

Ursinology Part 2 with Dr. Thea Bechshoft, Dr. Lana Ciarniello, Drew Hamilton, Wes Larson, Tsalani Lassiter & Danielle Rivet

Ologies Podcast

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Oh heey, it's your internet friend who calls herself your dad, who said that this second bears episode was going to come out as a midweek bonus episode just for funsies, and then started putting it together and it's, like, 37,000 clips from six different additional ursinologists and I was like, "What's... What's even in my skull? Is it just a cauliflower? Because no, that's not possible," so it's coming out as a part two, Alie Ward, back with another episode of *Ologies* about bears. Fuckin' hell yeah, bears, man. Part 2 of bears.

So, in Episode 1 of Ursinology, we asked Ursinologist Chris Morgan what bear conventions are like. And in this Ursinology Part 2, you can kind of pretend that you're hanging out around a campfire with a half dozen human beings who have dedicated their lives to helping and understanding bears. How lucky were we? Except for me, who did not know how to put this many interviews together, and who almost started crying in a hotel room this week, going, "What was I thinking??" But it's so fun, and it turned out great.

Also, it's divided into chapters. I'm going to get to that in a second, but first, thank you to everyone on Patreon at [Patreon.com/Ologies](https://www.patreon.com/Ologies) for all of these questions that we just continue every week to lob at experts. And thank you to everyone who reviews and rates *Ologies*, because I read every single one of them when I feel like I have made a terrible decision to make a clip show, and you remind me to keep going. Such as KJackson0529, who says:

... a friend played the scorpion episode on a backpacking trip and I'm hooked! I went to school for fluvial geomorphology and we are a fun bunch- just google parachuting beavers. You're welcome.

KJackson0529, I *did* google parachuting beavers. I *am* curious. I *do* need to hear more about how people toss beavers out of planes for science. But: bears before beavers. Let's get into it.

Get ready to meet... [*pumped up championship music and dramatic pause*] Six more bear experts!

First:

[Wes Larson: *Wes Larson, my pronouns are he/him.*]

Wes Larson, a world-renowned ursinologist who's been studying these creatures since 2011. You may have seen him in *National Geographic*, CNN, Al Jazeera, or on Instagram @GrizKid, where he dazzles 126,000 wildlife-loving followers with pictures of bears.

You'll also meet:

[Danielle Rivet: *My name is Danielle Rivet and my pronouns are she and her.*]

Danielle Rivet, who studied zoology for her bachelor's, researched bear diets for her master's, and is now a PhD candidate at the University of Saskatchewan monitoring polar bear movement.

Also joining us is:

[Tsalani Lassiter: *My name is Tsalani. My pronouns are he/him.*]

Celebrated wildlife photographer Tsalani Lassiter, who also partnered with *Nat Geo* to photograph carnivore ecologist Dr. Rae Wynn-Grant as she ducked into bear dens, and took data, and cuddled

cubs. And I have been following Tsalani on Instagram for a while, and if there's someone who can tell you the best way to observe a bear, it's this guy.

Other people I begged to record voice notes into their phone include:

[Thea Bechshoft: Thea Bechshoft. My pronouns are she/her.]

Dr. Thea Bechshoft, who studied polar bears for 15 years, taking her all over the Arctic in places like Greenland and Russia. She's also the author of the popular Facebook page, Polar Bear Questions. So yes, she's gonna answer yours, my friends.

As is:

[Drew Hamilton: Drew Hamilton. My pronouns are he and him.]

Drew Hamilton, an Alaskan-born bear spotting guide and wildlife photographer who has spent 20 years looking at bears. He's now based in Alaska and is such a joy when it comes to chatting about these important animals. He also takes incredible pictures.

And lastly:

[Dr. Lana Ciarniello: My name is Lana Ciarniello.]

The absolutely wonderful, Dr. Lana Ciarniello, a wildlife consultant, ursinologist, and ardent conservationist who studied human-bear interactions for her master's at the University of Calgary and bear habitat selection for her PhD at the University of Alberta. She is amazing and such a champion for the bears.

What a group! Y'all had so many questions that Chris Morgan and I just did not have time to answer, so I sent them off to these great bear folks who recorded them and sent them back. And we sliced, and diced, and put them into chapters for you. Starting with Chapter 1: Bears on Film, to get some reactions from ursinologists to bears in the media.

There's a total of five chapters in this episode, addressing everything from bear locomotion, to mating habits, polar bear fur, conservation tactics, itchy butts, pointy bits, campsite protocol, bear bells, singing *to* bears, singing *at* bears, and whether or not we should all move to Antarctica with all the world's bears for one big slumber party. So let's dive in with Chapter 1: Bears on Film.

Wes Larson: Hey, *Ologies* listeners. My name is Wes Larson. My pronouns are he/him. And so far in my career I've worked with polar bears, black bears, and sloth bears, mostly.

Okay, so I figure I'll get into these questions. Chris Brewer asked: Bears, Beets, or *Battlestar Galactica*? And Kate Stomps said: This question right here! So, we've got an *Office* fan out there, obviously.

Beets, you know, I could take 'em or leave 'em. *Battlestar Galactica*, I never got too into it. I watched a little bit. So, I'm definitely going to go with bears.

Okay, Ainsley Boren asked: Remember that documentary called *Grizzly Man*? He was on Kodiak Island where the subspecies Kodiak brown bear lives. Did the bears really get used to his presence and not attack?

Yeah, I do remember that documentary. I actually got to speak with the director of that documentary, Werner Herzog, and yeah, it's really great. They did a great job on that. He actually was in Katmai, which is close to Kodiak. It's right across the water from Kodiak. And as far as whether or not the bears really got used to his presence, they did habituate

to his presence. They started to just, kind of, accept him. Those bears are really well fed. They have lots of salmon streams, they have really good food sources, so they're not very territorial. They're not very aggressive. Those are the kind of bears that someone can be in close proximity to them like that. You couldn't do that with an interior grizzly bear; but with those big, coastal brown bears, you can.

But I mean, after a while; one of them ended up deciding to kill and eat him, so after a while you're going to come across a bear that maybe decides you're a meal, or doesn't like you, or whatever. It's just a matter of time.

Alie Ward: I wasn't sure if I was going to leave this story in because it's so sad, and tragic, and his methods of bear interaction were certainly controversial. But so many of you asked about ursinologists' feelings that I wanted to hear straight from at least one on it. So, my heart goes out to anyone who has been affected by any perilous bear encounter.

We'll talk more about how to keep you and the bears both safe in the episode. But first, let's meet Danielle and gossip about badonks.

Danielle Rivet: Hi there. My name is Danielle Rivet and my pronouns are she and her. I currently work with polar bears in the Western Hudson Bay area, specifically near Churchill and in Wapusk National Park in Manitoba, Canada, for my current PhD project at the University of Saskatchewan. But I've also worked with North American brown bears, more commonly known as grizzly bears, while I was doing my master's degree at Washington State University.

It looks like Hope had a very important question, and that is: Did you vote in Fat Bear Week, and if so, which bear was your favorite? Did 747 deserve the victory?

[*laughs*] Well, I always participate in Fat Bear Week. But for people who don't know, Fat Bear Week is kind of like a March Madness competition for bears that feed on the salmon at Brooks Falls, and it is so much fun to pay attention to and follow this particular competition. It happens every year, I think for the last seven years. Originally organized, I believe, by Mike Fitz, who was a ranger at Katmai for a while.

Basically, what it is, they take pictures of the bears at the beginning of the season after everybody has just come out of hibernation, and then they take pictures again at the end of the season when bears have been feeding on the salmon and they've really been packing on those pounds. They just look like big bear balloons, and it is the funniest thing in the world.

These bears are so fat! I have never seen fatter bears. It's unreal. I guess I've seen some fat bears, like at zoos, but this just really blows them out of the water. It's insane how fat these bears are.

But yes, I participate in Fat Bear Week. It's on Twitter and on Facebook. You vote, I believe, by going on Facebook and liking particular photos that are set up in the brackets, depending on who you think is the fattest bear in that particular bracket. And then the one with the most votes advances to the next round.

And this past year, for 2020, 747 was the winner. I don't know that 747 is my favorite bear for Fat Bear Week. I'm a pretty big fan of Holly, but Holly got knocked out pretty early after, I believe, the second round for her. She got knocked out by Chunk, and then Chunk was ultimately the bear that went up against 747 at the end of the competition.

Whether 747 deserved that victory or not is very debatable. I mean, we all have our favorites, right? I wouldn't have voted for him, but he's a *big* bear. I believe the rangers said that last year, 2019, they estimated his weight at 1,400 pounds and that they thought he was bigger this past year. So, bigger than 1,400 pounds in 2020. That is a massive brown bear. And it's so cool because these bears can only get that fat by being on that salmon stream right there. So, it's a really cool ecosystem, super fun and exciting competition to participate in. Just one of the cooler things that you can do on social media.

