STATE OF MICHIGAN

STATE OFFICE OF ADMINISTRATIVE HEARINGS AND RULES

In the matter of:	File Nos.: GW1810162 and MP 01 2007
The Petitions of the Keweenaw Bay Indian Community, Huron Mountain Club, National Wildlife Federation, and Yellow Dog Watershed Environmental Preserve, Inc., on permits issued to Kennecott Eagle Minerals Company. _____/	Part: 31, Groundwater Discharge 632, Nonferrous Metallic Mineral Mining
	Agency: Department of Environmental Quality
	Case Type: Water Bureau and Office of Geological Survey

D R A F T T R A N S C R I P T

HEARING - VOLUME NO. 41 (XLI)

BEFORE RICHARD A. PATTERSON, ADMINISTRATIVE LAW JUDGE

Constitution Hall, 525 West Allegan, Lansing, Michigan

Thursday, July 24, 2008, 8:30 a.m.

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Lansing, Michigan

Thursday, July 24, 2008 - 8:31 a.m.

JUDGE PATTERSON: Are we ready to begin?

MR. WALLACE: Yes.

JUDGE PATTERSON: Okay.

MR. WALLACE: Petitioners would call Dr. David Flaspohler, your Honor. And may I approach with a copy of our slides?

JUDGE PATTERSON: Sure.

REPORTER: Would you raise your right hand? Do you solemnly swear or affirm the testimony you're about to give will be the whole truth?

DR. FLASPOHLER: Yes, I do.

DAVID FLASPOHLER, PH.D.

having been called as a rebuttal witness by the Petitioners and sworn:

DIRECT EXAMINATION

BY MR. WALLACE:

Q Please state your name for the record, sir?

A David Flaspohler.

Q You testified earlier in this case, did you not?

A Yes, I did.

Q And I know that we previously offered and it was admitted by stipulation a copy of your CV. Would you just remind the court of what degrees you hold and what kind of work you do

for a living?

A Okay. Well, I've a Ph.D. in wildlife ecology, a master's in conservation biology and a bachelor's in science, in architecture and urban planning. So since 1998 I've been employed as first an assistant and now an associate professor in the school forest resources and environmental science at Michigan Tech University.

Q You were previously qualified and accepted by this court as an expert in wildlife ecology, conversation biology and ornithology, if you recall?

A Yeah; that's right.

Q Would you remind us of what disciplines are encompassed in those specialties?

A Sure. Well, wildlife ecology is -- has a longer history and deals with the sort of understanding the population dynamics and interactions of animals with their environment dating from perhaps the '30's. Conservation biology is a somewhat more new discipline from perhaps the mid '80's and is a more broad sort of multi-disciplinary science that deals with trying to understand how species not only interact with their environment but what kinds of things impact them, how they can be restored if their populations are low and is really dedicated to understanding biodiversity on a local, national, international scale and how it can be conserved and the role it plays in the maintenance of ecosystems and

supportive human society. So conservation biology is a very broad interdisciplinary science that draws from a lot of other subdisciplines.

Q And maybe you've covered them, but if you could just kind of enumerate some of the subdisciplines that fall within the scope of your --

A Sure.

MR. PREDKO: Your Honor -- I'm sorry, Dr. Flaspohler, but I want to place an objection. All of this background stuff we've already covered in the case in chief. His résumé has been submitted by stipulation. What we're here for is purely for the purpose of rebuttal testimony and not to just rehash what we've already gone over. And certainly all the background information has gone over and -- has been gone over in depth. And I would also note that after looking at the proposed slides all of these areas have also been gone over in great depth in the case in chief, and so there's really nothing new here and I want to renew our objection to this testimony because it's not proper rebuttal.

MR. WALLACE: And my response, your Honor; first of all, that was my very last background question. It's been a long time since Dr. Flaspohler testified and I thought it would be useful to talk about what kind of work he does and what he specializes in. So that's my final

question on that subject, and then we're going to move to the testimony. And the testimony is very specifically rebuttal testimony. My next question after that question would be: "Have you reviewed the Kailing and Koss testimony and two of intervenor's exhibits?" and all of the rest of the testimony is response to those exhibits and that testimony and only a very small portion of it. So it's very purely rebuttal; I was quite careful to make sure it would be that.

JUDGE PATTERSON: Okay. Go ahead.

MR. WALLACE: Thank you.

Q So if you could just quickly, sir, enumerate the subdisciplines within the --

A Okay. Yes. Well, as I said, it draws from wildlife ecology, landscape ecology, genetics, aquatic ecology. A lot of people in conservation biology tend to specialize somewhat within those, but the science itself really draws from a lot of those areas.

Q Dr. Flaspohler, did we ask you to reviewed portions of testimony and exhibits that have been admitted in this trial since you've testified?

A Yes.

Q And what have you reviewed?

A The testimony by two biologists: Kailing and Koss. And then two additional wildlife species assessments that I

don't think were available the last time I was here, so those are --

Q and would those be Intervenor Exhibits 160 and 161?

A Right.

Q The numbers are in the lower left-hand corner?

A Right.

Q And just for the record, what are those two exhibits?

A They're summaries of additional wildlife surveys that were done in relation to the proposed mine.

Q Sir, would you be so kind as to read into the record the quotes from Mr. Koss and Mr. Kailing to which you're going to respond this morning?

A Okay. Well, the first one's from Koss. He says,

> "Obviously there will be impacts for the duration of the mine on that very specific impact area, 92 acres, 145 acres, however you want to characterize it. But it's a small area and it won't have a lasting or significant impact on wildlife in the long -- in the area long term."

Q And how about Mr. Kailing?

A He says, "The proposed mine will have a minimal affect on wildlife species."

Q Sir, did you find anywhere in the testimony of these two gentlemen, Koss and Kailing, scientific support for those opinions?

A No, I did not.
Q Do you have a scientific or professional response to those -- to that testimony from Mr.'s Koss and Kailing?
A Yes, I do. Based on my understanding of the mine and the kind of activities related to it and on my understanding of previous industrial activities of that kind, I didn't see any evidence to contradict my belief that the impact area is going to be much larger than the -- at least on wildlife species -- much larger than the 92 or 145, or the footprint of the mine.
Q Okay. Did you find in the testimony of Mr. Kailing and Mr. Koss a study of cumulative impacts?
A No. There was no real reference to that, at least as I understand cumulative impacts and ecological science.
Q Okay. And what is your understanding of cumulative impacts and how should they be studied?
A Well, the idea of cumulative impacts is that species in natural communities don't respond independently to individual perturbations or individual changes in their environment; they respond to them in the layered fashion. So for example, if you have a combination of say changes in water chemistry and the addition of heavy metals into a water body, the species would deal with both of those things simultaneously, cumulative as opposed to just looking at one or the other independently. So to understand the effect of

something, an activity at this proposed mine I think you need to take a realistic look at how those -- the variety of potential impacts could cumulate in their effect on the ecosystem and on individual species.

Q And what type of scientist studies cumulative impacts as opposed to the specific individual impacts of air, water, whatever?

A Well, I think a lot of different scientists in ecological science, conservation biology have looked at cumulative impacts. It's something that has gotten more popular and common in the last 20 years or so, because -- partly because we have ways of amassing data and collecting information that perhaps were more difficult before that. But it also just reflects a more realistic understanding of how species are actually impacted by complicated environmental change. I mean, none of us -- we deal with our environment in precisely the same way that animals do. We don't respond to temperature alone; it's temperature and humidity, for example, that interact to give us a feeling for how hot it is outside. So you couldn't take someone in a lab and separate those two things and expect to get as accurate a picture of their perception of that environment as if you combined them. Imperfect, but that's an analogy.

Q With respect to this particular mine at the particular location where it's proposed to be developed, what would you

have expected to see studied in terms of potential impacts beyond the footprint?

A Well, I think the -- given the history of sulfide mining we have some sense of what -- of the spatial extent of impacts from past mining activities and, say, even beyond mining roads with heavy traffic on them and dust that is stirred up on the road and that escapes from the trucks. There's a number of studies like that in which people have looked at sort of a spatial extent of those impacts. And certainly the ones that I've seen extend well beyond this footprint that's being characterized as the impact zone. So as a scientist I would look at those past studies and say, "Well, if I'm interested in understanding the impacts of this one I would use that -- those scales as a way to try to better understand what the potential impacts of this activity could be." So and I'm talking about scales of hundreds of meters, perhaps multiple kilometers in terms of the past studies that have shown impacts from roads, for example; heavy road traffic.

Q Did you find in your review or materials you previously reviewed, but specific with respect to Kailing and Koss and the two most recent wildlife assessments, any scientific determination or any determination of the affected area, the potentially affected area to be affected by this mine?

A No; that didn't -- I don't think that was a big emphasis in

their -- in terms of critical thinking about that. I don't think that was a big emphasis of their testimony that I saw. It seemed to be that they took it as face value that all of the sort of -- the containment systems: water, air, noise, light would all work just as they were described; or if they weren't described they kind of gave them the benefit of the doubt, I think. So there were -- there wasn't any -- I don't think they brought a lot of science to bear on that question as far as I saw in the testimony.

