Prairie Pod Transcript

Season 4, Episode 29: Snake, Rattle, and Roll: Minnesota's bluff prairies in summer to cozy hibernaculum in winter

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Guest: Lisa Gelvin-Innvaer, Jaime Edwards

Podcast audio can be found online at mndnr.gov/prairiepod

Transcript:

Special Dedication to longtime conservationist, Marty Baker

Hey Prairie Pod listeners, Megan here. Thanks for tuning in to Season 4 of the Prairie Pod. We're so excited you're here and part of our prairie family. This past year has thrown a lot at us and for every challenge, we have risen to it, found opportunity, and championed the prairie and its importance to our quality of life. We felt it was only right that we start this season with a very special dedication to a very special conservationist. So, we're going to take a few minutes as our kick-off to the new season to honor the life of longtime conservationist, Marty Baker.

When you work in conservation you're not just working with coworkers, you're working within a community. And when a member of that community dies, you mourn not just the loss of a wonderful person, but also the loss of all the good they were doing for conservation, for the land for the prairie.

Marty was part of my community. He was part of our prairie community. If you drive across southern Minnesota from Windom to the South Dakota border, and find yourself on a Waterfowl Production Area with reconstructed prairie, that prairie was likely planted by U.S. FWS technician, Marty Baker. Marty worked out of the Windom Wetland Management District over the last 30 years and many of you may have known him.

Earlier in March many of us attended the viewing and funeral of Marty. As soon as you entered the room to pay your respects, hanging there was Marty's work shirt, badge in place, U.S. FWS logo prominently displayed. The only thing missing was his rancher style sun hat and constant

smile. His shirt was placed next to a bunch of cut prairie plants complete with little clipped in butterflies and birds. Next to a display of prairie flowers from the Windom wetland management district staff were Marty's fire helmet and work gloves placed with care and conviction that these badges of service are resting now. The thousands of acres of prairie that they cared for living on as a testament to the man who dedicated his life to them.

Marty was a lifelong learner, always curious and asking questions even though he knew more about the land in his pinky finger than most of us know in our whole being. At the viewing I met his wife Judi and two sons, Bennet and Andrew who have his eyes and his wonderful smile. I had never met Judi before, but when I introduced myself and expressed my sorrow at her loss and the loss of my friend, she pulled me across the Covid rope into the biggest hug I've received all year and thanked me. She thanked me because we recorded Marty's voice for her to have forever. As Judi was hugging me, she asked me if we could share his voice and wisdom with others. And because Judi asked me to, I'm sharing with you a place where you can go and hear his voice, sit with him one more time and try to learn a little about a lifetime of dedication to the prairie from my friend, Marty in Season 2, episode 3 "A legacy of conservation with the service".

Marty--We remember you with this small tribute now, while we work on continuing your legacy of finding joy in life and always being ready to learn. We honor your commitment to the prairie—knowing it will take many of us to match your contribution.

We hope you enjoy the show, this whole season, take a moment for yourself, and remember to be like Marty and find peace, joy, and hope on the prairie. I know he would say, "there's always something new to learn."

((sounds of birds chirping and wind blowing))

Megan: Hey, welcome back, it's season 4. Who's ready for more? Me, me, me, me. Okay. (laughter) Mike, I'm so excited.

Mike: You haven't had coffee this morning, have you? We got to keep you away from the caffeine.

Megan: No, I just had a lot, a lot of tea and I'm just so excited to see your beautiful face. Hi Mike.

Mike: There's caffeine tea. Hey, it's wonderful to see you too, Megan. It's been a long, how long has it been, eight, nine months? No, I'm kidding because we work together, of course.

Megan: I was going to say, not long enough. I mean, I don't have enough ticks on my little board yet. I'm just being Mike again. Mike, we made, season 4, it's the kickoff today.

Mike: We made it.

Megan: We made it. Can you, this is episode 29.

Mike: For you, yeah. I've had a third of that experience but that's kind of amazing, congrats.

Megan: Mike 29, you're feeling fine.

Mike: Congrats, Megan, on all that.

Megan: (Laughter) Congrats to both of us cohosts, friend. We couldn't do it without each other. Okay. (Laughter)

Mike: We're high-fiving through Skype.

Megan: We just virtually high fived. So that was amazing.

Mike: Virtual high five.

Megan: Oh, we better get started because we have got a season for you. It's going to be great.

Mike: I mean, this is probably revealing my biases but the first episode is, is a wonderful topic. It is the best topic ever. I, I don't mean that.

Megan: It's a bold statement. It's a bold statement. Okay, prairie friends, if you don't like this, you got Mike Worland to blame. Well today's podcast we're going to talk about s-s--snakes. Don't get scared. Snakes are a super important part of the prairie and we are going to be talking about fabulous bluff prairies of the east and the majestic expanses of prairie in western Minnesota. No matter where you are, snakes are an important piece (laughter) of what makes prairies function and we are just - -

Mike: Megan, I was just getting ready - - I'm sorry to interrupt. I was just getting ready to congratulate on not doing that on every S.

Megan: I did it on a C just for, so the C's didn't feel left out. Piece.

Mike: Oh gotcha.

Megan: I didn't want it to feel left out. We're going to slide into these details, see what I did there? We're going to slither, we're going to slide, it's going to be super. Okay.

Mike: That's nice. Thank you.

Megan: So (laughter…) what do we do with every season, we like to kick it off with a quote and typically we kick it off with a father, the conservationist, the one, the Aldo, the Leopold, but we're just going to shift gears in season 4 because we do what we want. So we're going to start with a fabulous, fabulous quote from Wangari Maathai, who is a fantastic conservationist and she said a lot of amazing stuff, she did a lot of wonderful work in Africa working on forests and other ecosystems there and she's just incredible and I can think of no better person to kick off season 4 than her. And this quote, Mike, it really resonated with me.

