



## Prairie Pod Transcript

Season 2, Episode 5: Herp Tracking in the Minnesota River Valley

Podcast audio can be found online at [mndnr.gov/prairiepod](http://mndnr.gov/prairiepod)

Transcript:

((sounds of birds chirping and wind blowing))

Megan: Hey, welcome back to the Prairie Pod. It is episode 5. I can't believe it. Jess, can you believe we're already at episode 5?

Jess: Truckin' right along here in Season 2.

Megan: Ha, I know. It feels good. And, I'm so very excited because today we have some awesome guests with us here. And we're going to have you guys round robin introduce yourselves so that people will know what's going on. This is like, we've got a stack, we've got a full house of guests. Carol, let's start with you. Tell us who you are.

Carol: Hi, I'm Carol Hall. And, I'm a herpetologist with the Minnesota Biological Survey program and I've been working with the DNR in this position since 1991, going around the state doing surveys for amphibians and reptiles.

Megan: Nice. Jeff, you go ahead.

Jeff: All right, I'm Jeff LeClere and I'm an MBS, or Minnesota Biological Survey, zoologist. And, so I also go around the state and survey for all species of amphibians and reptiles, in all areas of the state in Minnesota. But in recent years, I've been focusing on mark-recapture and telemetry with some specific species of amphibians and reptiles at specific sites in both southeastern and western Minnesota, and that's including, but not limited to, what we're going to be talking about today with the Minnesota River Reptile Project.

Megan: Jeff, you said a word there that I want to make sure everybody understands before we introduce our last guest: "telemetry." Whatcha talking about, man?

Jeff: Telemetry. That is, radio telemetry, that's where we take the nifty little transmitters and we put them inside the animals and we track them, every day or every other week or whatever it is to follow their movements, to see where they do specific things like how

big their home range is, where they nest, where they overwinter. All kinds of crazy stuff that they don't want to tell us but we have to know.

Megan: (laughing) Nice! Lisa?

Lisa: Hi, I'm Lisa Gelvin-Innvaer and I'm the regional non-game wildlife biologist for the DNR Nongame Wildlife Program for the 32 counties of the southern region, and we always say we're kind of small and we do it all. First of all, non-game wildlife are most of Minnesota's wildlife, those that aren't typically harvested for food or for sport. And that's everything from birds and mammals, fish and insects, but also reptiles and amphibians. And my work includes everything from survey and monitoring and research to translating that information to guide conservation and other land use. Also, on the ground habitat conservation as well as public outreach. So, whew, that's a lot of stuff, but one of my favorites, most recently, has been the work on what we're going to talk about today, the Minnesota River Reptile Project, because, one, I got to study a lot of fascinating critters and also because it weaves together all the different parts of my job, like restoration of prairie rock outcrops and that typical guidance, and so everything is connected, just like it is in nature. And, I get to work with some really cool people, like Carol and Jeff.

Megan: I like that. We're one big happy family in the DNR. Yay! Family! (laughter) So, we, this is a perfect segue, thank you all for that, and we're going to jump right in because we have so much to cover and we want to make sure to give you all the good deets. So, today, we're going to talk about everybody's favorite subject--snakes and skinks! Skink with an "i", that's what we're saying. Just so you guys know. (chuckles from the group) So, Jess was hoping we'd talk about prairie turtles. We might have time to ask that question for Jess' near miss in the field with a prairie turtle that was stalking her, but first we're going to get to the snakes.

Jess: We're going to have to get that question in eventually.

Megan: (laughing) Yeah, I know. We'll get there. So, specifically, we're jumping right in. So, Jeff, we're talking today about the Minnesota River Reptile Project and you mentioned earlier, when you were talking a little bit about what this is and about the tracking you do, so tell me--start out with the basics. What's a "herp"? What are we talking about?

Jeff--Uh, so that's kind of a loaded question. And, you wouldn't think it would be but it is. So I'm going to give you the short answer first. The short answer is that it is amphibians and reptiles in the same group. Herp is short for herptile, which means that amphibians and reptiles, again, which are two different groups, are kind of now in the same group. The act of looking for herptiles is often called "herping" and, for those of us who really like to do this on a regular basis, we're called "herpers". And, it's a very, so, anyhow that's the short answer. A little more lengthy answer is that amphibians and reptiles are not closely related to one another, as groups, so it's a little unnatural group. And also, the members that make up amphibians, for instance the smaller groups, frogs, toads,

salamanders, things like that--that make up amphibians--are not closely related to one another. And neither are the groups that make up reptiles. So, there really is no such thing as an amphibian or reptile anymore, unless we're talking about snakes and lizards, then the reptiles. But all of these we're finding out now, with the recent phylogenies is that none of these are natural groups, but we keep them together for the sake of tradition.