You can get on those webcams, I believe on Explore.org, and see a lot of the same bears that are there at Brooks Falls eating salmon, sitting in the water, and kind of all just hanging out together, looking for fish and waiting for their bellies to be full and for them to be super fat and ready to go into hibernation.

Alie: Patron Jane Ennis asked this next one: Can you watch *that* *Revenant* scene without wanting to stay inside forever? Is that a realistic bear attack? I know attacks are very rare, but damn, that was really something else to watch.

And to answer it is the wonderful Tsalani, who you should all follow on Instagram immediately. Just pull it up right now: Tsalani.

Tsalani Lassiter: My name is Tsalani. My pronouns are he/him, and I work with black and grizzly bears in the Western United States.

The Revenant scene. Very realistic bear scene, just given what we know about bear attacks, given how we've seen bears attack their prey, or what they do in fights. I think that's a very realistic attack.

When the character shot the bear with the rifle, the bear got *more* aggressive. It takes a pretty big rifle, a pretty big shot to take down a bear, and if you're not going to hit it just right, all you're going to do is piss off the bear and... [*laughs*] it's going to do more to try to take you out.

The way it shook him side to side, grizzlies definitely do that; we've seen that in the wild. The way they jump up and down on you to crush you or break into things, I think that was a very nice scene. Very scary, but very nice. I really did appreciate it.

And I think that scene actually did some good for bears. I think, you know, we'll rely less in Hollywood on real bears that people are training, or people are using for Hollywood, and it shows that you can actually get a very realistic bear in, like, CGI. So, I really appreciated that scene.

I just want to stress one thing. It's very important that you educate yourself and you're Bear Aware if you live in a place with bears or if you're visiting a place with bears. The more knowledgeable you are, the more confident you'll be in bear territory, and the less you have to fear. As a conservationist, I want to turn people's fear of bears into respect for bears. Respect their capabilities. Respect the nature. And respect the role that bears play in our ecosystem.

Alie: This next question is from Francesca Ortisi, first-time question-asker: If all general bear species fought, which one would win and why?

Tsalani: This is a pretty easy one. In general, a polar bear is the largest bear species, standing at like ten feet tall. Grizzlies, the big Kodiak grizzlies in Alaska would stand probably eight or nine feet. They don't meet too much, but I guess if they were to fight, if you had a big

grizzly and a smaller polar bear, maybe the grizzly would win. But in general, I think the polar bear... This is a pretty easy one. Nothing's going to touch a polar bear. They've got larger paws; they've got sharper teeth. I don't think a grizzly is going to be able to take one.

Alie: Okay, but what if there were species-on-species action that was not fighting? So, we have an expert for that.

Dr. Thea Bechshoft: My name is Thea Bechshoft, my pronouns are she/her, and I work with polar bears. Let's dive into some polar bear questions. From Anna Duewiger: Are grizzly bear/polar bear hybrids real? And if so, is this because of climate change?

Well, yes and no. So, hybrids have always existed to some extent, but now we are seeing that polar bears in some areas are spending more time on the shore because the sea ice is missing for longer periods of time. And we're also seeing that the grizzlies, or the brown bears, are moving further north, simply because they can find food for a longer period of time over the year. So, we do see more interactions between the two species, and sometimes those interactions end up with a mating and with hybrid cubs.

Stephanie Broertjes asked: Is it a pizzly or a growler?

So, I mean, really that's up to you, whichever word you like better, pizzly or growler. But unofficially, it's a grolar bear if the sire – that is, if the father – is a grizzly bear or brown bear. And it's a pizzly bear if the father is a polar bear. So, I would say that the hybrids that we know of, they are usually grolar bears because it's usually a polar bear female and a brown bear male. And I really apologize if I'm messing these names up royally, but yeah, I hope it works.

Alie: Ah! You're doing great. We love you. Now, if this were a *This American Life* episode, I would come in Ira Glassy-like and say, "Today on our radio program, we've arrived at Act 2. Act 2: Fuzzy Wuzzy. Let's get fur real.

You remember Tsalani:

Tsalani: Weird bear facts? Black bears are not all black. Most people don't understand this, but they come in various colors; black, brown, golden, blonde, there's even a bluish-tinted black bear, there's even a whiteish bear called the spirit bear, which is, like, shiny white. You can find that up in Canada, in British Columbia. So, I guess that's kind of a weird bear fact, and most people have no idea that black bears aren't always black.

Alie: Also here with us is Drew Hamilton, an Alaskan guide and bear spotter, who himself has a russet kind of fisherman wilderness beard that appears to get glimmering, icy crystals on it in the field.

Drew Hamilton: My name is Drew Hamilton, my pronouns are he and him, and I work with brown bears in Alaska and polar bears in Canada.

So, before I get into it, I think I need to make the distinction for what is a brown bear. Here in Alaska, it's a geographic designation. So, if you boil a brown bear, a grizzly bear, and a Kodiak bear all down to their scientific name, it's *Ursus arctos*, and it breaks down geographically. A bear that's found on the coast and has access to salmon is called a brown bear. If that bear is found up in the interior of Alaska, say, around Denali National Park, it doesn't have access to salmon, it's called a grizzly bear. And if that bear is on Kodiak island, well, that's a Kodiak bear.

Thea: Rebecca Swerida asks: Blue polar bears; is that a thing?

So, sometimes polar bears can be green, but I've never heard of blue polar bears. Polar bears that are kept in captivity in, you know, more humid parts of the world, they can actually get, like, a green tinge to them, which is a result of algae growing inside of their hair. And yeah, it looks kind of strange, but usually it can be relatively easily cured by soaking the bears repeatedly in saltwater because this kills the algae.

I mean, you could consider polar bears blue, partially, but that would be their tongue. Sometimes, if you see a polar bear tongue, it kind of looks bluish. Polar bears are born with a pink tongue, which, after a couple of months, starts to become mottled with black. And the tongue of adult polar bears varies in color. Some animals still have a lot of pink showing. Some are nearly all or totally black. And some have this mix of pink and black that can actually look bluish.

The roof of a polar bear's mouth and its inside cheeks are also dark in colors. And sometimes you will see pictures of adult polar bears with very blue or even pink tongues and cheeks. These are rugs, and the inside of the mouth is made of plastic, so, not really a real polar bear mouth or tongue.

As far as I know, there's no specific ecological reason for polar bear tongues to be mottled this dark color that they often are, and my best guess is that it may be genetically linked to polar bear skin color, which also goes from being pink to being black over the course of a few months at the same time that the tongue color is changing.

Eloísa Fróes said: I read about the fact that polar bear hair are not white but transparent and that their skin is black, and I freaked out thinking about it. It's like bears are covered with those fiber optic filaments. Why is it better to have transparent than white hair?

Actually, transparent and white hair are basically the same thing, because the color of your hair is determined by how much pigment is in there, how much melanin is in your hair. So the more melanin you have, the more pigment you have in your hair, the darker your hair is. Now, gray hair, our hair turns gray because we have a gradual loss of this pigment, and so once the hair is completely white, it's because there simply is no more pigment in it. So, if your hair is completely white, it's basically the same as polar bear hair. White hair, transparent hair, same-same.

One of the very persistent myths about polar bear hair is that they're completely hollow, which is not entirely the case. Polar bears have two types of hair. There's the guard hair, the longer ones on top, and then there are the woolen hairs underneath that are more curly, and softer, and really good at holding in the heat.

Both of these types of hair are transparent – without pigment – and they're mostly hollow, but they have this air-filled core where it's multiple chambers, one after the other, down through the hair strand. It's because of these properties that polar bear hairs scatter and reflect all visible lengths of light, and that makes them appear white to the human eye.

Now, with regard to the skin, polar bears are actually born with pink skin, but after a couple of months, while they're in the den with their mom, the cub's skin turns permanently black. And you can see this on the bear's nose, on its lips, and under the footpads.

There are quite a few theories that have been suggested over the years as to why this is. But the prevailing one is that the skin is black in order to absorb the maximum of heat from the sun, but also to aid in protecting the animal against UV radiation. Generally speaking, darker skin, or rather, higher levels of the pigment melanin in the skin, have been found to provide better protection against the sun's UV rays. And this goes for a wide range of organisms, from humans to blue whales. So, whichever is true, no albino bears have been reported to date, which could indicate the importance of having black skin in this species.

Katherine's girlfriend wants to know what polar bears smell like. I actually wondered the same myself for years, and so the first time I was close to a sedated polar bear, I buried my face in its fur to take a good whiff. And I can tell you that unlike, for example, dogs, and cats, and horses, and sheep, the smell of polar bear is incredibly subtle.

