an Underground Mine for Bat Habitat Kirk Navo, Colorado Division of Wildlife, Monte Vista, Colorado

Question: (Volunteer Access to Private Property) How do you deal volunteers making multiple visits on private property to make the assessments?

Answer: We seek land owner permission on private property. Most private owners have no problem with our conducting the surveys.

6. Pennsylvania Case Studies to Secure Underground Mine Workings for Bat Habitat Tom Posluszny, Office of Surface Mining, Wilkes-Barre, Pennsylvania
7. A Midwestern Case Study to Secure an Underground Mine for Bat Habitat: The Unimin A Magazine Mine in Alexander County, Illinois Joseph Kath, Illinois Department of Natural Resources, Division of Natural Heritage, Springfield, Illinois
8. An Overview of the Response of Bats to Protection Efforts Robert Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina
9. Evicting Bats when Gates will not work: Unstable Mines and Renewed Mining Dr. Patricia Brown, University of California, Los Angeles, California
10. Monitoring and Evaluating Results of Bat Protection Efforts Dr. Kate Grandison, Southern Utah University, Cedar City, Utah

SESSION 3 INTERACTIVE DISCUSSION

Question: (Highest Elevation for Bat Hibernation) Kirk what is the highest elevation you have found with bats in hibernation and with what species?

Answer: There is documentation of bats hibernating at 9,500 feet. There is a cave at 10,000 feet that we suspect has bats hibernating.

Question: (Life Expectancy of Gates) What is the life expectancy of a typical bat gate? Who will maintain the gate on private land after the State AML program withdraws its maintenance? Are there any other long term maintenance programs for gates on private lands?

Answer: This is a concern for both private and public lands and we don't have an answer.

Question: (Prioritizing Bat Closures due to Time Constraints) I work for the Navajo nation and we have primarily uranium mines that we are closing. We have been using exclusion process to remove the bats from the mine prior to closure. Since I am the only biologist, I can not get to all of the sites prior to closure.

Answer: I assume that all of the mines are not created equal and some may be more beneficial to bats than others. Given the lack of time for survey and exclusion, the first thing I would try to do is prioritize the mines in terms of their danger from a health and safety aspect and work on those first. I would not do any exclusion of bats during the winter or maternity season unless you had clear evidence that the mines were not being used during those times. For less than \$1,000 you can get a video camera and set it up and observe the mine opening which will give you an actual record of bat usage. Then after dark to put up your mosquito netting for a couple of nights and then do something more opaque before sealing the opening.

Question: (Protecting Gates from Clutter) In the East where you may find bats in a mine with multiple openings and you are trying to protect some of the shafts for the purpose of air flow, how do you design a gate that will not collect a lot of clutter over time?

Answer: At a mine in Wisconsin, they did a standard cupola closure on a shaft of a large iron mine with horizontal bars across the top that the bats can fly through and they have had no problem.

Question: (Quiet Bats not Detectable by Anabat) What types of bat are quiet as they enter the opening so that they are not detectable by the Anabat?

Answer: The Townsend's Big Eared Bat emit very faint echo location signals so that you have to be less than 10 feet from the bat and lined up just right to hear their signals. They also have a variable signal that is very difficult to pick up on an Anabat. We have a new Sonabat program that uses a Peterson detector that shows all of the harmonics and amplitude information which gives you a lot more predictability as to the species involved. In the arid west, we have California Leaf Nose Bat and Pallid Bats that emit very faint or no signals. They are big eared species that do not need to echo locate and can not be picked up with an Anabat.

Question: (Volunteer Program) Concerning a volunteer program, how do you advertise for the volunteers, where do they come from, and how do you keep them?

Answer: Getting volunteers is the easy part. We began our program with advertisements in the newspaper. We received an overwhelming response with people who were interested. In Colorado, we have a volunteer program that handles volunteers for a wide variety of jobs. We

have a wide variety of volunteers from college students through retirees. There is a core of 20 - 30 people who have stayed with us since we began the program who work with us every year. This group does the lions share of volunteer work. There is a big turnover of people who come in and try it for awhile but then the excitement wears off and then leave.