Mike: It's very appropriate. I like it too.

Megan: It's, it's, it's appropriate, so here it is. "There are opportunities even in the most difficult moments."

Mike: Yeah, that simplicity is wonderful and something we all need to remember.

Megan: We do need to remember that and I think it's just going to frame what you're going to hear in all of season 4. We have a lot of good prairie content, we have a lot of good restoration content for you, but we also have a lot of why prairie matters, why it feeds our soul, and why it's so critically important for our wellness, and so we're going to, you know, we're going to dive deep this season. You're going to be, we're going there. We're getting emotional. Get ready. (Laughter) Okay, Mike, sound of snake, snake, rattle, and roll. Okay, we have two very special guests with us today and we're just going to, you know, stop with our snake jokes and let them introduce themselves. Uh Jaime, we're going to start with you. Tell us a little bit who you and what you do.

Jaime: Sure. My name is Jaime Edwards. I am the wildlife manager for the Whitewater Wildlife Management Area in southeast Minnesota, and I've been here for not quite three years. And prior to that was, I was the nongame wildlife specialist that covered southeast Minnesota. Worked a lot on rattlesnakes and bluff prairie restoration as part of that job, and will be doing similar work here at the Whitewater, a little bit fewer snakes than some of the areas that I've worked in the past.

Mike: Welcome, Jaime.

Megan: Nice. Yeah, welcome.

Jaime: Thank you.

Megan: Mike's former coworker.

Jaime: Yeah.

Megan: I guess still, still is coworker.

Mike: Well yeah, absolutely.

Megan: One, one DNR.

Jaime: Yeah.

Mike: You bet.

Megan: Lisa, go ahead and introduce yourself.

Lisa: Well I'm Lisa Gelvin-Innvaer, I am the other nongame wildlife specialist for the DNR Southern Region along with the marvelous Mike Worland, and I've been in this position since 1999, so I've been here a while and, you know, working in conservation in prairies and native biodiversity, which includes snakes is a major part of our work and in fact, it's a key component under the Minnesota Wildlife Action Plan, which isn't only for our program but it's a guide for our work, and so part of that entails further drilling down, you know, to concentrating our actions liking, conservation focus areas including the prairie coteau conservation focus area. But of course, we can't do it alone and we also work with a lot of others, including the also marvelous Megan Benage and others and that's the power of prairie partnerships. So I'm just really excited to talk about snakes, for goodness snakes.

Mike: Oh there you go, there you go.

Megan: Well played, nicely done. We love working with you also, Lisa.

Mike: So she's said how long she's been on, I feel that opened it up for me to say her experience has made her a leader in the nongame program, so I'm very happy that she's.

Megan: No bonus points for sucking up. (Laughter.)

Mike: Oh, I thought there was. I assume there was. I wasn't going to mention how long she's been with the program, so she's said, that makes me happy to point out that she's a leader and I'm very happy she's on the episode.

Megan: Me too.

Mike: Well, let's jump right into the snakes. First I think let's start with Jamie and talking about the southeast. We mentioned the southeast bluff prairies on this show some, I think since I started, I've been bringing it up.

Megan: That's not. Jess brought it up quite a bit.

Mike: Oh, okay. Jess, I'm sorry if you're listening. I appreciate you bringing it up as well. But first of all, let's just immediately, Jaime, if you don't mind, let's immediately jump in to rattlesnakes because I think that is always a hot topic and always something that people want to know more about. You have probably talked for about 1000 hours in your career about rattlesnakes. So please, if you wouldn't mind, give us just a quick summary of their history in this state and their current status and where they live and that kind of thing.

Jaime: Sure. So timber rattlesnakes, scientific name Crotalus horridus, we're at the edge of the range in Minnesota. They occur in the southeast part of the state. Historically, they went all the way up to the Twin Cities following along that eastern edge of Minnesota in the bluff Lister/Driftless area. They have been listed as threatened I think in 1987 or 1989 and have been listed threatened ever since then. And the biggest thing that's threatening them is human persecution because a lot of people are afraid of snakes, they kill them when they see them regardless of whether they're doing harm or posing a threat, and so that's a big issue that the population now is no longer in the full extent of its historic range, it's now retracted to the far southeast corner of the state, so Houston, Fillmore, Winona, Wabasha Counties, maybe a small population in Olmsted County, but pretty resigned to the southeast part of the state.

Mike: Basically the bluff country, right?

Jaime: Yeah, pretty much, yeah.

Mike: How far west do they used to go, do you know?

Jaime: So there's been some records of them like about south central, about halfway across the bottom of the state but some of the old records, they're so old, that it's hard to tell if they're timber rattlesnakes or prairie rattlesnakes because a lot of times they'll

just say rattlesnake, and so we suspect some of those historic records were actually prairie rattlesnakes.

Megan: Well Jaime, I want to interject something here really quick. When you say records, a lot of our listeners might not realize that the DNR actually tracks the location of our rare species or species that are considered species of greatest conservation need, and so when you say records, you literally mean records, like we have a whole database of natural heritage inventory of the state and we're constantly updating that as we learn more about this beautiful, beautiful place that we all live, so I just want to make that point to our listeners.

Jaime: Well, and it's important with rattlesnakes too because a lot of our reports were from citizens reporting to the DNR and we were able to verify those with follow-up, and so it is important for people when they're out and about seeing different species to go ahead and report them, they can report them through Herpmap mapper, they can report them to the DNR, and it's just good to know what species people are seeing and where, even if it's common species, sometimes it's really nice to know too because some species that were common are no longer common, so it's nice to keep track of some of that. It definitely those listed species we're tracking through the Heritage Database.

Megan: Wonderful.

Mike: Sorry to interrupt you, Jaime, what else do we need to know about rattlesnakes?