If I were to compare it to anything, I think it would be... Imagine you've been going for a long walk along the oceanside on a really windy day. So, the smell of your clean, non-perfumed, wind-blown hair when you come back inside is kind of the closest I can come to what it smelled like.

There are a number of reasons why polar bears don't have a very strong smell. First of all, most polar bears spend their entire lives on the sea ice, which is a very neutral-smelling environment with water, and ice, and snow. But also – and this is actually quite important – polar bears don't have territories to defend like most other carnivores do. So polar bears don't need this strong scent to mark their particular area.

Also, all of this being said, I'm sure that a wet polar bear will likely have a slightly more noticeable smell than a dry bear, and a polar bear that's in the middle of eating a seal will strongly of the prey, so of the seal's fat and blood. Also, a bear that is forced to spend its summer on land instead of on the sea ice may smell somewhat of wet peat, berries, fermented algae. I also imagine that a polar bear with an upset stomach or an adult female who has spent the past three months in the den with her newborn cubs may well have a somewhat stronger smell.

Alie: We've arrived at Chapter 3: *Bearhavior*. How do bears bear to other bears? Y'all cared, and asked a lot of questions. And we have answers. Well, one incredible ursinologist with over 25 years of experience by the name of Dr. Lana Ciarniello does.

Dr. Lana Ciarniello: My name is Lana Ciarniello, and I primarily am working right now with grizzly bears, but I also work with black bears. I am also the Co-Chair of the International Union for the Conservation of Nature's Bear Specialist Group's Human-Bear Conflicts Expert Team. And in that role, I work with seven of the eight bear species worldwide. So, all species except polar bears because they have their own expert team.

So, Tammie asked: Have we been able to recognize or identify a language in bears?

The answer to that question is, absolutely, bears have a language. Bear language is more spoken with their body and their movements. So, how they face each other, whether they look each other straight in the eyes, whether they have their head down or their head up, all of those are how bears are talking to each other. So, these subtle movements in their body language.

Bears also can vocalize. They will clack their jaws and they will tell you things like, "Back off. Stay away. Get away from me." So, not only do they have their body movement

language, they can vocalize as well, although that is a bit less common. They often speak to each other with their body language.

Alie: Does Wes Larson, aka GrizKid, speak bear? He confirmed that their vocalizations can speak volumes.

Wes: They definitely use a lot of different vocalizations for communication between themselves, between other species. If you, for example, come upon a black bear in the woods and it's not happy with you, it's going to make, like, a [*whooshing in short, aggressive puffs*] noise, or it's going to clack its jaws at you. So they definitely vocalize a lot.

Alie: Lana also chimes in about some very on-brand *bear*havior.

Lana: So, Avery asks: We all know that they're the cutest when they're itching their backs on trees, but the question remains; why are they so itchy?

Ah, Avery, interesting you should ask that. This is exactly what I am working on right at this moment, them scratching their backs on trees. So, bears do this for a number of reasons, and we believe it is a method of communication between bears. Sometimes, on their way to the tree, you'll see them take their footpads, put them in a depression, and then, it's called 'cowboying'. They move them around.

Why do they do that? Well, they have scent glands in their feet and that releases the scent into those marks. Then they will mark all the way up to the tree, the marked tree, and they will either smell up and down that tree or investigate it, smelling who's been there, what they've been doing, and sometimes they will stand up or even stay quadrupedal, on all four feet, and they will itch their shoulder or their back on that tree. Again, releasing the scents from the glands.

Now, other bears can use that. It's a method of communication between them. A female may come up, she might have really young cubs, and she can go up to that tree and she will smell up and down, and she may make a decision. "Hm, a big adult male just rubbed on that tree. That big adult male has a possibility of killing these little cubs I have. I'm not going to go that way," and she'll turn around and go another way.

A paper just came out that talked about it being a "dating calling card." So, those who are itching on those trees more, or scratching their back more, may be getting mates from that. So basically, it's a method of communication between bears, but yes, you're right, Avery, it also feels good and gets rid of some of the hair and some of that itch.

Ah, we have another question on marked trees, and it says: Do all bears do the itchy fur dance that we see in those GIFs? The answer to that is yes, indeed, all bears do. Some bears may mark more than others, and that can be based on if it's the breeding season. If they're these big, large, adult males, they may be doing more marking. But absolutely, all bears mark trees. I have literally thousands of videos of it going right from our newborn cubs of the year, they're called – those bears that have not yet reached their first birthday – marking trees all the way up to 1,500-pound males marking trees. All bears mark trees, and they're talking to each other, pretty much, as they do. So, they're leaving their calling card.

Alie: Bearded bear dude Drew echoes that, just like me dancing after a few white wines at a wedding, bears can also use their body as an instrument.

Drew: They've got impressively complex communication. It's mostly done through body posturing, body positioning. There's some vocalizations involved, but really, it's very subtle body postures that can tell you exactly what's on a bear's mind.

Bella Trezza asked: I heard somewhere that bears grieve for their loved ones. Is this true? And what are the social structures of bear communities?

Bears do have emotions. They're probably not as complex as human emotions. I don't know that I'd be willing to say that bears specifically grieve, but they definitely feel loss. They definitely feel attachment. So, if you were to boil the different things that make grief, bears can feel those, maybe, independently, but I wouldn't necessarily assign the specific human emotion of 'grieve' to something bears do.

And as to what are the social structures of bear communities, that is an incredibly complex answer. So, it kind of depends on the bears and where they're located. On the coasts of the Alaska Peninsula, Katmai National Park, McNeil River State Game Sanctuary, you have incredibly high densities of bears, and those bears are forced to interact with each other frequently. So, they have actually developed complex social structures that are based on a rank and hierarchy system. People tend to think that that's based on how big a bear is, but it's really based on their attitude.

So, the alpha bear, the most dominant bear in an area, isn't necessarily the biggest bear in the area. It's the bear that has the attitude to keep all the other bears in check. Now, the family groups will tend to stick together for two-and-a-half, three-and-a-half, four-and-a-half years. The cubs will stay with mom and the independent bears, the teenage males and females that are independent, will sometimes pal around together for a number of years, particularly if they're siblings and grew up with mom together. Though, after they leave mom they'll still stick around.

And then you've got this demographic of large, male, older bears that are fairly independent, but there are a few places where these bears come together to feed. You think of the most famous being Brooks Falls in Katmai National Park or McNeil Falls in McNeil River State Game Sanctuary, and you get to see these amazing interactions between bears. I always say that one day at McNeil River is like a lifetime of studying bears because you can see 40, 50, 60, 70 bears at one time.

The most bears I've seen at one stretch of river at McNeil was 78 in a quarter-mile stretch of river. So, just sitting there you see all these different behaviors and all these different social interactions just, kind of, stacked one on top of the other. And so, you learn real quick.

Alie: Aside from Bear-a-palooza, what are smaller group dynamics like? Do bears ever have stepdads? Do they ever call home and see how their mom is doing? Lana has details.

Lana: Tammie also asked: Do bear families stay together or nearby one another as adults?

So, that's an interesting question. For bears, the father has no investment in the offspring, so he doesn't stay around at all. But for the mother, absolutely. She raises her young, and then it all depends if those young are male or female. If you're a female, you are allowed to have part of your mother's home range. So when we look at the genetics of female bears, it acts as a matriarchy. You've got your matriarch in the middle and then that rings out into these females who are their offspring as it goes down through the generations.

Males, however, are made to disperse. The mother will chase off her male offspring when they reach the age of dispersal, and she'll make them go away, and she'll keep after them. They will stay in that area for a while, while they grow up, but then once they get older, they will disperse quite long distances. We see this quite a bit when we see bears even coming over to where I live on Vancouver Island in Canada. People will be shocked, but it's not shocking at all. Male bears disperse, they go out to look for their own territories, and they do this to avoid inbreeding, to not breed with their siblings. So, trying to maintain that genetic line.

Ashley asks if it's true that bears have a social structure. Yes, it's absolutely true that bears have a social structure. Your big, adult males, they are your most dominant bears. They get the best feeding spots, they get access to the best females for breeding, they will fight each other for females for breeding. So, there is definitely a social structure that goes from your big, dominant males to your younger, the ones who've just dispersed, they're going to be your most subordinate bears.

Alie: Let's get PhD candidate and long-time bear fan Danielle back to address some tawdry bear sex gossip. By the way, if you have a dick, there's a chance it's about the same size as a polar bear's or bigger. They have, like, six-inch pickles, although, some research says that it averages 7.3 inches, but I think that the research was done by polar bears.

Anyway, bear boning, since they have an actual bone called a baculum. Let's get into their romantic lives.

