

SNAKES IN BOG AND WETLAND ECOSYSTEMS: QUESTIONS AND DISCUSSIONS

Moderator: Shelley Dunn

John Middleton - Question for Glenn Johnston - when you were talking about percent moss covers in your various calculations, were these sphagnum mosses, versus forest floor mosses?

Glenn Johnson - They were mostly Sphagnum.

John Middleton - And the second question I had was, in the historic photo you had of the field class at work, there was a birch tree, a lot of birch trees in the background... you don't happen to know what species that was?

Glenn Johnson - European Birch, along with some tamarack and spruce.

Rich Seigel - Bruce, when you tried to implement your work, what feedback did you get from resource managers?

Bruce Kingsbury - I think theirs was a mixed response - some individuals that I worked with would have nothing to do with this. Others say hunting is all that matters, but if you talk to them and get to know them, they feel a little more comfortable with you, and as you establish relationships it becomes less adversarial in some cases. But this is the kind of thing where we need to try to sort some connections out, and sometimes they work and sometimes they don't. Obviously, some land managers are here in this room and are very interested, and other land managers the last place you'd find them is in a room like this. So there's a big gradient... what I'm trying to suggest is that we work locally to the extent that we can, and I've had some success, to get the kind of things we'd like to see. In some cases it's going to work, in other cases it won't.

Dave Mauger - Agencies like Ducks Unlimited promote to the non-hunting public that their activities benefit non-game species... in an area where Ducks Unlimited has interests or projects on the go, would they be receptive to an approach that maybe identifies some activity that would be detrimental to massasaugas? Are they open to that sort of thing?

Bruce Kingsbury - I think that's another one that's a little bit variable... I think that what an individual or a group does with their money to some extent depends

on what the composition of the group is. They would certainly need to use it for ducks, but growing ducks doesn't necessarily mean square plots where you perfectly control the water and that sort of thing... that comes to a certain extent under the control of the land manager who has the land. At that point it becomes a bit of a personality thing. If that individual likes all sorts of species, he or she may manipulate what they do with the ground. They might face some haggling from some hunters, but if they are doing some things for hunting, they can still do some things that are in favour of non-game. My impression is that there is quite a bit of adjustment that can be done at the property level.

Ron Black - I would agree with that, Bruce... it's not going to occur on every site necessarily, but they are interested in producing some upland nesting habitat, some grassy or sedgey areas, and they are cutting plots around wetland in areas that are maybe dominated by conifer cover, and they're opening them up a bit.

Richard King - I agree with you on wetland managers in that there's an initial step to get them to accommodate more non-game wildlife... all federal land managers, at least in the U.S., are supposed to, because hunting license revenues, duck stamps, none of that goes to the management of federal properties. It's all tax funded, which everybody pays, and therefore everybody should be accommodated in a National Forest or National Wildlife Area. The problem is, you can look at the populations in Wisconsin where the habitat has changed and become closed-canopy forest. And we're looking at those and saying 'let's do some restoration here, get it back to where it was'. The problem is there's other rare or sensitive species that use that area... cerulean warblers, red-shouldered hawks, so you get managers to give consideration to non-game, now you've got conflicting issues. You say 'Cut it so we can have massasauga rattlesnakes', well, they'll say 'What do you have against cerulean warblers?' That's a tough issue...

Bruce Kingsbury - I don't think there's an easy answer for that. I guess what I would like to see is that some fair consideration is given to the other organisms that use those areas. The bottom line for me is, I think preserving biodiversity is a critical issue. Those areas

are often our best defense against the loss of biodiversity. We should use those areas wisely in terms of maintaining biodiversity. You remind me of a couple of success stories... one is that Federal wildlife areas have the mandate for managing. That doesn't necessarily mean that the person there is going to do anything differently, at least not right away, but that's a step in the right direction. And also within our state, I became aware of an internal document which tells people who are managing state properties that biodiversity is an important issue.

Dave Mauger - Where was your site located?

Bruce Kingsbury - It's in northeastern Indiana, in Pigeon River Fish and Wildlife Area.

Dave Mauger - I was kind of curious, because if there were massasaugas there, then one State agency couldn't just go out and flood habitat...

Bruce Kingsbury - Yes they could...

Dave Mauger - Under state law, and the Endangered Species Act, they still could? It seems like a contradiction that they could have a law for protecting this species and another agency doing something differently.

