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[00:00:00] **Speaker 1** I am rolling.

[00:00:01] **Speaker 2** Okay, so just for my edification, what's your title?

[00:00:06] **Speaker 3** I am a professor. Oh, okay. I'm a professor of entomology, and my specialty is in medical or public health entomology, which means that I work on insects and their relatives that transmit diseases to humans.

[00:00:22] **Speaker 2** And so can you talk a little bit about the research that you do with tics and diseases specifically?

[00:00:30] **Speaker 3** We do a lot of work on the texts that transmit Lyme disease in the upper Midwest and the Northeast. And our research really focuses on trying to understand a couple of things. One is what increases people's risk of exposure and then to what can we do about it. So what are some of the great prevention methods that can be used both around your home as well as just personal prevention?

[00:00:55] **Speaker 2** So a little bit of like academic and also more kind of practical everyday information for people.

[00:01:01] **Speaker 3** Absolutely.

[00:01:03] **Speaker 2** So tell me a little bit about trends in tick populations and diseases over the last few years.

[00:01:12] **Speaker 3** Over the last few years. Okay. Well, in terms of Lyme disease, which is the disease that we see the most human cases in our state, we've been seeing a kind of a steady increase. I think last year it was over 4000 cases that were reported to the state. And we're expecting because of some changes in the surveillance procedures this year, that that number is going to be higher. So we've been seeing this steady climb. We're seeing also with the ticks. You know, I wouldn't say more ticks over the last five years, but definitely over the last 20, we're seeing more ticks in more places. So they've invaded a lot of locations in the state where we didn't used to be able to find them. And that's particularly down in the southern quarter and then the eastern, say, quarter to a third of the state. So they've moved into new places and that usually takes them a little while when they move into those new places before the populations, you know, increase large enough and then they kind of stabilize.

[00:02:18] **Speaker 2** What causes or what is causing that change?

[00:02:21] **Speaker 3** I think the change is due to some long term changes in the state where, you know, around the 1900s, the we had logged off most of the forest killed most of the white tailed deer. The deer are a really important part of the lifecycle of the tick. They feed a lot of the adult females. So that's where a lot of the egg laying comes from. So with deer populations recovering and then with the forests recovering, you know, we first started to see those ticks in restricted areas up in the northwestern part of Wisconsin. And then over the next 30 years, they slowly moved to invade all of the habitats, I think, where they're able to survive. So ten, 20 years ago, maybe 50 of the 72 Wisconsin counties had an established population of deer ticks. And now there's only one county where we don't find them. Now, I will say that we don't find them everywhere. Of course, these are not ticks that are associated with open, grassy hot areas. They are very much associated with wooded locations. So when I say a county has an established population, I mean, if you go to the right kind of habitat in that county.

[00:03:34] **Speaker 2** Is climate change at all impacting their population?

[00:03:37] **Speaker 3** That's a really good question. And I am not an expert on climate change, but in talking with my colleagues who are, there is some sense that the climate change is driving two populations further north and to Canada, and that does seem to be a clear pattern. We're also seeing them move south, and so that can be a result of warmer temperatures. That doesn't make sense. That's more likely this change in the landscape. So the forested habitat, this kind of slow movement because these don't fly right. So their methods of getting around or they can be kind of slow to invade new places, especially if there's a barrier around them, like in an urban park, much like the one we're standing in.

[00:04:20] **Speaker 2** And as we were talking about before, what is kind of a new development this year.

[00:04:27] **Speaker 3** One new thing we've seen this year is earlier activity of the juvenile stage that we call a nymph. And our prior records, both here and in Minnesota, were the first time we saw nymphs with our active surveillance was about the end of a sorry hope. Hopefully you can cut that. I was going to say in April, which is not what I meant. Okay, let me try again. Okay. Okay. So. In prior years, we have started to see activity of the immature stage that we call announced around the end of May, and then they really start to peak in June. And this year we saw nymphs in middle May for the first time. So a good week to two weeks before we usually begin to pick them up. And that is probably related to warmer springs, warmer temperatures and they're getting active earlier. So that's a change.

[00:05:25] **Speaker 2** And what's significant about the nymph.