Danielle: My next question looks like it's from Megan Burnett Tarasiewicz. I hope I'm pronouncing that correctly. But Megan asks: What is bear reproduction like and when do they mate?

Bear reproduction is one of those topics that is actually super fascinating to me. They're one of the least productive mammals in North America. It takes them a long time to reach sexual maturity, and then to have babies, and then for those babies to grow up and then also reach sexual maturity and start breeding on their own.

If you just think about taking, like, one male and one female bear, and say they reach sexual maturity as soon as they can, and then they have their own offspring, and the offspring survive to do the same, it would probably take about ten years for the population to go from 2 bears to 15 bears.

Alie: Very impressive by human standards. That would be off the charts. But somewhere, there's a pair of rats just laughing their rat asses off at bears, because rats could grow a family to *half a billion* descendants in just three years. Listen to the Rodentology episode with Bobby Corrigan for more dazzling rat facts, because wow, can they make rats.

But back to bears:

Danielle: Bears typically are pretty solitary. They're usually only found together when it's a mom with cubs or during the mating season. The average breeding age for these bears is somewhere around three to five years. And just because they've reached sexual maturity doesn't necessarily mean that they're actually going to be breeding that year, especially males. Males might be capable of breeding at three or four years of age, but they usually don't get the chance to because there's a lot of competition from the bigger, older male bears out there. And it's the female that, kind of, chooses what's going on. He doesn't have a whole lot of say. He just kind of goes around into these different territories looking for a female that he can breed with.

But the larger bears in the population, typically, are the ones that tend to be the most prolific breeders, if you will. Bear breeding season usually is in the spring and summer; starts in May and usually lasts, maybe, until early July. Most of the breeding season, I would say, probably occurs in June for brown and black bears in North America. I believe it might be a little bit earlier for polar bears because, at least the polar bears I research in the Western Hudson Bay population, their breeding season occurs entirely on the ice. Sea ice is really important for polar bears, not only because of their access to food but because really important life history events like the breeding season occur on ice.

But typically, like I said, breeding season is in the spring for these bears, and males will go around to different territories looking for whatever females they can find. They'll compete with other males for access to those females. And it just, kind of, goes from there. I've seen copulation in bears before. It's a little awkward. Kind of looks, just, like two really big dogs doing what dogs do. But you know, they breed, and then they have their cubs born over the winter during the hibernation period, and the cycle starts all over.

Meryl Stark asked if bears give birth while hibernating.

So, this is really interesting, but yes, they actually do give birth while they're in hibernation. Most bear cubs in North America are born typically in January or February while mom is still in the den for hibernation. And when these cubs are born, they're completely helpless. They're blind. They don't have a whole lot of fur, but they are furred. They don't really have much going on for teeth in their mouths, and they're not really capable of moving around a whole lot on their own, so they are going to depend on mom for almost everything that they need, which would include things like getting food.

So, they're going to have to nurse from mom for the duration of the hibernation period. And they actually won't even come out of the den with mom until sometime in late March or early April; later in the spring than bears that would be emerging from hibernation without cubs.

And mom will usually have anywhere from one to four cubs, typically. She could have more, but two is usually the most common, and those cubs are born really, really small. They're like the size of a potato, pretty much, when they're first born. But by the time they're getting ready to go back into hibernation after their first year, they can be as much as 80 pounds, so there's a whole lot of growing that goes on during that first season.

It's really, really important to remember that, even though mom is in hibernation when she's giving birth to these babies, she's not actually asleep. It's not like she just wakes up surprised in the spring and she's like, "Oh no, I've got babies that I have to take care of." She's completely aware of what's going on the entire time because she has to take care of them, and provide warmth, and you know, nurse them, and things like that.

But it's important also to remember that nursing and lactating are really energetically expensive for these bears, and because they're in hibernation they haven't eaten in a long time. They haven't had anything to drink. And they do have a much lower metabolic rate than they would normally during the active season. Their body temperature drops during hibernation, though not quite as much as other animals that

hibernate. So, they're basically just, kind of, working off reserves of what they have stored up from the previous year before they went into the den.

So, that's what mom is using. She's taking stuff from these fat stores that she's accumulated and putting that into making milk for her babies and taking care of her babies. She just has to be really careful that she's not expending a whole lot of energy. So, she's still kind of in that hibernation phase, but she's not actually asleep while she's giving birth and taking care of her cubs.

My next question is from Natalie Ashburner-Wright. Natalie wants to know if there are any kinds of bears that are mostly monogamous.

Um, I don't think so. My experience is mainly with black bears, brown bears, and polar bears, all in North America, so I'm not entirely sure what would be going on with bears like sun bears, or pandas, or Asiatic black bears, or spectacled bears, or anything like that. But it's my understanding that bears in general are not monogamous at all.

Male bears are very promiscuous. They'll find as many females as they can to breed with because the imperative part for them is to just get out there and get those genes spread out into the gene pool. They want the babies to be theirs, so it doesn't really matter to them how many females they breed with.

But in addition, female bears actually have more than one mating partner in a breeding season as well. There could be, you know, a few different reasons behind that, but one of the reasons that I'm most familiar with, at least in North America and for brown bears that are in Europe, is that there seems to be a pretty high chance sometimes of larger male bears coming back into territories and killing cubs in order to bring females back in estrus so that they can breed with them again.

A female bear won't breed with a male if she still has cubs that are with her. And like I said before, those cubs typically stay with mom for the first couple years, maybe three or four years depending on how clingy they might be or what they might need. But males won't breed with females that already have cubs. Females just won't participate. So the only way that a male can make that work in his favor is to eliminate the cubs. So what he'll do is he'll come in and he'll kill the cubs, and that brings the female back into estrus during the breeding season so that he can mate with her and her next set of cubs will be his.

Now, that doesn't really work super well for maintaining populations, and obviously the female wants her cubs to survive as well. So, what the girls, kind of, all figured out to do was to go out and breed with a bunch of different males, because males will remember, essentially, who they've mated with during that particular breeding season. And if there's a possibility that those cubs are his, he is significantly less likely to come back into that territory later and kill those bears, just because it might already be his genes that are there and not somebody else's.

So, the answer to that question is no. I don't know of any bears that are mostly monogamous. I think most species, if not all of them, are rather promiscuous and they have multiple mating partners within a single breeding season.

My next question says: Whoa! Please talk about bears reabsorbing embryos. Is this more common in bears that live in closer contact with humans? And that question is from Ira Gray.

This is actually one of the most fascinating things about bear reproduction, I think. This has just completely blown my mind every time I think about it and talk about it. But bears do this really crazy thing that's called 'delayed implantation'. Basically, what that means is bears will have their breeding season in the spring or earlier in the year. Like I said, sometime between May and July, typically. And the embryo will be fertilized but it doesn't actually implant in the uterine lining. It just kind of hangs out there. I'm not really sure what's going on or how that actually works, but it just hangs out and stays there until it gets a lot closer to when the female starts thinking about going into hibernation.

What happens is, at least in brown bears, females that don't have at least 20% body fat when they go into hibernation, will not reproduce. So, if the conditions and resources have just been not super great, she can't find enough food, she's not overly fat when she's getting ready to go into hibernation, she'll actually reabsorb that embryo as if it never happened because she knows that she doesn't have enough resources to provide for any cubs that she would produce during that hibernation period. It would actually be super unbeneficial for her to have those cubs because she might end up starving herself and she would most likely lose any babies that she would have.

So in a way, females are actually able to decide whether or not they're ready to reproduce, whether or not they have enough resources, whether or not they're fat enough to support nursing and lactating through an entire hibernation period. It's so fascinating to me. I don't understand how it works, but that's basically what they do.

They breed in the spring, and they don't actually get "pregnant" per se until probably November when they go into their den. So there's this whole period of time where the embryo's just, kind of, floating around in there, hanging out. And then right before they go into hibernation, that's when they decide, "Yes I can reproduce," or, "No I can't." So either the embryo will be reabsorbed or it will implant in the uterine lining. And when the female actually becomes pregnant, that's, like I said, probably somewhere around November. And then she gives birth in January or February. She's actually pregnant for a very short period of time, considering.

Whether or not this is more common in bears that live in closer contact with humans, I'm not necessarily sure. To me, it's more of a function of resource availability and whether or not the female thinks that she has enough fat accumulation. So, in some circumstances I could see that being beneficial to be closer to humans because some of those bears might be getting into dumps or other anthropogenic food sources, maybe; feeding on things that they're not supposed to, necessarily. But they might be fatter bears, so maybe in that particular case they'd be less likely to reabsorb an embryo because they have a lot of resources and they're very fat.