SESSION 4: PROTECTING BAT HABITAT ASSOCIATED WITH SURFACE MINING AND RECLAMATION

1. Bats at the Surface: The Need for Shelter, Food, and Water Dr. Alan Kurta, Department of Biology, Eastern Michigan University, Ypsilanti, Michigan
2. Impacts of Mine Related Contaminants on Bats Dr. Thomas J. O'Shea, U.S. Geological Survey, Biological Resources Division, Fort Collins, Colorado
3. Surface Habitat Disturbance, Protection, and Enhancement Associated with Active Surface Mining and Reclamation Chris Yde, Montana Department of Environmental Quality, Helena, Montana
4. Endangered Species Habitat Replacement Sally Imhof, Kansas Surface Mining Section, Frontenac, Kansas
5. Surface Mining Case Study from Kentucky Dr. Richard Wahrer, Kentucky Department for Surface Mining Reclamation and Enforcement, Frankfort, Kentucky

SESSION 4 INTERACTIVE DISCUSSION

Question: (Acceptance of KY Bat Management Plan) Is the Kentucky Indiana Bat management plan fully accepted and in use by the State and the USFWS?

Answer: Not to my knowledge. There is no mechanism for approval at this point.

Answer: You should be cautious in trying to apply what Kentucky has done to other States.

Comment: (Bat Box Use by Indiana Bats) Concerning artificial bat boxes, it is my understanding that there is no evidence to suggest that the Indiana Bat uses artificial bat boxes. This may not work for mitigation as a substitute for trees.

SESSION 5: PROGRAM DEVELOPMENT

1. State Program/Colorado Julie Annear, Colorado Division of Minerals and Geology, Denver, Colorado

Question: (Mine Closure without Bat Surveys) Do you ever have to put a non bat friendly closure on a mine before a bat survey has been done?

Answer: We try to give Colorado Division of Wildlife adequate time to do their surveys.

2. The McLaughlin Mine Bat Program: New Ideas in an Old Mining District Dean Enderlin, Homestake Mining Co., Lower Lake, California

Question: (Constraints to Bat Use of Tire Tunnel) It seems to me that the temperatures recorded inside the artificial bat habitat may be too high to attract bats and there may be better materials to use that would be more bat friendly than old tires.

Answer: It is certainly unknown how well the tire tunnel will work at attracting bats. Because the average temperature is around 15 to 20 degrees Celsius and you need around 10 degrees in order for bats to hibernate, we feel the tire tunnel would only be used for summer roosts.

Question: (Management Approval for Bat Structure) How difficult was it to get management approval to build the artificial tunnel for bat habitat?

Answer: The tunnel did not really cost a lot and the approval process was fairly easy. It would have been much more difficult if we did not already have staff and equipment on the site.

3. Implementation of a Recovery Plan for the Endangered Indiana Bat Richard Clawson, Missouri Department of Conservation, Columbia, Missouri

Question: (Migratory pattern of Indiana Bats in Missouri) Could you give us some information on the relationship of where the Indiana Bats spend their summer versus where they hibernate?

Answer: The bats that hibernate in southern Missouri are going to North Missouri and southern Iowa and will range into western Illinois. Most of the populations seem to have a north/south migratory pattern.

SESSION 5 INTERACTIVE DISCUSSION

Question: (Define Riparian Area for Indiana Bats) We have had some discussions about what constitutes a riparian area of use to bats. Could you elaborate on what makes a desirable riparian area for Indiana bats?

Answer: It is a complex issue. Riparian areas are the first area where we found Indiana Bat use. The early studies of Indiana Bats in northern Indiana, Illinois, southern Iowa, and north Missouri indicated that riparian bat use meant perennial streams, year round pools of water, and well established riparian corridors with some large diameter trees of at least 12 inches diameter where a tree canopy overhangs the stream. Now with the advent of radio telemetry, we are looking farther and wider. In Kentucky they have found that the bats use the ridge tops of large contiguous forested areas where they will take advantage of ephemeral water sources. I think that they are actually using a lot more areas than we originally thought.

Question: (Double Standard of Safety during Bat Surveys) I have a concern about your statement that “if one bat surveyor gets killed, that will be end of the internal bat survey program.” This points out a serious double standard. Bird surveyors looking for Peregrine falcons fall off cliffs and are killed. When I do internal bat surveys, the most dangerous thing I do is get in my truck and drive on the freeway. Airplanes are not safe to fly in and cars are not safe to drive in yet we do it all the time. If a volunteer falls down a shaft on a bat survey, then you say that would end the program, but if he gets killed driving to the site it wouldn't. I think that is a double standard. Who is going to shut the program down?