Jaime: Yeah. So rattlesnakes in our part of the world are found typically on the south and west facing slopes in the southeast Minnesota. That's typically where their dens are found, which is why we focus on our habitat work on dens because we don't have enough time and money to focus on all of the habitat, so we pick the key component to their survival. And part of that is because timber rattlesnakes in our part of the world don't reach reproductive maturity until they're 9 to 11 years old, and they also don't reproduce every year because it's very physically demanding for the female to reproduce, and so because of that, it makes the den areas really critical for protection and for habitat enhancement and restoration. That's why we focus a lot on those bluff prairies. However, they are the timber rattlesnake and so they do use timber, and so they may den on those south and west facing bluffs, but once they emerge in the spring and they disperse, they are actually using the woodlands, the surrounding woodlands for foraging, so, which is why they're called timber rattlesnakes. This, the females, the pregnant females are going to stick pretty close to the dens but the non, which a pregnant female is called gravid g-r-a-v-i-d, so there's your words for the day, gravid.

Mike: Thanks for spelling that out, yeah.

Jaime: And so the pregnant ones will stay on the den and spawn themselves and incubate their young 'cause they give birth to live young, so they're not going to be laying eggs like some of the snakes, they're going to be giving birth to live young in September. But the non-gravid females and the males are going to disperse and they go off into the woodlands and forage. And so if you see a rattlesnake in southeast Minnesota, count yourselves very lucky. They are a beautiful creature, they're not as vicious as people like to make them out to be, they're quite docile, and even, and

situations where they can be cornered, they're still relatively docile, they sound scary because they rattle, they can also puff themselves up with air and they can thrash themselves around, especially those males and they can be a little scary. I've encountered a couple of males and they're ah, I just want to, I'll just back off and leave you alone. I'll go find another snake over there. (Laughter) I don't want to encounter any spiders on the way, I'm good though.

Megan: Solid advice. Now you just told everyone your weakness, Jaime. Never tell them your weakness. Never give it away.

Mike: Jaime has no problem with rattlesnakes but spiders are a different story. Yeah.

Megan: Well you're leading us right into I know we could easily go on a spider tangent here but you're leading us right into our next question that we have for you, which is one that I'm sure a lot of people listening are like ooh, rattlesnakes, I don't know about that. You know, so we want to talk with you a little bit about how, just how lethal are they and how often do people get bit. And before you answer that question, I want to set the stage for you a little bit. I have been lucky to see some rattlesnakes in my day, whether it was when I was working in the woods of Georgia and Alabama or whether I was in North Carolina or in the great state or Arkansas, where I'm from, or even in the southwest of the United States in Arizona. In fact, I just saw a rattlesnake. In fact, I feel like snakes are attracted to me.

Mike: They are drawn to you (inaudible.)

Megan: They know that I'm coming and they're like oh hey, I'm a real giant, did you see a snake today, here I am. Like I feel like that's how they treat me, so I am afraid of snakes, that is my weakness, I am terrified of them, anybody who's been in the field with me will know it doesn't matter venomous or not, I see a snake, I'm running. All of a sudden you'll just see a lady throw her clipboard and she's just running out of the cattails. I had a snake. I even had a snake land on my shoulder while it was hanging out on some cattails sunning itself. It shouldn't be up that high. That's not normal. (Laughter) It should be on the ground where I can see it. And so for our listeners who have this fear, one thing I will say, even though I am deathly afraid of snakes, I certainly appreciate immensely their role in the ecosystem, their role in our prairies, and I do think that they're very beautiful, I just don't want them near me. And so.

Jaime: That's a pretty common thing.

Megan: Yeah, you know, but they are super, super duper important, and so one thing I've always been impressed with snakes is that, I'm getting to my point finally, Mike, you're welcome, is that they don't want to be near me, either, even though I have this impression that I always tend to happen upon them in the field. When I do happen upon them, they are moving away from me or they are rattling to say hey, I'm here, lady, please get away. And so just talk us through, you know, help us calm down, take a breath, talk us through, you know, just how lethal are they, how often do people get bit. What's the concern level?

Jaime: So a bite is pretty rare. We've only had one death attributed to a rattlesnake bite and that was in the late 1800s, early 1900s and medical care was quite different back

then, and so we haven't had a death recorded since. We've had bites, we had a bite in 1984 where a guy was taking a picture of a snake and he slipped and his hand, he got his hand on the snake and it bit him on his thumb, and we. So if you're messing around with snakes, the chances of being bit are pretty slim. We did have what we consider a legitimate bite a few years ago where a person was going out and looking, going into the barn and the snake got pinched by the door and bit us. So how lethal or deadly is that? So with timber rattlesnakes, they have what's called a hemotoxin. There's neurotoxins and there's hemotoxins. Most of the species out west have neurotoxins and that will mess up your nervous system and really do some serious damage to you. With the hemotoxins, they're designed to break down tissue, and so it's painful but the chances of you dying from a timber rattlesnake bite are pretty slim. Going to be painful, you're going to have black skin, you're going to have some platelet issues for a while, but you're going to recover in the majority of cases. So I don't consider them very lethal. Certainly, you could, let me back up a little bit, with bites to humans, we consider about 40% of those to be dry bites and so a timber rattlesnake cannot shut off the venom, they have venom glands in their head with hollow teeth, but those muscles, which their head is really big and triangular, and so those muscles, if you squeeze that venom gland and push the venom down through the teeth and be actively injected. So a lot of times when a rattlesnake bites a person, they're not big enough to eat, they're not considered prey, it's more of a reaction defensive bite, and so a lot of times those are not actively injected venom times, they're considered dry bites. But it does take for a human, the average adult male about 10 vials of antivenom for treatment and those, and it's an expensive treatment, but there is an antivenom available and we do have that locally in rattlesnake country here, so I would say you're pretty safe in the woods if you stay at least three to six feet away from rattlesnakes. If you do encounter them, the chances of you getting bit are going to be pretty slim. So the one thing I would say if you are hiking in bluff country, if you're out hunting or just hiking, if you're climbing rocks, just watch where you're putting your hands, wear leather gloves, and if you're stepping down over rocks, you have a stick or something, just kind of poke that stick around before you're stepping over rocks. Particularly in May, May is the prime emergent time for rattlesnakes in Minnesota that can vary, but I would say typically the peak emergence is early to mid-May and that's changing a little bit with climate change, seems like that's coming out a little bit earlier, but so those are, so May and then in September and October, those would be the times that I would be cautious if you're hiking in rattlesnake country in southeast Minnesota and those bluffs.

