

SNAKES IN PRAIRIE AND GRASSLAND ECOSYSTEMS: QUESTIONS AND DISCUSSIONS

Moderator: Karen Cedar

Karen Cedar - There was a question about mowing and timing of mowing earlier this morning...

Tom Anton - The situation I'm in, they instituted a no-mowing regimen after a couple of snakes were found in an area where they mowed regularly...it was basically a highway embankment which is covered in grasses... one snake was killed, and now there's simply no mowing done along that strip of highway. But they haven't come up with any other remedial management issues for these roadside grasslands that are increasingly being used by wildlife of all kinds.

Shelly Dunn - Similar to that would be the management issues involving dikes... mowing on dikes.

Tom Anton - In the spring and the fall, and in cool seasons, there 's not a lot of surface activity. A lot of people don't want to gamble on any time of the day during the summer season at all, so just no mowing, cancel it altogether. The other issue we're faced with, especially in the heavily built-up areas, is the assignment of management priority to any habitat, whether it's prairies or bogs or wetland, and in many cases arbitrarily based on the existence of a native plant community that is under threat by exotics. In a site like the one I'm working on, which is an old field which is primarily exotics, even if there were not a moratorium, would be very low down on the management priority list. Even though there's a State-listed animal on that prairie. So a lot of their priorities are assigned based chiefly on plant communities, which is unfortunate.

Rich Seigel - I think if mowing is done correctly, at the right time of day and at the right time of year, it doesn't pose a serious threat. I used to actually ask my refuge manager to mow the levees for me because it increased the visibility of the snakes and the snakes were never killed by mowing. Of course the mowers they used were those big side mowers so you could change the height... they go down the middle of the levee and they're mowing the side. So you never actually touch the surface... the only mortality would be if there was a snake literally in the path of the tire and the snake got ran over that way, and that would be pretty unusual because the mower moves pretty slow.

So we do it that way and we've never found a dead massasauga in almost twenty years that was killed by mowers. We have found them killed by refuge staff driving on the levees in spring, because they want to go out and check on the ducks - we've had them killed by being run over, but never by mowing. So you can mow and not kill the snakes.

Bob Johnson - What time of year are you talking about - you said 'right time of day, right time of year'?

Rich Seigel - They will mow frequently in late May - early June because in the spring there's no vegetation to speak of, and then you get this big burst of vegetation after the spring rains and in late May - early June the vegetation's so high we can't see snakes anymore. They would actually come to me and say 'do you want this levee mowed', and I would say yes, and they would mow it six inches, eight inches high, and they never killed a snake. Never found a dead massasauga. Found lots of live massasaugas after it had been mowed... I never even found a dead garter snake. Now I don't know if we're talking about the same type of equipment... if you've got something that actually hits the ground, then I think you've got a potential problem where you have to be very careful about time of day and time of year. Talking about something where you can change it so it never touches the ground surface, it just cuts the grass ten or twelve centimetres high, then I think you can do it pretty safely.

Karen Cedar - One of the questions we'd like to address is fall burns - we have the option, at least in our park, to do fall burns, and I was wondering if anyone here has had any experiences, if there's any difference between spring and fall burns?

Rich Seigel - I wanted to make a general comment - we've heard several things here today suggesting as if burning is bad for rattlesnakes, and that if you burn you're going to have higher mortality or snakes are going to get picked off. But we've been doing it in Missouri since 1979, and they burn every two or three years. They burn about a third to a half of the prairie depending on how much fire is actually thrown. We've been doing it for twenty years, and the snake

populations are higher than ever. We've got lots of mark/recapture data from snakes that are caught right after a burn; that are caught that fall; that are caught next year; that are caught three years later. We've never seen a predation event and we've never seen a carcass. It still makes me a little nervous, I can understand someone going out after a burn and seeing how flat and open and dark it is, and the snake is so conspicuous. But Jennings has been doing it for years, we've been doing it for twenty, they've been doing it at Swamp Lake in central Missouri for twenty years even though they didn't know they had massasaugas. And there just doesn't seem to be any effect. I would say there's a research need for a graduate student who's interested in management issues to get transmitters into snakes either right before fall entering the hibernation period or immediately after emergence during a burn year, and note the survivorship of those animals. Although I share that immediate concern I just don't think there's that high mortality associated with burns, at least for snakes. Generally, if you burn frequently there are problems with invertebrates, and you might want to comment on that.

