Tracey: Hello and welcome to NC State's Audio Abstract. I'm your host, Tracey Peake. Spring time marks the emergence of not just flowering plants, but also of animals, including snakes. And North Carolina is host to a number of snake species, including some that can be hazardous to humans. We're speaking today with Chris DePerno, a professor of Fisheries, Wildlife and Conservation Biology, about which species of snakes are common to our state and how to successfully coexist with them. Welcome, Chris.

DePerno: Hey Tracey. Thanks for having me.

Tracey: Let's start by talking about the different species of snakes in North Carolina. Like how many species of snakes live here and, of those, how many are actually dangerous to people?

DePerno: So yes, there are 38 species of snakes that reside in North Carolina, quite a bit of biological diversity. Only six of those are venomous to people, and those include the Eastern coral snake, the copperhead, which everyone's familiar with cottonmouth, Eastern diamondback rattlesnake. We have the timber rattlesnake, and the pygmy rattlesnake.

DePerno: Now, it's important to understand that the distribution of these snakes vary throughout the state, so you're not going to have all these venomous species wherever you live. For example, the Eastern coral snake is present only in the Southeastern corner of North Carolina, whereas the copperhead is pretty ubiquitous and occurs across the state, and it is the most common venomous snake. Importantly, we do have some snake species that do receive protection under the state's endangered wildlife laws. For instance, we have a couple threatened species, the Southern hognose snake, the pine snake. The endangered species are the Eastern diamondback rattlesnake, and the Eastern coral snake. And species of special concern include the black swamp snake, the timber rattlesnake, and the pygmy rattlesnake. But most of the snake species in North Carolina are non-venomous. They're usually associated with down woody debris and they're completely harmless.

Tracey: This podcast is going to go up in April, which is when warm weather really gets here to stay. And what can you tell us about the snakes of North Carolina – do they hibernate? Are we going to see more snake activity as the weather gets warmer? When is sort of peak snake emergence time for the state?

DePerno: So, first snakes don't actually hibernate. What they do is they just become less active during the cold weather. So, this is normally around October-ish or so in North Carolina. It's actually called brumation. Brumation is, basically, a slowing down of the individual's metabolism. They're actually awake, they're just lethargic, and you don't really see them moving around. So, they're actually reacting just to the cold weather. Remember they're reptiles, so they're ectothermic, that means they raise their body temperature by searching out warm areas like the sun, laying in roads. And they can also cool themselves off by looking for and searching for areas that use cover and shade. So, their body temperature actually changes to the temperature of the surroundings. So, what we see in North Carolina on warmer days in the fall, winter, spring, these [bru-mating 00:04:38] snakes actually come out to take advantage of that, to bask in the sunshine. So, just like humans, snakes head out to enjoy the sun and, usually, it's around 60 degrees Fahrenheit or greater. So, when the weather does warm up, you can expect to see snakes. They're going to be coming out.

Tracey: Okay. Now, after they've been brumating, you sometimes hear that they’re more venomous when they first emerge. Are they more venomous? Do they store up venom like that, or is that just silly because they only have sort of set amounts at any given time?

DePerno: That's silly, right? Their morphology is designed that they have their venom sacs and they have venom, and that's it. They don't store it up and carry it around with them, so yes. So, a lot of people like to think that venomous snakes are more dangerous when they come out of brumation, right? And that's a myth. It's not true. The weather's warming up, we get outside, they get outside, and there's this interaction. But the point is that they're not more dangerous when they emerge from brumation.

Tracey: Okay. And, on a related note, the thing that you hear about little baby snakes, if that's even the correct term, baby snakes. They can be more venomous than adults, is there any truth to that?