Megan: (laughs) So you're not saying that snakes aren't natural? You just mean it's not natural for them to be grouped together. I just want to clarify...

Jeff: Exactly. If you're going to call anything a reptile nowadays, snakes and lizards still qualify. Everything else does not.

Megan: That's really good. I get really confused about that, so I'm thankful for that reminder. So, along those same lines, Jeff, tell us a little bit about the basics of gopher snake, identification in biology. How do we tell a gopher snake from other snakes?

Jeff: Ok. Well, the first thing I like to point out is you may hear us use the term "bullsnake" a lot during this. And that's really what we call gopher snakes here in Minnesota. So, so let's see here--a bull snake is a subspecies of gopher snake. And the only subspecies of gopher snake that lives in Minnesota and throughout the Midwest is a bull snake. So when we say gopher snake we mean bullsnake and when we say bullsnake we mean gopher snake. The only time this doesn't apply is when you get to the west, the western part of the U.S. where there are several subspecies of gopher snake. So that doesn't count. Here, same thing. (Megan chuckles) Same difference. Just so you don't confuse people. So, bullsnakes get about 6 feet long, on an average they're about 4 to 5 feet long, but can grow up to lengths of 6 feet long, and they really have a kind of busy pattern. They have these big blotches, or spots, down their back and on their sides, but they have a lot of little speckling that's in between these spots, so it kinda looks like they're, again, the spots and blotches that are on the outside are not really prominent as they are in other species of snakes. Another really crazy thing about their pattern is that they are kind of black and white up near the neck of the anterior portion of the body. Then when you get to the mid portion of the body it's kind of a dull yellow or a straw yellow for the background and the blotches become a nice kind of a rich, brown color. So, that's really cool, but when you get to the tail the yellow brightens up again, a nice bright yellow brown color and a nice, rich, dark black banding or circles on the tail or banding on the tail. And the important thing about this is it looks like you're looking at three different kinds of snakes, even though it's all in the same one. A really good way to differentiate this species from other species which kind of have the same color pattern and scheme throughout their entire body, so, things like fox snakes, northern water snakes, both species of hog-nosed--things like that--tend not to have as much speckling and tend to look the same uniform.

Megan: Tell them about their head.

Jeff: Let's see here, what else we got? Oh, the head is kind of yellow--yeah, the yellow coloration, which is heavily marked with black so there's a lot of dark markings on a bright yellow head. And these markings are so distinctive that we can even identify individuals, one from another, by using these types--these patterns on the head. The snout is very narrow and pointed and the rostral scale, the scale that is on the snout, is very tough and large. They use that to burrow into the sand and into the soil. So that's an interesting thing about these guys. So, they are colorful constrictors. They consume mostly small mammals, rodents. They have aggressive appetites and their first line of defense is camouflage. So they usually try not to be seen and they will just sit there, kind of coiled up, basking, hoping their crazy pattern will blend in with the surrounding grasses, which actually works pretty well.

(chuckling from Jess and Megan)

Megan: So it makes it kind of hard to find them.

Jeff: Yeah, definitely.

Megan: So pretty much a prairie snake, is what you're saying.

Jeff: Definitely a prairie snake. They need to have prairie. And, I would say, you know, their temperament varies quite a bit, they're individuals, so roughly half the snakes that you meet will be pretty aggressive, and they give a loud, raspy hiss, probably the loudest hiss of any snake in the state. And they'll coil up, and they'll strike, and they'll look all big and tough and they'll vibrate their tail. Now, their tail, when they're making this vibration, if it hits dry grass or leaves or anything like that, it's going to make a buzzing sound, or a rattling sound. And people will be like, "Oh, my gosh, I saw a rattlesnake!" Well, they don't have a rattle on the end of their tail, and, so, a lot of times people will mistake these for rattlesnakes. So, that's kind of an interesting thing. The other fifty percent of these guys that I've encountered are very docile, very calm. Even a wild snake, from the get go, you pick it up and it's just like, oh, ok, and it just kind of goes with the flow and is really laid back. So these guys vary a lot in their temperaments. And even though these guys put on a big, impressive display, and they're all mean and tough, they're completely harmless to humans. Even the ones that have the aggressive kind of demeanor, they're completely harmless to humans.