In other circumstances, I guess it might be the opposite, right? If you have a bear that is close to people and that's stressing them out, and they feel like they can't get enough access to resources, then reabsorbing that embryo because she's not fat enough when she gets ready to go into hibernation might be the best option for her. So, I think of it more as a function of resource availability and fatness, body fat, rather than how close the bear is in contact with humans.

Alie: So many cocktail party facts, this weird bonus-not-bonus episode is delivering and will continue to after a few words about sponsors who are making it possible to donate to not one, but six charities this week!

Wes chose the Grizzly Bear Foundation, which is dedicated to the long-term welfare of the grizzly bear in North America. Thea chose PolarBearsInternational.org. Lana asked that hers go to Northern Lights Wildlife Shelter in Smithers, BC, as they are holding the orphaned grizzly bear cubs that she will be releasing this June as part of Project Rewild, and that is WildlifeShelter.com. Drew Hamilton directed his towards FriendsofMcNeilRiver.org. And Danielle's is going to Idaho Black Bear Rehab, and we'll donate to Tsalani's choice as well. There are links to each of those in the show notes, and if you are so moved, toss a few bucks their way. I'm sure they'd appreciate it, but if you can't, that's okay because we did, thanks to these sponsors.

[Ad Break]

Okay, moving right along to locomotor questions. Chapter 4: *Bearly Gettin' By*. Let's toss it to Drew.

Drew: Hannah Cameron asks: I heard bears can't run downhill. Is this true?

Bears can run downhill, they can run uphill, they can run across hills. I've seen them scale cliffs that we'd have to be roped up to do safely. They kind of have the ultimate four-wheel-drive system.

Alie: Lana...

Lana: Ronan asks: Why do bears walk plantigrade, or on their heels like humans? And is there an evolutionary reason for this?

Well, Ronan, bears actually spend the vast majority of their time walking quadrupedal, on all four feet. So, they can stand up and they can walk plantigrade. Now, if they were to be walking plantigrade, the main reason for this would likely be a significant injury to one of their front paws. So, an injury where the weight-bearing of it hurts them, so it's easier for them to walk plantigrade on their back feet. I saw this once in a video with a black bear in town and it did have a significant injury to its front paw, so it was walking like a human.

So, why would they stand on their back legs? One of the main reasons that they stand on their back legs is when they are trying to see something or trying to figure out what something is. You'll see them stand up on their back legs, and oftentimes they may swing their head lightly from side to side, and what they're trying to do is catch the scent on the wind so they can identify what it is they think they saw.

For example, sometimes when you're hiking and you come across a bear, and it's not quite sure what that is, you may see it stand on its hind legs and swing its head from side to side. And then you're going to help that you've taken account of your wind direction and that the wind is blowing in such a direction that it's blowing *at* the bear, and therefore it can catch your scent on the wind and identify you as human.

Alie: Dr. Thea Bechshoft is technically a marine mammal scientist studying polar bears.

Thea: Michael PS is asking: What makes polar bears such good swimmers? Are all bears as good at swimming as polar bears and I just don't know it? I need answers! Thanks.

So, as far as I know, all eight bear species can swim, though some swim more and longer than others. Polar bears, for example, they are experts at doggy paddle swimming. They use their front paws to paddle with while their hind legs trail behind them, kind of

steering them like a rudder. And data from satellite collars show that swims of an average of 100km, or 62 miles, over three days, are not unusual.

However, the most extreme polar bear swim that we know of was an adult female. She swam for nine days straight, a total of 687km, or 426 miles, which is just mind-blowing. However, swimming is very energetically costly for the polar bears, and this incredible swim actually cost this adult female her cub, which was with her in the beginning. And it also cost her 22% of her body fat, meaning that although this swim was physically possible for her, it was definitely a challenge.

One of the consequences of climate change is that the Arctic sea ice gets more scattered, more fragmented. There was a new paper published recently showing that polar bears now are actually having to spend three to four times more energy than their grandparents did, simply because of the changes that we're seeing to their habitat, to the sea ice, which of course also is their essential hunting habitat. So they have to spend more energy to be able to catch seals.

Alie: It's kind of like student loan debt, but with your luscious, blubber booty getting spent on bullshit that your elders didn't have to deal with, but in this case, it wasn't their fault.

So what do they do? Do they just completely fuck off and just go live in the sea? I would.

Thea: Christopher Blackington is asking: Has any research been done on the possibility of polar bears evolving into full-time sea mammals like seals or even cetaceans? They spend so much of their time at sea, it seems like a natural next step for them.

So, interesting question. There is no research on this that I know of. Polar bears are marine mammals, it's even in their Latin name. They're called *Ursus maritimus*, or the 'sea bear'. But that being said, they still rely a lot on their fur for heat, and fur doesn't really keep you warm underwater. There you have to have a good blubber layer instead to keep you warm.

And also, polar bear cubs fare quite poorly in the cold water, which is why polar bear moms will often, you know, take the long way around on the sea ice so they can walk on top of the sea ice instead of having to have their cubs swim in the water between ice floes. So, I don't see it happening anytime soon, but you know, let's wait a few million years and see where evolution takes the polar bear.

Alie: Antarctica? Because that would be like humans moving to a planet literally called "No Human Can Live Here."

Thea: Hannah Nuest asks: Why aren't there polar bears in Antarctica?

To answer this question, you need to think about how the different continents have moved around during the different geological time periods. Antarctica has actually been separated from other continents by the vast Southern Ocean for about 45 million years, which is before polar bears evolved.

The family, Ursidae, which polar bears are a part of, didn't show up evolutionarily until about 30 million years ago. So even if they wanted, polar bears just couldn't really get to the Antarctic. Even if they wanted to, the Antarctic is simply just too far away for polar bears. They are excellent swimmers, but they would struggle to migrate all the way to the south pole.

Alie: It's too far. She doesn't see it happening. Now, speaking of seeing, actually, while a spectacled bear is one species of South American cloud forest-dwelling bear, should *all* bears be spectacled bears? Drew will field this one.

Drew: Ainsley Boren asked: Can they not see well? Do bears need glasses?

Bears see about as well as we do. A lot of people will tell you they don't see well, but it's not that their eyesight is poor; it's not their most dominant sense. They are following their sense of smell. Their sense of smell is so much better than ours that they rely on that more than their vision. That being said, I do know a couple of bears that squint a lot and probably could use a set of glasses or maybe some contact lenses to make it easier to catch fish.

And Fritz asked: I've read that bears – black bears in the study I read about – have some form of color vision. Do we know much about how they see? And how about differences in their ability to see color based on species?

From everything I've read, yes bears do see color. It's probably not quite the spectrum we see, but some diminished version of that. One study in particular looked at polar bear's vision and determined that they were missing a portion of the green spectrum, which always begs the question... They have the best seat in the house for the Northern Lights, which oftentimes will appear green to humans. So I always wonder what the Northern Lights look like to polar bears.

Alie: By the by, Drew's Instagram is linked on my website too, and his photos of the Northern Lights are bonkers! So do follow him @DrewHH.

Now, what about a bear following *you*? Thea addresses polar rumors, possible flimflam.

Thea: Jesse Hurlburt is asking: Do polar bears really hunt people?

So, not really, no. Sea ice loss has led to an increase in polar bear sightings in Northern coastal communities around the Arctic, and even though polar bears sometimes will enter human settlements out of curiosity, the main reason they do so is hunger. Because without a healthy sea ice platform that they can hunt seals from, polar bears will start looking for food in other places, and quite often this is to their own detriment.

We are expecting human-polar bear encounters to increase as more polar bears are forced to spend longer periods of time on shore and as human activities increase, which of course is both in response to longer ice-free seasons. All of that being said, polar bears don't really hunt people. It's a persistent myth, but there is very little reality in it.

Now, if you come across a bear that is hungry, or if you somehow manage to surprise it, or if you come between a mom and her cubs, that's not a good situation to be in.

However, I think the main issue here is that polar bears really are not afraid of very much. They're very opportunistic, they're very curious, and if there's something that looks interesting, they are very likely to want to investigate. And here the problem is that, even if they're just investigating a person that they come across, humans are fairly small and squishy, and polar bears are very big and have quite a few pointy bits.

Alie: Quite a few pointy bits!

Thea: Anne Delekta is asking: If attacked by a black bear, they say you should fight back. If attacked by a brown bear or a grizzly, you should play dead. What about polar bears?

Well, I mean, if you're attacked, you should definitely fight with everything that you have, for sure. There is no point to playing dead because, yeah, polar bears don't mind, you know, sinking their teeth into carcasses, for example, if there's a whale carcass that washed up on a beach. But of course, the best way to avoid polar bear attacks is to be very mindful of your surroundings when you're in polar bear country. So, always have a polar bear guard, always have a lookout when you're in polar bear country, that way you're not surprising a bear and a bear is not surprising you, and everyone is all the happier for it.