Q Give us an example of how as a conservation biologist, wildlife ecologist you would go about determining an affected area to be studied for the kind of Environmental Impact Assessment that's involved in this case?

A Well, one place you would look is in previous published literature where people have looked at this at affected areas from similar activities. And as I said, the scale of that would be at least a kilometer around the mine or where the mine activities are taking place. And that would be in that case for airborne for sort of fugitive dust and the accumulation of that and changes in the soil pH and all kinds of things like that; air pollution. So that would give you sort of a sense of the order of magnitude that you should be looking at. And if that were at least one potential scenario, then you could do -- that would give you some sense of the area that you would need to look at to

study -- to do, say, your wildlife surveys, the kind of things that they did here, but they really restricted those to this very small area where the actual sort of industrial activities are going to go on.

Q We had testimony earlier in this trial, sir, from Dr. William Taylor of Michigan State and he is a specialist in landscape ecology. Does landscape ecology have any bearing on determination of affected area?

A Sure. Landscape ecology, like conservation biology is a science that builds off of previous disciplines but is -- and is very multi-disciplinary and really takes the approach that there are a lot of phenomenon in ecological science, and beyond that in the interaction of ecological systems with human land use change, for example, which is a big part of landscape ecology is understanding how patterning of the landscape and human -- the patterning of human activities where it's -- whether it's logging or fisheries or mining or whatever; how those things have affects at large spatial scales. And essentially the landscape ecology became a discipline because certain questions related to human land use change could not be answered by looking at small spatial scales; you had to sort of back up and look at a bigger picture to really understand what was going on.

Q And when you say "large spatial scales," what would be an example of a large spatial scale relative to a mine like

this?

A Well, it would be -- you know, landscape ecologists talk about regions as sort of the Western Upper Peninsula might be a region, and a landscape within that region might be a county-sized area roughly. It could be somewhat smaller than that; it could be bigger than that depending on the kind of question you're interested in.

Q Did you see in what you reviewed for this case any indication that an attempt was made to study a county-sized area with respect to the potential impact of this mine?

A No. No.

Q Let's look at the next slide, if we may. Could you read the testimony of Mr. Koss regarding the Environmental Impact Assessment from slide three, sir?

A Okay. Mr. Koss described the Environmental Impact Assessment as, "Way more extensive, way more scientifically based than anything I've experienced in the past."

Q Okay. And what's your response to that, sir?

A Well, I would say two responses. One of them is I don't know what he's seen in the past. There was some reasonably good science related to some of the wildlife surveys. The way that the songbird surveys were carried out I think is -- was fine and I think that is -- follows acceptable protocols. And the small mammal surveys as well and the frog and toad surveys, at least in terms of what they did

actually look at was fine. But in -- so the science behind that is okay and maybe that's what he's talking about here, but there were areas -- there were whole taxonomic groups that -- for which they did no surveys at all.

MR. WALLACE: Why don't we look at slide three if we may -- slide four?

Q Go ahead, Dr. Flaspohler.

A Okay. Yeah, so in terms of being impressed by the science in that report there's a lot of volume of paper in there, but in terms of covering all of the bases and looking at all of the taxonomic groups, the organisms that could be affected by the mine, I don't think any biologist confronted with that as a metric or a bar would be really impressed with the job that was done in this case.

Q Okay. And you reviewed Intervenor's 160 and 161 as well, sir?

A Yes.

Q And did you find deficiencies in those surveys of the kind you're talking about right now?

A Yeah. Essentially those did additional bird, plant, frog and toad surveys that had been done before, sort of repeating really the part of the surveys that had actually been done pretty well in the past rather than filling in the holes that hadn't been done in the previous Environmental Impact Assessment of wildlife.

Q Okay. I'm going to ask you for some examples.

MR. WALLACE: What I'd like to do is pass out -- and this was previously admitted as part of an exhibit; it's more just to enable us to follow along with Dr. Flaspohler with respect to the more recent wildlife studies.

Q Sir, could you give us some examples of species not studied in the more recent surveys?

A Okay. Well, --

MR. REICHEL: Excuse me. Excuse me, your Honor. Could we ask counsel to identify specifically the exhibit this is from, just so the record is clear?

MR. WALLACE: Yes. This is entitled, "Michigan Endangered, Threatened or Special Concerned Species" that have been found in Marquette or adjoining counties, and this listing I believe -- I can give you the cite at some point. I believe it is slide seven from his earlier presentation. And that has an exhibit number but I don't have it right in front of me. Actually, it's slide seven of demonstrative Exhibit 143.

MR. REICHEL: Thank you.

A Well, I mean, when I look at what they surveyed and what they didn't, my -- I guess my conclusion is they surveyed the stuff that's easy to survey and they ignored the species that either are more difficult to survey or that for some reason they opted not to survey. For example, butterfly

surveys aren't particularly hard to do, but there was no reference --

Q They are not hard to do?

A They are not particularly hard to do, but they didn't do any surveys for reptiles, for a whole variety of invertebrates, some of which have Marquette County or adjoining county records and some of which are threatened or endangered or many of which are special concern in the state.

Q Talk to us just for a moment about, for example, the Northern Blue Butterfly. What kind of habitat does that exploit?

A Northern Blue Butterflies like open forests with sandy well-drained soils. They like a lot of the kind -- they can be found in the sorts of habitats that are found not just in the broad region but right in the mine footprint in the 92-acre -- they could be found in there; I'm not saying they are, but I'm saying -- you know, the approach -- and this is right out of their -- the text of either -- I think it was Kailing -- that their -- that when they went to do the surveys they looked at what the habitats were that occurred in the area that they wanted to survey, the species that are typically associated with those habitats, and that gave them guidance as to what to focus on -- what to focus their surveys on. They did that for birds. They could have done the same thing for invertebrates but they didn't.

Q Okay. What --
A And there are a number of species here that use habitats found within the mine area: butterflies, some of the dragonflies, land snails.
Q What do you do to survey for butterflies?
A Well, it's not so different from bird surveys where you can do transects like they did for the bird surveys with either points or just walked regular transects through the habitat. The timing is pretty key for -- just as it is for birds. For butterflies you have to time it during the period of time when the adults are flying, unless you're doing larval caterpillar surveys which are a little more difficult. But for the Northern Blue, for example, it has a real specialized -- the larva feed on a particular species of plant, so you could do surveys for that plant and then look for the caterpillars on the plant. But typically, you know, walking through a field looking for flying, you know, adult butterflies is one of the main ways that you can survey for them.
Q I see that the American Burying Beetle is an endangered species; is that right?
A Yeah, that's actually a federally endangered species; probably the most charismatic insect -- endangered insect in Eastern North America.
Q And how do you -- how do you survey for them or attract them

to see if they exist in a given area?

A Well, they're a carrion-feeding insect, big inch-and-a-half-long beetle; one of the biggest beetles in Eastern North America. And they come to dead animals and the females lay their eggs and the larva develop by feeding on dead -- small mammals and small birds. So you would build a -- usually what's called a "pit-fall" trap. In the bottom of that trap you can put a dead rat --

Q I know we just had breakfast, but how do you do this?

A Yeah, right. Right. You put a dead rat or something in a little cage with a screen over the top so that the scent of that decomposition reaches the beetle and they come for that.

Q Then all you have to do is wait and check it?

A Then you have to check it once a day or so and see what comes. And you'll get lots of different carrion beetles; there's many other species. But that would be a pretty easy way to check for American Burying Beetles and if you did that for, you know, five days in the study site and you didn't find them, I think any biologist would say, "Well, that was a good effort and it doesn't like they're there."

Q Do the wood turtle and the eastern box turtle exploit habitats such as the mine footprint?

A Yes. Sandy soils is what they prefer. And sure, you could find them there. I know there are records, as I said, in

adjoining counties: Baraga County for box turtles and -- I'm not sure exactly where wood turtles, but -- which counties they're all found in, but they could be seen in that area.

Q What do box turtles eat?

A They're really omnivorous. They eat plants. They eat fruits. They eat insects.

Q Are invertebrates scientifically any less important than vertebrates when you're studying the flora and fauna of a particular area or region?

A No; not scientifically. Certainly there are more species of them than there are vertebrates by far, by orders of magnitude. There are many more insects and arthropods than there are vertebrates, so from a biodiversity standpoint we'd be better off losing all the vertebrates than the invertebrates perhaps, but -- because there's just many more of them and they support the ecosystem at sort of the lowest levels by providing food and taking care of waste on the landscape like the burying beetle does and things like that. Beyond the science, legally the Endangered Species Act doesn't treat invertebrates with any less gravity than it does vertebrates, so legislatively that defining piece of endangered species legislation does not say anything like you only have to worry about the vertebrates and the rest you can ignore; it treats them all with equal importance.