Karen Cedar - What kind of timing do you follow?

Rich Seigel - In Missouri burns occur (if I'm listened to) no later than April 1. It's usually about a week or ten days before emergence. They have burned a couple of times in early April. I think in the two times they burned after snakes were active we saw about four dead massasaugas. And during those periods we sweep the prairie really carefully - I usually have a team of three to five students out with me as well as Fish and Wildlife personnel, sometimes it reaches ten or twelve people, we really cover the area well, and I can count on two hands the number of dead rattlesnakes. We see a lot more dead garter snakes and water snakes than we do rattlesnakes, but I think that's because they're out a lot earlier. The problem in Missouri is that that prairie is really wet, and they have to wait for it to dry before they can get it to burn. There's a very narrow window that they can do the burn. And we have to try to convince them that 'look, we'd rather not have you burn this year than burn on April 4th'. They're usually pretty good about it.

Karen Cedar - Our prairie is also very wet, so we have the same problem - a very small window. We have had dead fox snakes directly killed by the fire, and similar to your description we had garter snakes, but the fox snakes and the massasaugas would be coming out at the same time

Dave Mauger - The smaller the site is the more careful you want to be. Maybe if you only burn a third of that

habitat, then that's probably pretty good and you're probably not going to get those kinds of effects. But if I'm dealing with a 9.1-hectare site and the population is 20 or 40 individuals, then one or two mortalities could tip the scales.

Rich Seigel - There's no question if you burned at the wrong time of the year - you could have catastrophe.

Dave Mauger - That's what I was trying to avoid, was that indirect mortality... and I think we accomplished that - however, when we did that spring burn and we saw all those snakes sitting out in the open, and there's a lot of hawks out there, you know it was great for finding snakes and I got a lot of data from that but that was that observation that 'we'd better be careful with this'. I didn't document that any snakes got killed by hawks - it just raised a lot of caution. And the other thing I was noticing... I know based on my site, if there were massasaugas out sitting next to burrows, it doesn't matter if it's spring or fall, fire is going to be hitting pretty close. You want to try and minimize that... what you want to do is pay close attention to the size of your site, and establish criteria so that you always leave a substantial area unburned.

Karen Cedar - We do that sort of thing ourselves...

Dave Mauger - It sounds like you have some excellent opportunities to try and answer some of those questions. For instance, you have a higher fire frequency and there's no massasaugas - I hear that and I think, 'Why not?' There's prairie, there's grassland, why aren't the massasaugas there? It might have nothing to do with fire. It may just be other attributes of the habitat that are lacking, but it seems to me that we really want to find this out. If I was a manager I would want to know that.

Karen Cedar - Well, it's really difficult. The nature reserve has all the features that Spring Garden does... we can't find a single reason why they're not there. They both have ditches with crayfish burrows all over the place, open prairie, wet prairie, mesic prairie, dry prairie, oak savanna, they're practically identical. And the places where the rattlesnakes are found is in the wet prairie areas. We can't figure it out. A very serious question for us is whether we should be releasing snakes into what looks to be suitable habitat in the nature reserve. We have in the past done that and never found them again. That could be because they move around from where we release them, or they could have died off... we have no idea. But I was hoping that somebody here would have some idea - is this what we should be doing? Any ideas on that?

Dave Mauger - Well, I can tell you right off you want to try to find out more about the habitat that might explain why they're not there to begin with before you start releasing them. You may be missing some component that they need. I was only at your prairie one time, and it's a marvelous place, but you might need to try to find those microcosms, microhabitats, and do some detailed investigations into habitats, the community structure, elevations, stuff like that...

Karen Cedar - We have done that... we're not so much worried about the Spring Garden population because we have protection for it, but the LaSalle population is under serious threat. There are animals that we get from there that we can't release back into there.