Alie: So, bears, they do not like surprise parties. For all of us who love being out in nature and also want to do right by the bears, because they deserve it, Lana chimes in with more advice.

Lana: Okay, so Hannah asks: Attacks aside, what are the best ways to prevent a bear encounter?

Hannah, this is really kind of dependent on whether you're going camping, or whether you're hiking, or whether you're asking about the best ways to prevent around your home, like removing your birdfeeder. So I'm going to answer it like you're going hiking.

One of the best ways to prevent a bear encounter is, first, to know where you're going; what time of year you're going there and where you're most likely going to encounter that bear. So if you're going to hike, for example, in berry season through a berry patch, that might not be the best way to go, so you want to avoid their critical habitats or avoid places where those bears are most likely to be.

Another way we can prevent encounters is to really be aware of our surroundings. Rather than "unplugging" and plugging in things like earbuds and listening to music, you want to have your ears open, have your eyes open, have your nose open. You want to make sure there's no really bad smells like a dead animal somewhere that might be attracting a bear. You want to make sure that you're looking all around you and know what's going on. Is there any bear sign? Is there scat? Scat is bear poop, by the way; that's what we call it. Is there scat on the trail? Do you see a bunch of birds that could indicate maybe a carcass ahead? Those kinds of things.

Then, when we're hiking ourselves, you asked: Does singing loudly work?

Absolutely! I highly recommend using your voice. Your voice identifies you as humans, and the vast majority of bears know humans and human beings. So, singing loudly definitely works. Clapping your hands absolutely works. You've asked here about bear bells. I don't recommend bear bells. I don't recommend bear bells because they don't identify you as human. They've been shown to be in the same decibel range as birds, and bears are curious. So we don't want to actually attract them, so I actually don't recommend bear bells.

Another thing you want to do, Hannah, is know your line of sight. So, if you're coming up to a blind corner, you certainly want to be using your voice, and clapping your hands, or singing loudly, as you say, before you're going to come around that corner, warning the bear that you're coming. We don't want surprise encounters. We want a really good line of sight around us. We want to keep our eyes open, we want to keep our ears open, and our nose open in bear country. Avoid those surprise encounters and let bears know we're coming.

Also, we never, ever, ever, feed bears or provide food for them. Bears can find their own food. Do not provide human food for them. It really is true that a fed bear becomes a dead bear.

Another thing that we want to keep in mind in preventing a bear encounter is the direction of the wind. Is the wind blowing towards you? Is it carrying your scent down the trail so that the bear can get your scent before it's there? If you're using your voice and then it picks up your scent in the wind... Bears have an excellent sense of smell, so if they can get that scent... Bears really do their best to coexist with us, and a lot of times they'll just move right off that trail, be as silent as they can, and allow you to pass by. You might not even know they're there. So, wind direction is really important.

Wind direction's also important because I highly recommend that if you're going into bear country, you carry bear spray. Bear spray's an excellent, excellent tool, should you ever need it. We never want a negative encounter with a bear, but should we have one, we want to be prepared for it. You're also really going to want to know your wind direction then because the last thing you want is to dispense that spray and get it back all over you because it really does debilitate you, incapacitates you for quite a while.

Alie: Wes has studied bears all over the world and has not gotten killed one time, so let's hear his advice.

Wes: Lucy asked: I've heard mixed reviews on tools like bear bells and bear bangers and have first-hand seen that bear spray does basically nothing. What are the best tools for people to have with them when they head out into bear country?

Well, Lucy, I'm going to have to disagree with you on the bear spray thing. I've also seen it firsthand a lot of times and I've seen it work almost every time I've seen it deployed, whether that's in person, or in videos, or anything. My mentor was, kind of, the guy that wrote *the* paper on bear spray and it's been proven to be really, really effective, much more effective than firearms, even.

So, bear spray is definitely the number one tool I would recommend people take with them into bear country, especially if you're going to be around brown bears. The bear bells don't really work. Sometimes we actually joke around and call those dinner bells. There's just nothing... There's no real biological significance to that noise for bears. It doesn't really register for them. It's not something that they necessarily pay attention to.

Bear bangers, which are like the little flares or popgun, kind of, blasts that you can shoot at them, or cracker shells, or anything like that. All of that stuff works really well. They don't like flares flying at them. They don't like loud noises. Those all work. For me, I carry bear spray and then I have, you know, sometimes a firearm as a backup.

Shelley Carr asked: Bears seem so gigantic compared to what they eat. Are they just EATING ALL THE TIME? Or do they have a slow metabolism?

It's a great question. They're pretty much just eating all the time, especially in the fall right before hibernation when they go through hyperphagia. That's a time when they really are trying to pack on the pounds, and a bear will eat just about anything it comes across. They just really don't pass up any kind of feeding opportunities.

For example, a bear on a salmon stream will eat dozens of salmon in a given day. A bear in a berry patch can over 100,000 berries in a single day. And in hyperphagia, they're

eating anywhere from, like, 30-60,000 calories a day. They're really packing on the pounds.

And that's a big part of why human food is such a problem for them, because them eating a box of Twinkies, essentially, gives them the same amount of calories as they would get from eating berries all day long. So they really take advantage of any kind of high-fat, high-sugar food they can get. And once they get it they just want more, and more, and more. So, that's why the ones that get human food become problem bears. But yeah, they're really just that big because they don't pass up food.

Alie: Bears are just shameless chowhounds prepping for winter, and we love them for that. Except for when they eat the last of our cereal. And Tsalani has spent so much time photographing bears and even traveling by van on whims to different locations with his wife. How do they keep their snacks safe? Patron Hilary Kreman had a question.

Tsalani: Bear boxes. I know bear boxes are important for camping. They're also expensive. What's the next best thing?

Typically, if you're at a campsite, they'll already have the metal lockers for you. Some campgrounds will even rent you a bear bin. I've seen them for \$5 a week or so. You can always go to your local gear store and get a bear canister. Those are usually \$50-80, and then you can get a really good one for \$200-300. But I think, you know, keeping yourself safe, and keeping the bear safe, an \$80 investment is not really too much to ask.

If you simply cannot afford one, then I suggest just being super conscious and cautious of your food handling. Store your food 100 yards away from where you're camping. Cook 100 yards away from where you're camping, in a different direction. You can try hanging your food, although bears are pretty good climbers and usually can find a way to get to it. But yeah, I think a bear canister's not that much. But if you can't do it, there's ways that you can get around it.

Alie: Wes is back to answer his last question on his list, which I thought was very tender and sweet, to be honest.

Wes: Finally, we have a question from Cait Murphy, first-time question-asker. They asked: My dad has always had a fear of bears, so I asked him what he wanted to know. Here are his questions: One, have bears been reported using tools?

Yes, they have. Recently there was a paper about a brown bear that actually used a rock that was barnacle-encrusted, and it was scratching itself with that rock. It positioned it just right so it could rub its body on it and scratch it. And that was one of the first recorded bear tool use that's been, like, documented by scientists and it's in the literature.

Alie: This paper, sidenote, titled, "Tool-use in the brown bear (*Ursus arctos*)" appeared in the journal *Animal Cognition* and was written by Dr. Volker Deecke, an Associate Professor in Wildlife Conservation at the University of Cumbria. And it paints quite a splashy picture. It says:

The animal repeatedly picked up barnacle-encrusted rocks in shallow water, manipulated and re-oriented them in its forepaws, and used them to rub its neck and muzzle.

The bear exhibited considerable motor skills when manipulating the rocks...

The bear's like, "Oh my god, thank you so much!"

Wes: So they do sometimes use tools, but it's very rare and it really hasn't been recorded very many times. Really, just once.

And then the second question is: How do bears respond to music and do they sing?

Bears don't like loud music. If you're hiking on a trail and you're playing loud music or something, it's going to be annoying to all the other hikers, but also bears typically tend to run away from any kind of music or loud music. As far as if you were just to play, like, soothing music for bears for a while, I'm sure they'd get used to it. I don't know how exactly they'd respond to it.

And the second part of that question is: Do they sing?

They don't sing, as far as I know. That's a great question. They do, as I mentioned earlier, make a lot of different vocalizations, but I've never heard of a singing bear.

Thanks so much for the questions, guys. I'm really happy to answer them. Again, my name's Wes Larson. You can find me on Instagram @GrizKid. Also, a project that I'm working on right now that I'd love to tell you guys about is another podcast. It's called *Tooth and Claw*. It's about human-wildlife conflict, it's about attack stories. We talk about these different animal attacks, and then I explain what the people could have done better to avoid them, how they can prevent them, and we tell a lot of fun stories on that podcast. That's called *Tooth and Claw*. And that's pretty much it.

