

VIEW to the U transcribed
Season 6: Adventures in Podcasting; Episode #3
Professor Peter Kotanen
Department of Biology – U of T Mississauga
Ecology and Evolutionary Biology – UofT

[intro music fades in and out]

Peter Kotanen (PK):

It got worse.

There was this huge thunderstorm coming in, the rest of the party was inland, so they didn't know where we were.

There was a polar bear on the next island.

I'm Peter Kotanen, I'm a Professor in the Department of Biology.

So, I went up to the top of this little hill to see if I could get an idea where we were, and there was a human skull.

That's a bad day.

[theme music fades in]

Carla DeMarco (CD): I assure you no researchers or polar bears were harmed in this episode of the podcast.

Hello and welcome to VIEW to the U: An eye on UTM research. I'm Carla DeMarco at U of T Mississauga. VIEW to the U is a monthly podcast that will feature UTM faculty members from a range of disciplines who will illuminate some of the inner workings of the science labs, and enlighten the social sciences and humanities hubs at UTM.

On this latest edition of *VIEW to the U*, Professor **Peter Kotanen** from the Department of Biology at UofT Mississauga discusses his research and current projects, which have “ecological interactions between plants and their natural enemies,” such as herbivores, insects, and pathogens, at their core.

Our chat is also infused with a couple of Peter's tales from the field – in some of the wilderness in the northern parts of Canada – and for the second time on this podcast, we are privy to polar bear sightings in the Arctic.

But he also has his own *Gilligan's Island*-type story where he was shipwrecked on an island for days, with no movie star or millionaires in the mix, but at least one professor.

We also talk about geese – both the Snow Geese that are part of his research, as well

as the Canada Geese that are living large at UofT Mississauga.

Fun fact: a few decades ago, hardly any Canada Geese lived around these parts, but now, as most of us can attest firsthand, they are here by the thousands.

[theme music fades out]

CD: Kotanen is a Professor in the Department of Biology at UofT Mississauga and in Ecology and Evolutionary Biology at UofT where he studies the effects of natural enemies on non-native species, and has ventured to northern Ontario, the Arctic and Churchill Manitoba for his work.

He joined the faculty at UTM in 1996.

PK: I study invasions by non-native plants. In particular, I'm interested in insects and other herbivores that attack these plants. But I should say, I've worked in other systems as well. In particular, I've worked on snow geese at high latitudes in Canada, off and on since 1984.

CD: And do you primarily focus on plants and species in Ontario?

PK: At the moment, yes. Ontario and nearby areas. So most of the invasion work has been centered at the Koffler Scientific Reserve, in fact. But we actually have worked all through Northern Ontario up to Moosonee. And then the goose stuff, I've worked all through the Hudson James Bay system, and a few islands of the Arctic Archipelago as well.

CD: And so, you're working with geese?

PK: Yes. That's a bit of a backburner thing at this point. That's how my career started out. I was interested there in herbivory again, geese as herbivores, plants. That led step-by-step into the kind of herbivore work I'm doing now with invasions.

The most recently I've been up there working on geese was in 2010. But I'm still writing papers with coauthors. And the other thing is that, in a way, I've seen to have managed to finally merge these two threads together. I'm currently planning a project to work on invasions at high latitudes. So I'm going to be working in some of the same areas, but on different questions.

CD: And it seems to me, but again, I don't know if this is true. I noticed the geese population around UTM seems to be quite abundant. Do you know anything about that? Does it seem like there's more geese around than there has been in the past?

PK: Oh, they are. No, those are Canada geese of course, which are not the main thing that I study. But the story there is that it used to be that they really were migrants to Southern Ontario. Most of them bred at higher latitudes. We get them during migration. But then, there was actually a program of introducing them into Southern Ontario and into urban areas. And it really worked.

So if you look at records for Mississauga from 1960, the winter population of Canada geese was near zero and now we have thousands and thousands of them that over winter. It's an odd story, what happened was there was a particular sub species of Canada goose. Canada geese are very variable. There were some... We now split them into two species, but the really small ones are smaller than mallard ducks.

