

**“That’s Understandable” Season 2 - Episode 5
“The Spectacular Science of Trees” Transcript
Final Transcript 08022024**

Brendan (00:10)

I want you to imagine something with me. It's a warm Saturday in late spring. You've had a long week at work and need a little time to decompress. So you pack a picnic basket and blanket and you head out to your local park. The sun is beating down just a bit hotter than you expected. So you find a shady spot under the branches of an old oak tree. You sprawl out your blanket on the ground next to the tree, lean your back against the trunk and take a deep breath.

As you watch the branches sway and the leaves blow in the wind, you're refreshed. The air seems cleaner and you feel calmer, healthier, and more alert. This isn't your imagination. It's science. You don't need to be a few acorns short of an oak tree to believe in the power of trees. Trees have long been known to have several beneficial effects on the human health and the environment overall. A Pennsylvania study published in Science Magazine all the way back in 1984, showed that patients with a view of a tree outside their hospital room had significantly shorter recovery times after surgery. Another study published in Nature Portfolio in 2020 showed that patients with depression who live in areas with more trees were less likely to be prescribed an antidepressant medication. These examples don't even begin to scratch the surface, or bark, if you will, of the benefits that trees provide. Things like removing carbon dioxide from the atmosphere,

fighting wind and water erosion and providing renewable resources. Fortunately, I'm joined by guests today who are more than capable of helping me whittle down this big topic into something a little easier to comprehend. First off is Dr. Jessica Turner -Skoff, Associate Director of Science Communications at Longwood Gardens. She is an award -winning professional who focuses on bridging the gap between science and society by highlighting how plants not only make life possible, they make it worth living. Welcome Dr. Turner -Skoff.

Jessica B Turner - Skoff (02:42)

Thank you so much, it's so great to be here and I love the tree puns.

Brendan (02:49)

Our next guest is Dr. Peter James, Associate Professor in the Department of Public Health Sciences at the University of California, Davis School of Medicine and an adjunct Associate Professor in the Department of Environmental Health at the Harvard T .H. Chan School of Public Health. His research has been focused on estimating the influence of exposure to nature and other environmental factors on health behaviors, mental health and chronic disease. Welcome Dr. James.

Peter James (03:14)

Thanks so much for having me.

Brendan (03:16)

Absolutely. And last, but certainly not least is Dr. Holly Bamford, Chief Conservation Officer for the National Fish and Wildlife Foundation, or NIFWF for short. NIFWF is focused on outcome -based conservation, promoting the multiple benefits that healthy habitats provide. Welcome Dr. Bamford and thank you for joining us.

Holly Bamford (03:36)

Thank you, Brendan. Glad to be here.

Brendan (03:38)

Okay, so I'd like to start with a softball question for each of you, which is, and Dr. Turner -Skoff will start with you. What is it that makes trees so spectacular?

Jessica B Turner - Skoff (03:51)

Ooh, that may be a softball question, but narrowing that down, I will try to keep my answer under three hours just for the sake of this podcast. But trees are just spectacular for so many reasons. You know, besides being the anchor of the ecosystem and ecosystems and serving as the lungs of the world, cleaning our air, they make the lives of people better in so many incredibly diverse ways. You know, the ones that I like to point out would be mental health, physical health, and social health. There's a growing body of research that shows that removing extraneous variables, really focusing on trees and the benefits that they provide, that if you are around nature, you're more likely to have reduced negative thoughts, reduced symptoms of depression, lower levels of cortisol, which is so incredibly important for your physical health as well.

Trees can help encourage physical activity. And, you know, as far as social health goes, it really a holistic perspective would be they can improve kids' ability to concentrate and perform in school. They can help reduce violence and aggression in households. They create an atmosphere of community. So the reason that trees are so spectacular is because they just make our lives so much better. They make us better people. And, you know, we're really so lucky to have them.

Brendan (05:12)

Thank you. And I hope we'll definitely dive into sort of a lot of those components more, but it was great to sort of hear an overview of why they are so spectacular. Maybe next, Dr. James, I'll turn to you. You know, what, from your perspective, what makes trees so spectacular?

Peter James (05:28)

Yeah, to be the dry epidemiologist here, I want to kick things off with the biologist E.O. Wilson, he coined this term or popularized this term, biophilia, that we've evolved with nature to have an affinity for nature. I think it's important, we often think about how do we get connected to nature? I think there's another perspective here in that we are nature, right? This is where we evolved around trees, we're not supposed to be staring at computer screens all day long. So this is our natural setting. This is what we were supposed to be. And then I think our relationship with trees, that kind of underpins this idea. And there's some theories also that get at this a little further. The first would be stress recovery theory. Now, again, we've evolved to recover from stressors in natural settings, right? And so something about being around trees activates our parasympathetic nervous system in ways that reduce stress and autonomic arousal.

