Sustainability Matters Now Podcast

Season 1, Episode 3. Sustainability and Partnership: Biodiversity Restoration in Practice

00:13

Hello and welcome back to Sustainability Matters Now. My name is Tom Ritchie and today I'm really pleased to be joined by Dr. Molly Williams from the School of Life Sciences and Gemma Wilkins, Head of Sustainable Campus Operations at the University of Warwick. In September 2025, Warwick's campus became home to 30 white clawed crayfish, the UK's only native crayfish species. This project at Warwick brings together research from the School of Life Sciences, Campus Operations and partnerships with the Warwickshire Wildlife Trust, Coventry City Council and Natural England.

00:42

to halt nature loss and restore biodiversity as part of Warwick's Nature Positive Universities pledge. Molly and Gemma, hello and welcome to the podcast. Hi, thanks for having us. Hello, it's a pleasure to be here. I wonder what brings you both to this conversation on sustainability, please.

00:57

So, I've always been interested in nature from a really young age. I was lucky to grow up near a nature reserve, which is a wild file on wetlands trust site called Martin Mere up in Lancashire. And that was a really special place for me growing up. It's somewhere that I've been going since I was six months old. I still go back there every year. And so, I kind of grew up around nature and observing migrating birds and things like that, and also catching frogs in the garden and really getting quite hands on. So, it's an interest that goes back a really long way. I didn't start out my career in sustainability. I was actually a linguist.

01:28

And then over the years, I've got more and more involved in sustainability. And then it was about three years ago that I made this my full-time job as a kind of late career change. So, in my current role, I give a wide range of topics across sustainability that includes circular economy, includes energy usage, sustainable procurement, and ecology and biodiversity is a big part of that. I would say I'm someone who has found myself in this world a little bit. I very much am a molecular biologist by training.

01:56

have always been very nature-based in my outside world from my parents. We would always go on holiday and look at rivers and lakes and mountains and all of that type of thing. So, it's very much always been in the background of my life, but not necessarily something I saw myself doing as my career. And then just throughout my studies doing molecular biology, I then came across the research that I do now in terms of applying molecular biology.

02:23

to the environment and I just thought that was fascinating that we can use something that's so intrinsically linked a lot of the time with like more medical sciences and apply that to the environment and help environmental problems but using a molecular method. So, I guess that's kind of how I've ended up what I'm doing now and it's great that I get to do both the lab side of things but also get to go wading in rivers.

02:46

Yeah, thank you both. It's great to hear that you've both come to this project from such different starting points that Gemma for you, it was an interest as you were growing up that's grown into a passion and grown into something that you've chosen to do alongside being a linguist. And Molly for you, it feels much more like this is your discipline that you've always been focused on. Every conversation I have around sustainability always leads back to this point that people come to these topics because of an interest, because of a passion. So, Warwick's campus, as I mentioned in the introduction, is now home to White Claw crayfish as part of this national

03:16

Species Recovery Project. Could you both explain a little bit more about what an arc site is and why protecting this species matters, please?

03:23

So, an arc site in this context is an isolated water body. So, it's not connected to any other water courses, rivers or lakes. And that's really important because it means that it can be separated from invasive populations of signal crayfish and therefore won't be infected by a crayfish plague. Yeah, I think the arc site is quite a funny term, right? Because it literally came from Noah's Ark and the idea of protecting things by creating this environment that they can be safe. So obviously in this case, it's very much

03:53

an isolated water body, but it could be anything depending on what species you're thinking about. And that's quite literally why it's called an oxide.