Mike: I was just going to say it sounds like maybe so far in recent decades, it's been a bite every few years, every five to ten years, something like that.

Jaime: Yep, about that, yeah.

Mike: So it's pretty rare.

Jaime: Pretty rare. You're more likely to get stung by a bee or bit by a dog or hit by a car.

Mike: Right.

Megan: Nice.

Jaime: Not that you want any of those.

Megan: Yeah, not that we want any of those things, but that puts it into a nice perspective and the other thing that I took away from while you were talking, kind of giving us that really good overview, is that healthy respect for wildlife is always encouraged. Like you are in their home, we are certainly a piece of the ecosystem but we need to remember that we're a piece and that is their home also and we need to be watchful for wildlife in all situations, just like you would be for poison ivy, like you just need to be aware of these when you're outside. There are things that are, you don't want an undesirable interaction and so you just need to be aware and you also need to be respectful of wildlife. That's what I took away.

Jaime: Yeah. We do have some rattlesnakes mimic many of our nonvenomous species, will shed their tail and it can be pretty convincing that it's a rattle because they can shake it fast enough that it can make some noise, so I think Lisa will be talking a little bit about some species that can mimic rattlesnakes.

Mike: Jaime, I should just tell the audience. So I worked in the southeast for a little over a year and I was really stunned when I started down there at the work that you and others have done. You know, you across the landscape and you see all these bluffs. Anyway, I don't want to start going too far down the road and steal your thunder here. Can you tell us about the work that you and others have done down there for habitat management for snakes?

Jaime: So the program started out, it was called the Landowner Incentive Program and it was some funding we got from the Fish & Wildlife Service to target areas that have rare species, and so for us, we were working with timber rattlesnakes, among other species. And so that has, as that developed over the years, it changed into the State Wildlife Grant and then the Competitive State Wildlife Grant, so there's two pots of funding that we use for this, and plus the Lessard-Sams Outdoor Heritage Fund was used also to fund these projects, but what we are aiming for is a landscape level approach to movement where we worked with public and private landowners who have bluff prairies that actually had rattlesnakes, so we targeted those landowners and then we also targeted landowners adjacent to those, whether they were public or private, and we really targeted our work on bluff prairies, and one of the things that's happening with our bluff prairies is the lack of fire over the years has allowed a lot of trees and brush to move into these open landscapes and start to diminish the prairie and convert it into forest. Now some of those converted into oak forests and that transition happened and we let that happen. Now a lot of them are covered with cedars, and eastern red cedar is a native species but on these bluffs it's just gotten crazy, and so they completely cover the bluff, we lose all the prairie understory, and it's basically just dirt underneath, and so what we've done a lot is go in and remove those cedars or remove some of the tree species that don't belong on the bluff, so it depended on the landowners. Some of them wanted to leave oaks and hickories and some aspens, but for the most part, we would reduce that tree cover and reintroduce fire and try to get that prairie to come back, and we have a lot of success. A lot of landowners, very cooperative, great partnerships, we work with the Nature Conservancy, we work with the National Wild Turkey Federation, we work with Audubon Minnesota, so a lot of different groups you wouldn't think would

necessarily be doing a lot of snake work, but we had some great partnerships working on that, and that work is continued. I've changed positions but I'm happy to see that that work is continuing because boy, I'm trying to think. We surveyed, because just from surveying, we've surveyed over 600, close to 700 bluffs and we worked on probably I'd have to add them up, but I'd say close to 200 sites we worked on for rattlesnakes, so it was pretty extensive.

Mike: The habitat management for bluff prairie is, I mean, you are still doing that in your current position at Whitewater WMA, so you are continuing to lead the way on that kind of management.

Jaime: Yep, yep. Yeah.

Megan: Right. And as you're talking, Jaime, I know that this work, you know, is under the I guess banner of the timber rattlesnake, if you will, but I think the important thing to note, and I'm going to ask you about to talk about this little bit is that while we might say we're doing this for the timber rattlesnake and it certainly benefits them obviously, it's also benefitting lots of other prairie species, which is where these other groups come in. So tell us a little bit about, you know, the connection between bluff prairies and rattlesnakes. Why is bluff prairie management important? What is going on? Like what is it about a rattlesnake and a bluff prairie? Like help us understand that connection point and how they're a piece.

Jaime: I consider rattlesnakes to be a top-level predator for that community, that plant community. They're very critical for management of rodents. We do have a lot of mice and voles and shrews that occur on the bluffs, but work definitely while it benefits rattlesnakes, it benefits a lot of other species. We have five-lined skinks on many of our sites. Just about every single site that had rattlesnakes had six-lined racerunners, so there's definitely a very close connection in habitat type and selection for snakes and six-lined racerunners. We have whippoorwills nesting on the bluffs, particularly on the edges of the bluffs, we have tiger beetles, splendid tiger beetles on the bluffs, we have quite a few insects, butterflies and skippers, rusty patched bumble bees are occurring in some of these areas. We're also seeing like Leonard's skippers and monarch butterflies are becoming a rare thing now too. So the work we're doing is benefitting a lot of other species. It's just timber rattlesnakes got people's attention when it came to funding and so it's kind of unique, but we've shifted from just focusing our survey work on snakes and we have expanded it to other species just because we're seeing that benefit to a lot of other species. And one last thing is plants. There's a lot of rare plants that occur on those bluff prairies. Our bluff prairies are remnant habitats and so the genetics is important in those areas, and just having remnants remaining on the landscape. In southeast Minnesota, a lot of our regular I call them regular prairies, the flatter prairie, so we don't have as many of those left, so for us, these are critical habitats.