They evoke positive affect so we can have a better mood and reaction to stress. And that helps us to recover from stressors and be ready for the next evolutionary task. And that's one theory. Another theory is attention restoration theory. You mentioned something about being around trees helps us to focus. There is this idea that something about being in an urban environment or staring at a computer screen taxes our attentional control, our directed attention.

And something about watching trees sway in the wind helps us to replenish that directed attention and be ready for more cognitive tasks that are a little bit more challenging. And I think about this as when you're writing and you're focused and you hit a block, you stop for a second, you stare out the window, you take that beat and you look at a tree, you look outside and you turn back and you say, okay, I'm ready for the next task. And I think...

You know, those types of things are amazing that trees can provide these services for us. You know, you mentioned the randomized trial of the hospital in Pennsylvania. You know, there's this gold standard of randomized trials. There are other trials having people walk in nature versus walk in urban environments, doing, you know, a cognitive test before and after, or doing, you know, some questions about mental health. And pretty consistently we see that people perform better on cognitive tests after walking amongst trees and their mood is improved. There is certainly growing evidence. There's something special about trees.

Brendan (07:55)

Mm -hmm, that's great. I definitely want to dig into that more. How about you, Dr. Bamford? What makes them so spectacular in your eyes?

Holly Bamford (08:03)

Yeah, I mean, I think what Jessica and Peter said is just fantastic. And just to play off that a little bit, I mean, one of the things I find most fascinating about trees is how spectacular they work together to form this amazing, complex, yet beautiful thing we call forest. And at NIFWF, we approach conservation from like this ecosystem landscape perspective. And so we tend to focus more on the forest than on the tree. But when you think about it, forests are so much like human communities, like a community of forest thrives, they need to have diversity among their individuals. They need to have a diversity in age structure, in the type of tree. And for them to be healthy and resilient in the face of disease and disaster or whatever else gets thrown in their way, they really need to have a healthy community among the trees. And so at NIFWF and our partners like AstraZeneca, we focus our efforts on what makes forests healthy and resilient. And I think of ourselves as doctors for forests.

A lot of the work that we do is we do wellness checks, we do health plans for forests, and we even triage after they've been impacted by storms and wildfire. So really it's an all hands on deck and really to protect these just spectacular ecosystems is just one of the things I love to do.

Brendan (09:22)

It's clear from each of you, right? I could tell just by how you light up when you're answering the question that you're all big fans, you're passionate about trees and all of the different angles and roles that they play in our world. There was a collection of studies that were compiled in 2021 and a review of public health showed that exposure to green spaces is associated with a myriad of health benefits, such as better pregnancy outcomes, like birth weight, improved mental health, a lower risk of chronic disease, and reduced premature mortality, just to name a few. And I think many of you, actually all of you mentioned additional benefits, both from sort of a medical, but just a broader perspective as well in terms of mood and things like that. But I'd like to actually hear a little bit more about the impact on human health. So, Dr. James, I know you've done quite a bit of research in the space as you shared on the last question. Can you tell us a little bit more about the direct impact on between health and exposure or proximity to trees?

Peter James (10:31)

Yeah, so I mean, there's a growing body of research on how trees might impact longer term health outcomes, hard health outcomes. First off, I think it's worth talking about the main mechanisms, the main pathways we think about when we think about trees and health. So trees may buffer our exposure to air pollution, they may clean the air, they may buffer our exposure to noise, and also may cool urban environments and buffer our exposure to extreme temperatures. And all those factors have independent impacts on health outcomes.

They may provide an ideal setting for physical activity and social engagement, right? You might be more likely to go out for a run, you know, around where trees are shading or maybe interact with your neighbors. And, you know, physical activity and social engagement also have strong independent impacts on health. And then there's that kind of direct, you know, we just talked about this, but the direct impact of just looking at a tree that might impact our stress or our cognitive function, and that also might have downstream consequences for health.

And there have been literally hundreds, if not thousands of studies at this point that find fairly consistent association between exposure to nature, living in an area with more trees and higher birth weight babies, lower incidence of depression and anxiety, better physical activity and sleep, lower rates of cancer and cardiovascular disease, improved cognitive function, lower Alzheimer's risk. We're seeing studies that show lower Parkinson's hospitalizations many, many outcomes and even living longer. And that's, that's fairly consistent now that we show that independent of adjusting for neighborhoods, socioeconomic factors, we see that people who live in greener areas live longer. And, you know, these studies have been conducted in countries throughout the globe using an array of study designs, looking at different populations and findings are generally consistent. So I think there's some real traction. There's something going on there.