Megan: Well, that's the important point. You had me at how beautiful they were and then you started talking about their hiss and I got scared again. But we'll move forward. Carol, we want to jump to make sure we get this in. Tell us a little bit about the other side of what we're talking about today, skink identification in biology.

Carol: Well, five lined, common five lined skink, is actually not all that common in Minnesota and it is listed as a species of special concern or a species of greatest conservation need. And it is sort of patchy in its distribution in Minnesota. We have records in our study area, obviously, in western Minnesota, along the Minnesota River Valley, in Redwood, Yellow Medicine, and Renville counties. In addition to that, they

occur in southeastern Minnesota in the far south, two or three, Winona, Houston and Fillmore counties in the far southeastern part of the state. And then there's this other population that's up in Chisago County, north and east of the Twin Cities. So, they're kind of spotty. They are one of three lizard species in Minnesota. There's also the prairie skink which is very similar in appearance to the common five lined skink but is widely distributed and again is a grassland species and occurs in grassland habitats. The common five lined skink occurs in areas where there is forested habitat. They live along forest edges or forest openings, savannahs, and often [in an] oak type of forest community. And they also occur where there are rock outcrops is another important factor of the habitat they occur in. And they use that rock structure for cover. They might go underneath a little slab of rock or they could go down into the fissures, the crevice, to get protection during the winter. They would freeze during the winter so they need to escape, go underneath the frost line. So they need to have deep enough crevices where they can get away from that cold temperature. They feed on invertebrates, spiders, crickets, other things you might find underneath a log if you lifted up a log and saw creepy, crawly things. They'll get whatever they can capture. And, let's see, what am I missing? Oh, so Jeff went, I guess I could talk about the identification. They are about 8 inches in length, about half of that is their tail. They can be identified by the five lines, as their name indicates, down their back. The middle line turns into a V at the top of their head, and that is very evident in hatchlings and juveniles, but fades quite a bit as they age, which makes them a little more difficult to distinguish between the prairie skink. But the young ones, Jeff was elaborating on the tail of the bull snake, young five lined skinks have bright blue tails, I mean the bull snake tail has nothing on the five lined skink tail. (group laughter) It's electric blue, yeah, they're just beautiful. But when talking about the tail, if you do try to capture them that tail will come off and that's one of their defenses. They leave this little wiggling thing in your hand and they run off to safety, hopefully. (chuckling) And will that regrow? This is the myth that everyone wants to know. It does grow, yes, but you know it does provide some benefit, that the tail does provide some benefit to the individual, either nutrition or moisture during drought periods. And so, a skink is at a disadvantage if it loses its tail and whenever we capture them we obviously try not to let them lose their tail. (murmurs of agreement)

Jess: Wow, that was a really great introduction to these wonderful prairie herps. I'm using the right terminology here. (chuckles) Lisa, tell us a little bit about why we should care--why do these guys matter--why are we here today talking about these critters?

Lisa: Well, for one those are the species as we mentioned are species of special concern and state species in greatest conservation need. They're at risk. But, at the very basic level, to paraphrase the famous biologist Aldo Leopold, if we consider everything in nature good, then every part is good and to keep every cog and wheel is the first precaution of intelligent tinkering. These do play important integral roles in maintaining their ecosystems. They're both predators and prey. They're part of that whole food web. From a standpoint of humans, they provide ecological services. For instance, environmentally friendly rodent control. Jeff mentioned how the bullsnakes eat a lot of rodents, which can be agricultural pests, they can be vectors of disease which can be transmittable to humans, such as Lyme's disease, so reducing those rodent

populations is important. Five lined skinks eat a lot of invertebrates, such as crickets, and spiders, millipedes and termites and slugs and they also provide food then all the way up the food chain to other species. There is also the cultural significance. Both lizards and snakes are featured in Native American sacred texts and traditions and symbols, including the Dakota Sioux tribes along the upper Minnesota River Valley. Jeff mentioned herping, you know there is increasing popularity in herping, which is, you know, sort of the reptile and amphibian version of wildlife watching. Many people derive great enjoyment from these species. So, and lastly they are indicators of environmental health or un-health. As they go, so go a lot of other wildlife and so for people. So, those are important reasons why it's really important. We did also pick these species because they're underrepresented in survey and monitoring data. A lot of the information was old. Often conservation and management is based on response of vegetation, how vegetation responds to management or other specie groups like birds or large mammals. It's quite possible to make an area, a plant community, look good, quote-unquote, but not meet the needs of other associated wildlife. And reptiles can have very special requirements. They may not respond in the same way as like birds do or at the same scale. Certainly, reptiles cannot fly to new places when their habitats are lost. And, you mentioned that, for instance, the five lined skinks occur in small, kind of isolated populations, and mentioned the rock outcrops in the Minnesota River Valley. Those were historically prairie rock outcrops. They're not making more of those. And, so, if they get altered or lost in some way that becomes a real issue. And bull snakes tend to thrive best in native prairie, but we only have one percent of all Minnesota's historic native prairie let alone the dry native prairie. So, then, taking care of them and monitoring them helps a lot of other things and helps us gauge the effectiveness of our conservation.