Mike: I think it's important to point out that they're such a great opportunity on these bluffs for prairie management because competing land uses are very limited, right?

Jaime: Right.

Mike: They're way too steep. Trust me from my experience working on them. Nothing reveals your physical fitness quicker than working on these bluffs. (Laughter.)

Jaime: Humiliating.

Megan: Mike, is that why you came back? Is that why you came back to us? Like now the real story comes out. Those hills were real big in the southeast, I had to come back to this flatter land. (Laughter.)

Mike: I actually miss the workouts because it made me put on a couple of pounds since I left that job. But yeah, that's just a huge opportunity there because generally, it's not a challenge to - - maybe this is not giving you proper credit, Jamie, it's not as much of a challenge to do habitat management there because very often the landowners want it done and they're eager for it.

Jaime: Right. They either want it done or they're indifferent because they're not using it for anything, so yeah. I think that's a fair assessment.

Mike: Gotcha.

Megan: Well, they're using it for their clean air, their clean water, and their healthy soils. They just might not know that, but that's happening, people. That's happening.

Jaime: It is, for sure.

Megan: Breathe cleaner air with a bluff prairie in your backyard, that's for sure. That's what my mommy always told me. Okay. So Lisa, we're going to transition to you now. We're going to move west and we want you to tell us a little bit about the prairie snakes in the southwest part of the state. Give us an overview here.

Lisa: Okay. You know, we don't anymore have rattlesnakes out here and the snakes that we do have that are considered to be listed species would be the gopher snake, better known as the bowl snake, the plains hognose snake, the line snake. In fact, the only place they're found in Minnesota is in southwestern Minnesota. And then there's the North American racer, and these are all listed as species of special concern. But I do want to point out, something that most people might be surprised to hear is that all snakes in Minnesota are considered to be protected wildlife under state statute, and that means that nobody can take them, buy them, sell them, transport them, or possess them unless they're allowed under our state laws.

Mike: That's a good point.

Lisa: So, you know, it's really, and the reason was is because snakes do play such a valuable role in our ecosystems as Jamie was pointing out, you know, that they're really interconnected, and they're also really beautiful and fascinating creatures but, you know, it's that idea from Aldo Leopold that the first rule of intelligent tinkering is to save all parts, and so we've been trying to put more attention to that. You know, that idea of interconnectedness, you know, that was really brought home to me a couple of years ago. I was doing surveys out in our Prairie Coteau, that's the really hilly part in the far southwestern portion of the state, and I was looking for the illusive Richardson ground squirrel, better known as flickertails, that would be potentially remaining in that dry

remnant short prairie that they depend on. So I was talking to all the rural residents and they were recalling their old memories and those of their parents and their grandparents, you know, of a time when, you know, way back when there were, you know, bull snakes and hognose snakes were common along with other predators, and back then it was really common, like, you know, decades ago to kill snakes and other predators, you know, sort of like the only predator is a dead predator and particularly snakes. But as their numbers dwindled, then all of a sudden became this explosion of rodents like the Richardson's ground squirrels, the flickertails, and then that led to a whole other round of extermination. And, you know, now, you know, their numbers dwindled, and this is along with a backdrop of, you know, at the same time another dry prairie species, the burrowing owl also disappeared, so we have these three species that more or less, you know, not that they weren't other ones involved, but they really were interdependent on each other for food and used each other's burrows, all within that dry prairie landscape that meanwhile was being converted to other uses like agriculture and others. So now while we still find a few of these Richardson ground squirrels left in our Prairie Coteau, it looks like that burrowing owls as a nesting species appear to be gone and most likely are these prairie snakes like the bull snakes and the plains hognose, and so you know, we and our partners are working to restore prairie plant communities but prairie is so much more than the plants. It's that whole ecosystem, you know, the plants and the creatures that depend on that to be healthy. So as we're working to restore prairie, we can make it look good, but is it healthy? You know, and for, you know, species like birds, you know, they can fly there. If you build it, they will come. But what about species like snakes that aren't as mobile? They can't fly. And so, you know, that's, so it's both a habitat issue for them as well as, you know, as Jamie was talking about, the persecution of snakes.

Mike: It's a great example that snakes are part of a functioning community and that when they, I mean, everybody always ask this question, why should we care about snakes and other critters, especially the ones that people are afraid of, Megan. And so that's a great example, Lisa, that they are part of a community and when they disappear, negative things start happening to that community. And like in this case, the Richardson's ground squirrels are also disappearing on us.

Megan: And the burrowing owls, Mike, you forgot about the birds.

Mike: I did not, Megan. I did not forget about the birds.

Megan: What's interesting to me is that as Lisa was talking, it's like the connections are most obvious when they're gone, like so what I mean by that is like as you see a species decline and disappear, then all of a sudden you see these other species topple like dominos, and that wasn't necessarily as obvious when it was connected and healthy and whole, but as they start to decline and wink out for a multiple of reasons, then you're like oh, whoops, that was a string that needed to be there. And so it just it brings it home for me how, as Lisa said, cogs and wheels, that's an Aldo Leopold reference there, but how important all of these pieces are and that we really can't afford to lose that.

Mike: So Lisa, tell us about the challenges that we're looking at for all these prairie snakes. What are other challenges and how should we face them?