You know, there's certainly some limitations to these studies. They usually use coarse measures of vegetation that won't allow us to really pick out trees per se, but we're working on that. You know, we're using things like Google Street View to understand specific trees. We're looking at LIDAR data to understand tree canopy cover. So we can do better and we're working on this. But I think overall the literature is quite strong.

Brendan (12:45)

I think many people probably haven't thought hard as they, you know, walk down the street, if they're in an area that has trees about sort of changes in mood or it almost kind of, for most people, it's probably more of like an aesthetic, you know, sort of aesthetically pleasing versus thinking about all of the other, you know, the science behind the impact it has. Is it, in the studies, is the, you know, I guess plainly put, if you think about impact on health conditions, is it things like cleaner air or is it a combination of that plus, is there an aesthetic component too? More visually pleasing means, I don't know, it sort of makes mood happier and thus, I don't know, maybe has an impact on health that way. Is it kind of a combination or is it sort of one or the other that seems to have the larger impact on, on health?

Peter James (13:32)

We certainly are trying to tease those mechanisms out. In one study we published, we did look at what's called mediation, or basically looking at how much of these different pathways explain the relationship between living in a greener area and mortality rates. And we did see that a lot of that pathway was this mental health pathway. So 30 % of the association was explained by this mental health pathway. Now, I think it's really important for the listeners here to know that mental health is extremely important. And mental health...

can get under your skin and impact cardiovascular disease and other things down the line, right? So it's not that it's, it's just aesthetics. I mean, aesthetics may fundamentally drive our health, right? If you're living in a place that you find depressing, I mean, that might actually impact your health, right? Your heart health outcome. So yeah, I just don't wanna poo poo something because it goes through this mental health pathway. That's an extremely important pathway.

Brendan (14:32)

How about you, Dr. Bamford and Dr. Turner -Skoff, any additional thoughts on this question?

Holly Bamford (14:38)

Yeah, I would say, you know, Dr. James obviously has this squarely in his court. You know, we use a lot of these studies to help us assess the health of an ecosystem and kind of what conservation actions to take. But I got to say, going back to what Dr. James said earlier, you know, we are part of the ecosystem, human and trees evolving together. And I think it's just intuitive that nature and trees make us feel better. I mean, a perfect personal example for me and something that you know it's easy to see is the Central Park example in New York City. I mean Central Park was one of the first parks created was back in the early 1800s when immigrants were coming to the United States coming into the grid structure of New York City and they had the bright idea to section off an area for a park. And you know that park today from a real estate perspective is worth over 500 billion dollars if developed.

But it won't because that is literally the only sanctuary that people can go and walk their dog, hang out with their kids, throw a ball around, have a marathon, go to a concert, have a picnic, right? Like just entering, you know, leaving the streets of New York City and entering into Central Park is like a whole different universe. And you see people are happy and, you know, it's just intuitive that, you know, a study can tell you that, but you could see with your own eyes when you go to New York City and you walk into Central Park what it does to people. And in my mind, I think of parks like that is literally the heart and lungs of a community.

Brendan (16:07)

I was actually just gonna, and again, I mentioned the Longwood Gardens connection earlier. I think about my experience and you can probably describe it better, but it's a, I don't know how many acres, hundreds of acres of pristine land and flowers and trees. And so that's kind of like my central park, if you will.

Dr. Bamford that like, you know, walking in there, it's sort of like, you feel like you're in another world, right? It's like an escape from the realities of day to day. You feel like you're just in a clean, open space and it does sort of change, you know, change your mood and all of that that you said, but Dr. Turner -Skoff, you know, please sort of build on, I'd love, I'd love your thoughts as well.

Jessica B Turner - Skoff (16:47)

Yeah, absolutely. Well, Longwood Gardens is an oasis. You know, it's 1100 acres. We have formal gardens. We have natural areas. And, you know, people come here for inspiration. They come here for joy. They come here to be surrounded by beauty. They come here to find solace. Like there is something that's so in like just in your soul, you know, and there's a reason, you know, gardens are such a huge industry. I mean, there's, over 3000 gardens across the world and they get over half a billion visitors a year. That's a tremendous amount of people that are recognizing the power of nature. I did want to say one study that I think is a really compelling bookend for the ones that were discussed earlier. You know, sometimes we can talk about how great trees are, but what happens when trees go away? And we can have, there's a great study thanks to a, really productive little green shiny bug, the emerald ash borer. And so this, this is a invasive pest that came in the early 2000s and decimated ash trees across the country. Well, never let a good crisis go to waste. This allowed researchers to actually look at the health of communities that lost their ash trees. And you can trace increased mortality related to cardiovascular and lower respiratory tract illness based on the loss and the infestation and death of these trees. When we think about how important nature is, I mean, that's such a compelling example.