[00:05:28] **Speaker 3** The numbers are the most important stage in terms of disease transmission. And we think that that's because they're so much smaller than the adult deer ticks. Adult deer ticks are big enough so that you're going to feel them when they're crawling on you usually, or even if you don't when you're checking your body, you may feel a little lump. And so you recognize and you can remove those quickly. The nymphs, though, they really don't trigger any kind of a response. You don't feel them moving on you and they're so small, like the size of a poppy seed or a small freckle that they are actually hard to detect on your body. I myself have had them in places that are really easy to look at and miss them entirely. And of course, there are plenty of places on your body where it's not so easy to do a scan like that. So the numbers are associated with most of the disease transmission in our state. And you can see that actually when you look at when the cases start to be reported to the state that correlates with this activity phase for that animal population.

[00:06:31] **Speaker 2** I was going to say doing some reading, it looks like the Department of Health and Human Services for Wisconsin, they have like the Lyme disease dashboard, and it looks like there are already reports coming in for May and June. And so does that appear higher than normal?

[00:06:52] **Speaker 3** As far as I'm aware, it's probably not higher than normal. It takes a long time for those cases to get fully vetted and correlated in that data to be available. And of course, people who are coming in now could also have been bitten by an adult tick. Those adults do start getting active in April, although sometimes I've even seen them as early as January. If we get a warm day, they're going to be out there looking for something to bite.

[00:07:17] **Speaker 2** So should people be concerned about spending time outdoors?

[00:07:22] **Speaker 3** Well, I don't think people should be concerned enough to not spend time in our beautiful outdoors. But I do think people should be aware and they should be taking precautions. And those precautions are things like using a repellent like you would for keeping the mosquitoes from feeding on you. Those same repellents generally work pretty well for keeping the ticks off with our team will often have them apply those from the knee down because that seems to be where most of the nips attach. So you don't have to necessarily put it all over your body, but make sure that you're treating the area where they're likely to be. As you see, I'm wearing a pair of white pants today. So we also recommend that people wear lighter colored clothing when they're out so that they can see the ticks more readily and do frequent just scans to make sure that you don't have one is crawling on you. And another thing that can work well is to do a shower when you've been outside in an area like this where you could have been exposed is a little scrubby and that will help to get off any of the ticks that might have not fully started to feed yet. You can just dislodge them. And then one other thing that we do for our field teams is we have them use a chemical called Permethrin, and the permethrin is something you treat your clothing with. There are also some commercially available clothes already pretreated that seems to work very well to help protect them.

[00:08:50] **Speaker 1** And we have quite a bit of your claim. Okay, So now so I don't know if we want to rerecord this first from like when you started talking about the light colored pants. Once it's done. Yeah, that's when it started. Okay. I don't know if we want to wait and then repeat the same thing, so.

[00:09:06] **Speaker 2** Okay. See you in a second.

[00:09:08] **Speaker 1** Yeah. Let's just.

[00:09:09] **Speaker 3** Wait.

[00:09:11] **Speaker 1** For this thing.

[00:09:12] **Speaker 2** Yeah.

[00:09:13] **Speaker 3** It's kind of nice to get the birds in the background.

[00:09:16] **Speaker 2** Yeah, I can hear, like, that's my dream.

[00:09:18] **Speaker 3** Am I still rustling? I'm trying to be quiet whenever I know this.

[00:09:21] **Speaker 1** Little bit around the neck, but it's not too bad.

[00:09:24] **Speaker 3** Okay.

[00:09:25] **Speaker 2** Something we could.

[00:09:27] **Speaker 1** Maybe. I see. You know, the audio is really clear.

[00:09:30] **Speaker 2** So do you know what kind of is that occurring?

[00:09:34] **Speaker 3** This is Sandhill Cranes. Yeah, that's cool. Yeah.

[00:09:41] **Speaker 1** I live near Warner Park and there's lots of cranes around.

[00:09:45] **Speaker 3** I saw so many turkeys when I was coming in this morning. Did you guys see any on there now? Oh yeah. And they were one was standing right in the road and it was doing the flare thing so it only. And strutting around. Oh, great. Yeah, gorgeous. And of course, it's migration. So there's a lot of really interesting birds in the woods these days. I have this cool app called Merlin and a few Merlin captures the sounds and it will tell you what birds are out. Oh, cool. So even if you're a terrible birder, which I love to Bird, but I'm not good at it, I can use Merlin to say, Oh, I should be looking for a Baltimore Orioles somewhere in here. Or yesterday it was a Tennessee warbler. And what else did we have? We had a really beautiful one called a bay breasted warbler. And so anyway, it's a it's a great tool, if you like, to be in the woods and learn what you're seeing.