04:00

From reading about the project, saw that white claw crayfish have declined in the UK by 50 to 80 percent in the last decade and that the UK is home to a quarter of the entire population of that species. Could you speak a bit more about what's driven that decline and why we can't just remove the invasive signal crayfish species? Yeah, so signal crayfish are really widespread. They're basically very good at

04:23

taking over water courses. They eat anything, they are just more competitive than white claw crayfish. So that's just allow them to spread really easily. They're also able to migrate on land. So, if their home that they're in doesn't have the right resources, they can move quite easily to colonize somewhere new, which just means that our white claw crayfish that aren't quite as good at doing that have been directly outcompeted. Signal crayfish also carry crayfish plague, which is a pathogen that our native white claw crayfish have no protection against. So, if signal

04:53

fish come into the space where white-clawed crayfish are and they're carrying crayfish plague, which can directly wipe out the populations of white-clawed crayfish. Yeah, thank you Molly. I think that's a really useful way of understanding the difference between the species and it reminds me of the difference between red squirrels and grey squirrels as well. And I know your research uses environmental DNA to detect crayfish presence in water. How does eDNA work as a conservation tool and what role did it play in selecting Warwick campus as an arc site?

05:22

Yeah, really good question. So environmental DNA just broadly is

05:27

defined as genetic material found in the environment. So, it's basically a marker for what organisms might be living in the environment. So, we can get this data from lots of sources. You can get it from water, from soil, even from air. And you can filter the air and see what might be flying around that filter. And it's all by just using DNA. So, what obviously we all have in us and is really easy to distinguish species from one another using this genetic material.

05:56

So, for this project specifically, we used it to monitor the spread of signal crayfish across all of Coventry and on Warwick campus specifically.

06:08

We were looking at lots of different places we could put white-clawed crayfish across all of Coventry, and actually trying to find these isolated sites was really difficult because effectively our data showed that signal crayfish is all over

Coventry in all of our rivers and canals, which actually made finding an isolated site quite difficult, which is sort of how Warwick campus came about as somewhere we could potentially put them because although there are signal crayfish on campus, they are in a stream that's not connected to our dark site.

06:38

we selected. Yeah, I think that's really interesting, Molly, to hear about how you were looking more widely in Coventry and narrowed down towards the Warwick campus to be able to find one of these Arc sites. And Gemma, thinking about the Arc site, it's based

06:51

near NAIC, the NAIC Rill. What partnerships made it possible to prepare this space and make it useful for this conservation? So, we were initially approached by Middlemarch Environmental, who are the ecologists working on this project, and they had some familiarity with our campus already. And they had a look into a few different potential sites that could be an arc site. What was really surprising about the one that was selected in the end was the location. So, the NAIC Rill is in a very urban area. It's mostly surrounded by hard landscaping. It's very full

07:21

space outside the Lord Bhattacharya building and it's not a natural water course, it's more of a formal water feature, it's made up of straight lines and it's made of blocks with a series of small weirs so that the water flows down between the different sections and it's not really where you would expect a species reintroduction to take place. What was really great about the NAIC Rill is that it actually didn't need much work to make it ready for the crayfish, so the water quality was already good, it has a gravel substrate, it had some existing plants, so it was really

07:50

about enhancing what was already there. And so, the middle march team added some plants, they added refugia, which are kind of clay tubes that the crayfish use for shelter. And we worked with a few different teams around the university as well. So, we worked with our maintenance team to check the filtration within the rill to make sure the pump was working correctly and that it didn't pose any danger to the crayfish. We worked with our grounds and gardens team who maintained vegetation and water management.

08:14

We've made some changes in terms of how we manage the rills. So, we now use a different product to prevent algae. So, we use a barley enzyme now, which is much safer for the crayfish. And we also worked with other teams in the estates department. So, our capital programs team to check for interactions with other projects in that area of campus. Anyone who knows Warwick campus knows that there's always something big going on. And in that corner of campus, we do have a big refurbishment project and a decarbonization project. So, we needed to make sure there wasn't any impact or interaction with those different projects as well.

08:43

was really lots of teams coming together to make sure that that crayfish project was able to go ahead. So, the crayfish were translocated in September 2025 and have now been settling in for a few months. Could you tell us a little bit more about that process, please?