Bruce Kingsbury - Yes, but it happens all the time. In some cases law only covers the animal - it doesn't cover habitat. I think that the people on the ground are the managers in a sense... they're the ones who are making on-the-ground decisions. And my major point here is that we want to work together to achieve common goals. I'm not arguing for an easement to be put on those areas. I think what we have to do is collect information, and of course this meeting here is doing just that, but I think that many of us in our own areas can identify players that we can interact with, we might be able to have a positive influence in our areas. Sort of a 'think globally, act locally' kind of idea.

Shelly Dunn - I think that Bruce has effectively drawn attention to the people connections and the partnerships that are needed in order to generate the information that's needed to effectively manage this species. And to make some of the wiser decisions that need to be made... recognizing integrated sites, and recognizing that none of us are as powerful as mother nature and getting back to the 'do no harm' philosophy. But where we can make management decisions and enhance habitats, we can draw attention to that. We're going to move on to discuss critical manage-

ment issues for peatlands - the particular site I'm involved with is Wainfleet Bog - it's one of the three isolated remnant populations in southern Ontario. It's approximately a thousand-acre site. Now the majority of it is in public ownership and we are faced with a number of management issues. We have a number of data gaps, which we recognize and have identified in our management plan. There's pressure from individuals within the management group and within the managing agency to make rapid changes, and think that it's recognized that that's not a wise decision. That's one of the challenges we're facing. So if we lump the issues of water management and drawdowns together, I guess the main question is, we know that water and



humidity have an impact on the snakes when they are hibernating. We're talking about increasing the water levels because it is a degraded drier site, and ultimately increasing those water levels. We're hoping that it will not be a rapid increase. Can anyone provide any information or experience on what the effect of fluctuating water levels might be?

Rich Seigel - I work on prairie systems in a National Wildlife refuge that has a marsh in it, and the water levels in the marsh are manipulated, consequently the water levels in the prairie are associated with that. And one thing that we've noticed is that there are changes in the water levels in the crayfish burrows. These burrows get flooded if the water levels in the marsh are maintained at a high level, and the water levels drop when they draw down the water in the marsh.

Shelly Dunn - What time of year would that happen?

Rich Seigel - See, that's the problem... usually they do drawdowns in the summer, and that's fine because the snakes aren't in their burrows, and then they flood the marsh in the fall and keep it high in the winter and

the spring. So coincidentally they're doing what I would perceive as the right thing for the massasaugas, but that's strictly coincidental. I could easily foresee a situation where they decide they have to drawdown the water level all winter. And then all of the sudden there's no water in the crayfish burrows and there you could have a high frequency of massasauga mortality.

Shelly Dunn - What are they modifying - what are they drawing down for?

Rich Seigel - Cattails... they dry the marsh in the summer, get rid of the cattails, and then flood the water back in the fall.

Shelly Dunn - What's the fluctuation?

Rich Seigel - Oh, five or six feet. When they draw down they dry the marsh. They'll drop a five-foot marsh sometimes in three or four days.

Gary Casper - There was a study done recently on turtles in central Minnesota I think... I think it's in the proceedings of that Blanding's turtle symposium. But she had good data that a drawdown caused massive mortality. Granted, it's not snakes, but at least it's something. And we have our Dike 17 experience... In central Wisconsin near Richard's study site there's an area that had massasaugas... last time they did a winter drawdown was in 1989, we have not seen massasaugas since.

Richard King - They drew it down not to manage it, but to rehab the dyke.

Shelly Dunn - and they didn't increase it again?

Richard King - They drew it down in the fall.

Shelly Dunn - After hibernation?

Gary Casper - Yes... and we haven't seen a massasauga since.

Bob Johnson - Shelly, in your case, you're slowly going to be re-establishing elevated water levels in cells... I guess the concern is, there are snakes there now at low densities and they're hibernating in certain spots, and they're raising water levels, are you going to eliminate them from those hibernation spots if they're in hibernation? So if this is done it should be done in the summer, and even then you may destroy the hibernation area and eliminate some of their forage habitat. I think that's one of the issues, is what is the scale of it? How fast is the flooding going to take place? Can the snakes adapt to that in one season, or will it take

several seasons?