It's just the need to be in nature. It's recognized by the healthcare community. There's a reason there's nature prescriptions that are people are writing in Japan, Korea, Australia, the U.S. This is a program that doctors recognize the importance of having their patients be in nature and encouraging them to go improve their health and their lives.

Brendan (18:39)

Transition 1

As our guests described the myriad of health benefits that trees provide, I was surprised by just how many aspects of life they actually impact. And I wondered, just how aware the experts thought the general public is about how badly we need trees.

So I sort of mentioned it from my perspective around, and I would say maybe a thinking of a general population is that when you're interacting or seeing trees, you're not necessarily thinking about the benefits to them. So I'm curious from your different perspective, we just talked about a lot of benefits of trees. Is this?

And maybe your perspectives are different because you're maybe surrounded by people that are more like -minded. But do you think, sort of generally speaking, that the benefits of trees and the impact on human health, is it widely known and accepted? Or do you think it's sort of like, you know, only in pockets or, you know, certain communities?

Jessica B Turner - Skoff (19:21)

I think it's intuitive. I think if most people know that nature is special, it's restorative. And so, you know, when you tell people all the benefits, it's a lot of the, of course, you know, discussions. It's like, that makes complete sense. You know, it's because plants and nature and trees, they provide life and they also make life worth living, which is, you know, it's a central part of the human condition.

Peter James (19:49)

And if I could follow up on that, I completely agree. I think that in general, it's widely believed and people say, of course. However, I think we have not necessarily valued or prioritized trees when it comes to budgeting, when it comes to how we think about investment and maintenance in trees or in any landscape architecture. Right. It's basically seen as a perk.

or an amenity for the wealthy and not as something that's fundamental to us as human beings for our survival. And so I think part of what I do and many others do is baking in these ecosystem services and trying to quantify them for human health because we care about ourselves a lot, but also for the health of natural systems that sustain life on the planet earth. So I think it's really important that we go beyond saying, yes, of course, I get it, they're great.

And we actually try and say, look, we need to actually place value on these things and invest in these things because they're so fundamentally important to us for our survival.

Holly Bamford (21:00)

Yeah, and I'll just add to that at the end there is, you know, I agree 100%. You know, people think about trees and what they provide us, oxygen, they lower temperature, aesthetics, place to go. But I mean, there used to be a time in conservation where you can literally create a park and a refuge and kind of rope it off and nature will heal itself. Not today. Humans have definitely altered the ecosystem. And so not only do trees provide us a service, but we now have to provide them a service. And I think that's a little bit of what is not known, as Jessica and Peter both said. Like, I think people look at trees as providing us a service and they're going to be just fine. But in reality, even in my Central Park example, you know, you go through the history of Central Park, there was a time when it wasn't so nice and it wasn't so central. And they've

created a conservancy really to oversee the health and continued sustainability of the park. So it takes people.

Jessica B Turner - Skoff (21:54)

I also just wanted to say that the COVID era, I think, really provides us with really unique data. And if you look at the horticulture industry, home gardens, house plants, garden visitation, through the roof numbers. So when people were at their lowest mental and physical and social health, they were clinging to nature. They were finding ways to incorporate it in their lives. And I know lots of people who their relationship with nature and trees and plants changed during the COVID time period. And I imagine all of you know somebody or somebody you love had that change as well.

Brendan (22:23)

Yeah, I think lots of friends and family that picked up hobbies, I think, in doing things they never did before, like gardening or obviously walking outside and appreciating nature probably more than they ever had in their entire life. So I guess one of the benefits that came out of COVID.

Peter James (22:52)

And if I could just follow up on that, you know, Dr. Bamford mentioned this earlier, but with like Central Park, but you know, Frederick Law Olmsted, this, you know, the landscape architect who designed Central Park and the Emerald Necklace in Boston, many other places. And this was like in the 1800s, they didn't really understand germ theory, right? But they understood that parks were a place of refuge and fundamental for health. And even that they were a place that you could go in the time of pandemics, right? So, so we understood even in the 1800s, that green spaces were essential. Now we know it's because there's fresh air and you're not transmitting airborne diseases, but they provide a setting for you to be physically active, socially active without risking exposure. And I think during the early days of COVID, we closed parks. And that was probably the dumbest thing we did because people need to be socially active, right? And so people would still gather indoors.