[00:10:39] **Speaker 2** It's cool machine learning can do. Yeah. I wonder if like that will eventually develop for techs. Like you just take a picture of what?

[00:10:47] **Speaker 3** Oh, it's so interesting that you say that because part of our tick app this year we're going to do a the public won't see this yet because there are so playing with it. But we have an AI tool that can look at the picture, tell us what it thinks it is with pretty good certainty depending on how crisp the picture is, how well the picture has been taken. So we're going to pilot in the background. People will look at every single picture that comes in, but we're hoping it takes a lot of time to do that, right. We're hoping at some point that I can just with 98% certainty, generate a report which goes out automatically to the people on the other end. And then we don't have to hire a full team to be reporting on these things every summer.

[00:11:33] **Speaker 2** Just a lot of work.

[00:11:37] **Speaker 1** Yeah, that was a bit of construction, but I think it's stopped now. Okay. Yeah, we can repeat whatever you were talking about, the white pencil.

[00:11:45] **Speaker 3** And we were talking about how people. Yes. Go into the woods and what you can do to protect yourself. Right. Okay. Okay. So what? We certainly want people to be out enjoying our beautiful woods in Wisconsin and not to be afraid to do that because of ticks, but they should just take the precautions to make sure that day their kids, their pets are protected. And those precautions are things like wearing light colored clothing so that if you get a check on you, you be able to see it. Against that background, jeans are not a good choice. It's really hard to pick them out on dark blue like that. We also recommend that people use a repellent and that can be the same kind of repellents that you use for mosquito prevention. Usually for us who are putting that on like below the knee seems to be the place where most of the nymphs are getting on the body. So that's a good place to spray and then do a shower. When you've been outside in an area like this where you could have been exposed, be sure that you take a shower or use a little scrub and make sure that you're just removing anything that might be on your person, perhaps not yet attached and trying to feed.

[00:12:54] **Speaker 2** I've also heard you can throw your clothes in the dryer.

[00:12:57] **Speaker 3** Yeah, that's a great suggestion. If you potentially have some ticks that are on the clothing that maybe you don't see, if you put them in the dryer in a high temperature for 2030 minutes, that'll take care of that.

[00:13:12] **Speaker 2** Is so looking at, you know, if someone does find a tick bite, what should they do? What should they look for?

[00:13:23] **Speaker 3** Sure. So I think it's important that you recognize which kind of tick it is. And we have discovered in some of our research that actually many people in Wisconsin are not very good at telling the difference between wood tick, which is annoying, of course, to pick up fast, but it's not something that's associated with transmitting Lyme disease. The other tick, the one that we really worry about, that deer tick, is in the adult stage a little bit smaller than the wood tick. And then in the nymph stage, it's just a lot smaller. Again, it's of that poppy seed size and people that don't seem to be very good at recognizing which one they've got when they find a tick. So that's the first step. And you can take a picture of the tick and send it to us using our tool called the Tick app. And then we can do an identification and let you know what it is if you're not sure. There's also a lot of resources online that you can use to determine which tick you might have been bitten by. My recommendation then is usually to make some sort of a determination about when you think you picked it up. I mean, how long has it been attached? So if it's been feeding for less than a day, then I wouldn't I would probably take the tick, put it in the freezer, just hold on to it, but not do anything more active than that. If it's been on you for a day to two days, then I might consider having a conversation with my health care provider to see if perhaps a prophylactic dose or a preventative dose of an antibiotic might be. Warranted.

[00:14:58] **Speaker 2** Is it difficult if you do get Lyme disease? Is it difficult for doctors to diagnose that?