Megan: That's a perfect, beautiful response. I just want to say that.

Lisa: Thank you.

Megan: That was very nice. I liked it. We want to jump in, I really want to make sure we get to this. Carol, give us a really quick overview of the Minnesota River Reptile Project. What were you all doing out there? I know, how do you condense that? But try to give us the quick and dirty--what are you all trying to do?

(laughter)

Carol: Ok, well, we're trying to learn more about these rare species so that we can maintain, we can improve our management of them and try to have sustainable populations for future generations of Minnesotans to enjoy and learn about. To give you a quick glimpse of the study, would involve a little more time but I'll just give you a glimpse of our approach. With regards to the skink part of our study, we have four sites with varying degrees of management needs. Some of these are protected sites. The managers are going to go out there and do prescribed burning, cutting and what not, and they need to know how best to do that. So what we've done is identified--placed grids on the ground--that have cover objects that the skinks will use if they're present,

and one is metal and one is wood, and they're, what, over 90 cover objects within the project but placed over these four different sites. And they're in grids at each site. So the cover boards are checked and transects at least once a week. And the numbers of skinks are counted, they're marked, the sex is identified if possible, and the age and then we've also characterized, or collected data on the different habitat features on each one of these plots with the cover objects. And so, over time, as the data is collected, and the skinks using some areas more than others, we can do--Mike Worland, actually, who was on a previous podcast, is going to be doing some analysis, has done some analysis, and is hopefully going to be finishing up on that, to compare the number of skinks found with the different types of habitat features at each one of these plots. We collected information such as the percent of open rock that's available to the skinks; the cover, the types of woody cover or rock cover that is available at each one; the canopy cover; and such things as that. So, and in regards to the bull snake, which is also part of the project, we were--we knew that records occurred in the Minnesota River valley, but there hadn't been sightings for several years. And, given that we were interested in learning about skinks, we combined the bullsnake into the project so we could learn more about its presence and habitat use also. This is a disjunct--the bullsnake population is also disjunct from other populations in the state so it is a kind of a critical population in a site that we need to learn a lot more about so again, we can have a sustainable population there.

Megan: Carol, when you say it's disjunct you mean it's separated from other populations...

Carol: Correct. Yeah.

Megan: So it's kinda isolated there.

Carol: It's very isolated, yes. And there might be other individuals, there might be other populations out there along the Minnesota River Valley, you know, prairies that we don't know about. This is the one we know about and we're trying to learn more about it so that we can have it around for a long time. You know, likely, there were probably, bullsnakes were super abundant back when there were a lot of prairies in the western part of the state. But at this point, we have very few populations and we want to make sure they're around. It took us two years, actually, three years of surveys, to locate the bullsnakes that we're studying now. And as Jeff pointed out, we're putting transmitters in them, surgically implanting them, and tracking them. Initially they were tracked on a daily basis, or 5 days a week and at this point, with less staff on the ground, we're tracking them as we can, preferably one or two times a week.

Jess: So, you use the cover boards, and I presume you flip them up, right?

Carol: Correct.

Jess: And then you pounce on whatever's underneath it? (laughter) So then you're, it's real fun...

Carol: Be sure to avoid the cactus...

Jess: Well, yeah, that'd be an important step. It's real fun, it's quite a thrill to do this, I've done it before in Iowa, so then you get a sense of the abundance, right, it's basically what you're doing out there is getting an idea of how many...

Carol: And how they're using the habitat.

Jess: Right, and how they're using the habitat. Do you regurgitate them? Do you look at what they're eating?

Carol: No, no. We haven't done that. You know, we just look at, we haven't collected information on actual items that they could be eating but, you know, pill bugs, what's another name for them, there would be an abundance...