And I think we all know now that parks are fundamental. Yet another thing that parks are fundamental for is to serve as a refuge during times of pandemic.

Brendan (24:03)

Dr. Bamford, I appreciate you mentioning that AstraZeneca does have this relationship with the NIFWF. And I wanted to kind of shift gears to that because I think you're seeing more and more organizations, large companies that are starting to shift, either shift or maybe intensify their efforts from a sustainability conservation perspective. And so like you mentioned, AstraZeneca has this initiative called AZ Forest where we're committed to planning and maintaining 200 million trees across six continents by 2030. And like you said, within the US specifically, we partner with NIFWF to plant one or we're partnering with NIFWF to plant 1 million trees by the end of 2025. And it's not just about planning, but also to your point, I think it's about sustaining what's already here. How does planting and sustaining trees help to stem the tide of the climate crisis, which we're hearing more and more, what we're seeing the impacts of, right? Through storms and all these natural disasters, but what sort of relationship or what impact does planting and sustaining trees have on helping to curb the climate crisis?

Holly Bamford (25:10)

Yeah, Brendan, that's a great question. I mean, this is something that we're getting approached on a regular basis from other nonprofits, state, federal governments, and private sector and companies. And I think everybody recognizes that in the modern world, there's so many threats that are posed to, like the climate crisis, to wildlife populations, to forests, other natural habitats, that it's no longer enough that we can simply just kind of.

I guess I said earlier, rope it off and it's going to heal itself. We need to play a part and we have to step up. And so one of the things is tree planting and especially at the scale that AstraZeneca is undertaking, it plays an enormous role in ensuring that forests continue to function and provide what we are calling ecosystem services to this planet. And one of those services is their ability to sequester carbon as they grow. And I think that's what a lot of focus has been on many corporations to say, OK, look, maybe we can counter climate and you know start focusing on planting trees. But you can't just plant a tree and then like walk away. You really have to think about it from a forest perspective and I think that's exactly what AstraZeneca is doing. And I'm happy to give you an example if you would like. There's one example that a project that we're funding with AstraZeneca that I think really exemplifies combating the climate crisis.

Yeah, so last year we supported a project in West Virginia and it was working to restore forest on this land that was previously mined for coal. So literally it was an area in West Virginia, a coal country area. Communities were using that to mine for coal and it was left as just an abandoned coal mine. And it was over, it had invasives and just brush on the top of it and it really wasn't thriving. And so with the partnership we have with AstraZeneca,

We're now reestablishing a native hardwood forest on these barren landscapes. And this work is really going to benefit the diversity of various mammals and fish and salamanders, especially birds. So including these migratory forest birds that come into that geography that fully depend on these forests to survive and to make their journey across the United States. And from a carbon perspective, this is a really cool thing, that as these trees grow over the next 30 years, they will sequester over 40 ,000 tons of carbon dioxide. And this is the same as removing 8 ,000 cars off the road in a year. And so this is fantastic. I mean, this is what these public-private partnerships do. I mean, it's getting together with corporations, leveraging their resources to do good things in communities. And so if you really think about it, we're helping to turn a once coal production area back to native forests. And working with the communities there, that have historically focused on energy extraction. We're now healing those lands. We're actually creating jobs in the forestry sector. We're boosting recreation because this area is going to be open access for people to enjoy. And it's really just improving the quality all around of that area. So we're really, really proud of this partnership we have with AstraZeneca. And that's just one project. We have dozens that we have been funding across the country. So we're pretty excited about it.

Brendan (28:23)

Yeah, no, thanks for sharing. That's fantastic to hear. How about Jessica or Peter, thoughts from you around how planting sustaining trees is really helping to curb the climate crisis?

Jessica B Turner - Skoff (28:37)

Yes, absolutely. And first of all, I want to say AstraZeneca and Dr. Bamford, such exciting work. My dissertation was done on previously mined lands, surface mining. So it just really hits home.

Holly Bamford (28:48)

Yes, isn't it like one of the places that need help, right?

Jessica B Turner - Skoff (28:51)

It needs help, absolutely. And you know, another area that's kind of similar with the far, with the perspective of soil compaction, runoff, pollution would be cityscapes. And one of the reasons that trees can be so important for helping the tide of climate change is just reducing the urban heat island effect. You know, let's say you're at a pharmacy in the summer to get a cold drink. You step outside in the parking lot you get hit with this wave of heat. That's because cities,

they retain heat and they're only gonna get hotter and cities are only gonna get bigger. More and more people are moving to cities. And it's predicted that the health related problems with the urban heat island effect will skyrocket. So we need to be combining that green and gray infrastructure, making sure that we're taking care of city, city trees that we're planning ahead.