Shelly Dunn - I think Anne will agree, it's not expected to be a big flush or impact. As she mentioned, most animals should be out and moving about over that long a period of time, if we're able to manage it the way we would like, instead of the people who are wanting to manage in a fast fashion, a quick fashion in order to speed change. That leads into our next question... this site has been burned a number of times in different locations, and there was also a recent burn. Tree removal - European white birch has colonized a lot these sites, and it's felt that it wasn't found in the abundance that it is now in the past, and it has been suggested that we go in and wipe out these white birch. And I guess the question is, we've heard comments about there being 25 - 40% canopy cover required by the snakes - are they serving a habitat function? We don't know that right now because we haven't got radio telemetry, we really don't know where the snakes are and what they are doing. But is there any experience with these huge clear-cut areas and their effects on the snakes? I understand the fires at Cicero had beneficial effects, but it seems that there are shrubs and there is some vegetation; in a lot of cases birch is almost all we have in some areas... there are the remains of stumps from former fires, and pockets of cotton grass and sphagnum in some areas... but in a lot of cases there's just bare soil. So has anyone had experience with the effects of large tracts of clear-cutting on the snakes? Maybe all we have to go on is the percent cover requirement that they need...

Bob Johnson - In Wainfleet, where the peat mining strip was, that may be to your advantage in that those are open areas now that are regenerating. They're huge tracts with good edge effect, long linear edge effect... it's kind of funny - there's a seed bank there and you get the reestablishment of the native vegetation, and they're at different depths, so you get a really nice successional rebound. That may in fact be what you want to do in twenty or thirty year's time. In fact those peat mining areas may be to the snake's advantage, once they recover a little. Do you have any comments on that Anne?

Glenn Johnson - I have to agree that successional change is important, but what's it coming back to? European white birch?

Shelly Dunn - In a lot of areas, yes. We are seeing some of the bog-type species in some of the wetter pockets, especially in the ANSI portions of the bog we're seeing a bit of the typical bog-type low shrub/sphagnum communities - it is drying out in summer though. So it is on the rebound, there is potential... I

guess there's this mindset around that 'there's European white birch out there, there weren't as many of them, let's get rid of them'. They are wicking up some of the water, so that's also an impact that they're having, so that's an impetus to remove them... 'remove all the birch and the site will be wet' sort of philosophy. We know that with the drainage going out of the bog, the birches are not really a primary factor in the drying effect.

John Middleton - We need to be a lot more optimistic than that about Wainfleet, for reasons you've been alluding to... first of all, after 25 years of regeneration, species lists were 50% similar between the site being completely cleared and after 25 years of spontaneous regeneration. So there is a really quite dramatic and rapid movement in the direction of restoration of habitats, species, and so on. The second reason is that all that cleared area in the middle, we have at least in some cases pretty good records of when that vegetation was taken off. The peat mining procedure was to go in and do plots of a couple of hectares or so at a time; depending on when that was, there are ranges of at least 25 years of different stages of succession that happened after essentially the same kind of disturbance. So in terms of having a diversity of things in there, and sort of fortuitous experiments to see what does happen, you've got a lot of room to manoeuvre.

Bob Johnson - If I could just follow that... in a sense, the buttonbush community you're talking about when you're talking about the ANSI, that to me would be very poor rattlesnake habitat, and that's in the ANSI. So we have less opportunity to manage that - but these disturbed peat sites, you can manage those in perpetuity for rattlesnakes because they're already disturbed. I think there's a great opportunity here to carve out and look at not only single species management but that whole ecosystem, actually using that disturbance to our advantage.

Al Breisch - When you look at those peat mined areas, peat mining is usually done in a very flat profile, and based on the things we've seen in Cicero, you're looking for kind of a hummock and swale, it kind of suggests that in some of the areas you go in and try to modify the surface a bit - create some wetter areas and some drier areas. I'm not sure I'd let those flat areas that were mined for peat remain flat.

Bruce Kingsbury - They looked like they had a little bit of a slope to them, is that true?

Bob Johnson - Yes, you're absolutely right; however, when I was there with Kim, we walked the sites and they seemed to be mined in strips, and then

interstripped... there's a broad band of perfect hummock habitat. They're drying out a bit, the sphagnum is drying out, but those are the edge effects... you've got one habitat out there that's disturbed, but in terms of hibernation sites they pretty well exist...but it's the hydrology, if they were wetter, they might work. But again, there's a great opportunity for some experimental work... it's kind of exciting in a way, what looks like a very disturbed site has this great potential.