[00:15:05] **Speaker 3** It depends. I think for people who get a bullseye rash at the site of the tick bite or it doesn't always look like a bull's eye, but a large rash there. It's not hard. A doctor will know right away what that is and how to treat it. If you don't go in, though, maybe you didn't notice the rash. It's in the middle of your back or on your head where it would be hard to see. So you get perhaps a bit of a summer flu kind of symptom and you don't bother to go see the doctor for that because many of us would not. Then it can be a little bit harder. You know, you can move into a stage where you've got perhaps arthritis, you know, symptoms of arthritis or joint pain moving around. And depending on what those symptoms look like, you know, the doctor can order some tests, some diagnostics that can help. But it's not always as clear cut as it is with the rash.

[00:15:57] **Speaker 2** Are there vaccines for Lyme disease?

[00:15:59] **Speaker 3** There are no vaccines yet, although there are vaccines in progress. So we're hopeful that in the next year or two, we will have something that people who are out and exposed all the time, you know, would be able to take. It looks like it'll probably be a multi shot vaccine. So it wouldn't just be a one time thing as it is for some of the childhood illnesses. But still, it would be a great tool.

[00:16:23] **Speaker 2** This is kind of a silly question, but like so dogs can take nexgard for example, to try and keep ticks off of them. Is that not something that like is at all in development for humans like you? It just seems like such and.

[00:16:41] **Speaker 3** So like, like a pill or something that you could take. You know, I think part of the, the issues with those pills is that they, you know, we don't want to expose a large number of people to something that could have side effects. And so the kinds of ways we treat our dogs, I don't know if those things have been vetted as safe for people, although I have wondered myself, you know, maybe like the shampoos that we use for lice when our kids get lucky and lots of kids do. Why couldn't you use something like that so that if you did get a tick up here, you know, you wouldn't have to really worry about it. But it's not licensed for that. It's not registered. So you couldn't.

[00:17:24] **Speaker 2** Yes. Yeah. Just yeah, it's a.

[00:17:27] **Speaker 3** No, it's great. It's a great suggestion.

[00:17:29] **Speaker 2** So tell me a little bit more about the tick.

[00:17:33] **Speaker 3** Sure. So the Tick app is a research tool that we developed through the Midwest Center of Excellence for vector borne disease. And its intention is to help us learn more about where people are being exposed to deer ticks and Lyme disease, what they're doing when they're exposed, and what kinds of prevention behaviors people are using, and also how we can encourage them to use more of those behaviors. So it's a research study, and if you downloaded the app first, be asked to consent to being in the study and we'd ask you some questions about your property and your activities. And then you'd have this option if you did get any ticks on you to take pictures, send them directly to the scientists. We can identify them, give you an estimate for how long the tick has been feeding, and then make some suggestions about what you might want to do as your next steps. It also has some really great information in it that you could use to identify the tick yourself. If you didn't want to take a picture and send it to us. So there's a there's a tick one or one that would provide some useful information for people.

[00:18:43] **Speaker 2** Is there anything else you want to add there?

[00:18:47] **Speaker 3** You know, some of the things that we've learned from our tick app tool are that people maybe don't really realize where they're being exposed to ticks. So we've found some surprising correlations between what people report they've been doing and where they think they picked up the ticks and where we think they missed it, picked up the tick, given that they're not actually attached to the body that long. So an adult tick wouldn't be on you for more than a week, seven days. And yet we have people telling us that they picked up ticks in places that they visited a couple of weeks ago. And I think that's because they have, in their minds, a kind of a search image of the kind of place where they would pick up a tick and it doesn't match where they've been in the last week or so. And that, to me says many people are imagining that it's when they go to their cabins or it's when they're out in the woods hiking instead of in their own yards. We've done quite a bit of work now with homeowners who've been gracious enough to let us come into the yard, some of them up in the Eau Claire area, some in the Mirror Lake area. And we're finding a lot of takes, especially when you have a property that abuts a wooded area. You're right up next to a woods. It's highly likely that you could have some ticks in your own backyard. So I think they're being exposed around their houses and not realizing that that's important for people to know. Yeah. Yeah.

[00:20:15] **Speaker 2** Anything else that I didn't ask? Oh.

[00:20:21] **Speaker 3** Did we get the. Yeah, I think. I think you got it all. Okay. I hope so.

[00:20:26] **Speaker 2** Okay. Yeah. Thank you.

[00:20:27] **Speaker 3** Yeah. Well, thank you.