And, you know, kind of thinking about trees as preventative medicine. How can we care for the trees now to make sure we have a healthy and productive future?

Peter James (30:00)

Yeah, that's a really great point. I think there's a growing number of studies that are showing the effects of trees in reducing the effects of heat on mortality and other health outcomes. So I think it's really important to consider. And one other thing I will add, a lot of things have been covered already, but I think in the context of equity, we also really want to think that during extreme heat events, low -income blocks where you may be less likely to have air conditioning as well, or maybe don't want to pay to run air conditioning. Those low -income blocks have lower tree cover, and they're going to get a lot hotter. And this has been measured that because of this tree cover, there's massive differences between wealthy and poor areas in terms of the actual urban heat island. So trees may be a vital way to confront not only climate change, but also these kind of health disparities when it comes to climate change.

Brendan (31:01)

Yeah, thanks, Dr. James. That actually is a great segue. And you mentioned it earlier. You know, obviously we're talking about sort of urban versus rural and the variety of access to trees. And you hit it on the head right there about sort of inequities when it comes to accessing trees in green space. So recognizing all the benefits that we've talked about, right, from a health perspective and others, what is being done or maybe what is being done or maybe what can be done to help increase equitable access to trees? Dr. James, I'll start with you if that's okay, I feel like it was a nice continuation on what you were just talking about.

Peter James (32:12)

Yeah, for sure. First off, we've published a number of studies using different metrics that show very stark disparities in terms of who has access to green space in this country. And so, wealthy white neighborhoods predominantly have the highest access to green space. I think it's also important to know that there's a great study in the UK about 20 years ago now that showed that health disparities between the wealthy and poor, were smallest in areas with the highest amount of green space. This idea that having more green space in a low income neighborhood may actually improve the health of those residents more than if you added green space to a wealthy neighborhood, right? And in fact, the literature I talked about earlier, many of those studies find the same thing, that the effects of trees are strongest in lower income neighborhoods, right? And that could be because lower income folks may spend more time in their neighborhoods. They may have more pre -existing comorbidities and they may rely on neighborhood assets more for health. So they're not going to have, you know, a Peloton or gym membership, right? So they use their neighborhoods for health. And so, you know, planting trees may actually decrease health disparities. I think that's a really valuable way of thinking about this type of intervention. And, you know, the USDA has actually invested money in this through the Inflation Reduction Act.

They have invested \$1 .5 billion now on urban forestry projects that are just picking off. And so these projects, I think it's 385 grant proposals that were funded to increase equitable access to trees. And 100 % of the funds here are flowing to these Justice 40, you know, disadvantaged, historically disadvantaged and underrepresented communities. So I think that that will be great because we'll be able to invest in urban greening in these neighborhoods. And, you know, I'll put in a plug, there was no funding to study the health effects of these, of these, these

interventions, right? So maybe AstraZeneca would want to want to measure some of that, putting it out there. But yeah, so I mean, I think there's, there's a lot that's being done. This is a big, big investment. I'll be really excited to see where it goes.

Brendan (34:18)

Yeah, that's fantastic to hear about all that investment. Dr. Bamford, any additional thoughts from you?

Holly Bamford (34:23)

Yeah, I mean a lot of what Peter just talked about is we're working very closely with USDA and Forest Service and he's exactly right, there's a lot of resources out there that's trying to tackle this issue. I mean this issue we take very serious here at NIFWF and we've been working on it for a really long time. I mean one of the unique aspects of being the nation's largest conservation funder with the federal sector is that we can help step in and fill gaps where conservation funds are needed to address these very concerns.

I mean, we fund projects across all types of landscapes across the United States, from pristine forest in remote areas to small family -owned forest properties to these rural communities and also the urban neighborhoods where poverty and other social economic factors has really resulted in a reduced access to green spaces. And, you know, we see this across the country, where communities that are in need who support conservation and fully understand the importance of forests and trees, but they just lack the resources to take on those big projects. And, and Brennan, you asked, well, what can we do about it? Well, I think that's one of the really cool things about these public private partnerships that where what we try to do at NIFWIP is bring in that federal money, match it with our private money like AstraZeneca and we could play a really big role to get the money in the hands of those communities and those organizations that work there to be able to plant those trees.

And so the partnership we have with AZ right now, we're actually looking at focusing on urban space in Wilmington, Delaware, Philadelphia, Pennsylvania, really helping those local communities to plant trees, open access for these underserved communities. So it's been really great to see this move along and try to fill that gap as best we can.

Brendan (35:54)

Mm -hmm. That's great. Jessica, anything?