Answer: This is an issue that needs to be dealt with. We certainly need to make sure that both professionals and volunteers involved with bat surveys in mines are properly trained.

Answer: It is my opinion that a specially trained and experienced miner should be the safety officer that should accompany every biologist that does an internal mine bat survey. I think the BLM and Forest Service mine safety courses are good but they are not adequate for the amount of experience needed to go into abandoned underground mines. You need to have someone in charge who's sole responsibility is the safety of the people conducting the survey.

Answer: We need to think about developing some type of release that documents that those doing internal surveys accept the responsibility for their actions while doing the survey.

Answer: Having been involved with the rock climbing industry, that industry has developed a similar release. Releases for dangerous activities have been developed and do work.

Question: (How Safe are Coal Mines for Bats) Considering the inherent instability of many coal mines in the East, are we setting up biological sinks by encouraging bats to inhabit mines that may be unsafe for them when the entire system may collapse and kill the bats?

Answer: Although mine workings are inherently unstable, we need to keep in mind that bats are using mines because they are being forced out of natural caves and their populations have suffered because of their loss of natural habitat. Although the mines offer only a temporary habitat over an unknown life span, they are allowing the bats to expand their territory until a better solution is provided.

Question: (The Value of Bat Habitat at a Superfund Site) In the northwest, we have a copper mine on forest service land. It is a superfund site. Has anyone dealt with bats at superfund sites? The contractor working on the site wants to plug the openings because they feel that oxidation of the rock produces acid mine drainage. We have done summer surveys but have not found bats. There are about 15 miles of internal working with about one third that is flooded. There are 90 acres of tailings that contaminate water runoff. Will plugging improve or degrade the site?

Answer: I am not aware of anyone trying to tackle a similar situation where you are trying to balance the needs of wildlife with issues like acid mine drainage. If you have an acid mine drainage problem, you need to stop the oxidation in order to control the production of acidity. Although this is a natural process, it happens at an accelerated rate at a mine site. I suspect that

sealing the openings would be of benefit but would have no way of knowing how much of the problem it will solve. Given the toxic metals at the site, I would be more concerned about the exposure of wildlife to those toxic materials than the potential loss of habitat.

SESSION 6: INTEREST GROUP RECOMMENDATIONS TO ENHANCE BAT CONSERVATION ASSOCIATED WITH MINING

1. National Association of Abandoned Mine Land Programs Mark Mesch, Utah Division of Oil, Gas, and Mining, Salt Lake City, Utah

Question: (National Bat Gate Information Database) What would be the value of a national database on research and other information related to the effectiveness of bat gates?

Answer: I do not want to see a clearing house that would govern the direction of bat research. However, I think that something similar to the National Abandoned Mine Land Database that would monitor the work being done of bat gates and the effectiveness of those gates for bat conservation would be very useful. The States are collecting a lot of data in this area and I think that if it were collected on a national bases in a user friendly way that trends in effectiveness of bat gate design and effectiveness would become apparent and advance the field much more quickly and effectively. Right now we do not have any systematic way to manage that data from a national perspective. The type of information I am referring to would include: gate design, habitat location and characteristics, bat behavior, etc. Without this data, we are going to miss the opportunity to develop more effective bat gate designs. Utah has been developing a database that could be modified so that it could be used a basis for this national database.

Answer: Concerning the problem of Congress not releasing the funds for AML programs, I would like to encourage you to write a letter to your congressman and senator or to the Secretary of Interior requesting Congress to put the funds to the use for which they were intended. OSM has just recently received an increase in AML funding because about a year and half earlier we had a big influx of letters requesting their release.

Question: (Use of Additional AML Funds for Bat Gates) Assuming the Congress did give the AML funds to the States, how do we know that any of it would be spent on bat conservation?

Answer: Each State AML program has already established a priority system for identifying reclamation problems, including the need to either close or gate abandoned mine openings, that need to be addressed by these funds. An increase in funds would not change these priorities it would only increase the rate at which they could be addressed. It would mean that we could do more inventories, more surveys, more reclamation, and install more bat gates. Instead of needing 20 years to address these problems we could do it in 10 years.

