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The Last Stand Podcast

Episode 1: Sounds of the Forest

[music interlude]

Diya Vij (DV): This is *The Last Stand* podcast, a mini-series on the social life of forests, reparative land management, and just climate futures on the occasion of Creative Time's newest public art commission, Kamala Sankaram's experimental opera of the same name.

Over the past four decades, Creative Time has commissioned and presented ambitious public art projects with thousands of artists throughout New York City, across the country, around the world, and even in outer space. We work with artists to contribute to dialogue and debate on the most pressing issues of our times, and to foster dreams for our collective future.

Kamala Sanakaram is a composer and performer, moving freely between the worlds of experimental music and contemporary opera. Expanding over five parts and ten hours, Sankaram's *The Last Stand* invites us into 300 years of sonic history told entirely through field recordings. As the years unfold, the human impact on the forest becomes visceral: species disappear, storms intensify, and the drone of highways and planes becomes constant. At the heart of *The Last Stand* is the fundamental truth that our planetary survival depends on collaboration with our natural neighbors.

Welcome to *The Last Stand* podcast. I'm Diya Vij, Creative Time's curator and your host.

[music interlude]

The series begins with artist Kamala Sankaram and Dr. Suzanne Simard, the world's leading forest ecologist.

[music interlude]

Dr. Suzanne Simard (SS): Hi, I'm Dr. Suzanne Simard, I'm a professor of forest ecology at the University of British Columbia in Western Canada. Um, I've spent my career studying how forests work, old forests, young forests. And one of the amazing things that I discovered is that, um, trees are not solitary, that they are actually connected to each other by this below-ground mycelium, a fungal mycelium.

These are called mycorrhizal fungi, they're helper, fungi. Uh, the trees provide carbon or energy

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in photosynthesis to the fungi, and the fungi use that energy to grow their immense bodies through the soil and pick up nutrients and water and deliver them back to the tree. Um, it's an amazing mutualism, all trees all over the world have these mutualisms, these connections. These networks below ground are universal. And through these networks, trees communicate with each other. They communicate their identity, how healthy they are, how resourceful they are, how poor they might be. Um, and you can imagine this internet is constantly chattering back and forth between trees about, uh, about their resource availability information. And, uh, this really has transformed how we think about forests, you know, until now, uh, we've really just viewed forests as these competitive communities, where trees compete against each other. But what this shows is that they actually are cooperating at the very same time that they're above ground shading or competing in some other way with each other. So it's a really much more complex community than we ever really realized. The old trees, I call them mother trees, are the hubs of these networks, and they facilitate through this communication system, the regeneration of their offspring.

Now, what does this mean for forest management or how we deal with our forests? Well, we've been managing this competitive interaction for years, for decades, for centuries. This means clear cutting our forest, weeding them out with herbicides, you know, in some cases fertilizing them and all of these activities really are not that good for the forest. You know they don't really respond that well, they're kind of sickly when they come back after clear-cutting and planting into monocultures. And they have lower carbon quantity, they have lower biodiversity, they're just not that resilient. And so, you know, forests, how we manage these forests, for example, just to give you an idea of how important this is, deforestation is one of the number one causes of loss of biodiversity or species extinctions in the world. And we are in what we call the sixth mass extinction now, and forestry is partly responsible for it. Um, the other thing is that, you know, the clear-cutting of our forests, of our old growth forests is contributing about 20% of our fossil fuel -- of our greenhouse gases on top of fossil fuels.

And so it really is a driver of global change as well, climate change. And so we really do need to change our practices, so we keep these old mother trees, so they can facilitate the recovery of these forests, to keep carbon in the ground, and keep biodiversity in our forests.

Kamala Sankaram (KS): My name is Kamala Sankaram, or I guess I should say Dr Kamala Sankaram, right!? I am a composer. I work mainly in opera and theater, and I came into writing after having had a career as a singer, doing mostly experimental work, and one of the reasons why I started to focus more on composition is that I wanted to see more stories that felt resonant to me and my experiences and also to a modern audience. And so my, my work in opera and theater has mainly been around putting people in stories on stage that are not normally there, um, with an emphasis on trying to think about social justice issues and how we can create

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empathy for people who are different than we are. So, for example, I think the piece that I'm most known for is about a Pakistani human rights activist named Mukhtar Mai. I just recently did a piece about surveillance capitalism, where we data mined the audience and put their information into the video design of the show. And so this piece really came about first as discussions with my sister, Sheila.