Lisa: Well again, first of all, we do have those habitat issues. Not only are, you know, they greatly diminished, they're highly fragmented. Again, the idea that snakes don't fly. But there's also issues, it's not just the amount of habitat but for instance, what condition they're in and how they're managed. You know, it oftentimes we manage to make, you know, the vegetative community, the plant community look good to be healthy or we manage for groups of species like birds, but reptiles like snakes can respond very differently and at different scales, and so we need things like effectiveness monitoring to look at how the snakes respond to different kinds of management. You know, prairies definitely need management but particularly in fragmented landscapes, we may need to adjust that so that it accommodates, you know, that sort of larger suite of species that make that ecosystem healthy. And of course, then, again as both Jamie and I brought up, you know, the problem that, you know, snakes get a bad rap, you know. There's so many, you know, myths about snakes and, you know, I think, you know, if people just, you know, really, you know, had more experience with them, they would realize how beautiful and fascinating they are, and even okay, even if you're not going to love them, you know, they can be very beneficial not only for keeping ecosystems healthy but helping to, you know, sort of tamp down species that can be, for instance, agricultural pests or that can carry diseases. And frankly, most snakes just kind of go around their business, you know, quietly and unseen, hiding in camouflage is kind of like their first go-to or, you know, when they are cornered, they kind of can put on a tough guy act like, you know, Jamie was referring to before, we have, you know, some snake species like the bull snakes or like fox snakes that will vibrate their tail and things like dry leaves and such, kind of sounds like a rattle but, you know, it's their tough guy thing, but, you know, most cases, you know, savvy people know, you know, landowners really value these beneficial snake neighbors and simply let them be on their way and that's the kind of message that we're, you know, that we're really trying to get across.

Megan: Wonderful.

Mike: One message I try to communicate is that it's, it's totally fine, Megan, to be afraid of snakes, and there's really no reason necessarily that you, that you need to fight that or be ashamed of it or anything.

(Laughter)

Megan: I'm not ashamed. Let it be clear. I'm not ashamed, I feel like there's a lot of projection from you to me right now. I'm confident in my fear of snakes. I'm owning it.

Mike: Okay.

Lisa: You need to hold one of those adorable little redbelly snakes that they're not, or like the lion snakes that aren't even as big around as my pinky. They are adorable.

Megan: Lisa, let's talk about it offline. That is snake therapy by tossing a snake into Megan Benage's hands is not going to be the thing that makes Megan Benage be like, wow look at these beautiful little critters. No. They are beautiful. They need to not be touching me, that was where you went wrong. So let's, we're going to transition here before we get too off track.

Mike: This is important. Megan, your attitude about snakes is wonderful because yeah, yes, you were afraid of them and yet you appreciate them and you respect them, and so that's the key thing.

Megan: Absolutely 1000%.

Lisa: I just want to give a quick shout-out to those like our park naturalists at Blue Mounds State Park, Amber Brooks that she does these really popular programs with their sidekick Chuck the garter snake and together, they're winning hearts and minds one snake at a time.

Jaime: Fear of snakes is typically a learned behavior, so do you have other family members who are afraid of snakes?

Megan: This podcast is about prairie, it's not about Megan Benage's therapy issues, so we're going to transition here. I'm really glad, Lisa, that you mentioned Blue Mounds State Park because there is, you can tell Mike wrote this question, a very cool and interesting project at Blue Mounds State Park that we want to hear more about. You did something really incredible and really hard to do by building a hibernaculum out there and we want you to walk us through that.

Lisa: Okay, well just to give a little backdrop, you know, some ideas start with a trickle, this started with a flood, and there had been a dam on Lower Mound Creek that goes through Blue Mounds State Park, and there was this huge flood that wiped out most of the dam. And long story short, a lot of discussions and it was decided that they were going to restore the natural prairie stream and remove the rest of the dam, so that has lots of benefits. The downside is that that dam structure had served as a den, a hibernaculum primarily used for overwintering by a number of snakes, and so a decision was made jointly with the Division of Parks and Trails to try to see if, you know, we tried to avoid destroying, you know, natural dens, hibernaculum, but sometimes it can't be avoided like, you know, with projects like this or like roadway projects, and so we wanted to try to see if we could create an artificial hibernaculum nearby that could provide habitat for them, but could also see if, you know, if something like that would work and that could be used in other situations, so kind of an experiment. The problem is there's lots of designs for these things out on the internet. The bad news is most of them are really experimental untested like, you know, just because there's a design, is it good? So we decided to use this modified version of one that was designed by a professional herpetologist, an expert in reptiles and amphibians from Wisconsin, shout-out to Bob Hay and so this project was to evaluate whether they would use it and then more importantly was it safe for them. So when you're thinking about overwintering, the first thing, you know, you got to remember is that snakes are quote unquote "cold blooded," mean long and short they can't regulate their internal body temperature like birds and mammals can, but is dependent on the outside, you know, surrounding temperature. So they need something that it's, you know, they need to be warm enough so they don't freeze during winter but cold enough so that their internal metabolism slows down so they don't expend a lot of energy to survive that long winter. Yeah, exactly, it's the Goldilocks thing, not too hot, not too cold, just right, so that was what we were aiming for with these conditions. So, you know, again, we collaborated with Parks and Trails and, you know, again with, you know, the people that provided the design

and we tweaked it and so long short, we created the hibernaculum in the fall and then later that year is when they removed the rest of the dam structure, so we tried to rescue as many snakes as we could. Unfortunately, they ended up doing the demo kind of late when it was cold, so that was an involved effort as it was, but we tried to keep them warm and transferred them and put them down the hole. Meanwhile, we had a temperature probe down, we had a pipe extending down so it'd go down to the bottom because we wanted to know what were those temperatures. So here's what we learned. We had evidence it was the design was to go, because just to put in perspective, frostline, they have to be below the frostline and the frostline in Minnesota, depending on the year can go down to like 11, almost 12 feet, so but the idea for the snakes that we were kind of looking at, garter snakes, redbellies, fox snakes, not all snakes have the same needs, but they kind of like a little bit of water, not flooded, but a little bit of water at the bottom and it keeps them from drying out, desiccating, and it also helps water, you know, kind of helps moderate temperatures. So that took us down to the water table, which is about seven and a half feet, and then we mounded it about five feet, so to get that kind of, you know, 11 to 12-foot insulation, so to speak. So anyway, we checked the following spring and sure enough, there were snakes coming out and then also we had, we monitored later, you know, the following fall and we had snakes going in and out, we had time lapse cameras that documented that, we also did some other monitoring around it.