Q Is there any explanation given in any of the materials you've reviewed or the testimony that you reviewed to imply they completely ignored invertebrates in their fauna study?
A No, in fact when I heard the last time I was here that there were some other wildlife or threatened and endangered assessments that were going to be revealed that I hadn't seen before and then I got these I thought this was where it would be, but as I said, I don't see anything in there suggesting that they had done -- that they did those kind of surveys.
Q Are salamanders, for example, useful for -- study of salamanders and inventorying them useful for any purpose in monitoring environmental conditions?
A Sure. Salamanders and amphibians in general are sensitiva to environmental change because many of them have a terrestrial and an aquatic life stage, so they utilize two different very distinct kinds of habitats. They have semi-permeable skin, so they're sensitive to changes in chemistry -- water chemistry. So as opposed -- and also they're pretty sedentary; they're kind of pretty much stuck on the landscape that they live in, unlike migratory songbirds, for example, which come and go and spend maybe a third of their life in a particular place breeding; whereas amphibians are not nearly as mobile. So environmental change that happens in that amphibian habitat is -- that,

for the lifetime of that amphibian, it will have to deal with.

Q Do amphibians use vernal ponds?

A Sure.

Q And what are vernal ponds?

A Vernal ponds are just temporary ponds that usually fill up, up here we are, with water from the snowmelt and they hold that water for the early part of the spring and maybe early summer, and in that time frogs and toads sometimes and also salamanders will lay their eggs in those ponds and breed. So they're essential to the reproduction of particularly salamanders. And what makes them really advantageous is that they -- they usually don't contain fish because they're vernal, they're temporary, so there's no predators on the larval salamanders; they're safe places for them to have like a nursery.

Q Okay. I think in the latest wildlife survey they found wood frogs. Did you see that?

A Yes.

Q Where would you expect wood frogs to breed?

A They could breed in a pond -- in a vernal pond. They could breed in wetlands, a variety of -- probably not big water or moving water, but ponds, small lakes.

Q Would you expect the area of the -- within a mile or two of the mine to include in the spring vernal ponds?

A I would think so. You know, a lot of this, as I said, is that well-drained sandy soil in the Yellow Dog Plains, which might not have the density of vernal ponds that you would have in a mesic forest where the soils are a little more clayey and they retain moisture better. But there is some of that forest type around, so I would expect you would find some vernal ponds around there if you search for them.

Q And while we're on the subject of the environmental affects on particularly -- on particular kinds of wildlife, are there any sentinel -- if I can call them that -- plants that you would expect to find in the area of this mine?

A Well, sentinel in terms of -- that's a term that's used to -- in ecology at least to denote species that sort of act as more sensitive indicators of environmental change. Some species are more sensitive; as we mentioned, amphibians. So related to some of the potential affects of this mine air pollution could be one and if that were true, lichen species are often used as a -- have been used for decades in Europe and also in North America as a sentinel species. They're very sensitive to air pollution and their density goes down pretty quickly once the air quality goes down.

Q Are there any species of lichens that are found in this area that you would particularly expect to use as sentinel species for air pollution?

A Yeah.

MR. PREDKO: Your Honor, I just want to place another objection. I let the testimony go on now beyond any specific response to what was testified by Kennecott witnesses; now we're into lichens and I don't believe any Kennecott witness testified about a lichen. We've now talked about vernal ponds, which is the second time that we've talked about vernal ponds with this witness, and so it's repetitive of previous testimony and now we're off into an area that's not even rebutting what Kennecott witnesses have said, so it's not proper rebuttal.

MR. WALLACE: Well, it's -- we're accused of either it's new or it's old and the accusation this time is it's new. The reason why we're talking about lichens is that they presented the court with some 200 pages of additional plant studies put into evidence in this case after the application was filed and we want to respond about the adequacy of those and I'm asking him about lichens and their importance. And my next question is, "Were the kinds of lichens you would expect to examine and inventory for as sentinel plants studied in the wildlife studies, Intervenor 160 and 161?" That's what I'm going to; not testimony but these exhibits.

MR. PREDKO: And my objection is, is that this is information that could have been testified about in the case in chief. Those reports he's talking about were in

petitioner's possession well before this trial started and they certainly took time to criticize every other portion of the EIA and if this is a portion that they wanted to criticize they could have done in their case in chief. And that's not what rebuttal is for; they're supposed to link rebuttal to actually something new that a Kennecott witness testified about that they could not have anticipated. And so I think we're getting far afield.

MR. WALLACE: Well, I've only got a couple questions about this, but in any event these two studies that were introduced here we vehemently objected to because they weren't part of the EIA and they came in later, they were done later, and they were put in evidence for the first time in this case. We objected to them; they were admitted. They were admitted after Dr. Flaspohler testified and now we're responding to them, which is exactly what rebuttal is for.

JUDGE PATTERSON: Okay. Go ahead.

A Well, they're in the -- in these reports that you're referring to they did note some lichen species, some ground lichen species, like ranger moss that did occur in the area. Normally epithetic lichens are the ones that are focused on for air pollution monitoring, and those are lichens that grow in the trees, like Usnea mosses, old man's beard lichen. If you've ever been up in the woods up north and

you see those trees hanging with that sort of fine Spanish moss-looking green stuff; that's Usnea lichen and that is -- that's one of a number of epithetic lichens that grows in the trees that's sensitive to air pollution.

Q And were those inventoried or surveyed in these reports?

A Not that I could see.

MR. WALLACE: Can we look at slide five?

Q Were snakes inventoried, sir?

A No.

Q Were turtles inventoried at all?

A No.

Q Do you know one way or the other whether there are any lizards that are -- that habituate the --

A They're not likely to find any lizards up there, so I wouldn't really have expected them to find them, to look for them.

Q Okay. Would you expect turtles in the headwaters of the Salmon Trout River?

A Sure. In wetlands there as well.

Q And ecologically scientifically are snakes and turtles less important than birds?

A No.

Q Are they distinguished under the Endangered Species Act as not being worth surveying or protected?

A No.

Q I think we talked about vertebrates and invertebrates. Did we cover that sufficiently from your standpoint, sir?
A Yeah, I believe so.
Q Okay. What about inventorying for merlin and bald eagle? First of all, were merlin and bald eagle noted as a species in any of the inventories you read?
A Yes, they were. And so they did see at least one merlin and -- which is a medium-sized falcon, and a bald eagle; which are -- both have listed status in the state of Michigan. And so that was in there. The thing that I think anybody -- any ornithologist would have a problem with would be when you're surveying -- the surveys that they conducted for birds were really designed to survey songbirds that are fairly common; sort of species that you can reasonably expect to see while you're walking through the transect and those -- that's just fine. Merlins and bald eagles, like a lot of forest raptors, exist on a whole different scale. Their home range is much larger than a sparrow or a warbler or verio or something, the songbirds. And so the surveys designed to survey these sort of small high density songbirds cannot -- you can't use that same methodology to survey species that exist on a different spatial scale and cover a much larger scale.

So forest -- there are whole specialized surveys for forest raptors that if you really want to know something

about the presence, absence or density of forest raptors, that's what you have to do. You're going to run into them occasionally while doing these other surveys, forest raptors, like they did, but it doesn't -- that kind of survey doesn't really tell you very much about their density. It doesn't tell you -- if you didn't see them on the surveys that they had conducted you might conclude they're not there when in reality, you know, they're flying five miles here and five miles there and you just didn't happen to pass through that morning when they were in the particular area that you were in.

Q Did you note whether or not in the Alec Lindsay-Skye Haas survey that they saw a pair of merlins?

A Yeah, I believe they said they did see a pair.

Q And what -- in so seeing -- and that's a threatened species, is it, sir?

A Merlin?

Q It is perhaps not a threatened species?

A Yeah, I believe it is threatened. I might not have even put it there, but it does have -- I think it's threatened; I don't think it's endangered in this state.

Q Okay. And seeing a merlin or a pair of merlins, what then physically would you do with -- how would you deploy your human resources to find whether they were nesting in the area of the mine?

A Well, if you suspected that they might be nesting or if you just wanted to know, you would do systematic transects on much larger scale than they did here, because the whole mine site might be one small portion of the merlin's home range or a bald eagle's home range or territory. So what you would be looking for is the nest itself if you could find it, and you could find that early in the season by watching the birds as they built the nest hoping to find them carrying material to the nest or carrying food to the young after the young were hatched. So if you wanted to verify breeding or if you wanted to do the opposite, conclude that they're not breeding, that's what you'd have to do.

Q Is there any reason why eagles could not nest in the -- would not nest in the area of the mine?

A No, there's no reason they wouldn't. I agree with the statements that Kailing and Koss said, that usually eagles will nest near a large body of water: river, lake. So that is a typical nest site, but that doesn't mean that every nest is found in that particular situation. But that is the most common site that they seem to choose; emergent large trees and near water.

Q Would you expect the area of the mine to be within the foraging area of eagles that lived in the area?

A It could be.

MR. WALLACE: Let's take a look at slide six,

please.