Rich Seigel - Just for those of us who aren't familiar with your site, what's the population like in terms of numbers?

Shelly Dunn - We don't know... within ten years and up until this year, we've had three or five unconfirmed sightings and three confirmed sightings this year. So there were three confirmed sightings, the first in about eight or ten years. I guess the other issue, and it may be a non-issue, there was a small fire this summer that was suppressed by Ministry of Natural Resources staff, and the method that was used was peripheral ditches. It was basically a moat around the fire to prevent it from spreading. We have information from the spotted turtle people that those may be having a detrimental effect on those populations, so there is an impetus to fill those in. I guess the question is, the existing ditches are there - are the ditches in there good, or are they having a negative effect on the snakes? Maybe we can also talk about the areas that have been stripped, where there are the remnant ditches... those are the obvious hibernaculum areas.

Bruce Kingsbury - You don't have to necessarily fill in the ditches... you could leave the network in place and just put a block at the outflow.

Shelly Dunn - It was planned to do an experimental small plot to see the lateral effects of the ditching... the big picture is it's blocked the water off from proceeding from the bog and let it back up onto itself, or prevented it from running off.

Shelly Dunn - there's been some mention of herbicide use... we want to discuss the effects of herbicide use and bioaccumulation on the snakes...

Ron Black - There is some literature out there that looks at effects on prey base... but I'm not familiar with all the herbicides that are used and the toxicities of them.

Bob Johnson - Glenn Johnson has information on herbicides based on his Cicero work.

Shelly Dunn - Okay, I guess another question is the people connection. Our intent is to get the locals in-

volved... there are some who don't want the snakes returned or enhanced in the area, and I guess the question about the sensitivity issue... how do we know if the volunteers we enlist are sincere, that they're not going to use the data in the wrong way, and that we're going to get the best possible data? Has anyone had any experience with that, or is there concern?

Bruce Kingsbury - I guess it would depend on how you were going to employ these people, because if they were volunteering to help out and it involved things like distributing pamphlets and giving talks on natural history, I would count on their sincerity. But if they were being recruited to do snake surveys, I would caution you to be extremely careful. I have had several experiences now... we showed one poacher where we were working, because he promoted himself as being a student with an interest in this field. He was a student, and he did have an interest... I had another individual lie to different agencies and claim an association with me to try to collect site locality information on water snakes. There's a lot of people out there who will say whatever they think you want to hear so that they can find out where those animals are, and you have to be very discriminating at that level.



Shelly Dunn - There's some habitat questions we have, and again we don't have radio telemetry, we really don't know where the snakes are going... there were three confirmed sightings this summer, so we have the locations for those, and sort of a general area to start in. We know in Cicero where there are the sphagnum hummocks acting as I understand it as both the rookery and the hibernation site. Just wondering, visually (similar to how Chris can identify sites based on the size of the slab of the rock and the percent cover) is there something like that that exists for the rookery sites? Is there something specific about the areas that they mate in? Are there any unique characteristics or fea-

tures associated with either hibernacula, rookeries or mating habitats, and why? Is there a preference?

Glenn Johnson - I guess I can comment about Cicero Swamp... the rookery sites were areas that were low and open, with some cover quite near the surface, so the snakes could effectively bask yet still be somewhat concealed. That seemed to be the situation they used, with a low shrub type at the surface. Hibernacula were a sub-surface feature - so places that retain water so they don't freeze, with enough space so that snakes can fit into them. Water levels are usually within a couple of centimetres of the surface at the time the snakes enter the hibernacula at Cicero. It's the kind of system where the water table is right below the surface or on the surface, and the hummocks are higher.

Shelly Dunn - You said low vegetation... were there characteristic species?

Glenn Johnson - Yes, it's leatherleaf... it provides this sort of dense, spreading cover, along with other similar plants.

Bruce Kingsbury - In the areas where we worked, the snakes hibernate in an area where it would never flood but would always stay saturated - there was a small stream right next to where they hibernate. I'm not sure that flooding would be a problem... I think drawdown and freezing would be much more of a risk than the water coming up, but I don't know if anyone has encountered that. I know of several species that hibernate in areas where they get completely underwater and they're okay.

Shelly Dunn - For how long would you say they're underwater?