Jeff: Wood lice.

Jess: Sow bugs.

Carol: Wood lice?

Jess: Sow bugs.

Carol: Yeah, sow bugs.

Jeff: Roaches.

Carol: Roaches, yeah, roaches were actually pretty abundant out there. That was pretty interesting and I guess that would be a part of their diet, but we don't know, and I don't think anyone caught one with a roach in its mouth.

Lisa: The skinks seem to like the... the skinks seem to like rivers of low vegetation that wind through the rock outcrops and that's where there food is, there's cover, there's shade, moisture. So it's kind of that interspersed.

Jess: Yeah, that's great. So, thanks for that overview of the project. Carol, real quickly, just how much longer do you plan on being out there watching these skinks and snakes?

Carol: (laughs) That's a good question. We started in 2014, 15, I'm sorry, 2015. So we did a trial run that year and added additional cover objects in 2016 and in 2017 continued that effort. So that's when our funding basically ended, the project ended, but we hope to come up with some best management practices for the land managers and then return, if we can get funding to do this--long term monitoring is not an easy sell--but

we would hope to go back in maybe 5 years or so and look at how the population may have changed, based on the management practices that have taken place there.

Jess: That's awesome. So, Jeff, tell us a little bit about what you think the future holds for skinks and snakes in the Minnesota River valley.

Jeff: Well, in my opinion, I think that, five lined skinks, I think the future looks pretty good, especially with the data we're collecting, habitat measures we're taking, I think that if we can provide best management practices and technical guidance and land managers get in there and properly manage their habitat and their population, it looks pretty good for five lined skinks.

I'm less optimistic about bull snakes, and the reason for that is because we're finding that these are a prairie species that require a lot of space. They're a big snake, they need a lot of space. We're not sure how their genetic flow is, in other words, their connectedness to other bull snake populations so we don't really know how that will impact future populations. Or populations in the future, I should say. The other thing is that prairie restorations, as they are now, may not be sufficient for bull snakes. In other words, they seem to need a certain structure to the prairie that restorations might not provide for them.

Megan: Are you saying we need to be more diverse, is that what you're saying?

Jeff: Yeah what I'm saying is that they need grasses of intermediate type and height. When the grasses are too tall, and that's all you have on the ground, bullsnakes cannot thermoregulate properly. In other words, everything is too closed in, it appears, and they can't bask properly or they don't seem to want to use those areas, for whatever reason. When you have a great diversity of seed mixes in there and you have areas of taller grasses but then shorter grasses, they seem to really like that a lot more. Now this is all anecdotal based upon our telemetry results. But that's what it looks like. And so there are areas of restored prairie that they just seem to not want to use and they just really seem to favor those more native sections of the prairie.

Jess: Or, possibly, restorations that look more like native prairies in their structure and diversity that are approaching that native prairie structure.

Jeff: Mmmhmm.

Jess: Maybe they could survive there as well.

Jeff: Yeah, perhaps.

Jess: Bees, too. Bees need that bare ground, right, for nesting, so there's lots of things that can benefit from that varied structure. Birds, there are a lot of birds, too, that can benefit...

Megan: Good job mentioning the birds, Jess... (Jeff laughs) This is a good segue while we're mentioning all the critters. We're just going to move into...

(Jess and Megan together) Let's Science! To the Literature!

Megan: So this is the part of the podcast where we're going to recommend a book, a blog or paper and today we are super lucky because we have a whole bunch of resources for you so we're going to just round robin this, in order. So we'll go ahead and start with Carol's pick. Tell us a little bit about the paper you chose and give us just a real quick overview of it.

Carol: Ok. Well, I was interested in this paper because I recently emailed Dr. Hecnar and he provided this to me. I have to admit I haven't looked at it in a super amount of detail but he provided a report called 'Population Trends in the Effect of Ground Cover Selection of the Five Lined Skink at Rondeau Provincial Park with a Suggested Ranking of Locations for Translocation in the Carolinian Region'. Ok, so, it's a long title. It's a report to kind of follow up with long term surveys he's been doing with his students in Canada and looking at the habitat uses of skinks. And they've gotten to the point where they know where the skinks are, they know where the best populations are, and they're looking at places where they can repopulate. You know, bring young skinks over to another site after the habitat has been improved. One of the issues that we face along the Minnesota River and elsewhere in Minnesota is that the invasive species, such as red cedar, can take over sites, and with proper habitat, as Jeff mentioned, we could improve those sites. We could even repopulate some if we find that skinks are absent at sites where they previously had been. So that's, he's got a lot of great information in here. The 2016 report that was also put out covers a lot of telemetry that they did on skinks. It's pretty fascinating, and it's something that we wanted to do but weren't able to do with skinks although we've been doing it with bullsnakes. And they found that the skinks use trees quite a bit. They're actually going in tree cavities to nest. One individual skink was found over 30 feet up in a tree. (laughter) Probably trees, you know they provide good cover, there's probably a lot of insects in there, and they can adjust their temperature based on just moving to different parts of the tree. So, anyway, that's a short and sweet reply, response I guess.