As far as the charity, I've picked the Grizzly Bear Foundation, which is a great grizzly bear charity that I've done some good work with and I really like those guys, so that's who I'd like to send the money to. Thanks a lot.

Alie: And this brings us to our final chapter. Chapter 5: Pressing *Paws* on Bear Peril. Let's go back to Thea with the polars because they seem the most screwed.

Also, Dr. Bechshoft, I'm sorry that I made you read off the f-word. I bleeped it just in case you don't want it on record that I made you read off the f-word about bears.

Thea: So, Kelsey Story is asking: How f****d are bears in general and polar bears in particular?

The majority of the world's bears are in trouble because of human-caused habitat loss. For polar bears, of course, this habitat loss is the loss of sea ice, their primary habitat for hunting, traveling, mating, and for raising their young. And so, to answer your question, it really depends on our everyday choices and on the civic leaders that we elect.

If we want to limit the consequences of climate change on polar bears as well as humans, we really need swift political action. We need to vote with the climate in mind in each and every election, and let our representatives know that we support bold climate action. If we use this window of opportunity that we have for climate change solutions, we can reduce the detrimental effects of climate change in the years to come.

We will still see a decline in sea ice quality and extent, and polar bears will suffer the consequences of that. But if we manage to lower the temperature in the Arctic again, the sea ice will eventually be restored and the bears will have a chance to thrive once again.

However, if we choose to continue burning fossil fuels and emitting greenhouse gasses at the current rate, it is predicted that we could lose up to one-third or more of the world's wild polar bears within the next 35-40 years.

So yeah, I cannot overstate the importance of this. We still have a window of opportunity. If we act swiftly and we greatly reduce our greenhouse gas emissions, we can absolutely still limit the adverse impacts of climate change; not only in the Arctic but also globally. We fully have the power to stop human-caused climate change and to save the Arctic ecosystem, including the polar bear.

Katie Timothy, and probably a lot of other people, want to know: How can we save the polar bears?

So, polar bears need the sea ice as a platform for hunting seals. Without sea ice, polar bears won't have access to this incredibly energy-rich prey that otherwise keeps them around and healthy. So, no sea ice means no polar bears. We have to protect the Arctic sea ice. In addition to being essential to the health and safety of people and animals in the north, it also plays an essential role in keeping our climate stable around the entire world.

So to save the sea ice, to protect polar bears, and to improve conditions for people around the world, we have to actively reduce the risks. The best way to do this is by reducing our use of fossil fuels. Because when we burn fossil fuels like coal, and oil, and natural gas for energy, we release more and more carbon dioxide into the atmosphere. And the atmosphere is like a blanket that surrounds the Earth, and normally it helps keep our world at a stable, livable temperature. However, every time we add extra carbon dioxide into the atmosphere, it's like we're thickening this blanket, making it harder for the heat to escape.

So this extra heat becomes trapped under the blanket, warming up our world, and disrupting the climate. And for polar bears, this disruption takes the form of habitat loss. The warmer the Arctic is, the less sea ice is formed. And again, no sea ice means no polar bears.

Each of us can play a role in protecting the polar bears' future, and our own, by becoming involved in our communities and working to change systems. This means that we must vote with the climate in mind at every level of government, supporting civic leaders who understand the importance of addressing climate change and who commit to making renewable energy the easy and affordable choice across all communities.

In addition to this, simply talking about climate change is incredibly valuable. Most people are just as worried about climate change as you are, but if we want to speed up that transition from fossil fuels to green energy, we need to start including the climate and climate change solutions in our everyday conversations.

Katherine Finney is asking: I've heard people propose we move the polar bears to Antarctica to help them avoid extinction. Is this as bad of an idea as it sounds like it is?

Heh, well, Katherine, for some reason this is a question I get asked quite frequently. In other words, there's probably a number of you out there wondering the exact same thing.

So, in theory, yes, we could absolutely move some or even all polar bears from the Arctic to Antarctica. At least for a while they would probably thrive, feasting on the penguins and Antarctic seals, because Antarctic animals are not used to any predatory threat while they're on land. So they would likely not even try to flee from the bears. It would be like one big polar bear buffet.

This, obviously, would also be one of the biggest problems with introducing polar bears to Antarctica. The bears would just wreak absolute havoc on the Antarctic ecosystem. And even if it were to happen, a land chase between a polar bear and a penguin is no contest, and very soon the penguin populations would be severely decimated. The same would likely happen to the seals, not least because polar bears would be able to eat their way through the seal pupping fields with no problem. Antarctic seals give birth on the open sea ice and not in birth lairs under the snow as the Arctic ringed seal does, which is the polar bear's primary prey.

So, in other words, what started out as a feast for the polar bears would soon turn to famine instead because the available prey would disappear, leaving the polar bears with nothing to eat. So while this devastation of the Antarctic ecosystem would be the most obvious reason to not move the bears to Antarctica, there are other considerations, too.

For example, even though they're similar at first glance, Antarctica is, on average, much colder than the Arctic. Temperatures easily go as low as -60°C, or -76°F. Polar bears are really well insulated, but not for temperatures that are this low for very long. And it will require massive extra amounts of food year-round to keep the bears with the energy needed to stay warm and alive. So, sufficient prey is unlikely to be available year-round in the Antarctic, and the bears could end up freezing or starving to death.

Logistics would be another challenge. Which bears would you move? Would you attempt to still keep the currently existing polar bear subpopulations separate? How would you catch them? And also, very importantly, who would pay the simply enormous cost of the project? So, to sum up: Yep, moving polar bears to Antarctica could definitely be done, but it would create more problems than it would solve.

The reasons I listed above are just a few for why moving the bears would be an ecological disaster in every imaginable way. Polar bears evolved in the North and are superbly, perfectly evolved for the Arctic environment that they inhabit. So, moving polar bears to Antarctica in the hope of saving the species would be an extremely short-sighted solution indeed. So, I for one, strongly suggest that we instead focus all of our energy on curbing climate change.

Alie: Drew weighs in on our brown bear friends.

Drew: Ryan G asks: How are bears coping with climate change? Not just polar bears, but all bears.

I think most people have heard how polar bears are coping with climate change, but brown bears and black bears are much more adaptable than their polar cousins. So, here in Alaska, specifically the brown bears that specialize in salmon, are going to have problems with warming streams, warming water temperatures. Once a certain temperature threshold is breached, those streams can no longer support salmon, and that's when bears are going to start roaming around and looking for other food sources, potentially bringing them into proximity and conflict with humans. And when bears and humans have conflict, the bears always lose.

Alie: To give them a little bit of a win, Drew asked that a donation be made to Friends of the McNeil River, and you will find a link to them in the show notes.

Now, if you are Team Bear in your heart but you want to be professionally Team Bear, Dr. Lana has advice.

Lana: Rebecca writes that she wants to be an ursinologist and that all of her bear research and fieldwork so far has been through various volunteer programs. So she's asking me if there's a specific branch of work that I would recommend, like the National Park Service versus sanctuaries, versus independent researchers.

So Rebecca, no there isn't a branch I would recommend. It takes all of us and it takes all of those people to truly put together a conservation effort. What I would recommend is that you decide, you take a look at yourself and all the work going on out there, and what really interests you? Which branch of bears really fascinates you? And follow that. Follow your passion.

Rebecca followed up her question with what branch of research would I recommend, to, basically, how does she get to live my life as an independent research scientist working on bears. So Rebecca, in all honesty, I came across bears in my undergrad, in one of my classes, and I did a directed study on them, and then I did an undergraduate thesis because it just really fascinated me. I did it on bears being disrupted during denning by snowmobiles, and it's something I, at that time in my life, had never thought about. This is well back in the 1990s.

So, I just started following that, and reading more about it, and did an undergraduate thesis on the bear poaching trade. And then I decided that I was really interested in bears and wanted to continue in this realm. I was really interested in bear-human interactions, so I sought out Dr. Stephen Herrero, and if you haven't read his book, *Bear Attacks: Their Causes and Avoidance*, it is still the bible today for bears and human-bear encounters. And I applied for a master's with Steve Herrero, and I got accepted into that program, and did my master's with him on human-bear conflicts in a park called Liard River Hot Springs Provincial Park in Northern BC, and that was on black bears.

I'm still obsessed with bears. I traveled around working as a technician for a number of different people on a number of different field projects in a number of different locations all across Canada and decided I wanted to do my PhD. This time I wanted to work with grizzly bears and I wanted to get my mathematical skills up, my quantitative and my modeling skills up. So I located a professor at the University of Alberta, Dr. Mark Boyce, who was very strong in that field. And I followed that passion, and I did the Parsnip Grizzly Bear Project.

So I guess, basically, this long answer to your question is, I just kept following my passion and I just kept following what I wanted to do. And like you, I also volunteer countless hours towards conservation.