Mike: So they started, you're saying the snakes started using the, the snakes started using the hibernaculum even without you putting them in there, they chose to go there.

Lisa: Right, exactly, and we also, you know, pulled the data from the temperature probe. Our temperatures, despite, you know, like really like there were, there were air temperatures documented during the coldest part of the winter like 30 below, the temperature at the bottom never went below about 35 degrees Fahrenheit and never throughout the year got above 60, so also if it got really hot, it was also a place of refuge during the summer. So we got those Goldilocks conditions. And so we hope some even more monitoring.

Mike: Nice. Okay. Just to interrupt you the, so the real impetus for this was the fact that they were destroying this dam, taking down this dam, right? This old dam. And the snakes were underneath it or around it in the soil and there was a risk of mortality. I just part of the point I'm trying to get at here is that they don't necessarily need us to build them hibernaculum in normal conditions. In this case, it was trying to prevent these snakes from getting killed, correct?

Lisa: Right, in that particularly, there were some alternatives but this was also again a real opportunity for experimental use, you know, again if you can't avoid, you know, destroying a hibernaculum, that this way that there may be some mitigation options.

Mike: Gotcha.

Lisa: And it was also real a valuable platform for outreach, you know, we've used a lot of this, you know, like footage on it, you know, photos and video on social media, again, the interpretive naturalist has keyed into this, and we also have done, you know,

expanded to do other monitoring prairie on Blue Mounds that we hope to apply elsewhere.

Megan: I have to ask really quick, was Chuck the naturalist helper in the burrow?

Lisa: No. Chuck is a captive garter snake, a beautiful one with a red stripe, that they use for education, and Chuck's amazing. - -

Megan: All right, I was just checking.

Lisa: I had them crawling around my head.

Megan: I just need to know. Well this has been wonderful. Jamie, Lisa, you guys are just a fount of information and I, we could talk about this all day, we really could, but we have got to move to our next section.

LET'S SCIENCE: TO THE LITERATURE!

SCIENCE!

Megan: All right. This is the part of the podcast where we recommend a book, a blog, or a paper and one of the things that I have just been hearing over and over again in my mind as Lisa and Jamie have been sharing with us is partnership, prairie, science, and outreach. Those are things that make successfulness. (Laughter) There is other things that make good projects work. Okay. Lisa, just lead us away with that wonderful failing grammar on my apart.

Lisa: Okay, well the first scientific article that I want to highlight is called Responses of Grassland Snakes to Tallgrass Prairie Restoration by Richard King and John Vanek and it's a very recent one from 2020, and you know, sort of the take-home points is, again, it really reiterates the importance of snakes as higher order predators in grassland ecosystems, that it's really important for restoration success, so we really have to be considering them in that suite of our effectiveness monitoring, and also that idea that larger, more mobile snakes are able to reoccupy grassland restoration soon after conversion, for instance, from grow crop agriculture if they have suitable habitat adjacent or some sort of, you know, safer travel corridors, roads and things can be very, you know, lethal to them. But the occupancy by the smaller, less mobile species often does not occur, so there may be - -

Mike: Really shows the - -

Lisa: - - some need for more active management or reintroduction.

Mike: Really shows the value of the connectedness that we talk about when we're talking about prairie management.

Lisa: Right.

Mike: Yeah.

Lisa: And then the second one is Body Temperatures and Movements of Hibernating Snakes and Thermal Gradients of Natural Hibernacula by Malcolm Macartney, Karl Larsen, and Patrick Gregory, and the reason I was looking at was because of our

hibernation work and it says that, you know, dense and extreme northern portions of the species appear to be more isolated and uncommon and they become really a lot more important because of the more extreme temperatures. You know, they have different stressors than species in southern parts of the US and that even though, you know, you might look at the sort of surface geology, you might think that there's lots of, you know, potential suitable dense that they're not as actually widely distributed and available as you might think, and that there's really a lot more that we need to learn about what are suitable hibernacula. So again, underscores, you know, we really need to try to avoid destroying those if at all possible, even if there are maybe, you know, some successes with artificial hibernacula.

Mike: Great, very good, thank you. Lisa, Jamie, how about your, what's your pick?

Jaime: I'm going to go on the opposite end of the research scale because Megan, most fear of snakes is a learned behavior, so I'm targeting.

Megan: Oh, here we go again.

Jaime: I'm targeting.

Megan: I learned my fear from the snakes themselves, let's be clear! They taught me to respect them!

Jaime: There is a children's book called Rattlesnakes and it's written by Ted O'Hare, and it's pretty basic but it has lots of great pictures of a bunch of different types of rattlesnakes because there are many different species, and it talks about some of their characteristics and it also, one of the things that happens when people try to do outreach with snakes in general is they always put them in this really menacing pose, and so this book does a good job of not making them all look like they're about ready to attack. And then the other one that I like is, it's the Take Along Guide of Snakes, Salamanders & Lizards, and it's by Diane Burns and Linda Garrow and this is another one that's pretty good for kids to just talk about snakes and their habits. We did a research study as to why people don't like snakes and a lot of it is they don't like the way they move, so I want to give people a, this isn't literature per se but this is an at-home experiment that you can do to see what it's like to move like a snake. So go into your kitchen and get your Saran wrap and wrap it around your legs and put your arms down along your side and wrap that around or that packing tape, and then get on the ground and throw some candy on there and try to move towards it. And then you'll see why snakes (inaudible, laughter and cross talk.)