Q What conclusions did you draw about the duration of the subsequent wildlife species assessments, Intervenor's 160 and 161, sir?

A Well, they did their surveys in the spring, summer and fall, which are the easiest time to do surveys and that's the appropriate time to do them for at least most of the species that they were surveying. For migratory songbirds that's when you have to do them, when they're breeding and when they're singing. For small mammals that's probably the appropriate time of year to do the surveys. For some species often I think agencies will do winter track surveys as the best way to survey for large wide-ranging winter active mammals, like moose or deer or bobcat or cougar out west or wherever. So that's a time of year when they didn't do the surveys for large mammals.

You can do them in the spring and the summer. I mean, you can go out and look for prints and you can look for skat and you can hope to see one, but a lot of those mammals are nocturnal and even when they're not nocturnal they're just very wary and difficult to spot. So they can be there. I mean, as we all know people have been claiming there are cougars in the U.P. for 20, 25 years and lots of people claim to see them and perhaps they have seen -- some people have seen them, but you don't see them very often.

And that's true even where -- out west where -- in places where you know they are. So a lot of these mammals can be best monitored in the winter because they leave a track through the snow and you don't have to see the animal or even look for its skat to find evidence that it's there.

Q And would that be true of martin and fisher as well?

A Yeah.

Q And just remind us what sort of animals are martins and fishers?

A Those are large weasels. A martin is about this (indicating) big and a fisher's about this big.

Q So you're indicating two feet and then three feet long maybe?

A Yeah. If you add the tail they both have big bushy tails, but the body of a martin is about sort of a -- maybe 75 percent bigger than a squirrel. Although, they're -- these are weasels so they don't make a living like squirrels do. They kill and eat things like squirrels and that's their main -- and some mice and stuff. And a fisher is a big weasel; not as big as a wolverine, but pretty good sized.

Q Are there substantial populations of martin and fisher in the U.P.?

A Yeah, they're both up there.

Q Okay. Has there been concern about the stability of their populations of either of those, if you know?

A Some in the U.P. Northern Wisconsin has had a really hard time providing habitat for martins, keeping pine martins in that landscape. They've reintroduced them and had poor success. And a lot of it -- a lot of people -- well, one of the things that both of those animals need is lots of sort of large logs on the ground to provide habitat for the mammals that they hunt and eat. So where you have a lot of intensive forest management you tend to lose that component of the forest structure, and that might be the reason. But both of their -- both of those animals are in that landscape. I've seen pine martins up there. I've seen fishers as well.

Q Did you -- do you recall seeing testimony by Mr. Koss about the winter use of the Yellow Dog Plains as a corridor for fur-bearing animals?

A Yeah, I think either Koss or Kailing, one of them mentioned that that was a -- either it was a corridor or a likely corridor. I can't remember the exact word they used.

Q Okay. And this corridor concept, between what and what would the Yellow Dog Plains in the area of the mine serve as a corridor?

A Well, it's kind of east-west the Yellow Dog Plains are, and north of there is the Huron Mountains and south of there is a lot of forest including the McCormick Tract. So you know, on a landscape scale that whole sort of bulge of north of

Marquette is -- for species with a home range that move -- like wolves that move around that area, that could be a corridor for movement between those two heavily forested landscapes that aren't managed as intensively as the Yellow Dog Plains, for example, for timber.

Q Could the presence of a mining operation such as the one proposed here act as barrier in this corridor?

A Well, it could and it would depend on the species and its sort of behavioral reaction to those kinds of activities and it would depend on the -- sort of the mining activity you're talking about. Now, the footprint of the mine is within -- that whole landscape the actual sort of fenced-in area, if I understand it correctly, is going to be -- that's a kind of barrier that can be gotten around pretty easily by, say, a pack of wolves. You add the road and the activity on the road to that and that might complicate things a little bit for wolves that are traversing that regularly, and deer and moose and other species like that.

Some of those species while they might tolerate roads they don't tolerate heavy traffic very much. Wolves are one of those. There have been some definitive sightings in Wisconsin that have shown that road density is negatively correlated with wolf habitat quality or habitat use. So to the extent that you get lots of -- you know, the mine site becomes kind of a industrial facility and then the road's on

top of that, you'd probably have changes in the behavior of dispersal and movement of some animals.

Q There was testimony by one of those gentlemen about the Ives Woods wolf den -- I'm sorry -- Ives Lake wolf den?

A Yeah.

Q Ives Lake being -- where is that located; do you know?

A That's up in the Huron Mountains.

Q Okay. And so apparently there's been a den of wolves recognized there in the past?

A Yeah.

Q Would you expect wolves using the Huron Mountain Club property in the area of Ives Woods -- Ives Lake -- excuse me -- as a denning area to be affected by road density resulting from the mine? And let me include in that question that you tell us what "road density" means.

A Well, I think by "road density" you're just talking about the sort of density per square kilometer of roads, and probably it would be important to distinguish are these like paved highways or are these, you know, rural roads and thus the level of traffic on those roads is going to be another important factor. Yeah, I think it's perfectly plausible, if not almost certain, that a wolf den, a wolf pack that's near Ives Lake is going to at some point in its movement move through that Yellow Dog Plains landscape.

Q And on the subject of road density; does a two-track or a

dirt road -- does that have the same impact on a foraging wolf as a road that's used by, let's say, 40 ore trucks per day?

A No, it wouldn't have the same impact. In fact, there's been studies showing that wolves will actually use -- say in the wintertime they'll use snowmobile trails, packed-down snow to get around where there isn't a lot of traffic, but they will tend to avoid areas where there's a lot of regular road traffic. So roads aren't entirely bad, but a lot of traffic is pretty much entirely bad from the perspective of wolves, not only from the potential of getting killed trying to cross but also just the noise and the activity. You know, wolves are shy creatures that tend to stay away from people as much as they can and human activity.

Q And just going back to your -- to be clear, did Intervenor 160 or 161 reflect 12 months of flora and fauna studies, sir?

A No, it didn't.

MR. WALLACE: Let's look at Exhibit 7.

Q Dr. Flaspohler, there was testimony that the Michigan Natural Features Inventory was used kind of as a launch pad for determining what to look for in -- on the flora and fauna requirements of the EIA. What is your opinion as to the adequacy of using the MNFI as a basis for determining what to study?

A Well, that database is useful, but it can't be seen as a -- as resulting from any kind of a comprehensive survey of at least on a statewide level. There may be parts of the state, maybe the University of Michigan Arboretum or something like that where -- that's just crawling with biologists where if you looked at the Michigan Natural Features Inventory data set on that particular location it might be a pretty reliable indicator of what's really there.

Now, if you go to a rural part of the U.P. where there aren't very many biologists and people don't get out there -- people that report what they see to the Natural Features Inventory don't get out there very often and you query that database and it says that you've got wolves and you've got bald eagles and you've got gentians, well, that's true; that is -- in no way should lead you to believe that that's all there -- the only threatened or endangered species that occur in that site, because no one's looked for -- in all likelihood nobody's looked for many of the rare species that could be there, because that -- sometimes that takes specialized identification skills and sometimes it just takes somebody with boots on the ground looking for those things.

So while it's entirely appropriate and it's good that they did that, sometimes when I was reading it I was sort of given the impression that they went there, they got

that list and then they went and confirmed those species were there, and sure enough they were there and -- but I'm -- but there are a lot of other things that could have been there and that's kind of where that -- why I generated that table, because if you really wanted to know what might be there I think that would have been an approach in addition to looking at the natural features data that would have been more comprehensive.

Q Let's go ahead to slide 10. I just want to ask you briefly about Intervenor's 160 and 161 from the standpoint of Kirtland's Warblers. Is there any indication in either of those exhibits or the testimony that you read from Mr.'s Kailing and Koss that from your standpoint the survey for Kirtland's Warblers was done adequately?

A Well, Kirtland's Warblers, like the other songbirds that they surveyed for, you would survey at the time that they did. You'd use roughly the same methods that they did. I think you could sort of think of Kirtland's Warblers somewhere in between some methodology that resembled a typical songbird survey like they conducted, but probably on a much larger spatial scale because its density in that landscape is closer to one of these woodland raptors that I talked about earlier. Not because it requires a large area like those woodland raptors do to nest, but simply because it's not very common.

So I think a more extensive survey of appropriate jack pine age class habitat in a broader affected area would have given a better sense to me as -- in reviewing this of Kirtland's Warbler occurrences or lack of occurrences in an area that extended outside of the footprint in which under certain scenarios could be affected by mine activities.

MR. WALLACE: Your Honor, if I could have about five minutes we could wrap this up I think. A five-minute break?

JUDGE PATTERSON: Sure.

(Off the record)

MR. WALLACE: I'm passing the witness, your Honor.

JUDGE PATTERSON: Okay.

MR. EGGAN: And I have no questions, Judge.

JUDGE PATTERSON: Okay.

MR. PREDKO: Good morning, Dr. Flaspohler.

THE WITNESS: Good morning.

MR. PREDKO: Welcome back.