Sheila passed away in 2019. Before that we had been talking about working on a piece together and she was interested in landscape architecture and ecology. She was in the Netherlands, which of course they're, they're kind of ahead of where we are about thinking about things like that in the United States. Um, but she also was a visual artist and, um, had a practice doing light fairs and light festivals across Europe. So we had talked about maybe making a piece inspired by tree communication because both of us had just read *The Hidden Life of Trees*, which of course introduced us to, uh, Dr. Simard's research, and so we were both feeling very inspired at that. And then, um, after she passed away, I saw the Open Call for Creative Time and thought, Okay, well, you know, this is something we were talking about. I am thinking about this. Maybe I should see what happens if I apply. Um, the idea behind the piece is really taking the way that I approach thinking about storytelling, which again is how do we create empathy for people who are different from us, and then learning about how amazing this different intelligence is that trees have and how they are social and how, you know, part of the reason I think that we are not dealing as well with climate change as we should, is that we -- we sort of filter out the other beings that inhabit the world with us. And so I thought if I take this practice of, uh, you know, the way that I think about storytelling and maybe tell a story with the trees at the center, rather than people, maybe that would be a way to change the way that we think.

So that's really where it came from.

You know, I came into this with a broad conceptual idea, and I originally had thought that I would create something that tried to mimic the mycorrhizal fungi networks. Ah, maybe some kind of subsonic pulse or something to be like the, you know, the electrical charge that is the way that trees communicate. But after talking with Dr. Simard and with other researchers, I came to realize that this was really putting my own human perception onto the way that things work. Like you can make a metaphorical representation of it, but it's not really centering what the tree would experience. And so there were, there were a few things that changed my thinking about it. One is this idea of the mother tree, um, that I think when I came into it again, I was really thinking about having this protagonist tree and that's what the mother tree would be. But I have learned that it's more collaborative and communal than that, and that really, it's not the story of one tree -- it's the story of the whole forest.

And so we can use the, we use the White Oak up in Black Rock as sort of the center point

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around which things were evolve, but there are other trees that are also there, all the, all the way through. And in the end, and I mean, not to give away the ending, but in the end, it's the other trees that really the mother tree gives life and they survive. So I think that, um, it's through these conversations that I really that's, that's how the piece was made. It's it, it's not what it was when I first started talking to people.

SS: Um, right now I'm involved in what's called the Fairy Creek blockade. Fairy Creek is on the Southern end of Vancouver Island, which is on the west coast of North America. Um, and we're what we're fighting for at Fairy Creek is this last watershed that's got 2000 year old trees.

That is the last untouched watershed. It's clear cut all around it. People from all walks of life, whether they're young or old, are coming together to try to save this forest. This last forest. And I feel, you know, I'm involved in talking to the media and producing affidavits for the courts. There's several court cases going on, trying to block the logging.

We feel like our chances are, I don't know, less than 50% of winning, but, uh, but we keep going because this is so important globally. You know, these battles, it's important to win these battles because they provide hope for people. Like if we feel like we have agency in what's happening in our environment, then we can do it even more.

But when people lose hope or they feel that their governments aren't acting on or in the public good, which, you know, cutting old growth forest is not in the public good, then it gets discouraging. And so we've got to keep moving to keep keeping people hoping and involved. And I'm so glad to hear that these movements, yes, they're happening all around the world.

And the reason is because we're losing these forests so quickly. Um, you know, we overall, we've lost about 30% of forested areas globally, but the the loss of old growth forest is even worse. Like in British Columbia, for example, we only have 3% left of the iconic Valley Bottom Forest, old growth forest, left in the region.

So, yeah. And, and the reason it's not just important spiritually and culturally, but from a global change perspective, you know, there are in that forest alone, there are 20 species at risk. They are, um, carbon hotspots. They've contained more carbon even than a tropical rainforest. I mean, these are precious places, so it's on us to do the best we can to fight for these forests so they can remain connected, so they can remain healthy, and do what they need to do: Clean our water, clean our air stores, provide homes for all these creatures. I

KS: I think one of the things that's come up, you know, as I've been working on this piece and talking with people, is this idea that there's an either/or. Like either we preserve forests or we

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have a lumber industry. And I feel like that's not quite right. Like there has to be some kind of middle ground, if we can change the way that we think about it. I wonder what you are thinking about.