Dave Mauger - Well, if you're confident that you have habitat that's suitable and they just can't get there, because there's roads or whatever, or maybe they were there a hundred years ago, then you might have a reasonable case to do that. But establishing a population from one or two individuals... maybe you're looking at a captive programme, something like that.

Karen Cedar - Just on the translocation question... I was wondering if anyone has had any successes or problems with moving snakes, not talking about that study where they moved them way the heck out of the way, but just moving them a mile or so. Does anybody have any results - snakes coming back, anything like that?

Chris Parent - I can give you a few anecdotal observations. We have one snake we put a radio transmitter in and we've been tracking the snake for four years now. The snake hibernates in Killbear, but then heads out of the park and hangs out around the cottages that border the park. I think on two occasions he's been discovered by the cottagers, who have asked us 'would you please mind moving our snake from the property please?' We will move the snake a hundred, hundred and fifty metres, and there's absolutely no impact. The snake just keeps on doing his thing as if nothing happened. I think that's happened twice now, where we captured a snake and relocated him a short distance from where he came. Last year, someone who was working for me up in Sturgeon Bay Provincial Park was called by a cottager that they had a rattlesnake on their deck. The rattlesnake was moved approximately 200 metres. The next day it was back at the cottage, they called the person again and Mary-Jo went back and caught the snake again and moved it approximately 400 metres - two days later the snake was back. This time we moved the snake about 600

metres and the snake did not return to the property. We get asked all the time, 'if you move them a hundred metres, will they come back?' Our experience is generally not, but we can't say it will never happen. Occasionally they do.

Karen Cedar - Do you know about the one you moved 600 metres? Did it survive?

Chris Parent - We marked the snake, but this was in Sturgeon Bay Provincial Park, so our presence in that part of the world is nothing like it is at Killbear. So I can't tell you what happened to that snake... presumably if it could move 400 metres and find its way back in two days, that extra 200 metres was enough that it wouldn't affect survival.

Bob Johnson - We feel that snakes will survive a return if they are released within a 'home range.' Even at 600 metres the snake may be doing well, but just not being seen. The work that Ben and I did in Georgian Bay was based on the work that Michel Villeneuve did in Georgian Bay Islands National Park. Michel, didn't you release snakes back at the campsite 24 hours later? When you moved those snakes from a campsite it was to a wetland in the center of the island, and they were back in the campground within 24 hours?



Michel Villeneuve - Prior to the knowledge we have now of the sensitivity of translocation, we had them travelling almost a kilometre within 24 hours.

Bob Johnson - So on the basis of that work, when we did our translocation programme we used that data, so we purposely moved them outside of a kilometre. And from all this work that's been done in Ontario, home range, total distance moved is about 3 kilometres but furthest distance from point A to point B is somewhere

over a kilometre. So that kind of fits your data, we made an assumption that the home range of those animals was a kilometre from any one site. So we purposely put them outside of that home range. And that's where all our snakes died. We did not have a resident control population in that study, but that fact that they all died makes it a bit suspicious because we were previously recommending that people move the snakes beyond the home range so they didn't come back to their cottage site, because that was the purpose - not having them come back. But based on that we now tell people they must not move them outside home range, they must stay within a kilometre, and in fact we've told people 'you can't move them.' We can tell them that even when you just return it to the same area, you either rarely see that snake again, or it just manages to co-exist with you. So now the people we deal with, we're telling them 'Don't move them off of your property, just move them out of the main traffic area and move them off a few metres from there'. And people are doing that and never seeing the snake again. So it's very much like Chris is saying - even though the cottagers aren't seeing them doesn't mean they're not there, it means that the snakes are just very cryptic. And when you do see one maybe once in five years, it's still there the next five years - you just don't see it. So my guess is if you move them outside of home range all those survival factors you're talking about - brood sites, hibernation sites - may have to be rediscovered anew. In fact, you may be causing mortality by doing that.

Karen Cedar - One of the other things I would be interested in finding out is minimum viable populations.

Rich Seigel - Well, based on what I said yesterday, and based on the data Chris has, I think you're probably looking at 50 individuals... just to throw out a number.

Karen Cedar - How big an area?