2. Interstate Mining Compact Commission/Eastern Regulatory Authority States Dr. Richard Wahrer, Kentucky Department for Surface Mining Reclamation and Enforcement, Frankfort, Kentucky

3. Western Interstate Energy Board/Western Regulatory Authority States Homer Milford, New Mexico Mining and Minerals Division, Sante Fe, New Mexico
4. The U.S. Fish and Wildlife Service Bob Currie, U.S. Fish and Wildlife Service, Asheville, North Carolina
5. National Park Service John Burghardt, National Park Service, Denver, Colorado

Question: (Safety Training Courses for Underground Mines) Could you tell us about the underground mining safety training program sponsored by BLM and Forest Service?

Answer: The tuition is waved for Forest Service and BLM staff. There is a tuition charge for others. You need to get in touch with the National BLM training center in Phoenix Arizona. You can find it on the BLM Website. There is a National Training Program page where the course is listed. The Forest Service does a class at the National Minerals Training Center in Missoula Montana coordinated through Tuti Smith. I think they have a course coming up in May or June of 2001.

Question: (Training for Abandoned Underground Mines) Do any of these training programs focus specifically on the hazards of abandoned underground mines?

Answer: Yes. In these classes we address aging roof control, lack of ventilation systems, decay of wooden timbers, chemicals that were used at historic mill sites, training on contaminants used in ore processing in different time periods, and historic mining methods.

6. International Association of Fish and Wildlife Agencies Terry Johnson, Arizona Department of Game and Fish, Phoenix, Arizona
7. Regional Bat Working Groups Mary Kay Clark, North Carolina State Museum of Natural Sciences, Raleigh, North Carolina

SESSION 6 INTERACTIVE DISCUSSION

Question: (Are Conservation Agreements limited to non listed Species) Do conservation agreements work for both listed and non listed species?

Answer: The Conservation agreement is specifically for unlisted species. The candidate conservation agreement would apply if it were going to be treated as a candidate species. We are currently trying to develop a national model for the development of conservation agreements.

Comment: (Convincing Managers to Install Bat Gates) Some of the State people have said that their managers have discouraged installing bat gates. We have seen what the Utah and New Mexico AML have done in terms of being leaders in the installation of bat gates at mine sites to promote bat conservation. This is while other State AML staff are having problems convincing their management to fund bat gates rather than just closing the mine opening. To these States,

you need to go back to your management and remind them that OSM has sponsored this forum and we heard about the hundreds of bat gates being installed by the Utah and New Mexico AML programs and OSM has not written any bad reports on these States for wasting AML funds on bat gates. The Director of OSM spoke at the forum and two the OSM regional directors attended the forum. This is good evidence that OSM is strongly supporting the Bat Conservation effort.

*Question: (Funding for non coal States)*How can non coal States get funds to put bate gates in mine openings?

Answer: A good question that we don't have an answer for.

Answer: In the East, you could approach the State Game agency for section 6 funds or the non game program.

Answer: On Forest Service lands funds from the clean water action plan and abandoned mine land funds could be used for these closures.

Answer: I have discovered that the Natural Resources Conservation Service has actually provided funding for some bat friendly closures.

*Question: (Use of AML Funds for non coal)*Could you use AML funds to put up a bat gate on an old salt peter mine?

Answer: I don't think Utah could provide the funds but we could provide gate designs and technical assistance.

Answer: New Mexico would disagree with that. We could fund it.