08:56

So, the translocation went ahead at the end of September and once everything was ready at the NAIC Rill it was all prepared for our crayfish and we needed to go and get them from their donor site. So, I was lucky enough to join the Middlemarch team on the day, and we went up to Leicestershire, and it was a bit of a sleepless night the night before I'll be honest because the traps had been set and we didn't know how many crayfish we were going to catch. We were hoping for 25 that was the minimum that we wanted to be able to translocate. So, we went out in the morning on the speedboat and the first trap that we pulled up had six

09:26

crayfish in it. So that was a huge sigh of relief for everybody that was involved. We knew that we were getting good numbers and actually in the end we managed to catch about 90. So that was a really really good total, and it meant that we had a good selection to choose from. So, the team sorted those into males and females, they measured them and selected those crayfish that were most suitable for translocation. So, there's a few things that we were looking for there. We obviously wanted them to be strong and healthy, free from disease.

09:51

but also, just about the right size that they would be suitable. So, the males in particular, the big males can be quite aggressive, and they do have a tendency to attack and potentially eat some of the other crayfish. So, we needed ones that were just around about the right size. So, once we had all of those crayfish ready, we packed them into crates and with damp hay, they can be out of water for a short period of time and travel to campus and release them into the NAIC Rill. So, it was something that was a real privilege to be part of. It's not every day that you get to reintroduce an endangered species on campus.

10:22

So yeah, really pleased that we were able to contribute to this project. What does longer term monitoring look like and how will you know if the Ark site has been successful in six months or a year or further into the future? So, at the moment, the priority really is to give the crayfish space to allow them to settle in, to thrive and hopefully breed. So, there is water testing, which is going on at regular intervals to make sure that the water quality stays as it should. We're constantly monitoring the habitat in terms of making sure the vegetation has established. We'll be adding in some additional refugia.

10:51

There's actually some interesting clay structures which are being made for us by a master potter in Yorkshire, which are custom made structures to support the crayfish. So, there's all those kinds of additions and monitoring going on, but really, it's a case of letting them get on with it. And then when the time is right and we feel that the population has had a chance to establish, that's when the Middlemarch team will come back and do some trapping to see what the numbers are looking like and what the health of the crayfish is.

11:18

In terms of success of the project, the aim really is to allow that population to increase, which would then enable translocations to other sites, whether those are on campus or whether they're elsewhere in the region. There is one other pond on campus which was also enhanced as part of this initial project with the Natural England funding. So, if we do get good numbers, then we may be able to translocate some of the crayfish directly into that pond as well.

11:42

And it sounds great that the project can continue to grow at Warwick as well. And the potential I'm also thinking about for people to eventually be able to teach using this as an example. We've kind of alluded to partnership throughout and the projects itself involved Warwick Sheer Wildlife Trust, Middlemarch as you've mentioned, Coventry City Council, Natural England, and of course the university. How does this kind of cross sector collaboration work in practice and what does each partner contribute to make this work? Yeah, I think it was

12:11

From my side, a fabulous project to be involved in because of all the partners involved. I mean, as a university researcher, you can very quickly get lost into your research. So was really nice to be able to work with the Wildlife Trust and the council to see direct impact of what we were doing from a research side. It was wonderfully coordinated by Gina Rowe at the Wildlife Trust, who did a fabulous job of bringing everyone together and making sure we were having regular meetings.

12:38

discuss the progress so we had monthly meetings with all the partners involved to make sure it was moving along nicely and it was a great opportunity from my side anyway from the ED &A side we took volunteers out with us from the local community to help do some of the sampling and we got to do some cool training with Natural England about how ED &A works like kind of share that knowledge with

13:02

wider team who might not know, but it was just such a great partnership to see how these institutes can all work and all bring in their own knowledge about how we can combine that together to make real change on a project like this because I think sometimes you have the idea but actually actioning that and making something happen I think it didn't always look possible across the project but I think once we'd identified the NAIC as a site and we realised that actually

13:27

It doesn't need to be a natural water body. We can put in things like the refugia and stuff. So they don't have to be able to burrow into the banks. And actually, that's nice from a maintenance side because they're not destroying your banks. And once we'd identify things like this, it was really easy then to move forward and kind of make the change, especially with people like Middlemarch on board who could actually handle the crayfish and do that side of things. So much of what we see in sustainability tends to be perhaps either individuals who are very, very passionate.