Rich Seigel - As an interactive population - I think you've got a bigger issue to grapple with before you start talking about how many individuals you need... You know, we haven't dealt in general with the whole topic of translocation, we've talked a lot about specifics. Ken Dodds and I have a chapter in a book on burrow conservation, it's a follow-up to a paper we wrote earlier on translocation, if anybody wants a copy of the chapter I'll be happy to send them one, even though it's on burrows it talks about translocation in general. One of the points we made - do you all know what the Hippocratic Oath is? The first tenet is 'First do no harm.' And there's this tendency that I've been hearing over and over again, and I understand that people have a very honest desire

to improve things, but I think that principle should guide conservation concerns. The first concern we should have is not doing anything that's going to cause harm. And in this case, we're hearing about moving animals from an area where there's already a very small number of individuals, and quite frankly they're probably not viable anyway, and now you're going to manipulate that by moving them into an area where you can't explain why there are no snakes. Then I think that you have a very bad recipe that violates that tenet. Before you start doing captive breeding or any other type of process, the first question you should answer is 'Why are there no snakes there?' and make sure you understand that, and once you've identified that make sure that's been taken care of. I think it would be an enormous amount of time, an enormous amount of effort, and it's not going to get you anywhere because you're not going to get what you want, which is a self-sustaining population.

Karen Cedar - What would you recommend doing then with snakes that can't be released where they were from?

Rich Seigel - You have probably a lot of nature centres around that could use a display animal...

Karen Cedar - No we don't... we just have our own, and we only keep one rattlesnake in residence.

Rich Seigel - I know that argument you get with gopher tortoises a lot, but your concern has to be for the species, your concern can't be for the individual. If you want to just move something, you've got a snake that can't be released where you found it and it's got to be released in the wild, and if you want to do that that's fine... but if you start investing major resources into that; you're putting transmitters into those snakes, you start marking the snakes, putting PIT tags into them, and pretend you're actually going to accomplish something towards reestablishment, I think you're fooling yourself.

Bob Johnson - But those snakes could be released... you've got backyards backing onto Spring Gardens, and they could be released back into that prairie... because that person may not see them again for three years. If we are going to move or release snakes we should gather as much information on survivorship as we can. And if the snakes are genetically similar or just isolated patches of a once larger population, they might be moved to secure areas?

Karen Cedar - The Spring Garden area I'm not worried about. Although it's completely surrounded by homes, there's still a nice big block of land in the middle. But

a lot of the snakes we're going to start getting from the Normandy-LaSalle area, there isn't going to be anything to release them to... and I was wondering, what I was thinking now is it might be better to release them into the Spring Garden population rather than trying to establish a new population in the nature reserve. This is sort of the dilemma - do we take the LaSalle snakes and put them with the Spring Garden snakes, where we're pretty sure we'll be able to protect them, or do we bring them to this new place? Obviously we're not ready to make any choices here yet. Probably it needs more research.



Dave Mauger - Why don't you just bank them until you can figure out what to do?

Karen Cedar - We don't have any facilities to keep them properly... we have one display snake that's been in captivity all his adult life, and we don't want to be bringing in any more. We don't hibernate our snake, so he's out and active every day of every year. We just don't have the facilities to keep more than one.

Bob Johnson - I can say in response that this institution and a number of other institutions, zoos, can certainly hold all the snakes that anyone can provide, easily, if that's an issue... there's no problem there. Rich, can you comment on, I know there's some biologists who would say you shouldn't supplement an existing population unless you know what the carrying capacity of that environment is... in fact, you're now going to overstock a limited carrying capacity environment. Can you comment on that quickly, because it seems that that may be the only option.

Rich Seigel - I'm not so worried about carrying capacity as I am about a couple of other things. First of all I'd be worried about, if you're doing it because you're

concerned for that animal, and in fact that animal is going to die after you release it, all you've done is let it die out of your sight. If the motivation is 'I've got to do something for this snake, I can't let it be killed', but it dies six weeks later after being hit by a car, that's just as bad as if you had killed it yourself. Secondly, I would have concerns about translocating disease, and translocating genetic problems. You don't know, you just don't know whether or not that's an issue, and you want to know. Again, going back to the analogy of the Hippocratic Oath, you're saying 'I have a patient who's very ill, I have this untested experimental drug which may do good or it may not do good; should I use it?'