**Bat Conservation and Mining:
A Technical Interactive Forum
Participants List**

<p>Malcolm Ahrens (EXHIBITOR) OSM 501 Belle St. Alton, IL 62002 (618) 463-6463 x 104</p>	<p>Jeff Bennett U.S. National Park Service 2525 Gambell St. Anchorage, AK 99503 (907) 257-2445</p>
<p>Dr. Scott Altenbach University of New Mexico Biology Department Albuquerque, NM 87131 (505) 277-3449</p>	<p>Robert Berry Brown Berry Biological Consultants 135 Wilkes Crest Bishop, CA 93514 (760) 387-2005</p>
<p>Lynda Andrews Wayne National Forest 219 Columbus Road Athens, OH 45701 (740) 592-0215</p>	<p>Chuck Bitting National Park Service Buffalo National River Harrison, AR 72601 (870) 741-5443</p>
<p>Linda Angerer U.S. Forest Service 825 N. Humbolt Ave. Willows, CA 95988 (530) 934-1146</p>	<p>Ann Bledsoe VA Dept. of Mines, Minerals, & Energy P.O. Drawer 900 Big Stone Gap, VA 24219 (540)523-8119</p>
<p>Ervin Barchenger OSM 501 Belle St. Alton, IL 62002 (618) 463-6463 x 129</p>	<p>Dr. Mike Bogan US Geological Survey Biological Research Division Albuquerque, NM 87131 (505) 346-2870</p>
<p>Jacqueline Belwood Cincinnati Nature Center 4949 Tealtown Rd. Midford, OH 45150 (513) 831-7153</p>	<p>Ed Boone KY AML Program 2521 Lawrenceberg Road Frankfurt, KY 40601 (502) 564-2141</p>

**Bat Conservation and Mining:
A Technical Interactive Forum
Participants List**

<p>Virgil Brack (EXHIBITOR) Environmental Solutions & Innovations LLC 781 Neeh Road Cincinnati, OH 45233 (513) 451-5504</p>	<p>John Burghardt National Park Service Mining and Minerals Branch P.O. Box 25287 Denver, CO 80225-0287 (303) 969-2094</p>
<p>Ramona Briggeman Indiana Division of Reclamation RR 2 Box 129 Jasonville, IN 47438 (812) 665-2207</p>	<p>Carl Campbell KY Dept. for Surface Mining, Recl. & Enf. #2 Hudson Hollow Frankfort, KY 40601 (502) 564-6940</p>
<p>Eric Britzke (STUDENT) Dept. of Biology Tennessee Technical University Cookeville, TN 38505 (931) 372-3013 erb8167@tntech.edu</p>	<p>Gary Camus Pennsylvania Game Commission 2001 Elmerton Ave. Harrisburg, PA 17110-9797 (717) 783-1728</p>
<p>Dr. Patricia Brown University of California at Los Angeles Dept. of Physiological Science 134 Wilkes Crest Rd. Bishop, CA 93514 (760) 387-2005</p>	<p>Stephen Cawood McBrayer, McGinnis, Leslie, & Kirkland PLLC 163 W. Short St., Suite 300 Lexington, KY 40507-1361 (859) 231-8780</p>
<p>David Bucknam Colorado Division of Minerals & Geology 1313 Sherman St., Room 215 Denver, CO 80203 (303) 866-3567</p>	<p>Mary Kay Clark NC State Museum of Natural Resources Raleigh, NC 27614 (919) 715-2599</p>
<p>Angela Bulger Burns & McDonnell 9400 Ward Parkway Kansas City, MO 64114 (816) 333-9400</p>	<p>Richard Clawson Missouri Department of Conservation 1110 S. College Ave. Columbia, MO 65201 (573) 882-9880 x 3241</p>

**Bat Conservation and Mining:
A Technical Interactive Forum
Participants List**

<p>Carole Copeyon U.S. Fish & Wildlife Service 315 S. Allen St., Suite 322 State College, PA 16801 (814) 234-4090</p>	<p>Jody Eberly USDA Forest Service Rt. 1 Box 1908 Winona, MO 65588 (573) 325-4233</p>
<p>Robert Currie U.S. Fish and Wildlife Service 160 Zillicoa St. Asheville, NC 28801 (828) 258-3939</p>	<p>Hugh Edwards (EXHIBITOR) Frontier Environmental Solutions PMB 561 Ridgecrest, CA 93555 (760) 371-4927</p>
<p>Gabrielle Diamond (STUDENT) 2743 West 5275 North Cedar City, UT 84720 (435) 867-5728</p>	<p>Dean Enderlin Homestake Mining Co. 26775 Morgan Valley Rd. Lower Lake, CA 95457 (707) 995-6070</p>
<p>Joel Diamond (STUDENT) 2743 West 5275 North Cedar City, UT 84720 (435) 867-5728</p>	<p>Bruce Evans Black Beauty Coal Co. P.O. Box 312 Evansville, IN 47702 (812) 424-9000</p>
<p>Sheryl Ducummon (EXHIBITOR) Bat Conservation International P.O. Box 162603 Austin, TX 78716 (512) 327-9721</p>	<p>Robert Fala WV Dept. of Environmental Protection 10 McJunkin Rd. Nitro, WV 25143 (304) 759-0510</p>
<p>Keith Dunlap Indiana Karst Conservancy P.O. Box 2401 Indianapolis, IN 46206-2401 (317) 242-2505</p>	<p>Mitchell Farley Ohio Division of Mineral Resources Mgmt. 34 Portsmouth St. Jackson, OH 45640 (740) 286-6411</p>