DePerno: So, this myth is that young snakes have not, I guess, learned how to control the amount of venom they inject. So, they're more dangerous than adult snakes, that's a false premise. So if we think about this, we got to think about it maybe evolutionarily, right? So, if we want to make the assumption that snakes are able to control the amount of venom they inject. There is not evidence that suggests that venom discharge is actually controlled by any decision. What would be the benefit of that in the wild. So, any snake bite can vary greatly in the amount of venom that's injected. So, it's possible to receive a worse bite from a juvenile snake than from adult on a certain day and maybe vice versa on the next day. So, there's no consistency in the research.

DePerno: Second, let's think about this, there has to be some advantage or disadvantage for a snake to inject all or some of its venom. If a snake does release all its venom when it bites you or bites a prey item, then it's left itself maybe defenseless against predators because remember, snakes are predators, but they're also prey. And remember young, especially with copperheads, they're born live, they don't require maternal care, so they're ready to roll, they're ready to move across the landscape. So, they're operating just like adults.

DePerno: Number three, I think, is learning what are the advantages and disadvantages? We'd have to assume that the snake is going to learn throughout its life. When does a young snake, a juvenile snake have time to learn? It's really unlikely that learning occurs, especially enough learning that it leads to some evolutionary response in these juvenile snakes. And I think the last thing is if you think about full envenomation, you have an adult copperhead and a juvenile, the amount of venom is quite a bit different. So, why would we assume that the juvenile snakes are going to be more deadly? I think adult snakes are as dangerous or more dangerous than a young snake. They have more venom, they're larger. So, in summary, I know that was a long answer, but it's very, very unlikely that this legend is true. It just doesn't make biological sense. It doesn't make evolutionary sense. And there's really no evidence to suggest it's true. I don't know where these myths start, but we hear them all the time.

DePerno: Our recommendation is to don't mess with venomous snakes. No matter what size or age. As long as you can correctly identify them, that's the key, just give them a wide berth. They'll do their thing. You do your thing. Copperheads are very docile. I've seen them in my backyard. I look at them, I give them a wide berth, I walk away. I come back later, they're gone. They're doing their thing. I'm doing my thing. There's no need to kill them. In fact, we highly don't recommend that. They serve an extremely important role in the ecosystem. They eat a lot of rodents, and other snakes eat them. So, just respect all snakes, respect the role in the ecological community, and just leave them alone.

Tracey: I think a lot of what makes people nervous about snakes, is the inability to correctly identify them. I'm not comfortable identifying snakes. So, what resources or tips can you give people if you see a snake in your backyard before you freak out and assume it's there to kill you how can you go about sort of figuring out which snakes are venomous and which aren't without having to get right up on it?

DePerno: All right. So yeah, I think this answer's, to me, it's fairly logical. Everyone has a phone these days with a camera and they take pretty good pictures. I would recommend anyone that comes across a snake that they're not sure of take a picture from distance. There are plenty of resources out there. Here at NC State University in the Fisheries, Wildlife and Conservation Biology program. We teamed up with the North Carolina Wildlife Resources Commission, and we put together a wonderful and very nice 21 page glossy book on snake identification. It just was published a few months ago. There are tons of resources out there on snake identification. There are Facebook and social media groups that will help you identify them.

DePerno: So, I get a lot of emails from people that say, "What is this snake?" They've already killed it. And then they send me a picture and I've got to tell them, "You just killed a non-venomous snake that's very beneficial to the environment." So, I think a lot of this falls on the public to do a little bit of leg work and educate themselves. They also have to understand that they're living with these animals and they have to show them the respect that they are so due. So, I think there's a lot of personal responsibility, but there are tons and tons and tons of resources available on the web, through outreach groups such as myself, and professors, and other universities. So, the information exists.

Tracey: Most people encounter snakes accidentally, and that's why they freak out. Are there certain times of day that we should maybe be a little bit more aware of our surroundings, if we're going into an area that's got a lot of wooded sort of debris? And, related to that, where are we more likely to encounter a snake?