CROSS-EXAMINATION

BY MR. PREDKO:

Q You talked today again about cumulative impacts of multiple stressors. And this is something that you talked about when you were here two and a half months ago; right?

A Yeah.

Q And when you were here two and a half months ago, you told

us that the methods for measuring cumulative impacts of multiple stressors are a work in progress in the area of ecology; correct?

A I don't recall saying that, but I think you could characterize it that way, yeah.

Q And you also told us that this is a novel and new area to ecology. Would you agree with that?

A Yes.

Q What experience, prior to your involvement in this case, do you have with reviewing or assessing environmental impact assessments submitted to governmental bodies?

A Reviewing environmental impact assessments? None submitted to a government, no.

Q And when you were here last time, I talked to you about the way Kennecott did its assessment. And it had -- and you agreed with me that it would be a good idea to get all of the different disciplines involved and review the various potential impacts and to have all of those people talk to each other. Do you remember that line of questioning?

A I think so, yes.

Q Now, are you aware that in environmental impact assessments that are submitted to the DNR and the DEQ, as far as assessing cumulative impacts, that the way that Kennecott has done it here is the standard way that that is done?

A I was going more off the definition of "cumulative impacts"

as it's used in ecological science. I've seen the verbiage in the 632 Section, I think, which is maybe what you're talking about. And from what I can see, they don't define it real clearly, what they mean by "cumulative impact." So I suppose it's open to interpretation. But my interpretation and the way it's used in my discipline is, you're talking about layered impacts, cumulative impacts; not looking at a whole bunch of different impacts independently. That's the opposite of looking at it in a cumulative way, because you're looking at it independently as opposed to cumulatively.

Q And I understand your position, Doctor. But my question was, are you aware that the way Kennecott has done the cumulative impact assessment in its EIA is the standard way that that is done in Michigan?/

A Yeah, I wasn't aware of that, 'cause I haven't seen a lot of these.

Q You talked a little bit more about the Kirtland's warbler. And you indicated that you did review, since you were last here, the 2006 and 2007 Wildlife Threatened and Endangered Species studies that were done by Kennecott?

A Yes.

Q Did you review the specific survey that was done for Kirtland's warbler?

A I believe I did. I saw that they didn't find any. And so,

yeah, I believe I reviewed it; yes.
Q But you understand that they --
A They did a separate survey, yes.
Q You understand that that was after a Kirtland's warbler was spotted in the area of the Yellow Dog Plains; that Kennecott directed their consultants to specifically go out and look for Kirtland's warblers in that specific report which was published and put into the record here? Is that the report that you're aware of?
A Right. I believe I saw that. I mean, I looked at the overall bird surveys, which didn't find Kirtland's. And it may be that the distinction between those and this specialized Kirtland's isn't perfectly clear, like where one ended and the other one picked up. But the conclusions from that; that none were found; I got that.
Q You understand from the testimony of Mr. Kailing that the wildlife biologists were out there specifically looking for the Kirtland's warbler?
A I did understand that, yes.
Q You said today that in reviewing Mr. Kailing and Mr. Koss' testimony, that you noted an absence of scientific support for their opinions. Now, you are aware that their opinions relied on literature reviews and research; correct?
A Well, possibly literature reviews. Research from which you'd reach the conclusion that an affected area is

restricted to a particular spatial scale, I didn't see research that tested that, that would lead you to that conclusion to confidently say -- do you see what I'm saying?

Q When I meant research -- I meant research papers done by others. So I was kind of in the same context of a literature review. You understand that they went out and looked at literature, research, that had been done by others with respect to effects of human stressors on wildlife; yes?

A I didn't really get that impression from reading it. My impression was that they didn't take a critical look at the spatial scale at which they might see effects from mine-related activities; that they sort of took it on faith that the mitigation methods that are described in the EIA would function perfectly. And therefore, if that's -- if you assume that, then therefore you conclude that the footprint is only as big as they acknowledge that it is.

Q Well, once again my question is only limited to -- are you aware that Mr. Kailing did literature reviews?

A Yeah. That seems probably very likely. I didn't -- you know, when I looked at his testimony, I didn't go back to every source that he cites. And I didn't see a lot of citations in there, but -- that would support the conclusion that we put up on the screen right here. I was looking for that, and it wasn't -- it didn't seem to be -- it wasn't obvious to me.

Q And you're certainly aware that Mr. Kailing and other Kennecott consultants actually went out and did the wildlife surveys; correct?
A I was aware of that, yes.
Q And from reading the testimony, you're also aware of Mr. Kailing and Mr. Koss' education and experience relating to wildlife and impacts of human stressors; right?
A Well, certainly their knowledge of the wildlife of the Upper Peninsula is extensive. And their knowledge of the particular landscape in that area is very extensive and more extensive than mine, in terms of having their -- having walked through it. Now, there's a difference between walking through and classifying forest types in compartment maps into balsam fir and, you know, mixed maple, and actually doing surveys for rare and threatened species. And so while I would say that their knowledge is extensive in some areas, I wouldn't say that they -- they have some expertise, I guess is what I would conclude.
Q Well, you understand that Mr. Kailing has spent many years doing environmental impact assessments; right?
A I think I got that out -- I can't remember that actual point, but I wouldn't doubt that.
Q Well, you also understand that Mr. Kailing used to be employed by the DNR and has experience in reviewing and assessing environmental impact assessments; right?

A I think I got that too. I mean, I didn't -- I don't remember every element of their background or education or work experience, but I don't have any reason to doubt that.
Q Now, you talked about certain taxonomic groups that Kennecott did not survey specifically?
A Uh-huh; yes.
Q And one of those groups is amphibians?
A Well, they did survey frogs and looked -- they listened for frogs and toads. And they did -- but not salamanders, for example.
Q Specifically you mentioned salamanders?
A Yes.
Q My question is, are you aware of any threatened or endangered salamander that exists in Marquette County?
A No.
Q Are you aware of any threatened or endangered salamander that even exists in the UP?
A No.
Q And with respect to reptiles, are you aware of any threatened or endangered reptile that has been documented in Marquette County?
A I would have to look at the actual occurrences for those turtles that are listed in that table. Certainly adjoining counties I know at least the box turtle and wood turtle and Blanding's -- whether those are Marquette County records,

the Natural Features Inventory data would have that.

Q And just to be clear, Doctor, my question with respect to reptiles was related to threatened or endangered reptiles. And the ones, I believe, that you just listed are special concern; correct?

A Correct.

Q And special concern don't have any legal protection; correct?

A Correct.

Q And that's because -- well, they are special concern because their population is believed to be declining or it's unknown; right?

A I suppose they might -- I haven't looked at the actual definition of "special concern" that the DNR uses. Usually "special concern" is the next step closest to threatened. So they might include as unknown some species for which they have really poor data, but usually "special concern" means just that; that there's concern about its population level.

Q But sitting here today and even looking at your list here, are you aware of any threatened or endangered reptiles that have been known to exist in Marquette County?

A I couldn't -- no. I would answer "no."

Q Now, going specifically to some of the species that you talked about today you say were not surveyed, you talked about the American burying beetle?

A Yes.
Q And you know that the American burying beetle, at least as far as MNFI is concerned -- they believe that this is a species that possibly extirpated; correct?
A Right; right.
Q And are you also aware that the last time, according to MNFI, that one was document in Marquette was 1916?
A Right. It was a long time ago.
Q And the last time that one of these was documented even anywhere in Michigan was 1961?
A It was a long time ago. But again, I don't know when the last time anyone put one of those carrion traps out for one was. It may have been since 1916 in Marquette County.
Q Well, and you also know that the American burying beetle is not found in sites with soils unsuitable to burying carrion, such as those with very loose sand; correct?
A Well, my understanding is, American burying beetles are pretty generalist. And I hadn't seen that about their life history. It surprises me a little bit, because I would think of anything that would be easy to bury a dead animal in the sand would be easy. But I would have to look into that life history. Now, it's possible they have some preference for certain soils over others, but my understanding is they're pretty generalist and they're -- you know, they occur out in the great -- in some of the

plains and out east. And they had a wide range all over eastern North America at one time.

Q Well, you're familiar with the abstracts that are available on the MNFI database; correct?

A Yes; yes.

Q And the abstract that I've located for the American burying beetle says, quote, "It is not found in sites with soils unsuitable to burying carrion, such as those with very loose sand, extremely dry soils. Do you have any reason to disagree with that?

A No, I don't have any reason to disagree.

Q The other species that you have listed here that Kennecott allegedly failed to survey is the acorn ram's horn; correct?

A Correct.

Q And this species is in fact presumed to be extirpated; correct?

A Correct.

Q And the last time that one of these was document in Marquette County, according to MNFI, was 1907; right?

A It was a long time ago, I know.

Q Now, you talked about both the bald eagle and the gray wolf. Are you aware that the DNR is in the process of de-listing both the bald eagle and the gray wolf?

A Yeah, I am.