(chuckles)

Megan: And we have just one quick clarification for our listeners. So, you mentioned red cedar, you talked about it being invasive, and it absolutely is but I just wanted to clarify it is a native species in the state of Minnesota but it's--we call it invasive but here's where we get in muddy waters here, but it's invasive because it doesn't play well with prairie. So, if you want to maintain prairie habitats you don't want red cedar in that habitat. It also tends to make monocultures which means it only likes itself and it makes lots of itself and then that sort of gets rid of this prairie horizon that we talk a lot about on the podcast. And that's what we need if we're going to maintain all the species that rely on prairie and, I'll note, that Jess and I are individuals of those species that need prairies. (chuckles)

Lisa: And buckthorn is a non-native, invasive species that's a problem.

Megan: Right. And Lisa, it's your turn!

Lisa: Ok, well, the one I picked was by Joshua Kapfer, James Coggins and Bob Hay and it's called 'Spatial Ecology and Habitat Selection of Bullsnares at the Northern Periphery of Their Geologic Range'. And, hey, you know, Minnesota is near the northern edge of bullsnake range and one of the reasons I really like this is there were a lot of things that seem to apply to our area, for instance that they found that their bullsnares had a large home range. They did seem to see a lot of site fidelity, that they were using the same areas year after year. Now, we did see some differences between our 2016 radio tracking, and I mean 2017 and 2018. Seems like in 2018 they used some, they went a lot further than they had the previous year so that does show that you can't do just one year of tracking and say that that applies all the time. They did find, interestingly, that their bullsnares, a lot of them overwintered in south-facing rock outcrops, deep in crevices just like our five lined skinks do. Now, we haven't seen that yet with the snakes we've been tracking but it does make us think that the potential for that along the Minnesota River valley that that's a way for them to get deep enough below the frost line. Another, some other things that I thought were really key points is that because there is such geographic variation in how bullsnares use habitat we've seen differences, even in Minnesota, between the more eastern populations versus those in the more western Minnesota River Valley, that there is not a 'one size fits all' prescription. You don't turn to page 34 and this is what you do everywhere. So you really have to know what your local population is doing and what their local conditions are for that. And, also, for management, the timing, intensity and frequency really make a difference for bullsnares so you might not want to do repeated burns in the same area annually for bullsnares. And also there's times of the year when they're just coming out of overwintering where they're still a little sluggish and cold that they could be more vulnerable. So, while fire and some of these other management tools are really vital for prairie management, you really have to be a bit more nuanced, particularly since our prairies are so limited and fragmented now, that we don't have that unlimited, unbroken prairie, so we really need to be a bit more careful.

Jess: That's another classic theme of the prairie podcast. There's no recipe for the cake that is the prairie management. We can't...

Megan: You need sugar! Which is the diversity.

Jess: Well, yeah, (laughter) we definitely need this in key parts, right? Like Megan's cake can be different from my cake, can be different from Lisa's cake, can be different from Jeff's cake and Carol's cake.

Lisa: Let them eat cake. (Megan laughs)

Jeff: Hopefully. (laughter)

Jess: Ok, Jeff, give us your fabulous science pick.

Jeff: Ok, so mine was one I happened to be an author on. It deals with 'Intergeneric Hybridization in Snakes in the Western United States'. And this happens to be a couple of hybrids that were found between bullsnakes and fox snakes in both Minnesota and Iowa. And the reason I chose this paper was not only because it was significant at the time, it was one of the first supposed intergeneric hybridization occurrences in snakes in, like, ever, across--you know, like in the world. (chuckles) And this one we were able to prove, not only using morphological analysis but also genetic analysis. So, these were definitely hybrids between these two species. So, not only is that unusual but the reason I chose this for today's paper, or topic, is because an interesting thing that we've been seeing in Minnesota with all of our populations of bullsnakes is that fox snakes seem to be very absent or very scarce within the population of bullsnakes, but they are common surrounding the area there. And, in one of the study sites, which is the eastern part of Minnesota, is where one of these hybrids was found. So, again, we're talking not only about how bullsnakes are declining, but also keeping their genetic diversity. And, we need to be careful that as the population or the habitat changes we're not allowing more adaptable fox snakes to penetrate, to come into those habitats and push the bullsnakes out. So I thought that was an appropriate paper.