Bruce Kingsbury - I know *Crotalus* has been kept underwater and certainly observed in the field apparently underwater for a month. And what's critical is that it happens when temperatures are near zero, so they're thermally protected. If that had happened during the active season it would have been a different matter. Given where massasaugas are known to hibernate in certain wetlands, I think there's certainly the potential for them to be flooded as well.

Richard King - In the Wisconsin site that I work, there's always the same elements there, the same saturated soil, and we did have one male that got flooded out the second winter that we had him, and he was covered by three or four feet of water... in excess of a metre anyway, for the entire winter. And I was surprised to see him the next spring... I was glad he made it.

Bruce Kingsbury - Just because of the physiology of what happens to their metabolism when it's cold, they can tolerate a lack of air for quite some time. That's sort of counter-intuitive, but given what he's just said and what I know about other species - if your water levels are coming up gradually, I think I would be a little less concern with that than if you're dropping them.

Doug Sweiger - We've got a site at the Bruce that was completely flooded for the entire winter as well - there was a telemetered snake in it and there were no ill effects on the snake.

Shelly Dunn - The waters are going down by the time they're emerging in spring? Or are they actually coming out when the water is still there?

Doug Sweiger - Didn't catch this one actually coming out, but it was definitely underwater.

Anne Yagi - What about the effects of subsurface fire? Our concern is do we fight fire or do we let it burn?

Al Breisch - I know at Cicero that's a concern for us as well. It did burn about a hundred years ago, and the feeling is it would be very difficult to get it to burn again, but if it did burn and it got into that peat layer, it could go on for months if not years. And since you don't really know where the snakes hibernate, yes I would be concerned about that.

Shelly Dunn - Fires have in the past continued throughout the winter in the bog, we know that... one of the issues is, do we manage it? Do we come in full force every time there's a small fire that has potential to spread?

Bob Johnson - When you get your management plan done, when you get some of your local hydrology established, the water itself may prevent fire from spreading and continuing.

Kim Frolich - That's our long-term goal... to get the water levels up so we don't have to deal with these very frequent wildfires.

Bob Johnson - But at the moment, you have the potential for a fire that could last a hundred years and go deep into the bog. And if you play around with opening up some of those canals and you get some oxygen in there, you could be in a lot of trouble. I think as long as you acknowledge you're fighting peat fires there's lots of expertise and certainly in Sweden and Ireland, there's lots of bog fires. I think in the long term we may have zones where you're not worried about fire because of the hydrology of the surroundings. And in

fact we saw the beneficial effects on Cicero of the burn... we could be planning burns that have positive effects a hundred years down the road. But right now it's a real threat to the bog.

Anne Yagi - I don't want to increase the aeration/oxidation process that's going on in the peat, because it will just spread the fire quickly.

Shelly Dunn - I guess with the scenario where the fire goes down to the roots, is there the potential that it's opening up pockets under there that could act as hibernating sites? Maybe burning a hole in the peat at a root where the snakes might come?

Glenn Johnson - It's possible, but there would have to be water in there.

Shelly Dunn - How much water? The indication has been that humidity is important, but how much water, how close does it have to be to the hibernation site?

Doug Sweiger - They're right on the water table.

Bob Johnson - We've heard a lot of really interesting, challenging, thought-provoking information that you'll want to distil, implement and share with your colleagues and peers also when you go back home. Are there any question or concerns, comments about managing attitudes before we conclude?

Ron Black - Well, I'd just like to point out that in some cases it's not the public's attitude we have to change, but it's our own attitudes within our organizations. It's interesting because our legislation in Ontario protects massasauga rattlesnakes, and some people are not very interested in enforcing that legislation, or are not interested in the issues around that such as collection. I certainly would be interested in talking to anyone who had some pointers on how to tweak their interest, how to get them more interested.

Doug Sweiger - Just further to Ron's remarks about getting attitudes to change, and the point Michel brought up about sharing intelligence internally and then maybe providing it directly to the offices involved in law enforcement... I think remarks like Tom Anton's remark about a pair of massasaugas being sufficiently exotic to fetch \$750 or \$850 U.S. dollars overseas might pique interest a little bit. I think a lot of it has to do maybe with old ideas about having no value. As much as it's abhorrent to some people, putting a value on something can suddenly make it of more interest, perhaps. But that kind of information shared internally, a price list of herpetiles for instance... for an officer who maybe doesn't appreciate non-game, who thinks commercial

fish for example are worth money and will therefore devote more time to them...