Q And that's because they deem that those species' populations

are at a point where it no longer needs protection; correct?
A Yes, I'm aware of that.
Q Now, you've talked about the surveys that the Kennecott consultants have done. You haven't done any threatened or endangered species surveys yourself of the area in and around the mine, have you?
A No, I haven't.
Q Are you aware of any other consultant for the Petitioners, other than these bird surveys that were done by Skye Haas -- of any other survey that was done for wildlife at all?
A No.
Q And so as far as the merlin and the eagle flyovers that were noted in the surveys, you don't have any information to tell us that there are actually nests in and around the area of where the mine is going to be, do you?
A No. I think with the merlin there was some suggestion that the pair -- when a pair was seen by -- I think it was -- I don't know if it was Skye Haas, but I think it was in some earlier testimony that that was -- that would suggest that they have a nest nearby. But whether "nearby" means 100 meters or ten kilometers, merlins could range over that kind of an area. So you'd have to do a more systematic search to find the nest site.
Q And you understand that that bird survey that was done by Skye Haas was of a much larger area? It was essentially of

the entire Yellow Dog Plains; correct?

A That could be true. I haven't actually seen that survey or even the methods that were used for it. I just have seen anecdotal results from it.

Q Did you read Dr. Strand's -- or I'm sorry -- Dr. Lindsay's testimony?

A I didn't read his testimony. Like, the transcript? No.

Q But you do somehow have knowledge of the pair of merlins?

A I think take must have been in a -- it must have been in some other testimony that I saw that. I don't know where I saw that, but I'm sure I've seen it.

Q In that testimony that you reviewed, did you note that that survey that was done by Petitioners does not identify any particular location for any of the birds?

A No, I wasn't aware of that.

Q Now, you talked about the MNFI database today. And you made a similar comment last time; that the MNFI database is not very rich. Do you remember that?

A Yes.

Q And last time you told us that there is no other comprehensive database like it in Michigan to conduct these types of surveys; correct?

A Correct.

Q And you do understand that under the MDNR threatened and endangered survey guidelines, that it specifically says to

use the MNFI database; correct?

A I think I'm aware of that. Among other sources of information would be my suggestion. And I think that they did look at the Breeding Bird Atlas. They looked at other sources of information beyond that database when they set up the bird portion of the survey and perhaps the amphibian portion.

Q Well, you also understand that they reviewed other literature with respect to mammals too; right?

A Yeah, they did, Curtis book.

Q Curtis book, which is an authoritative text on Michigan wildlife?

A Right. But that same comprehensiveness just wasn't applied across the -- across all organisms. That was --

Q Again, you're talking about the amphibians and reptiles that we just talked about; right?

A Right.

Q Now, with respect to vernal ponds, I asked you last time if you had ever been out to the site and witnessed any vernal ponds yourself, and you said no. Have you been to the site since and seen any vernal ponds?

A No. I haven't been there looking for them, no.

MR. WALLACE: There hasn't been any vernal since the last testimony.

Q And you do understand that both wildlife biologists and

wetlands scientists who have examined the site have testified in this case that they did not see any vernal ponds when they examined the site; correct?

A I've seen that testimony, yes.

Q When you were here last time, we talked about generally -- or you talked about effects of logging or forestry practices and how that can create open spaces which can change, I guess, the nature of wildlife that occupies the area. Do you remember that?

A Yes.

Q And you had that same kind of concern with respect to the proposed mine; right?

A Sure; yes.

Q And you had noted when talking about logging that after the logging, the species would change. And then as the trees regenerate and come back to their previous state, that the wildlife would come back; right?

A Yes.

Q What kind of time period are we talking about there, for an area like the area of the mine site, when we're talking about jack pine trees?

A Well, you're going to have -- you'll have species that will -- in a forest cutting situation, you have species that will colonize the site that prefer that open condition after the trees have been removed. So there's everything from -- you

lose birds and other species that like a more mature jack pine forest, and you gain species that like a younger forest. And that species composition, as those trees grow up and the conditions in that site change, will then also evolve and new species will -- species that like that early successional situation will clear out in maybe five to ten years, and species that then preferred the mature forest will eventually re-colonize it. And for jack pine, jack pine is not a particularly long-lived species up there, and it depends how it's managed. A lot of times it's not allowed to get more than maybe 50 or 60 years old, and sometimes even younger it's cut. So the time scale is decadal, I guess you'd say, for a species like that, as opposed to hemlock or white pine, which would be centuries, you know, for those species to mature. Does that answer your question?

Q It does. And you understand that the proposed mine is proposed to be there only for a short time, a ten-year period; correct?

A Yeah, I understand that.

Q And then after the mining is done, the land will be returned to its native state. That's the plan; correct?

A That is the plan, yes.

MR. PREDKO: I have nothing further. Thank you, Doctor.

MR. REICHEL: I have no questions, Doctor.

MR. WALLACE: I just have a couple more, Doctor, at this point.

REDIRECT EXAMINATION

BY MR. WALLACE:

Q You used a term for the period of time during which -- over which this area might -- the footprint area might be restored, and you said "decadal"; is that right?

A Yeah In terms of the -- if everything went according to how it was planned, the -- you know, the jack pine, within 30 years, 20 years, would look a lot like it does in the surrounding landscape.

Q So "decadal" means the return will be measured in decades?

A Yes, of the trees.

Q Of the trees?

A I mean, we're just talking about trees here, not necessarily everything else.

Q And the "everything else" might take longer or not?

A Well, it all depends on what the impacts are and how extensive they are. And that all depends on what goes on and what works and what performs the way it's expected to and what doesn't, in my opinion.

Q And when you say "what performs as expected," you're talking about all the plans that there will be no acid discharge; that there will be no air pollution; that there will be no

mine collapse?

A Yeah, that's what I'm talking about. I mean, if you have faith that all that is going to perform perfectly -- and that may be why Kailing and Koss came to that conclusion; they accepted all that. It's harder for me, knowing the history of sulfide mining and knowing the -- just the fact that things don't always work the way they're planned to work, to believe that that's all going to operate with smooth perfection year after year, you know, given the unpredictability of environmental factors and engineering.

Q You were asked whether the study of cumulative impacts is a novel and new field. What has been the history of the evolution of cumulative impact study as a discipline and over what period of time are we talking?

A Well, I would put that -- the science -- it's not a stand-alone discipline the way conservation biology and landscape ecology are that I mentioned earlier that have kind of emerged as ways to answer questions better than they could be answered by the more traditional disciplines that preceded them. And cumulative impacts study is a tool to try to answer questions better than they could be answered independently. And to me, you know, it's perhaps ten years old. But if you're interested in using the best available science, then that's what you would look at. And you would model cumulative impacts on a variety of taxa and a variety

of communities, and you would look at best-case scenarios, worst-case scenarios, something -- scenarios in the middle, and you would get a much better sense than just sort of the strict assumption that everything's going to work perfectly and this is the extent of the impact. That doesn't seem very realistic to me, given what I know about ecological systems and even what I know about mechanical systems. Very limited, but --

Q You say this study of cumulative impacts has been gaining traction for something like ten years?

A Yeah, at least ten years; ten to 20 years.

Q And that term and its existence in academia and accepted science predates this new and novel statute, does it not, sir?

A The new and novel statute being the 632?

Q The mining -- 632.

A Which came about in '05 or something? Yeah; sure, it would predate that.

Q You were asked whether Kailing and Koss demonstrated in their testimony a basis for determining that the footprint of the mine was an adequate way of defining the affected area. I guess my question is, in all of their testimony did either of those witnesses articulate a scientific basis for saying the affected area -- potentially affected area is limited to the footprint of the 1300 acres around it?

A I didn't see that. You know, as a scientist -- you know, I think most scientists approach these kinds of questions with critical thinking and skepticism, and that's how we get better science and better results and better policy decisions in my opinion. And I didn't see that in their testimony. I didn't see a sort of critical look at what may be true, but it may not be true, that is being purported to be the assessment of the effects or the extent -- spatial extent of the affected area. And that's what I think is -- that was -- that approach, that critical thinking approach I think is what was missing from their testimony, from what I saw.

Q Is there any scientific basis for defining potentially environmentally affected areas by north/south and east/west boundary lines of ownership?

MR. PREDKO: Objection. If you're stating that's the way that it was done here, there is no testimony to support that. So I would say it mischaracterizes testimony. If you were asking as a hypothetical, maybe that's different.

MR. WALLACE: I'm not characterizing testimony. I'm asking a question about the 92 acres.

Q Is there any scientific basis for looking at ownership boundary lines to define "affect area"?

A No, not ownership property lines. I mean, those often

don't -- are irrespective of ecologically -- ecological linkages that span across the landscape, right. Political boundaries of states often -- sometimes they follow rivers, but often they have nothing to do with life zones or -- they don't make any sense from that perspective. So from that same perspective, if you're a landscape ecologist like Taylor or these guys, they recognize that ownership boundaries -- if I have three dogs and they're barking all day, I can't be confident that the extent of their barking is going to end at my property line, obviously. So that's a trivial example, but --

Q Okay. Thank you.