SS: Yeah, definitely. I mean, there's always a middle ground, and these polarized arguments can stall us. But here's what I think we need to do. You know, the remaining old growth forests that we have, of which there's such a small percentage, we really do need to fight to save those old forests. They have, you know, the genes and that alone will help us get through climate change. Right? Because these old ancient trees, some having lived thousands of years, have seen climatic fluctuations, and it's included in the genes and the seeds. So we need those seeds so that our future tree can have the genetic capacity to survive future climatic variation.

So that's one thing, but then we also have a lot of forest that is coming up as second growth or degraded forest, and there's so much we can do with these forests. So shifting our, you know, collectively across the world are cutting of old growth over to forests have already been cut before. When they have, you know, when we do go back in to get wood from them, to save the mother trees because they have mother trees too. Those are just the biggest oldest trees, and they're important because they facilitate, because they engender, or they nurture the regeneration of the next generation. They actually provide water and carbon and nitrogen and information for seedlings coming up that will help them get started. Just like, you know, we help our kids get started. It's the same thing in a forest. So, you know, we need to, you know, when we do harvesting to keep these old trees, keep the old legacies in the forest. They all protect carbon and biodiversity on all that, for us, that we've lost. Right? We have lost forest, and we need to get them back and regenerate them. So that means planting trees and looking after those trees.

KS: This sort of encapsulates one of the ways that the piece changed as I talked to people is that it also became about the biodiversity of the forest and what kinds of other animals would be in the forest. So that's really what most of the sound is, it's the birds and frogs and how they come together to create the music.

SS: I'm so happy to hear that. You featured these creatures as your operata.

KS: Yeah, they're basically the singers and the orchestra. And there's a white throated Sparrow who has the aria. They they've kind of took on the musical. I mean, because they are the musical. That been the other really cool thing about working on this piece is I decided to just take field recordings and then see where they led. And all of the animals have their own rhythm and they have their own pitch. And so I didn't change what they sounded like really. I didn't change the pitch. I just sort of put them together as an ensemble. And the crazy thing is that a

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lot of them are kind of singing in the same key. They're all in tune with each other. They also have their own internal rhythms that I, most of what I did is I would take one animal to start with and I would sort of create a tempo map or tempo grid based on that animal's rhythm and then just line everybody else up. And most of the time you can do that. They're just sort of synced up with each other. It's kind of crazy.

You know, you think of that as sort of a metaphorical idea, but it's actually true. They are harmonizing with each other, literally.

SS: Yeah. Yeah. I mean, it reminds me of, you know, the connections that I've observed in the forest and how trees are in sync with each other all the time. They're always aware of each other's presence and what they're doing and communicating this. And I never realized that until I started looking into it and actually measuring it and saying, wow, this, this is a synchronous, collaborative, ensemble.

KS: I've noticed that even here in New York city, the people that I have played this piece for so far now come up to me and say, "oh, I heard that bird or I heard that frog." And I even had that experience in the Bronx. I think I told Diya this already. A couple of weeks ago or so I was down in Kingsbridge, which is not the tree-filled part of the Bronx necessarily. There are street trees, but, um, you don't really think of it as having a lot of greenery, but then I heard these tree frogs and they were just there. They were there and I had never, you know, I had never noticed them before, but now I think the soundscape of the world has changed for me after spending so much time listening to all of these different animals. And now I notice them in a way that I didn't before.

SS: Yeah. I mean, it really does take slowing down, stopping and listening and being there. And suddenly it explodes in your ears to hear all these things that you might, as you rush through the forest, if you're on a walk going somewhere and you don't, you don't see the trees, you don't hear the sounds, but when you slow down and start noticing, then it's like, oh my God, this is just full. It's a cathedral.

[music interlude]

DV: Our next guests are evolutionary ecologist and ecoacoustics expert Dr. Monica Gagliano and musicologist Frank J. Oteri. The two discuss the sonic relationship between plants and musicians.