Jessica B Turner - Skoff (36:20)

Dr. James said it really, really well when he said that trees are often treated as a nice to have when they should absolutely be treated as a necessity. We need trees not only where people live, but people need access to the beautiful areas that exist. You know, Longwood Gardens, we are one of many, many institutions nationwide that participate in programs like Museums for All, which if you're receiving food assistance, you can receive free or discounted rates to it visit your local arboretum or garden, be around nature, see the beauty, get the good vibes. Also, local libraries are another place that you can check out because oftentimes they have memberships to these cultural institutions that you can check out and come visit. Again, we really wanna make sure that nature is for everyone, that everyone can enjoy the beauty of plants and trees and receive the benefits that it provides.

Brendan (36:58)

Transition 2

Throughout the conversation about the innate appreciation humans have for trees – and the importance of humans acting upon that appreciation – I began to wonder about what impact any of us can make on our own. What could we do for these plants that do so much for us?

As you all were talking, I was thinking about, we talked about sort of the larger initiatives happening between public and private partnership. But there's also each of us as individuals. So I'm curious, I'll come at it from maybe a pessimistic view. So I'm one individual, what can I do? Is there any impact I as an individual can have on the climate crisis or helping to reduce this inequity around access to trees. Just kind of opening it up, what would you say to our listeners on what any one individual can do?

Holly Bamford (37:56)

I was just thinking when you said that I was like only you can prevent forest fires. So I was thinking of you walking around with two buckets of water. But you know today I think it's instead of you only you can prevent forest fires. It's more like only you can really protect forests and you know and provide they're going to provide us services as we provide them services. So I think as any individual you have to acknowledge, recognize, cherish and protect forests and protect trees. And so that's one thing I would say is instead of walk around with buckets of water, maybe just walk around a forest.

Brendan (38:35)

Yeah, that's great. Anyone else?

Peter James (38:37)

I was going to say just kind of every time I get this question about what an individual can do, I think it's kind of wrong to place the onus on the individual here. And really we're talking about policy and what we invest in as a society, right? And so, you know, the boring things, it's a vote, right? And to tell your policymakers to invest in this and that this is a priority for you, right? I think it's short-sighted to think that, you know, we can just that, you know, there'll be a line item in for parks and trees in the budget from year to year, you have to advocate for this work. And certainly there's communities where the policymakers are doing that. But I think there's many other communities that don't have that political power, don't have, you know, there are many reasons why, but I think we need to invest as, you know, federal government, local government to really see this as a many ways, like many co-benefits for health and the climate. So we need to package this and really, really pitch it to our policymakers.

Jessica B Turner - Skoff (39:46)

I couldn't personally agree more. I feel like, you know, trees, they're an investment and they need to be treated as such. And if you take care of them and they'll return dividends because bigger trees means bigger benefits. However, you know, city budgets, what's the first thing that gets cut? Tree care. You know, it's, it's something that it needs to be prioritized at a local, federal, national, global level.

Not only that, but... I am one of the biggest tree fans you could ever meet. And I am saying trees are not enough. We need to have the appropriate green and gray infrastructure. We need to be working on getting that policy because there's big changes coming and we need to be ready for them and we need to be future focused and treating trees as an important investment to help address some of those changes is a great thing we can do, but we need to do more.

Brendan (41:11)

I think it's great to hear the different perspectives on what we can all do for small and large scale. I have one final question to wrap up, but I did, this conversation is extremely timely

because last week I was in a meeting where someone had brought up this, something that they had learned. And I thought the timing was perfect because I'm with three experts on trees here that I can ask. So I recently learned that, trees have genders and that there are characteristics of male or female trees that make them more appealing in certain areas or maybe there's even additional benefits from an environmental standpoint to certain male versus female. So I thought I just have to ask this group here, what is, so obviously first I'd hopefully confirm that there are that there are genders, but then what are the characteristics or different characteristics of male trees versus female trees and what are sort of the advantages or why we might plant one or the other?

Holly Bamford (42:08)

I'm not sure, maybe Jessica, do you know as the...

Jessica B Turner - Skoff (42:11)

Well, different tree species, some are both male and female, some are male, some are female. And, male's can produce pollen, which can really aggravate people's allergies. Also, I can think specifically of the female ginkgo tree, which creates some very smelly sidewalks. So that's one that where people definitely typically try to plant male ginkgo trees. So it can vary based on the species, but there's research out there that shows any disservices that trees provide. People in the end don't really care because the benefits are so great that that's what they can focus on. So, male or female, or if it's both, just protect and plant and care for trees.

Brendan (42:54)

I like that answer. Anyone else on that one or also I'll go to that. Okay.