Jess: It's really interesting.

Jeff: For today's, yeah...

Jess: We always have to think about those competitions between species, or whatever is causing it, it's really interesting...

Jeff: Yep

Jess: It's like Lisa's Aldo Leopold quote, now, about the cogs. (group murmurs in agreement). Ok, well, we'll reference those as well as some other great references like the amphibians and reptiles in Minnesota book and a couple Minnesota Conservation Volunteer articles. But, that was really great. Thank you all for bringing your picks. Hey, Megan---

Megan: Yeah, Jess?

Jess: Take a hike!

Megan: All right, I will! And today I think I might want to take a hike on some rock outcrops and find some of these electrifying blue tailed skinks or these beautiful yellow--no, I'm not going to look for bullsnakes, let's be honest, I'm not (laughter and chatter from the group)

Jeff: Oh, come on now! (more laughter and chatter)

Megan: Oh, great, and they're super important, but Megan is afraid of snakes and she gets the snake shakes (hooting from Jess) Yep, I know it, ecologist fail. So, (laughs) it is what it is, so we are going to talk hiking, yeah, on some of our amazing public lands so I just want to mention, as we always do on this part of the podcast, that these are *your* public lands, these are places where you can recreate--you're a landowner, people! Get out there and explore your land holdings. So you can visit, and you can learn about where you can do this, on the DNR's website, the DNR Recreation Compass. And so all the things that we're going to mention today don't forget that you can just type that into your old Google machine, the DNR Rec Compass, or Recreation Compass, make sure that you're in Minnesota or it's going to be a fairly long hike, (laughs) and you can find the lands that we're going to talk about today, which are yours! So, let's go ahead and start with Carol.

Carol: So, you won't find any five lined skinks at the site that I picked, unfortunately, prairie skinks may occur there, but--and if you do find five lined I want to know about it!-- but it's the Whitewater Wildlife Management Area. And it is widely known by outdoor recreationists, hunters, anglers, whatever, there's trout fishing there, turkeys and deer, so a lot of people go there for that reason, but it's also got a great herp diversity. In general, southeastern Minnesota is a herp hotspot in the state. So, the Whitewater Wildlife Management Area has several bluff prairies and these have rock outcrops and grasslands and they're surrounded by oak forests or oak woodland. There's also some savannah within the WMA, and these provide, these sites provide habitat for a variety of snakes, including the smaller ring neck snakes; fox snakes; milk snakes; bullsnakes occur there although they're not very prevalent; eastern hognose snakes; and there's rattlesnakes in the vicinity, but it's probably pretty unlikely you would encounter them down there. But if you get up to the bluff prairies, these are south facing rock outcrops, you can have a beautiful view of the Whitewater River and that entire valley and it's just an awesome place to go to.

Jess: That's great. All right, Lisa. Give us your pick.

Lisa: Gosh, it was really hard to choose, but I think my pick is going to be the Swede's Forest Scientific and Natural Area where you can find five lined skinks. It's a little over 200 acres in Redwood and Yellow Medicine counties, located along the Upper Minnesota River Valley. And, I love it because of the rock outcrop prairies. I love the old bones of those ancient outcrops, they're billions of years old, I just want to drape myself on them, and -- (laughter) --there are all these really cool, like, rare plants, and the five lined skinks, and you know, you can lose yourself in those vistas. I say find yourself in the process. You know, and while you're exploring those rock outcrops look for the evidence of the grooves on the rock from glaciation. But, even so--view gently, because there are a lot of sensitive species there that depend on the rock outcrops and, you know, so view, but view gently. So, the other thing, you know, while I have the opportunity, while I have a captive audience here, we've been talking about the importance of monitoring, conservation, and, of course, what we're doing now--outreach to let people know about prairies and the important plants and critters that live there--but in order to do that, we have to have support for that. And one of the ways that people

can do that, is one, by letting their decision makers know that they support this kind of work but also to donate to the Minnesota Nongame Wildlife Fund, which provides over 80% of the funding for the nongame program. We don't get any state general fund money, or funding from fishing or license fees. And there's many ways to contribute. One of the key ways is the Nongame Wildlife Check-off, while you're doing your taxes, but, any time of the year, online donations, one time or recurring, you know, that ongoing membership type of approach, mailing your donations, or even estate planning. We use those not only directly, but to leverage and match other funds. So, show the love, it's not enough to love the wildlife you've got to care for them, too.