Kimberly notes that she's fascinated by carnivores and would love to get involved in some research. So, she asks: What gaps are there in research on Ursidae in general?

So Kimberly, if we're looking at gaps, I guess now for our North American bear species, I think a hot topic is climate change. So, how is warming affecting bears? From a human-bear conflict perspective, what I specialize in, we're seeing a shortening of the denning period. Bears are not denning for as long in some areas, and that can, of course, increase human-bear conflicts because they're out of the den for a longer period, so they have more time to potentially get in conflict with humans.

Another thing we're seeing in coastal populations is a look at the salmon runs. So, we'll look at the food resources for bears, what's going on with them and with global

warming and the temperature rise in our sea, what's happening with our salmon. And if that is affected, what in turn will happen with those coastal bears.

In looking at this question from an international perspective, in my work with the IUCN Bear Specialist Group, there are a number of gaps with our Asian species, sun bears. We're really just starting to learn about them, their ecology, the biology. Things we kind of take for granted that we know of with our North American species, we're just learning about those things with a number of species over in Asia; the sloth bear, the sun bear, and also in South America, the spectacled bear.

So, this comes back to Rebecca's question. Kimberly, you need to just ask yourself what area really fascinates you and what can we look at in that area? Another big topic with bears is connectivity, trying to reconnect these small and isolated populations that we have. We'll see that even in the US, where I'm assuming you're based. Trying to reconnect these populations, taking these 'islands' and linking them back up for the health of the bears and the genetics of those bear species. Connectivity, threatened populations, lots in conservation biology that is still left to explore.

In thinking about Kimberly and Rebecca's questions, and those of you who are listening that are really interested in bears, or all you wannabe ursinologists – which by the way is a new word for me that I'm going to call myself from now on because I quite like it. Anyway, I encourage you to check out the International Association for Bear Research and Management. The acronym is the IBA, or International Association for Bear Research and Management. That is our international association; we host conferences. There's a number of great people. There's a jobs board. There's a newsletter. You can read what's going on, what projects are going on around the world, and you can find out a lot more information on bears from the IBA.

Also, the Bear Specialist Group, the IUCN, International Union for the Conservation of Nature's Bear Specialist Group, also has a webpage. It is linked to on the IBA webpage, and that can show you more on the research that our teams are doing and what's going on around the world with our bear species. So, thank you very much for having me, and I hope that those listening will think about bears when they go out into bear habitat and the conservation of bears, protecting their habitat, and minimizing negative human-bear encounters.

Alie: You can follow Dr. Ciarniello on Twitter @LanaCiarniello, and I very much suggest you do. She's awesome.

What about polar bear expert Dr. Thea Bechshoft?

Thea: If you want to follow me online, you can find me on Facebook and on Instagram at Polar Bear Questions. You can also find me on Twitter @BioThea.

Now, the charity that I choose to support is Polar Bears International. Polar Bears International is a nonprofit conservation organization, and their mission is to conserve polar bears and the sea ice that they depend on. This work is done through media, through science and advocacy to inspire people to care about the Arctic, the threats to its future, and to the connection between this remote region and our global climate.

Alie: And of course we're tossing some cash toward Danielle Rivet's org of choice.

Danielle: Thank you for the donation to a bear charity of my choosing. For this particular episode, I would appreciate it if any donations could go to the Idaho Black Bear Rehab that's in

Garden City, Idaho. I'm not originally from Idaho; I'm from Virginia. But this particular rehab is operated by a wildlife rehabber who has, basically, dedicated the last 30 years of her life to giving orphaned black bear cubs a second chance. They are able to rescue, and rehabilitate, and release orphan cubs whenever they get them in, and they just really have a great bear rehab program. They have lots of trained rehabilitators that work there, and they try to work with the state wildlife agencies to make sure that bear rehab is a standard part of their management policies now.

They're also very involved in educating the public about black bear rehab and how all of us, really, are responsible for protecting wild bears and their habitat. So, Idaho Black Bear Rehab is a really, really great place to think about maybe making a donation if you're interested in that kind of thing. That's Idaho Black Bear Rehab in Garden City, Idaho.

Thank you so much, Alie, for having me. This has been so much fun. I'm so glad to say that I've finally now been on an episode of *Ologies*. I am so excited. I never thought that would ever happen. So thank you so, so much for that and for everyone who sent in such great questions for us to answer.

If you're interested, I am on Twitter. You can follow me there @GrizzlyGirl87. Also, if you're interested, we did just recently get started with a Zooniverse project called the Arctic Bears Project, so you can... if you're familiar with Zooniverse, you can go there and look at a lot of the camera trap photos that we've been getting of all of the different kinds of Arctic animals that we see at the remote field camps in Wapusk National Park, where we are using remote trail cams to monitor the Western Hudson Bay polar bear population, but we have lots of other really cool animals on those photos as well.

And it just kind of gives you an opportunity to go through and see what kinds of animals, and the data, and the photos that we're working with. It's so cool. Lots of cute little caribou babies and polar bear babies, and all sorts of really exciting things there. So make sure you go to Zooniverse and check out the Arctic Bears Project.

So help scientists help the bears. You can do that right now, even if you are in no pants, or on a bus, or on a bus with no pants. Or in Antarctica with no bears! And let this be a lesson to ask seven smart experts doofy questions about bears, because look at this wealth of information and love for bears we now have. Ah! Also, I would like to be friends with all of them, if that is okay.

Now, there are links to all of the great things we talked about with Chris Morgan and to so many things that we chatted about with these six ursinologists, up at AlieWard.com/Ologies/Ursinology. There's also links to their socials in the show notes. I suggest you follow all of them right now and get more bears in your timeline. I did; there is no looking back; it's the best choice I've made in 2021.

You can follow us @Ologies on [Twitter](#) and [Instagram](#). I'm on [both @AlieWard](#). Ologies merch is available at OlogiesMerch.com. Thank you, Shannon Feltus and Boni Dutch, who host the comedy podcast *You Are That* for managing the merch. Thank you Erin Talbert for adminning the [Ologies Podcast Facebook Group](#). Thank you Noel for scheduling so much and being so amazing. Thank you, Emily White of the website The Wordary for making transcripts of the episodes. Caleb Patton bleeps them, and those are up at AlieWard.com/Ologies-Extras. A link to that is in the show notes.

Thank you to full-time fiancé and co-editor, Jarrett Sleeper, for getting through these edits with me. This episode turned out to be a real beast, and I'm so excited about it, and I'm so happy to have it out in the world, even if we were stumbling to put it up.

And as always, thank you Steven Ray Morris of *The Purrrcast* and the dino podcast *See Jurassic Right*, for bearing with these big episodes as well. Nick Thorburn wrote and performed the theme music.

And if you listen until the end, you're forced to hear me confess something to you. This week, I'm just going to straight-up say it: I don't think I knew until way too recently that there were no polar bears in Antarctica. I never learned that until, probably, like two years ago, maybe? If that? [*shamefully whispering*] I kind of thought that all the polar bears were down there. I was like, "That's where the ice is, right?" [*even quieter*] I had no idea.

Also, when I was a kid I thought that there was an Antarctica on the bottom and there was, like, an "Arctica" continent on the top, kind of like Earth was a burger and those were just ice buns. So, hey, you know what? We don't all know everything, okay? Apparently, there's no bears in Antarctica. Who knew it meant "no bears"?

Ursinologists.

Also, hummus tastes pretty good on hard-boiled eggs. Now you know.

Until next week, where I put up an episode on time, probably. Tuesdays. Tuesday morning. I got this. Okay.

Bearbye.

Transcribed by Emily White at TheWordary.com

Some other links you may enjoy:

Follow all of these Ursinologists: [Instagram.com/tsalani](https://www.instagram.com/tsalani) [Twitter.com/grizzlygirl87](https://twitter.com/grizzlygirl87), [Instagram.com/drewhh](https://www.instagram.com/drewhh); [Twitter.com/LanaCiarniello](https://twitter.com/LanaCiarniello), [Twitter.com/biothea](https://twitter.com/biothea), [Instagram.com/GrizKid](https://www.instagram.com/GrizKid)

Donations went to: FriendsOfMcNeilRiver.org, [Idaho Black Bear Rehab](http://IdahoBlackBearRehab.org), [Northern Lights Wildlife Shelter](http://NorthernLightsWildlifeShelter.org), PolarBearsInternational.org, [Grizzly Bear Foundation](http://GrizzlyBearFoundation.org)

[Lana Ciarniello's work](#)

[Bears and photos: helping conservation efforts](#)

[More on Tsalani Lassiter](#)

[Drew Hamilton's website](#)

[So many rats](#)

[Barnacle rock scratching bear!](#)

[The ursinologist who observed tool use](#)