Ron Black - That's a good point, Doug, and in fact the point of sharing intelligence, just that statement tweaks their interest right there. Michel and I have had discussions about sitting down with our officers and discussing intelligence and I think that may be the way to approach the subject with them.

Bob Johnson - Let's bring this to a close simply by going back to a summary Robert Hay wrote seven years ago at the first symposium. Robert agreed to do a summary of some of the management concerns that we had for massasauga rattlesnakes at that time, more as a conclusion of that workshop and a bridge or a link to the one we are holding today. I was going to use them to judge how far we've come in seven years. Certainly we know now that 'wetland habit use is preferred over upland use' is not necessarily true. In fact Chris found out quite well that you can look in those areas and not find any snakes... I was lucky enough to visit the eastern diamondback rattlesnake research site in Georgia in the summer... again, reading Klauber it certainly coloured our approach to where we looked for rattlesnakes, and they were finding that Klauber's information on what eastern diamondbacks did wasn't all true either... it was true of one or two populations that Klauber was familiar with, and it's the same for the massasauga. In some areas there's dependence upon upland habitat for brooding and hibernation. Another concern, 'Intentional killing of massasaugas by landowners and uninformed persons across their range'... I guess we should say that although that's still going on, and that's still a concern, we can see from the presentations that we heard today that this certainly is being addressed and there has been some positive change. Although what we do in Ontario may not be fully implementable in your jurisdictions in the United States, at least we're all working together, and I think Ontario may be setting a certain standard. Certainly those of you in the United States who deal with many more species of venomous snakes, some which are definitely more life-threatening than the one we're dealing with here in Ontario, have a greater challenge than we do. But I think if you could see the full-scale turn in people's approaches to rattlesnakes in this province... we may just be a little bit further along the path than you, but I think we have to stick to that path, all of us together. I think the fact that we have a well-organized recovery team here in Ontario gives us a certain advantage over other jurisdictions, and certainly a listing would help you in the United States move along that path a little faster.

The other point that Robert Hay made was 'our lack of knowledge regarding life history and critical habitat re-

lationships of the massasauga limit our ability to manage them effectively. This may severely limit our ability to mitigate for, or work toward recovery/restoration.' Certainly our lack of life history data will complicate recovery. In seven years there has been a change; we do know how to manage this species effectively in a number of jurisdictions. I think there's probably not the political will, or perhaps not the funding. Research would go a long way towards addressing this issue... we do have enough information now to manage much more effectively, or at least we can set up a framework for management with which we can test some of our management assumptions. This last point here... gene pool contamination is certainly still relevant today. I think Lisle's work really indicates this, and in seven years we've come a long way towards understanding that this is probably more important, more critical, and a great hurdle to overcome.

Lastly, I'm going to cut right to the education issue here that Robert Hay mentioned last time... and his comment, 'Individual landowners can be the massasauga's best ally. We should follow Ontario's lead.' I think he hit it on the nail seven years ago and it still applies today. We are in a leadership role here in Ontario in terms of public attitudes and public education, and I think that only gives all of us strength to keep working in our own jurisdictions, and to use that as a source to effect a change in attitudes where you come from, and I'm proud that Ontario can do that. I'm sure our recovery team looks on our efforts as setting a model or a standard; we might be able to do it here a little more easily than in the United States, but once it's done you use that as the basis to say 'they're doing it, we could be doing it too'. Both for funding agencies and political jurisdictions. One other comment that I think is really appropriate - 'Legal protection may also reduce the pressures from collection for the pet trade, something that still haunts populations where the snake is yet unprotected.' We've dealt with that quite appropriately. And lastly - 'Federal listing by the USFWS is likely.' Seven years ago, and we heard today that it may not be likely, but at least we're closer to making that final decision. So within the next year we may have the benefit of this listing, and if we don't at least we know where we should begin in the recovery process. It's been a long two days, I certainly appreciate the honesty with which you've approached these meetings, and the concern you've expressed, your own abilities to be trustful of those who were posing some alternatives you may not fully have agreed with. In the seven years since the 1992 symposium, I think we understand we're working together for recovery and I look forward to the collaborations our recovery team will have over the next seven years.