MR. WALLACE: I have nothing further.

MR. EGGAN: I have nothing, your Honor.

MR. PREDKO: Just a couple, Dr. Flaspohler.

RECROSS-EXAMINATION

BY MR. PREDKO:

Q The last time that you were here, we discussed an article that was a Petitioners' proposed exhibit in the 632 case, Exhibit 104. And you told me that this that we put up on the screen here, it's entitled "Assessing Risks to Wildlife Populations from Multiple Stressors: Overview of the problem and Research Needs." And this was a paper that you had gathered and submitted to Petitioners' counsel for this case; right?

A Yes.
Q And so you're familiar with this paper?
A Yeah, roughly.
Q And you and I talked about this paper. And this paper that is -- it's dated 2006; correct?
A Yes.
Q And this paper talks about methods to assess cumulative impacts for multiple stressors; right?
A Yes.
Q And this is the paper that led me to believe that this -- that the methods portion is a work in progress. And when we talked about that, you agreed with me; that that's what the paper says; right?
A Well, that's what she said. And that may be in this paper. I haven't actually -- I can't recall if that "work in progress" quote is in there. But I think, as I said, that's a fair way to -- it may not be the best way to characterize it, but some tools related to measuring cumulative affects our -- a work in progress. Others are not as -- often it's applying established methodologies but in a more sort of simultaneous modeling approach. So it -- I mean, it's novel. But, you know, if I'm going to the doctor, I consider established treatments and also the latest treatment. So just because it's novel doesn't mean it shouldn't be used, I guess is what I -- my philosophy.

Q Well, as of 2006 in this paper they're talking about the need for a variety of research and development and the need for substantial additional progress in this area. Do you agree with that?
A I'd go along with that, yes.
Q And so as of 2006, the methods are still a work in progress; right?
A Okay. Sure.
Q Is that "yes"?
A Yeah. I mean, whether you call it a work in progress or novel, you know, maybe Munns calls it "work in progress"; I might call it "novel." But whether it's -- any ecologist would have heard of this. You know, if you did a literature search with key words "cumulative impacts," I don't know what you'd find. you could see an increase, I'd bet, over the last ten years in the number of papers that have used that term. And that would some measure of its -- how common it's becoming. But particularly for activities like this where you have a large, complicated thing going into a landscape where you could easily set the bar, if you wanted to, for understanding potential cumulative impacts, if it doesn't happen, it's a missed opportunity, especially since the verbiage is right in there and the DNR -- and they may have written that verbiage without explicitly saying what it is, but I think the discipline has come to define it as how

I defined it, as looking at sort of many impacts simultaneously.

Q Do you understand that "cumulative impacts" has been a term that's been used prior to this statute?

A I'm sure it was; sure.

Q In regulations within this state?

A I'm not -- I wouldn't be surprised. And perhaps it means different things to different disciplines, as a lot of terms do.

Q And at least according to this paper, there is no definite method that can be used for assessing the effects of multiple stressors on wildlife; right?

A Well, there's not one method you could use for every situation for every species. But I think on a species-by-species basis, you could define methods pretty clearly. If you wanted to know cumulative impacts on frogs, you would have a certain approach that would be different than cumulative impacts on migratory songbirds or -- so there isn't one method; I would grant you that. But I think like any ecological research, it has to be tailored to the question and the organisms hat's true you're studying.

MR. PREDKO: Thanks, Doctor.

THE WITNESS: Okay.

MR. WALLACE: Nothing further, your Honor.

MR. REICHEL: Nothing further.

(Off the record)

MR. LEWIS: As the court may recall, we had some discussion about rebuttal or surrebuttal I think in fact last week. We had entertained the notion that we might call Greg Council back. We advised Petitioners counsel of that and I think the court. We thought about doing that last week, in fact. By the end of that day we advised Petitioners counsel that we would not be calling Greg Council. At the time we talked about this and these proceedings, we also indicated that we reserved the right to potentially call other witnesses in surrebuttal at the conclusion of the Petitioners' rebuttal case. So we withdraw Greg Council.

Since that time we've had more discussions about that, and we discussed -- Mr. Reichel and I specifically talked to Mr. Wallace, Mr. Haynes. And then I talked to Mr. Eggan later in the day yesterday to tell them what our intentions were, so that we could give them a heads-up on scheduling or when we would like to get this done and what we intended to do in terms of witnesses and subject matter. Mr. Reichel had entertained at one point calling back one of the DEQ witnesses and had advised us and Petitioners' counsel that since then has decided not to call that witness?

MR. REICHEL: Yes, that's correct, Mr. Lewis. We

had indicated to counsel that we were considering calling one witness in surrebuttal but upon further consideration decided to rest on the existing record. So Respondent DEQ does not intend to offer surrebuttal.

JUDGE PATTERSON: All right.

MR. LEWIS: So we're left with, then, two witnesses for Kennecott. They are -- would be Tracy Arlaud -- the court may recall that's the lady who testified earlier as an expert on blasting and other aspects of mining with the Australian accent?

JUDGE PATTERSON: Uh-huh (affirmative).

MR. LEWIS: And she would be recalled to specifically address the testimony presented in the Petitioners' rebuttal case as to two narrow topis, that being the potential noise from the mining and Mr. Parker's latest testimony as to the potential effects on fish from the mining.

The second witness would be Steve Donohue, and that would be quite narrow. It may not take more than ten minutes, but specifically only to address what Mr. Prucha said in his rebuttal testimony as to the permitting process for the Crandon Mine and specifically testimony elicited from him as to the Wisconsin DNR requiring Foth to redesign and increase the capacity of the water treatment plant for that system. Mr. Donohue will be presented to address Mr.

Prucha's comments on that only.

So that's our proposed surrebuttal; narrow, won't take much time. Our proposal, which we discussed with Petitioners' counsel yesterday -- the timing is driven by Ms. Arlaud, who has been out of the country in Greece and will not return until next Wednesday the 30th. Mr. Predko will present her testimony. He will not have access to her until Thursday the 31st. We propose to do both these witnesses on Thursday, the 31st. We propose to do both of them by telephone here in the courtroom rather than bringing them back in. It does not merit that, we don't think. And we would --

JUDGE PATTERSON: I think the problem we have, Mr. Lewis, is, there's another hearing all next week here. So the hearing room will not be available.

MR. LEWIS: Well, in terms of your schedule, then, shall we look at the week after?

JUDGE PATTERSON: Yeah; fine. I'm available any day that following week.

MR. LEWIS: Okay.

JUDGE PATTERSON: Wait a minute. Well, either Tuesday, Wednesday or Thursday of that week.

MR. LEWIS: Okay. So we will re-discuss again and get back to the court, assuming we reach an agreement. Now, I know Petitioners' counsel has advised me they're going to

object to any surrebuttal generally. So know we'll be talking about that. But if we are allowed to do surrebuttal --

JUDGE PATTERSON: Wait a minute. What week are we -- I'm sorry.

MR. LEWIS: -- we'll get back to that. We'll get back to you on the dates.

JUDGE PATTERSON: I was looking at the wrong -- we're talking about the week of the 4th through the 8th -- right? -- of August?

MR. LEWIS: Yes.

JUDGE PATTERSON: Okay. Yeah, I'm available any day that week except Tuesday. So the 4th, 5th (sic), 7th or 8th.

MR. LEWIS: All right. Again, we've discussed that with Petitioners' counsel. I think they have some objections to place on the record. And if we get past that, we'll discuss with Mr. Reichel and Petitioner's counsel a schedule and proposal and get back to the court with that.

MR. PREDKO: Your Honor, you said the 4th -- I thought you said the 4th, 5th, 7th or 8th. But you had said Tuesday you were unavailable, which is the 5th?

JUDGE PATTERSON: Yeah. 4th, 6th, 7th or 8th. Yeah, I did say that. I'm sorry.

MR. PREDKO: Okay. Thank you.

MR. EGGAN: Your Honor, we do have a position with respect to surrebuttal. And our position is that first of all, they've indicated they reserve the right for surrebuttal. There is no right, obviously, to surrebuttal, either by Constitution or otherwise. There is ample case law to support that fact. It is a matter completely within your discretion. And we would ask you to exercise your discretion against allowing surrebuttal. The case has clearly gone on and on much farther than any of us ever anticipated. And the specter of surrebuttal also calls in to question the possibility that we will then want to bring someone back to testify in sur-surrebuttal, if that's what it would be called. And this could go on and on. And so from our perspective, someone needs to have the last say in this case. Because we -- and I'm speaking directly on the Part 31 part of this case -- have the burden of proof, we came in just like a -- just any -- just like any other lawsuit. The party with the burden of proof went first. And there was a response. And we have an ability to respond to the response. But there needs to be an end to this. And it really the party with the burden ought to have the last say. And that's why we believe that surrebuttal in this case is not appropriate, should not be granted, because it's just going to go on and on. And so we would ask the court to exercise its discretion against allowing surrebuttal.