Megan: Perfect! I love that. So we do a little bit of--I'm still, I'm still struggling a little bit because, with this 'view gently' thing, I'm imagining that I'm viewing gently when I go out there that you're also going to be draped on a rock outcrop, so you should also view gently because of the sensitivity of the habitat but also so you're not walking on top of Lisa! (laughter)

Lisa: Watch them trip on me! (more laughter)

Megan: Jeff, what's your pick?

Jeff: Well, my pick is going to be Blue Mounds State Park. Blue Mounds State Park is found in Rock County, in the very southwestern portion of Minnesota, and it is beautiful! It's known for its geology and its rocks. Those rock outcroppings are something that really attracts me to that area. And, I'm not going to drape myself all over the rocks like Lisa, (chuckles), because I'm afraid I'll roll away and roll into a cactus. (laughter) And cactus are numerous out there and that's one of the things that makes it cool, but I don't really want it stuck in me. So, (more laughter), there's (Jeff laughs) a lot of diverse plants and animals that live out there. And, especially some of the plants are listed species that you can only see them at certain times of the year. And these little tiny, like, basically they're nothing more than little puddles that form on the rocks. And they're just little tiny, and another cool thing is sometimes you get like little shrimps in there, too. And, I wanted to find a way to work shrimps into this, too. (laughter) That's a good way, to, you know... But they are kinda cute, they just motor around in there. It's pretty awesome. But, even like from aerial photography, the place looks just great, it's impressive. And there's bison out there now, so, you know, so what's not to love? It's just a really great place to go. And there's lined snakes there now. It's the only place in Minnesota you can see lined snakes.

Jess: It's quite a nice campground, too. Megan and I stayed there...

Jeff: No fishers? (laughs) (group laughter)

Jess: No fishers there! Just the average--no fishers, you're safe!

Megan: These are all great! And, these are all part of your public lands. So, we are super--I mean, can you tell that these folks love their jobs? And love this beautiful place

that's called Minnesota. I mean, I'm really grateful that you guys have shared some of this awesome knowledge with us today. I just want to thank each and every one of you for being here today. I--I just enjoy so much learning, hearing new things and getting the nitty-gritty in depth. And we're really, really grateful that we live in this beautiful state of Minnesota where we have all of these amazing places that we can visit. Because of the citizens in Minnesota who value our natural resources so much, and they support it through things like the legacy amendment and the nongame check-off--that's you guys voting out there saying we love conservation, we love our lakes, we love our prairies, and we want to keep Minnesota one of the best places in the whole wide world to live. So, thank you very, very much for that. I just want everyone to know that we're done for the day.

Jess: Sad!

Megan: It's--I hate it! Jess, don't you hate it when we're done?

Jess: Yeah, I hate it. I didn't get my scary turtle question answered. I'm going to have to check out Carol's book.

Jeff: Ooooh.

Jess: But, you know, I'll be okay. And maybe I'll post the answer on the website, if I can. But I'm glad Jeff worked the shrimp in there, you know, that's a big part...

Megan: I think it was fairy shrimp, right? (group laughter)

Jeff: Oh, yes, fairy shrimp, yep. (more laughter)

Megan: I just wanted to clarify that.

Jeff: Yeah, shrimp in general, you know...

Jess: We had a lot of fun today. Thank you all so much.

Megan: I know, thank you. And we will catch you next time on the Prairie Pod on Prairie Tuesday. And we are going to be talking about interseeding into established restorations, where Jeff was mentioning we need to find ways to make some of our older, dense plantings maybe a little more diverse, not maybe a little more diverse, definitely more diverse. Diversity is the backbone of everything...

Jeff: Yes.

Megan: And that is what we want. So we're going to be talking with some awesome wildlife managers and land managers and you're not going to want to miss it. Just like always, you can find all the resources that we talked about today, including the Take-a-

Hikes and the Let's Science on our website at [mndnr.gov/prairiepod](http://mndnr.gov/prairiepod). We will catch you all next time.

((sounds of birds chirping and wind blowing))