**Bat Conservation and Mining:
A Technical Interactive Forum
Participants List**

<p>Laurie Fenwood U.S. Forest Service 1323 Club Drive Vallejo, CA 94592 (707) 562-8958</p>	<p>Jim Gregg IL Mines and Minerals AML 148 Rue Vue DuLac East Peoria, IL 61611 (217) 782-0588</p>
<p>Judy Fisher Tri-State Grotto P.O. Box 276 Berkeley Spring, WV 25411 (304) 258-1822</p>	<p>Ronald Griffin OSM 575 N. Pennsylvania, Ste 301 Indianapolis, IN 46204 (317) 226-6700</p>
<p>Dave Flemming US Fish and Wildlife Service 1875 Century Blvd. Atlanta, GA 30345 (404) 679-7096</p>	<p>Margarita Guzman Bureau of Land Management 1800 Marquess St. Las Cruces, NM 88005 (505) 525-4339</p>
<p>Joe Galetovic OSM 1999 Broadway, Suite 3320 Denver, CO 80202 (303) 844-1400 x 1448</p>	<p>Bob Hall Bureau of Land Management 2475 Beverly Ave. Kingman, AZ 86401 (520) 692-4408</p>
<p>Dr. Kate Grandison Department of Biology Southern Utah University Cedar City, UT 84720 (435) 865-8345</p>	<p>Ande Harris U.S. Forest Service 201 N. First St. Vienna, IL 62995 (618) 685-2111</p>
<p>Vance Greer OSM 1951 Constitution Ave., NW Washington, DC 20240 (202) 208-2945</p>	<p>Dr. Michael Harvey Tennessee Technological University P.O. Box 5063 Cookeville, TN 38505-0001 (931) 372-3013</p>

**Bat Conservation and Mining:
A Technical Interactive Forum
Participants List**

<p>Rebecca Hatmaker OSM 530 Gay Street Knoxville, TN 37902 (865) 545-4103 x 148</p>	<p>Terry Johnson Arizona Department of Game and Fish 2221 W. Greenway Rd. Phoenix, AZ 85023-4399 (602) 789-3507</p>
<p>Kay Henry, Acting Director OSM 1951 Constitution Ave., NW Washington, DC 20240 (202) 208-4006</p>	<p>Alene Jones AZ State Mine Inspector's Office 1700 W. Washington, Suite 400 Phoenix, AZ 85007 (602) 542-5971</p>
<p>Steve Hensley U.S. Fish & Wildlife Service 222 S. Houston, Suite A Tulsa, OK 74127 (918) 581-7454 ext. 227</p>	<p>D. Scott Jones PA Dept. of Environmental Protection Rd. 2, Box 603C Greensburg, PA 15601 (724) 925-5500</p>
<p>Michael Herder Bureau of Land Management 345 E. Riverside Drive St. George, UT 84790 (435) 688-3239</p>	<p>Joseph Kath Illinois DNR, Division of Natural Heritage 524 S. Second St. Springfield, IL 62701-1787 (217) 785-8774</p>
<p>Sally Imhof Kansas Surface Mining Section 4033 Parkview Drive Frontenac, KS 66763 (316)231-8540</p>	<p>Andrew King (EXHIBITOR) BHE Environmental Inc. 11733 Chesterdale Road Cincinnati, OH 45246 513-326-1169</p>
<p>Joy Johnson OSM 525 N. Pennsylvania Indianapolis, IN 46204 (317) 226-6166 x 242</p>	<p>Edward Kirby Indiana Division of Reclamation RR 2, Box 129 Jasonville, IN 47438 (812) 665-2207</p>