Megan: I love that you're like: You need to have a reward. Don't just do it to do it, make sure that there's candy that you are going to get after you do this. Don't just be wrapping yourselves up people, for no reason, put a doughnut on the floor, make it worth it. Make it worth it.

Jaime: Exactly. Exactly. And his is a perfect activity for everybody whose stuck at home and need a science experiment for their kids, perfect. (Laughter.)

Mike: Awesome. Jaime, that's amazing. I love also, I'm proud of you. You're maybe the first, Megan can confirm this. Is she the first one ever to have a book targeted towards kids on elect class?

Jaime: I don't know if it's the first ever but first one with activity for sure. (Laughter)

Mike: Hey Megan.

Megan: Yeah Mike?

Mike: Let's go for a hike and look for some reptiles.

(Laughter)

Megan: Okay.

Mike: Yeah.

Megan: I mean, yay, let's - -

Mike: Reptiles.

Megan: - - do that, let's go on the prairie, you first, you first. Jamie tell us where we're hiking today?

Jaime: Okay, well 'cause I'm at Whitewater, I'm going to pick an area in Whitewater, and we call it the Minneiska Cutoff Road, it's an old cartway that we use an access road, it's off of Highway 30, which is just west, excuse me, east of the Whitewater River, so it's part of the main branch of Whitewater. And you can take that access road back into a sand prairie, sand-bearing savannah and bluff prairie all together, and it's a really unique area, it's mostly remnant habitat, there's all kinds of different wildlife species in this area. We did find some rattlesnake sheds in that area, but we haven't actually found live rattlesnakes but we did find some sheds. But it's just, it's amazing. You can climb that bluff and you can see over the whole valley and it's one of the few places that you can go where you only see one or two houses. It used to be you couldn't see any houses from this area but one did person did build on the bluff but it's just so beautiful. And we're also doing some restoration work in that area, so it's an opportunity to see restoration as well as see the remnant habitat and enjoy a lot of different prairie species, reptiles and amphibians, insects, birds, all kinds of good stuff.

Mike: I'll second that. I love that road that Jamie is talking about. I've gone there now I think two or three times just on my own time for the fun of it because it is so cool in there.

Jaime: It's unique, especially for most of Minnesota but for southeast for sure because that sand prairie is really unique.

Mike: Right. Lisa, how about - - sorry, go ahead.

Jaime: Mike, riddle me this real quick. When you hike up a bluff, is there a donut at the top and are you wrapped in Saran wrap? (Laughter)

Jaime: I haven't tried that but that's, I would have licorice at the top, so maybe then I would do it. (Laughter)

Mike: There you go.

Megan: True. I just want to know if this was a motivated hike - -

Jaime: It'd be easier to go down though because you can roll.

Megan: - - what was your motivation?

Mike: That's a good point, yeah. (Laughing.) Yeah, we're just, and just slide right down it then.

Lisa: Shake, rattle and roll.

Megan: Lisa, take us back.

Lisa: Okay. Well, you know, it's always hard to choose but this time I'm going to highlight Eden Wildlife Management Area. It's in Pipestone County, not that far from the western border of Minnesota, and it is one, particularly the northern part of it where they've had really excellent prairie restoration, it's a place that Mike and I have been serving for pollinators, bumblebees, and butterflies. I have seen some garter snakes there, so we know there's snakes. It is amazing. This past year became one of my favorite places to go. It is just awash in color, waves of color as the different prairie flowers bloom and it just, is so beautiful. You do have to sometimes, you know, brave, you know, there are some areas of thistle in there but those are also very popular with pollinators, but it is just amazing. It was my favorite place to go survey. There was so many bumblebees and a number of favorite bumblebees are out there and I learned so many new butterflies. I just, if you want a really beautiful prairie experience, I recommend Eden WMA.

Mike: I'm glad you picked Eden, mentioned it. It's important to point out that the area you're talking about is a restoration, and so when you go in there and it is exploding with flowers, it's almost an unfair comparison to remnant prairie. It does appear to have a lot of value for insects and pollinators and it's a cool place.

Megan: Wonderful. This is great. I love this season. I can't wait. We're going to, oh, man, we started with snakes, which I'm fine with, and we're just going to keep moving on into all these beautiful pieces of the prairie and what makes it so incredibly important and special. So next week we're going to be talking about a very special occurrence that happened right here in southern Minnesota just outside of the City of Mankato. It's a story of healing, Dakota history, ecology, restoration of the landscape that's been reduced to just under 2% of its native range in Minnesota, - -

Mike: I'm excited about this one.

Megan: - - we are going to be chatting with a very special guest. I know. We're going to be talking about the Minnesota Bison Conservation Herd and the return of those bison in Minneopa State Park. It's going to be beautiful. I can't wait. We've got so much good stuff for you this season.

Mike: Hey Megan.

Megan: Yeah Mike.

Mike: I just want to mention since we have two current nongame program staff and one former, it's important I think for us to mention the Nongame Wildlife Program. We are dependent on donations and so please listeners, donate if you can, if you care about prairie, we do a lot of hard work on prairie. Lisa and I, it's a big part of our jobs, so tax returns or online at our website.

Megan: Wonderful. As always, you can find all of the resources we talked about today on our website at mndnr.gov/prairiepod. This episode was produced by the Minnesota Department of Natural Resources Southern Region under the Minnesota Prairie Conservation Partnership, which is part of the Minnesota Prairie Conservation Plan. It was edited by Dan Ruiter and engineered by the fantastic Jed Beecher. Oh, my gosh. We'll catch you next time on Prairie Tuesday. This has been fun, see you next week.

Mike: You couldn't help it, could you. You had to do it.

((sounds of birds chirping and wind blowing))