Holly Bamford (42:57)

Yeah, I think we look at it again from an ecosystem perspective. So diversity is key. And I think from it, they even say that trees in a community can actually communicate with each other through the soil and through the roots. And so tracking moisture levels and droughts and things like that, and being able to kind of account for that and be prepared for it to make themselves more resilient. So when we look at a stand of trees, we're looking for kind of the diversity in age and structure and type. You know, it's funny, even dead trees play a role in the community of trees because they provide a wealth of food for animals on the bottom. When they fall into streams, they slow down erosion, they slow down the water. So there's just, the ecosystem of trees is, I think the key is diversity and that increases its health and its resilience. So I think a lot of the challenges that we're going to see.

Brendan (43:58)

So we've, you know, each of you in a sense have sort of laid out your arguments, if you will, right? As to why trees are so spectacular, the important role they play from an environmental standpoint, from a health, human health standpoint. But, you know, as we close, I just want to give each of the opportunity to say from your perspective, what is the single most important thing about trees? Or if you want to say like, what is the biggest takeaway that our listeners should have from hearing this podcast episode. Either or both.

How about Dr. James, I'll start with you.

Peter James (44:31)

All right. Yeah. So great. I get to go first. This is a, this is a tricky one. but I was, you know, when I think about this, I think what one thing can improve mental health, increase our focus, improve cardiovascular disease, Alzheimer's cancer risk, you know, help us live longer, can help us address health disparities while also cooling our environments, sequestering carbon, helping us face a climate crisis head on, right? This one intervention can benefit so many

things at once has so many upsides, right? And I think we just have to recognize that, you know, maybe we need to quantify that, we need to monetize that, you name it, prioritize it, right? I think that's the thing for me is when you study trees, you see that there are so many different benefits. Can we bring that all together and kind of encapsulate those benefits and communicate that to the public and to policymakers? I think that's just, I know that's a cop-out answer, because it's not a single thing. It's all these things together, right? And that's what makes them so amazing, so spectacular.

Brendan (45:40)

How about you, Dr. Turner - Skoff?

Jessica B Turner - Skoff (45:42)

There's exactly as Dr. James said, incredible, incredible benefits. So I think that instead of saying one important thing about trees, I want to say one important message that we all need to hear. And that is that people need trees, but trees absolutely need people. We need to be planting the right trees in the right place, giving it the right care. We need to acknowledge that there are healthcare essential and that they should be treated as such. So even if you can't plant a tree, there's opportunities. You can adopt your local tree in your community, you know, make sure you're watering it when it's drought time, like during the summer, water your trees, make sure it's being mulched. And, you know, a lot of people mulch incorrectly. So, you know, go to the Morton Arboretum's website. They have some great resources on how to mulch a tree and protect it and enjoy it. And support your local garden as well. I have to throw that out there. I truly believe that.

Brendan (46:42)

Yeah, yeah, that's great. How about you, Dr. Bamford?

Holly Bamford (46:45)

Yeah, I mean, I would say it's hard to say a single, right? But, you know, from a practical standpoint, I would say the single most important thing for listeners to take away is the role that trees are going to play in helping us build a better future. You know, forest helps stabilize the climate. They regulate ecosystems. They protect biodiversity. They play an integral part in the carbon cycle, as we heard. They support livelihoods. They make us feel better and they can help drive sustainable growth. They are part of our economy. You know, so I just think the trees are going to be an integral part of our future and we have to take care of them. According to the U.S. Forest Service, there's currently about 300 billion trees in the United States. Now, if you compare that to the U.S. population, which is about 300 million, that is a thousand trees per person.

So as I said earlier, if we're going to be doctors for forests, we got a lot of work to do, guys. And I think we're all up for the challenge. And I think that's the key is we got to protect our trees. And we're up for the challenge.

Brendan (47:56)

That's a great point to end on. Dr. James, Dr. Turner -Skoff, Dr. Bamford, I'd like to thank each of you for your incredible insights and your time today. Really, really fascinating conversation. So thank you again.

Holly Bamford (48:09)

Thank you very much. This was great.

Jessica B Turner - Skoff (48:11)

Thank you.

Peter James (48:12)

Thanks so much.

Brendan (48:13)

Trees provide so much for us, from cleaning the air we breathe to providing us with shade on the hot, sunny day. But it's easy for us to forget how much trees give. Hopefully, today's episode planted a seed of understanding that will continue to grow into a deeper appreciation for just how spectacular the science of trees really is. Thanks again for joining us on That's Understandable. For more information about today's episode and guests, be sure to check the show notes. Until next time, be well, be healthy, be understanding.