No doctor would do that. They would never attempt it, because it's a clear violation of how they view the world. And yet we do that, and we don't even know what the results will be... we take an animal, we find it in one area, and we say 'well, it probably won't hurt if I bring it over here and release it in this site', because we don't have the resources to monitor that animal, and to put a transmitter in and to have people out following it. We have no idea whether that's done any good for the individual, any good for the population, or is actively doing harm. So I think if you have this kind of concern with disease and genetic problems, and you have very good evidence from your own study that shows that moving animals results in a lack of success and the animals die, how much evidence of this do you need

before we say 'either this methodology doesn't work, it is not a valid conservation tool, or we need a lot more basic research into this before we start using it as a conservation tool.'

Karen Cedar - What kind of research would you recommend using... I'm thinking of the nature reserve, we've done lots of plant research, studying the habitat, the structural diversity and the actual species that are there. Is there some kind of research that we should be doing to prepare these sites?

Rich Seigel - I think you want to know what your other snakes are doing there... I think that would be the easiest way to start. You said you have lots of snakes?

Karen Cedar - Yes...

Rich Seigel - Okay, so what are the fox snakes doing? What kind of survivorship do they have? What kind of brood capacity do they have? Where do they hibernate? What's happening with those? They're a good associate of massasaugas... obviously it's not a viperid, but at least it's often found with massasaugas. If fox snakes are doing well, and you can show the fox snake

population is healthy, they're reproducing, then at least you know you've got a healthy site for snakes. For all you know your fox snake population is declining, they're just not declining as fast as the massasaugas, and so you know then that something's wrong. So if I was looking to do research out there, since I don't have massasaugas, I'd work on fox snakes.

Karen Cedar - We don't have any research, in terms of critical habitat for our snakes... all we have is sightings. And where the sightings have been, they're not touching that area... but in regards to critical habitat, we have no telemetry data at all... so we don't know where these snakes are going. That was the reason we started the project this summer, because even if we could get one transmitter into one snake, we'd have some idea of what kind of habitat they're using. You can't really base much based on sightings. Obviously the snakes aren't living on roads, but that's where a lot of them are found.

Dave Mauger - I think that's your basic problem... if I were you, the first priority I would have would be to get some telemetry work done.

Karen Cedar - That's what our whole aim this summer was... we had two people on it and that's all they did. It's unfortunate that they didn't find any snakes. But we're still going to be continuing - it's an urgent matter for us - but in lieu of finding rattlesnakes, we need to be covering some other bases.

Michel Villeneuve - We haven't really had the chance to talk about law enforcement in regards to these ani-

mals here, and I'm certain that we all share the same feeling that poaching of this particular snake is a serious threat, and we shouldn't forget about that. A couple months ago I tried collecting some information on the U.S. side for any kind of convictions related to massasaugas, whether it was for collection or killing, and it was pretty alarming to get the response from your law enforcement agencies - they're really not any different from the Canadian ones in that their reply generally was 'the only good snake is a dead snake'. Which is a real tragedy, but I'm sure there are some good officers out there. We do have some intelligence on people who are actively searching for these snakes or for any rare species... we're not fooling ourselves, national parks both in Canada and the U.S. are prime areas for collectors. I certainly would like your input especially on the U.S. side of any kind of information or intelligence regarding people that are involved in that kind of thing, and also any kind of convictions.

Bruce Kingsbury - There was a three-year undercover operation that just concluded several months ago and a number of individuals were arrested, and one of the individuals was caught with quite a few massasaugas.

Michel Villeneuve - As a law enforcement officer it's a tough sell to the attorney-general, and to the judges maybe. I just wanted to leave it at that - and on that note, a couple of years ago we had an individual on Beausoleil Island who killed a rattlesnake, and we were successful and got a \$500.00 fine which isn't bad... a couple of weeks ago we nailed a guy for having five bass over the limit and he was fined \$1000.00.