FUTURUM
**PODCAST**

## Dr Laurel Lynch

**Dr Laurel Lynch** is an ecosystem ecologist studying how, as scavengers, Tasmanian devils influence their ecosystems. In this podcast, she shares her excitement of fieldwork and discusses the importance of teamwork and collaboration for successful research.

# Break the podcast down:

**01:04 Your research is about Tasmanian devils and how they impact their ecosystems. Could you tell me a little bit about that work and why it excites you?**
The first project was focused on the transmission and genetics of facial tumour disease and how that interacted with the host, which was the Tasmanian devil. It's really exciting work, but it's very genetic- and cancer-ecology based. So, the rest of the ecosystem ecology group said, "how can we take everything that this team is doing and scale it up to see if we can document the effects that facial tumour disease is having within the ecosystem itself".

One of the reasons that I was really excited to work with Tasmanian devils is because they are one of the few scavengers that eat bone. And that's really cool as bone is rich in calcium and phosphorous and some of these key nutrients that we know limit plant growth. When bone decomposes naturally in the landscape, it can take decades to break down. So, the calcium and phosphorous is tied up in this bone material, it's not plant-accessible, it weathers really slowly and that might continue limiting plant growth.

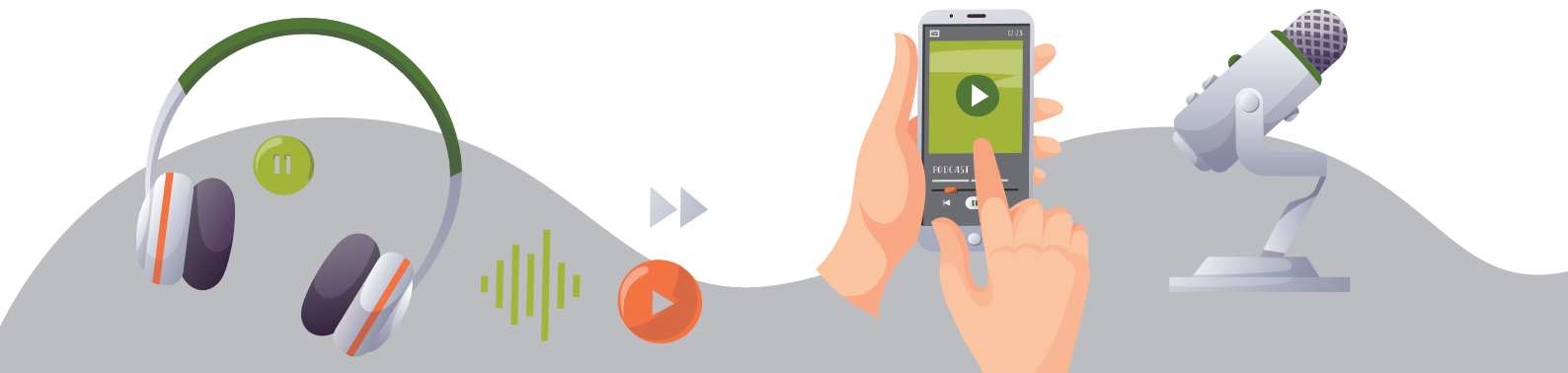
02:29: In places where the devils are really active, eating the bone and pooping all of those nutrients out across the landscape, all that calcium and phosphorous returns to the landscape in hours to days. And that's a much faster cycling of those key nutrients than is available for plant uptake and also for microbial growth.

So, we were really excited to consider how animals impact ecosystems. We know that they do, but we exclude them often from our studies. Likewise, a lot of wildlife biologists that are focused on wildlife and their interactions, they aren't excluding the ecosystem, but they don't necessarily think about how biological interactions might feed back into soil or plant function.

It was really fun to bring this whole group together. There's a lot of researchers in Tasmania and Australia, the mainland, and a lot of researchers from the US. It's bringing together people who study invertebrates, people who study Tasmanian devils, people who look at tree growth and soil function. It's a big group and that collaborative spirit is something that really gets me excited about research.

**03:45 Your interest in ecology and research started when you were growing up in Alaska. Could you tell me a bit more about that?**
I was super lucky! I had a great childhood and really awesome parents who liked hiking, skiing and river trips, so that's how I grew up in Alaska. We spent a lot of time in the interior parts of Alaska, and up far in the north in the tundra areas and in Canada. The tundra and the Arctic are what got me interested in research, and in ecosystems in particular. They're just really fascinating landscapes. There are also no trees, so you just have this huge open vista all the time. It's really easy to start asking these big, landscape-scale questions when all you see are mountains and all the way out to the ocean.