**Bat Conservation and Mining:
A Technical Interactive Forum
Participants List**

<p>James Kiser Appalachian Technical Services P.O. Box 98 Whitesburg, KY 41858 (606) 633-0613</p>	<p>Kelly Lane St. Louis University 5857 A Groener St. Louis, MO 63116 (314) 752-4131</p>
<p>Raymond Kowalski OSM The Stegmaier Bldg. 7 North Wilkes-Barre Blvd., Suite 308 Wilkes Barre, PA 18702 (570) 830-1409</p>	<p>Jerry Legg VA Dept. of Mines, Minerals, & Energy P.O. Drawer 900 Big Stone Gap, VA 24219 (540)523-8119</p>
<p>John Kretzmann New Mexico Mining and Minerals Division 2040 S. Pacheco St. Sante Fe, NM 87505 (505) 827-5985</p>	<p>Dylan Little Environmental Innovations & Solutions LLC 781 Neeb Road Cincinnati, OH 45233 (513) 451-1777</p>
<p>Dennis Krusac (EXHIBITOR) U.S. Fish and Wildlife Service 1720 Peachtree Rd. NW, Ste 816 N Atlanta, GA 30309 (404) 347-4338</p>	<p>Melanie Little Environmental Innovations & Solutions LLC 781 Neeb Road Cincinnati, OH 45233 (513) 451-1777</p>
<p>Michael Kuhns OSM The Stegmaier Bldg. 7 North Wilkes-Barre Blvd., Suite 308 Wilkes Barre, PA 18702 (570) 830-1403</p>	<p>Michael Litwin U.S. Fish & Wildlife Service 1510 E. Maxwell Lane Bloomington, IN 47401 (812) 334-4261</p>
<p>Dr. Alan Kurta Eastern Michigan University Department of Biology Ypsilanti, MI 48197 (734) 487-1174</p>	<p>Robert Madej R.D. Zande & Associates, Inc. 1237 Dublin Road Columbus, OH 43215 (614) 486-4383</p>

**Bat Conservation and Mining:
A Technical Interactive Forum
Participants List**

<p>Vernon Maldonado OSM 505 Marquette NW, Ste 1200 Albuquerque, NM 87102 (505) 248-5077</p>	<p>Homer Milford New Mexico Mining and Minerals Division 2040 S. Pacheco St. Sante Fe, NM 87505 (505) 827-1163</p>
<p>Chester Martin USAE Research & Development Center 113 Estelle Drive Vicksburg, MS 39180 (601) 634-3958</p>	<p>Greg Miller (EXHIBITOR) Bureau of Land Management 3165 10th St. Baker City, OR 97814 (541) 523-1301</p>
<p>Darryl Martinez Navajo AML Reclamation Department P.O. Box 1875 Window Rock, AZ 86515 (520) 871-6982</p>	<p>Thomas Miller OSM 575 N. Pennsylvania St., Room 301 Indianapolis, IN 46204 (317) 226-6166 x 232</p>
<p>John Mehuys Missouri Dept. of Natural Resources P.O. Box 176 Jefferson City, MO 65102 (573) 751-4041</p>	<p>Myra Miyoshi U.S. Fish & Wildlife Service 8588 Route 148 Marion, IL 62959 (618) 997-3344</p>
<p>Len Meier OSM 501 Belle St. Alton, IL 62002 (618) 463-6463 x 109</p>	<p>Bryan Moore National Park Service 601 Nevada Hwy Boulder City, NV 89005 (702) 293-8979</p>
<p>Mark Mesch Utah Division of Oil, Gas, & Mining Box 145801 Salt Lake City, UT 84114-1203 (801) 538-5349</p>	<p>Dennis Murphy The Doe Run Company, SEMO P.O. Box 500 Viburnum, MO 65566 (573) 244-8104</p>