DePerno: So yeah, that's a complicated question as well. So, it really depends the species. In North Carolina, we have a quite a bit of diversity with our snake species. We have diurnal snakes, we have nocturnal snakes. Their diets vary as well. Some snake species, primarily, they focus on eating rodents. Others eat eggs and birds. Others consume amphibians, reptiles, fish, insects, spiders. Other snakes, earthworms, invertebrates. So, we have a lot of diversity and we have a lot of variation. So, we have nocturnal, diurnal and a lot of food variations. So, because of that, you can encounter snakes all the time. I see black racers in my yard and red bellied water snakes. I see them out during the day. I've seen copperheads in the day. I've seen copperheads at night.

DePerno: So really it's about where they occur. So, let's take your home. Human dwellings provide warm shelter, and that's why we stay there. For a snake it's going to provide warmth, shelter, prey, water. So, there's certain characteristics that may make your property really attractive to snakes. So, they like hiding places downed wood, rock piles, old cars out in the back 40, other debris, piles of wood, piles of metal, piles of plastic. All of those could be really nice places for snakes to occur. So, I know that when I'm in my backyard and moving around, I've got wood stacked up, I've got rock piles, I know that those are probably likely areas where snakes might be. I also know that when I'm working in my garden, we know that most of the snake species in North Carolina are tied to down woody debris.

DePerno: There's a lot of snakes that you'll find commonly in your gardens, the brown snake, I mean, so you see these quite often. They'll use openings, and rocks, and bricks. So, if you want to reduce some of the snake encounters maybe you should minimize some of these structures. So, if you've got wood pile stacked up against your house, and you commonly see snakes there, well guess what? You're going to commonly see snakes there because that's a nice place for them. So, the best way to discourage snakes, I would think, is to maybe address what might be attracting them.

DePerno: These things will be attracted to where food is, so if you have a lot of rodents under your crawl space you're probably going to have snakes. So, eliminating some of those prey sources will kind of force those snakes away from you. And also proper home maintenance, maybe sealing off small openings or cracks, make it a little bit more difficult for these things to get into your buildings. Really removing items that provide shelter, or prey will help move snakes away from your property.

DePerno: Now, commercial snake repellents exist, but they really haven't been scientifically evaluated.

Tracey: Yeah, I can't imagine it would be worthwhile to do that when the other stuff is just basic best practices with home and lawn maintenance because you don't want to attract a bunch of mice to live in your crawl space either because that presents its own problems.

DePerno: Yeah. I just know whenever I'm outside in the area that I live I can encounter a snake at any time of the year, anytime of the day or night. So, I'm just always kind of thinking about it.

Tracey: Okay. Well, and that's probably good advice for other people as well, so they won't be so surprised when it does occur.

Tracey: And so, on kind of a lighter note, do you have a favorite snake species or snake?

DePerno: I really don't. I appreciate all their role in the ecosystem. I mean there's some really pretty gorgeous snakes. I mean, gosh, I have a red bellied water snake that hangs around. I see it every year, it's pretty big. That's kind of a really cool looking snake. You have ringneck snakes, they're really pretty. I like copperheads as well because I think they're misunderstood. But I really don't have a favorite. I just appreciate them for what they're.

Tracey: Okay. And what is your favorite snake fact, or the coolest thing that you know about snakes?

DePerno: Well, there's a few things. Do you know kingsnakes eat venomous snakes? So, I think that's pretty cool. One thing is is there's 3,600 known species of snakes in the world approximately. So, there's pretty good diversity, but interesting there's only about 400, maybe a little bit more, the numbers are all over the place, or so species of venomous snakes. So, the vast majority of snakes that we encounter are non-venomous. You just have to educate yourself. And only a small percentage of those are actually harmful to humans. So, I think they've been vilified unfairly, I mean, for a lot of reasons. So, I think I'd tell people to keep everything in perspective.

Tracey: We've been speaking today with Chris DePerno, a professor of Fisheries, Wildlife and Conservation Biology. This has been the Audio Abstract. I'm your host, Tracey Peake, thank you so much for listening.