**04:42 Do you think those experiences out in the tundra helped prepare you for the fieldwork that you've done in your career?**
Yeah, you can't pick your weather, whether you're doing fieldwork or out hiking in the wilderness. I think that was one early life lesson that my parents instilled in me – complaining doesn't make anyone happier. So, you embrace being uncomfortable and see the beauty in the storms and getting stuck out in a snowstorm or rainstorm if you aren't expecting it. So, always being prepared for changes in the weather but also just being present, even if you're uncomfortable, is really important.



And in research too, you want the quality of your research to stay high and consistent at all times. So, you have to keep paying attention, you have to keep recording information and data as they come in, even if you want to go to sleep or want to go inside. It doesn't necessarily stop.

**05:53 How do you stay focused in those moments?**
Having good teammates is absolutely key. I've always been really lucky in having collaborators that are fantastic to work with. So, even when it's uncomfortable, it can be fun and it's great to have colleagues that can see the humour in those situations too.

**06:19 What role does teamwork play, not just in fieldwork but in the rest of your job as well?**
It's huge. We've got huge, pressing, big questions right now. How are we going to deal with climate change? How do organisms adapt and acclimate? And they're questions that can't really be asked or answered by single teams of investigators. It's really exciting. It also means that people who used to work in isolation are coming together and working in these big collaborative teams. It requires retraining ourselves to be more social and collaborative. But I think that that is really exciting right now.

**07:02 If you were just coming out of high school and going into university now, would you be excited about becoming an ecosystems ecologist?**
Absolutely! We have tons of new and exciting research questions we can ask, new tools we can use to answer them and different approaches to all that work. It's just really exciting. Not only is the teamwork and structure changing, but just the way that we're asking questions is modernising too. It's a really exciting time, I think, to be involved in ecosystems science.

**07:37 Another exciting part of ecosystems ecology is all the fieldwork that you get to take part in. What's that experience been like for you?**
It's such a weird experience because it's super tedious and boring half the time. You're just sitting there moving a respiration chamber, taking the same measurement for 50 minutes, then moving it a couple of feet, taking the same measurement for 50 minutes, and just doing it for hour after hour after hour. But again, having good team members, you make silly songs up and have poetry slam contests together and read out loud to each other. You look at the landscape – it's amazing, it's beautiful. It might be swarming with mosquitoes some days and in a snowstorm on others but it's always different. Being outside, you're spending a lot of time outside, you know that every day is different.

Then for the devils project, that was completely unexpected for me. I'd never been to Australia. I don't know what those forests look like, I'd never seen a Tasmanian devil, I really knew nothing about that system. It was absolutely wild! Menna Jones is our collaborator in Tasmania, she's worked on devils for decades and is absolutely fantastic. Having her run through all of the permitting for us, help us pick field sites, go out to the field sites with us when we were first there and tell us, "by the way, this is a wet eucalyptus forest," and we were like, "okay here we are!"

**09:25** The only way that ever could have happened was Menna and her team who helped us really get everything going. Not only that, but she was a fantastic collaborator who can help us contextualise our results. That's what I mean by having these big teams. When we have interesting patterns in the data, we can go to Menna be like, "oh look, we've found differences in phosphorous content between sites," or "the microbial communities are totally different in this type of system versus this type of system, this is what we think is going on." Then we talk to Menna and turns out we've got this weird little tunnelling potteroo animal that eats fungus, is really abundant in this area, and they are probably moving spores around and helping fungal communities be more robust or complex than in other systems where the potteroos aren't as present. We would never have thought of that but, of course, that makes sense.

So it's making those connections and bringing in someone's expertise, like Menna with this group. You have completely different ways of interpreting your results that are probably much more accurate. That's another really exciting part of collaborating broadly.

**10:53 Do you have any final tips that students can take away from this conversation?**
My major advice for any students who are interested in research and getting involved in science is to figure out a lab that you can associate with and get involved with. Start observing other researchers. How are they setting up experiments? What types of questions are they asking? How do they design a clever experiment to test that? That's the really exciting part. And then you of course are learning the lab skills and learning the field skills, but you want to come out of graduate school with the ability to ask interesting novel questions. Being able to shadow great researchers is a wonderful way to start picking up that different approach to the natural world. How do you observe something and then come up with a question that you can test? That is the creative side of research that I think is really exciting. When you look at someone who's been a research scientist for 40 years, you understand how they can still be interested in their field. They're asking different questions all the time, they're learning every day and that, to me, is what's really exciting about being a research scientist.