Bat Conservation and Mining:
A Technical Interactive Forum
Participants List

<p>Kevin Murray (STUDENT) 901 S. National Springfield, MO 65804 (417) 836-5366</p>	<p>Dr. Tom O'Shea US Geological Survey Biological Research Division Fort Collins, CO 80525-3400 (970) 226-9397</p>
<p>Kirk Navo Colorado Division of Wildlife 22 S Road 1 East Monte Vista, CO 81144 (719)587-6906</p>	<p>Harold Parsons, Jr. WV Division of Environmental Protection HC 73 Box 27 Ireland, WV 26376 (304) 452-8625</p>
<p>Kathleen Nickell Bureau of Land Management 100 N. 6th St. Dolores, CO 81323 (970) 882-6835</p>	<p>David W. Pelren U.S. Fish & Wildlife Service 446 Neal St. Cookeville, TN 38501</p>
<p>Jim Nieland U.S. Forest Service 42218 NE Yale Bridge Road Amboy, WA 98601 (360) 247-3946</p>	<p>John Perez New River Gorge National River 104 Main St. Glen Jean, WV 25846 (304) 465-6537</p>
<p>William O'Leary IL DNR, Office of Mines and Minerals 503 E. Main St. Benton, IL 62812 (618) 439-9111</p>	<p>Aaron Poe U.S. Forest Service Chugach National Forest Girdwood, AK 99587 (907) 754-2345</p>
<p>Patricia Ormsbee U.S. Forest Service Willamette National Forest Eugene, OR 97401 (541) 465-6318</p>	<p>Russ Porter OSM 505 Marquette Ave., NW, Suite 1200 Albuquerque, NM 87102 (505) 248-5087</p>

**Bat Conservation and Mining:
A Technical Interactive Forum
Participants List**

<p>Tom Posluszny OSM 7 North Wilkes-Barry Blvd., Suite 308 Wilkes Barre, PA 18701-5293 (570) 830-1413</p>	<p>Blake Sasse AR Game and Fish Commission 2 Natural Resources Drive Little Rock, AR 72205 (501) 219-4141</p>
<p>Lynn Robbins Southwest Missouri University 901 S. National Springfield, MO 65804 (417) 836-5366</p>	<p>Andrew Shaer WV Dept. of Environmental Protection 525 Tiller St. Logan, WV 25601 (304) 792-7075</p>
<p>Bernie Rottman Black Beauty Coal Co. P.O. Box 312 Evansville, IN 47702 (812) 424-9000</p>	<p>John Scheumbauer Bureau of Land Management 901 Pine St., Suite 201 Rolla, MO 65401 (573) 364-0203</p>
<p>Henry Roye Oklahoma Conservation Commission 2800 N. Lincoln Blvd., Ste 160 Oklahoma City, OK 73105 (918) 967-4341</p>	<p>Richard Seibel OSM 501 Belle St. Alton, IL 62002 (618) 463-6460</p>
<p>Charles Sandberg OSM 501 Belle St. Alton, IL 62002 (618) 463-6463 x 126</p>	<p>Richard Sherwin University of New Mexico Department of Biology Albuquerque, NM 87131 (505)277-1291</p>
<p>Ronald Sassaman OSM 1999 Broadway, Suite 3320 Denver, CO 80202 (303) 844-1400 x 1521</p>	<p>Mark Stacy Indiana Division of Reclamation RR 2, Box 129 Jasonville, IN 47438 (812) 665-2207</p>

Bat Conservation and Mining:
A Technical Interactive Forum
Participants List

<p>Linda Stamer U.S. Forest Service P.O. Box 290 Fawnskin, CA 92333 (909) 866-3437</p>	<p>Brent Wahlquist OSM 1999 Broadway, Suite 3320 Denver, CO 80202 (303) 844-1400 x 1401</p>
<p>Joel Tigner Batworks 2416 Cameron Way Rapid City, SD 57702 (605) 721-4564</p>	<p>Dr. Richard Wahrer Kentucky Department of Surface Mining Reclamation & Enforcement #2 Hudson Hollow Frankfort, KY 40601 (502) 564-2320</p>
<p>Dan Trout OSM 5100 E. Skelly Drive, Suite 470 Tulsa, OK 74135 (918) 581-6431 x 25</p>	<p>Edward Winchester Frontier Environmental Solutions 1539 N. China Lake Blvd PMB 561 Ridgecrest, CA 93555 (760) 371-4927</p>
<p>Sanda Vana-Miller OSM 1999 Broadway, Suite 3320 Denver, CO 80202 (303) 844-1400 x 1472</p>	<p>Chris Yde MT DEQ, Industrial & Energy Minerals Bur. P.O. Box 200901 Helena, MT 59620-0901 (406) 444-4967</p>
<p>Kimery Vories OSM 501 Belle St. Alton, IL 62002 (618) 463-6463 x 103</p>	
<p>Shawchyi Vorisek KY Dept. of Surface Mining Reclamation & Enforcement 2 Hudson Hollow Frankfort, KY 40601 (502) 564-2320</p>	