MR. WALLACE: I join in that, your Honor. We do need to bring this to an end. The term is probably not appropriate, but "stop the madness" comes to mind. I mean, there's a point at which there needs to be a conclusion. And the rules kind of assume exactly what Mr. Eggan says; that Petitioner will finish because Petitioner has the burden. And I don't know what this might mean logistically for us. And in terms of the calendar, my son is getting married in New York on August 9th, and I'm going to be gone a good bit of that week traveling. So that's a problem. I don't know specific if there's a date available. But we just shouldn't go here. And I would bet -- I mean, I only contribute, you know, three-plus decades of law to -- thinking about this. But I would bet in this room lawyers have not seen surrebuttal in any or many cases. I've never seen it. I've never seen it permitted, ever. And there's a reason; 'cause you've just got to end things. And we've tried to be succinct. We tried to be succinct today. We cut back on other -- to get over the rebuttal part, and rebuttal is very standard. But surrebuttal is extraordinary and just really leads us down a path that's hard to -- it's hard to picture when we'll be able to end.

JUDGE PATTERSON: Mr. Lewis, anything else?

MR. LEWIS: Yeah, briefly. No right to surrebuttal; there's no right to rebuttal. We made those

arguments before. Discretion of the court, same is true for rebuttal. In that regard the Petitioners were given broad latitude for their rebuttal case. Mr. Wallace has never seen surrebuttal. I would submit that Mr. Wallace has probably never seen rebuttal allowed to the extent it was allowed last week. We do intend to keep this short and focused as I indicated. We've got maybe 20 minutes with Tracy Arlaud; I've got ten minutes with Steve Donohue. That's the scope of our proposed surrebuttal. Under the rule again, "The administrative law judge may allow rebuttal testimony and may permit further testimony as deemed appropriate." So I take we're doing this as minimally as we can. And given that Petitioners were allowed broad latitude in their rebuttal case, I think we ought to be allowed to specifically respond to the very limited new information that Petitioners submitted in their rebuttal case.

JUDGE PATTERSON: I'm going to allow the surrebuttal. I have done that previously in my experience. Obviously it's very limited. I think that would be the end of it, despite counsel's concerns. I will allow that if you can advise me of a date.

MR. LEWIS: Thank you. Yes, your Honor, we will have to talk to counsel.

MR. EGGAN: Your Honor, if I can raise one more issue? And that is -- actually, I need to raise two issues.

But the first is, we established a briefing schedule that began 55 days from a week ago Thursday. So the briefing schedule would provide that our briefs are due on September 9. Given surrebuttal and the fact that this record is not going to close now until August, we would ask that the briefing schedule be extended by two weeks to allow us to accommodate the fact that the record is not going to close. We would like an additional 14 days, or actually simply, I guess, begin the 55 days from the day that this surrebuttal testimony is finished. And the reason for that is not that the testimony in surrebuttal is going to take a long time. But Mr. Wallace and I, and I Mr. Haynes and Ms. Halley, are all working diligently on proposed findings of fact and conclusions of law. And what these witnesses say -- and we don't know what they're going to say -- affect our ability to really develop theories and to put our proposed findings together. So we would simply ask -- and I think it's a reasonable request -- for additional time to close the record.

MR. LEWIS: Your Honor, we did discuss this with Petitioner's counsel last week. At the time Petitioner's counsel were advised that we might call Greg Council that week. We advised them later that day we would not. At the time we advised Petitioner's counsel that we reserved the right to perhaps call additional witnesses after the

conclusion of their case. Based on that information, Petitioner's counsel and we agreed on a date for the briefs to be submitted to this court. So I think we had basically your prior agreement on this that we put on the record with the court.

Secondly, we've told you what the nature of the surrebuttal is and the scope of it. And practically I can see no justification for Petitioners to be claiming that they would need additional briefing time based on that additional information. As Mr. Eggan has indicated, they're fully capable of working on the briefings at this time, as we are and as Mr. Reichel is. And certainly there's no grounds to delay that briefing schedule because we're going to have 30 minutes of testimony the first week of August. There will still be remaining some 30 days before those briefs are due. Petitioners did just in their objection to surrebuttal, complain about the length of this process and their desire to bring this to an end point. That's certainly our desire and our client's desire. And we certainly would like to keep that schedule in place. I don't think there's any grounds justifying moving that schedule, and we'd like to keep it that way.

MR. WALLACE: I'm sorry, your Honor, but the schedule is already extremely tight for what we have to do, and we're beginning to get a sense of that. And most of us

are doing this ourselves. We don't have huge staff support. We'll doing this ourselves as your Honor will have to do this himself at some point. And it's a huge record. And, you know, asking for another couple weeks in light of this I don't think is unreasonable.

JUDGE PATTERSON: Let me bring this up: I obviously -- I've been involved in this almost exclusively for a number of months, and I anticipate at the conclusion and previous to receiving your closing briefs or whatever you want to call them, I'll do some catch-up. I've got a little setback. I'm going to be out of commission for two weeks as of August 25th. I'm having shoulder surgery. So I would -- I'd like -- moving it back two weeks would help may and, 'cause I'm not going to have that time to catch up between then and now. So on that basis -- Mr. Lewis, I understand your concerns, but I'm going to be out of commission for two weeks.

MR. LEWIS: I'll explain to my client it was because of your schedule, your Honor.

JUDGE PATTERSON: I'll take full blame for it.

MR. EGGAN: That would change the briefing -- the proposed findings of fact and conclusions of law to be due now on the 23rd of September, according to my calendar?

MR. LEWIS: Agreed.

JUDGE PATTERSON: Okay.

MR. EGGAN: There was that one additional point.

JUDGE PATTERSON: Oh, yeah. You had two.

MR. EGGAN: Yeah. I think there's going to be a need for counsel to confer a little bit on some exhibits that need to be included in the record. Mr. Bracken and I had talked about a couple of exhibits, and we had not been able to connect as to the admissibility of those exhibits and whether he admits. In going through the transcript, I've noted that there are a couple of exhibits that were offered but which do not appear on the exhibit list. And so I want to -- I want to be able to go through that and make sure I know what those exhibits are, so I can discuss them with other counsel and make sure that they're in the record.

JUDGE PATTERSON: Okay.

MR. EGGAN: There are a couple that are offered and admitted, yet don't appear on the list. That's all.

MR. REICHEL: Just to be clear, you're referring to the list maintained by the court reporter?

MR. EGGAN: Correct; yeah.

MR. REICHEL: I think each of us has maintained our own respective lists --

MR. EGGAN: We have; we have.

MR. REICHEL: -- which may or may not all coincide.

MR. EGGAN: Yes.

MR. REICHEL: And I certainly think that it's in our mutual interest to clarify any doubt about that.

MR. EGGAN: I think so too.

JUDGE PATTERSON: I agree.

MR. EGGAN: The other thing is -- and this will be among counsel, but we've been cooperating pretty well. I think we at least are at a point where we believe we have almost all of the exhibits that were offered and admitted by the court in one place now. And so to the extent we can assist any party in having documents that they think may not already be in or which are in and they don't have a copy of, please let me know and we can resolve that.

MR. LEWIS: Well, perhaps we could at some point have our paralegals compare lists and discuss those.

MR. EGGAN: They've been doing that; they've been doing that. And I guess I'm really reporting what they're telling me.

JUDGE PATTERSON: Mr. Lewis, are those your exhibits that are in the small hearing room?

MR. LEWIS: I don't know. I believe those are judge's copies.

JUDGE PATTERSON: Oh. There's some concern about those being in there. If they could be moved someplace?

MR. LEWIS: You don't want them, in other words, your Honor?

JUDGE PATTERSON: Correct.

MR. LEWIS: We will attend to that.

JUDGE PATTERSON: I don't think I'm going to need copies if I have the original exhibits.

MR. LEWIS: We'll have Nicole check with your administrator --

JUDGE PATTERSON: Okay.

MR. LEWIS: -- is that all right? -- after the hearing?

JUDGE PATTERSON: Yeah, that's fine.

MR. WALLACE: And finally, your Honor, Dr. Flaspohler's demonstrative today is 194.

JUDGE PATTERSON: 194?

MR. REICHEL: So that's Intervenor 632, Exhibit 194; is that right?

JUDGE PATTERSON: Petitioner.

MR. REICHEL: Petitioner. I'm sorry.

(Petitioner's Exhibit 632-194 received)

JUDGE PATTERSON: Anything else?

MR. REICHEL: I don't think so.

JUDGE PATTERSON: Because there's another hearing next week, we need to clear out.

MR. REICHEL: Just so we're clear, on the surrebuttal is the plan going to be as Mr. Lewis proposed to do it, by -- in the hearing room by telephone?

MR. LEWIS: Yes, that's our proposal.

JUDGE PATTERSON: That was my understanding.

MR. REICHEL: I have nothing further, Judge.

MR. LEWIS: If it changes, we'll advise the court.

JUDGE PATTERSON: All right.

(Proceedings concluded at 10:38 a.m.)

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