The really big ones are, well, the ones we have on campus. And that's a sub species known as giant Canada goose. They were thought to be extinct for almost 30 years. And then a couple of small populations were discovered in the upper U.S. Midwest in the 1960s. And as a way of bringing them back, the suggestion was, "Why don't we introduce them to urban areas? There're no predators. There's lots for them to eat." And boy, did it work. So not only do we have thousands of them now, but they're actually the biggest Canada geese in existence.

CD: Yeah. They look quite healthy.

PK: Oh, yeah. No, they definitely like it. I mean, I should say that many of them, most of them are still nest at high latitudes. When I work in the Arctic, I work on snow geese, but there always are Canada geese in the area as well. It's just, here in the Great Lakes, it's a relatively recent phenomenon.

I will just say a little bit about the project that we're trying to get started. The reason we're returning is that Churchill, Manitoba is a bit of an anomaly in terms of invasions. By the time you get that far North, there are very, very few non-native species. In Churchill, there are more than a hundred non-native plants recorded. And the reason is because it's a grain port, you can't drive there, but there is a rail line. And they ship grain up from the Prairies and then ship it to Europe. And when the green comes, then all the weeds seeds come in with it. So there are a lot of non-native plants that have occurred in Churchill. And a real interest there in the future, I mean, it's climate change question. Is that, are they going to spread? Right now it's just an anomaly, an outlier on all the graphs, but as temperature continues to increase, are sites like this going to become hotspots for future invasion? So if you want to know how I link bears and invaders together, that's the reason.

CD: I think a lot of people are fascinated with polar bears, but also just to know more about some of the plants that a lot of us don't really maybe notice or don't know very much about it.

- PK: It's a great environment to work in and I'll put it in a word for the Koffler Reserve as well. I mean, they've been very good to me and a really nice place to spend time.
- CD: The other thing I wanted to ask is how has your research been impacted if at all, by the current pandemic situation? I imagine you can't travel as much as you were.
- PK: Yes. For us, it's been very severe. Again, we're a lab that does field work. So we were supposed to be working in the Arctic this year. We were supposed to be starting this project I mentioned looking at invaders at high latitudes. And we never got there. So we just really can't do this kind of field work until travel as possible again. So we're waiting with fingers crossed for things to start up again. But yeah, in fact, we had some plants shipped down from Churchill. So like I say, we didn't make it to the field this summer, but we've managed to get some specimens that we're actually working with. And we'll get some work in Ontario.
- CD: Maybe when you're going up into the Arctic, you're not coming in contact with a lot of people. But is it just that you can't travel because there are travel restrictions?
- PK: Well, there are a couple of things. One is the travel restrictions. The other is that a lot of small Northern communities and small Native communities are really concerned about the virus arriving. They've got a very bad history of it and they've got very few resources to deal with it. So a lot of small Northern communities have essentially their own quarantines. Northern Manitoba was off limits for months. We just couldn't get there as a result. I mean, once you were there and were in the field station, I think you'd be fairly safe. But that's not really the concern. It's the concern for the community.
- CD: Yeah, that's understandable. And so I mentioned that this season of the podcast is Adventures in Research and perhaps tapping into the fact that people are at home and may be interested in hearing some anecdotes about your time. Either in the lab or maybe out in the field or in grad school. So can you tell me your story or stories?
- PK: Oh, I have lots of them. All of our stories are really field stories. A lot of the good ones really involve the Northern component of the work.

Where I've worked in the Hudson James Bay system, there are a lot of polar bears. And so, everything you do there is structured by polar bears. So, we have to carry firearms everywhere. We have to be constantly vigilant. You can't go to alone. It's a really different kind of work environment. So the first year I was in the Arctic as a grad student, between July 1st and September 1st, I had 53 encounters. Which gives you some kind of idea. What happens is when the ice melts on Hudson Bay, they just come in and they sit on the shore and they wait

for the ice to come back in. So you wonder how can there be that many large predators in such a small area. The answer is that they come on with this vast ocean and are just waiting to go back out again.