13:55

or small groups, but this clearly is an example of systemic change and actually bringing different partners together to make something like this happen. And I think that's such an incredible thing to see at the university and very much helps demonstrate the university is walking the talk. Gemma, I know Warwick signed the Nature Positive Universities Pledge last year in 2025 as well. How does this project in particular connect to broader commitments around halting nature loss and helping to restore biodiversity on campus, please?

14:24

We've just refreshed our environmental sustainability strategy for the university and that includes a commitment to support nature recovery on our campuses and beyond. That support takes a number of different forms. At the most basic level, it's fulfilling our legal obligations and the biggest one of those is biodiversity net gain. And that requires a 10 % increase in biodiversity for any development requiring planning permission and we do have lots of development on our site. But the reality is that nature doesn't care about planning boundaries, it cares about having joined up

14:54

habitats and the right habitats in the right place. So that's why it's so important for us to be working in partnership with local authorities and with others in the wider region such as Wildlife Trust to take a landscape level approach to nature restoration. We also take guidance, for example, from the local nature recovery strategies which were recently published.

15:13

And that gives us an idea around which habitats are priorities for the region, which species are priorities for conservation, and that helps us to make sure that what we're doing on campus makes good ecological sense. And so, in addition to that, Nature Positive Universities is a really useful network, and it provides opportunities for us to see case studies, what other universities are doing, and it also has opportunities for student ambassadors, and we do have a few of those at Warwick.

15:37

get involved and understand how the universities all around the world, not just in the UK, are approaching similar challenges when it comes to nature. You mentioned about being able to access different case studies of what other universities are doing and I think if we were to look at this as a case study for Warwick, what would you say to other

universities for how to work with their local authorities and their communities to try to do similar projects that support native species recovery and help restore biodiversity on their campuses as well?

16:05

So, I think it's about being open to opportunities, looking at doing things a bit differently to how you might have done them before. When we were first approached about the NAIC as an Arc site, we were a little bit sceptical, to be honest, because of the location and because it is such a formal area of campus. And we just didn't know whether it was something that we would be able to go ahead with. So, we were absolutely delighted when this project worked out and we were able to have a species reintroduction right in the centre of campus.

16:32

So yeah, I think openness is really important. Collaboration is really, really key. And I know we've talked about that an awful lot, but I would highlight in particular in relation to funding. So, funding for this type of work is really scarce and actually joining forces with others gives you the best chance of being able to access that funding, being able to go ahead with it. So yeah, bringing those kinds of different types of organisations and different types of expertise together does give you the greatest opportunity for success.

17:00

I will just add to what Jemma said that I think it's also really important to bring in students and researchers and everything from your university who can maybe add to the story and not only benefit from their own research, which in turn might bring in subsequent funding to the university, but also help these initiatives move forward both from a data side, what we can do with that, how we can study our own universities and wider areas, but also just getting people involved. think having examples like this is great for us and then feedback to our students.

17:30

and talk about how they can volunteer potentially to help out with these types of things, as well as the broader community and bringing them into universities. And I just, think that we also make sure we articulate how to then care for these spaces and make sure that people are informed because, for example, our own project, we do have Signal Crayfish that are potentially near and we have to be really...

17:52

careful that people aren't going to find them, pick them up and chuck them in the rill because they think that's where the crayfish belong. And that sort of biosecurity risk and how we communicate that I think is all so important and so positive thinking about these type of projects going forward and how people can bring together the university as a whole, but then also researchers within that, undergraduates within that, and then even broader the local communities to push these things and help save nature because I think that's ultimately what we're trying to do. Yeah, thank you both.

18:22

What would your advice be to anyone who wanted to learn more about how this came about and what the next steps are. Thank you both for joining the podcast and for sharing about this and for being able to bring the two perspectives from the research side but also from the operational side as well and really showing how important those two things are in working together to help with improving biodiversity but also with these types of projects that we see on campus. oh

19:10

Looking forward to speaking to you both again, maybe in a year's time to get an update on how the project has gone. But otherwise, yeah, thank you so much and have a lovely rest of the day. And I'll speak to you very soon. Thanks so much. Bye. Thank you very much, Tom. Thanks, Tom. Great chatting to you.