PK: When I was a master's student many years ago, I was a student of Bob Jefferies in the botany department here. And he was working at La Pérouse Bay, which is just East of Churchill, Manitoba. And the camp is an isolated camp on an island in the middle of a river. And we had frequent polar bear incursions. And what you'd have to do is the whole camp would get evacuated. You go sit on the roof of one of the buildings until you managed to scare the bear off or it left. So there were a lot of nights you wind up sitting in your pajamas on top of the kitchen, with the bears roaming around underneath you.

CD: And to just give us a sense of... Because most of us have never seen a polar bear in real life. How big are they? And what are you supposed to do if you were to encounter one?

PK: They're enormous. They're the world's largest terrestrial predator. And I'll give you the weights in pounds, because that's how I learned them. A good weight for an adult male is 1200 pounds. There have been individuals recorded, weighing over a ton. I mean, they're just gigantic. When you see them in the zoo, you often are sort of looking down into a pit and they look big, but you don't realize how big they are until you're on the ground and facing one.

There are a couple of things that we do about this. One is that as I mentioned, we have to carry firearms everywhere. In fact, my most recent grad student, they made her get a firearms license because she's going to be working up in the North as well. But they're mostly noisemakers. We've never shot a bear. I've never worked with anyone who's shot a bear. But you certainly fire them in the air. And that hopefully will scare off an aggressive animal. The real defense though is distance. I mean, you're working in these flat environments, often treeless environments. And the real rule is just that if a bear appears you leave. If there's a bear within a couple of kilometers of you just get out of the area. That's the best way of keeping safe.

CD: Have you ever been really scared by one of these encounters?

PK: I've been chased twice. And again, I've had lots of encounters, but I've been seriously chased twice. And this again was way back when I was doing my master's. We knew there was this aggressive bear in the area. There were a number of reports that it chased some people on a three-wheel, all-terrain vehicle.

So, I was out with another student and we saw one coming over the bushes, maybe 300 meters away. And it started to head toward us very quickly. And it turned out there was this observation tower, this moose observation tower there.

So, we ran for it and we got there. I don't know, maybe 50 meters ahead of it and got up in the tower and fired over its head. And then eventually it went off. The next day in the same area, the same thing happened. But this time when it saw us, it started running. And we got to the tower in 10 meters ahead of it.

PK: And we wound up sitting on the roof of the tower, firing over its head. It was paying no attention at all. Eventually what we had to do with radio into camp. And there only were half a dozen people in camp, but they got a bunch of all-terrain vehicles, lights, air, horns, flares, and they came charging over the Tundra, like some kind of Chuck Norris raid or something. Sort of hilarious. And the bear backed off enough for us to get out. Most of the ones you meet are not aggressive. Most of the ones you meet are like black bears. When they see you, they're not interested. They ignore you, or they run off. But there's this small percentage that can be a problem.

CD: Why are some of them more aggressive than others? Do you know?

PK: I don't think it's really well understood. Part of it is probably habituation to humans. So, Churchill is a major destination for polar bear tourism. People go up to see them. It's actually probably one of the best places in the world to see them. But they see a lot of people. And I think a lot of them are less afraid. Where I've worked in remote areas they almost all is run when they see you. But there are probably other things too. It may be they're having trouble finding enough food just because of age or other factors. I'll tell you one more, very quickly. Way back when I was Bob Jefferies' grad student, we did a survey trip to what was then the Keewaydin district of Nunavut. It's now Kivalliq Coastal Hudson Bay, which was enormous fun. It's one of the nicest places. I mean, you'd get up on a hilltop and there would just be flowers to the horizon. I mean just a beautiful place.

PK: And at the same time everywhere you went, there were signs of human activity. There were inuksuks and tent rings, [inaudible 00:11:49] and cairns. But it was a wild trip. And the worst thing that happened was we were traveling up the coast in one of these big freighter canoes, they were enormous. We had, I think, three all-terrain vehicles in it. And we turned into the mouth of one of the rivers. In Southern Ontario it would be a massive river up there it's small enough, it's not on most maps. And it was this glorious whitewater river with whitewater all the way down to the ocean. There's just so much water running through it. We pull into the mouth of the river and the motor blows out. So we managed to grab some paddles and paddle ashore. We wound up an island that was probably about the size of the South building. And we were there for three days.

CD: Wow.

PK: So yeah, I tell people I've been shipwrecked and that's the reason.

CD: A three-hour tour.

PK: It got worse.

There was this huge thunderstorm coming in. The rest of the party was inland. So, they didn't know where we were. There was a polar bear on the next island. So, I went up to the top of this little hill to see if I could get an idea where we were, and there was a human skull. That's a bad day. What it was, it was a historic grave that had been dug up by animals, but even so-

CD: It seemed rather ominous at the time. I'm sure.

PK: Oh, it did. And we collected data while we were there. And we published it in the *Journal of Applied Ecology*. That's actually one of my more highly cited papers.

CD: That's awesome though. The way that you've just sort of painted that picture. It's like a lot of people aren't going to end up having the opportunity to venture to that part of the world. And so even just to get a sense of what it's like up there is pretty neat.

PK: I love working up there. I kind of like natural history generally. I've worked in a lot of Ontario. I like these environments. But there really is something special when you get above the tree line. It's just such a vast area. People you meet are often hunters or most of the villages are largely Inuit. It's just like walking out of North America into something else.

CD: And so, one of the last things I wanted to ask, so a lot of us are stuck in doors right now. And I think this is likely to continue, particularly as the weather gets colder. Although you sound like someone who likes to be outside in the colder weather. But if people aren't able to get outside as much, I was just wondering if you had any things that you've been doing while we've been stuck indoors? Maybe reading or watching movies or something that you would like to share that you've been doing as a kind of diversion from what's going on?

PK: I do. I have to say it really has been difficult. I mean, I'm a birder. That's what I'd normally be doing for entertainment a lot this summer. Sort of a natural history geek. I just haven't been able to do most of that stuff. I have been reading a lot of books. And frankly, I've been reading a lot of pulp fiction, like mystery science fiction. The other thing I've been doing is I'm a fan of British television in particular. So, I've been watching a lot of old British comedy shows and newer ones. Things like *QI* or the *Great British Bake Off* is great. So, there's been a lot of that. But yeah, I haven't really found a magic solution. Those are the things that are keeping my spirits up and keeping me going during this.

CD: Is there anything out of the pulp fiction that you've read that you would recommend?

PK: For example, I really like Ian Rankin. He was a very popular detective author. There's a relatively recent science fiction author, Becky Chambers, who I really like. So, I've read all of her stuff. Her first book was *The Long Way to a Small Angry Planet*. And of course, other things as well.

Again, my wife was actually a specialist in English literature. So we have a house full of books. I should also say that I've got a 14-year-old son. So of course, the other thing we've been dealing with COVID is him learning at home. And he's been taking it very well, but it adds a whole other level of complexity when you're getting the schooling and that kind of thing as well.

CD: And it's such a different way of learning.

And I'm totally with you on the British stuff. I've been a big fan of some shows like the British *Office* and *Fleabag*. And I also like the *British Baking* and I liked the Canadian one too, but the British one's pretty good.

Okay. So, this is fantastic, Peter. Thank you so much for telling me about your adventures and your research. I really appreciate your time today.

PK: No problem. It's a pleasure.

[theme music fades in]

CD: I would like to thank everyone for listening to today's episode of *VIEW to the U*.

I would like to thank my guest, Professor Peter Kotanen from UTM's Department of Biology, for taking the time to chat with me and tell me about his research and for the entertaining anecdotes from his fieldwork.

I would like to thank the Office of the Vice-Principal, Research for their support.

A special shout-out to Professor Anna Korteweg, who recently invited me to come to her class and present on podcasting – it was a great experience, and I think she will be appearing in an episode in the new year.

The next *VIEW to the U* coming up in December will feature Professor David Samson where he will talk about his sleep studies.

If anyone else out there is listening regularly, please take a moment to rate the podcast. It helps others find the podcast and learn more about UTM's research and its researchers. Also, we are now available on Spotify, so check us out on that platform.

Also, if you are a UTM researcher who has a story to tell, please get in touch with me. I'd love to hear your story.

Lastly, and as always, thank you to Tim Terrific for his tracks and support.

Thank you!

[theme music fades out]