[music interlude]

Dr. Monica Gagliano (MG): I am based on Benjamin country, and so I would like to start the conversation by honoring the country that I stand on. I'm an ecologist. I'm an evolutionary ecologist, and I'm currently working based at Southern Cross University, which is the local

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University here. I started as a marine scientist. I turn to plants. I realized much later than the questions that I was asking at the start were pretty much the same at the end. So I keep having a lot of questions and sometimes a little answers. I'm very curious, and I learn a lot when I interface with other disciplines.

Frank J. Oteri (FJO): Hi, I'm Frank J. Oteri, a composer. I live just a few blocks away in New York City by the Shore Copa Rock, which is the rock where allegedly Manahata was sold, but I'm a composer and a musicologist. Since 1999 I have been editing New Music Box, which is a web magazine that was created at a place that was then called the American Music Center, which ten years ago merged into a new organization called New Music USA, and that's something I still do.

MG: For me, bioacoustics is the study or the exploration of sounds that are related, produced, or connected in some way to the bios, so to the biology or more generally to nature. The reason why this interfaces with me is because I'm interested in the sounds that are relevant to plant life, both sounds that plants emit themselves, but also maybe more interestingly, the sounds that plants are listening to from their environment and what they make with it, what they make of it. And now these sounds or these landscapes allow plants to interface with other systems and maybe make certain choices and decisions for their own benefit or to support the system itself.

That said, when I started this work with the plants and it became plant bioacoustic because initially that's where we started. We looked at the biology of the plant, whether the blind could emit sound or could respond to sound. But given that I'm an ecologist, I would be more tempted to define it as ecoacoustics because of course, I don't think that the bio itself stands in isolation alone. So the plant is not just made by the plant on its own. Especially when it is a matter of sound, it is always in relation. Relational spaces are where this work develops, and so I would say the ecoacoustic would better define it in the sense that the eco at the front would point to those relationships or relational spaces.

FJO: Music, very obviously musical instruments have been made for millennia out of plant substances, most obviously trees, but not exclusively trees. Reeds of various kinds for various wind instruments. There's a whole tradition of this. Of course, those plants have no agency in the music that's being made with them.

I sort of wanted to begin with this quote from a short story by Roald Dahl that I came across many years ago that I love that I think has some bearing on this conversation. It's from a short story called *The Sound Machine*, and the quote is "a flower probably didn't feel pain, it felt something else, which we didn't know about something called toin or spurl or plinuckment, or anything you like." And what I love about that quote is I always think of it when I remember it,

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because when you remember things, you always change things from what they actually are. And I always think that he's talking about sounds that plants make, because obviously, for me, is somebody who's very attuned to sound pain is something that you express through a scream or something. So this toin or spurl or plinuckment are sounds that we can't hear from these plants. But obviously, with all the research that's being done, we're discovering that there is sound to these to many other species, beyond the so-called Animal Kingdom. I have a litany that we can talk about of composers who have created works more directly with plant sources and have been trying to interact with plants.

When I got the message from Diya about this about are there other precedents for this? I did a deep dive. Nothing that's 10 hours. I've got to say, so this is very exciting. That really takes it into a narrative realm that actually makes it operatic. That makes the plant life for the protagonist, as it were. But then there are some interesting examples. Somebody who immediately comes to mind is John Cage in the 1970s, he created this piece called *Child of Tree*. And from the 1950s until the end of his life in 1992, created music primarily through chance procedures.

Somebody who immediately comes to mind, somebody I've talked with for New Music Box, is Miya Masaoka who's an amazing, amazing composer. It connects plants to various electrodes and analyzes their waves, connects them to a laptop and does this amazing music that's created through the bio form. Now it's getting into a realm I don't understand. It's getting into Monica territory.

MG: Often when this biodata from plants or bio signaling from plants is transformed or translated into music, there is obviously the claim that this is the music of the plants, and it's not. First of all, plants themselves, as agents, do not make music. We make music as humans, and maybe some animals, we consider them making music—We are taking over the agency of the plant and over imposing the human. Now, plants actually do have agency. They do have their own decision making going on. They have their own choices to make.

And so it's a very interesting thing that you brought up, because I really love some of the work that some people do with this. And I don't understand, there is no need to extend to the claim that we are doing the music of the plants. Now you're doing maybe music with plants or inspired by signals that come from plants. The amazing opera, 10 hours, I really like, because it's actually taking the sounds as they are and like, these are the sounds from what's happening in this moment. And in that moment, there is no need to embellish them. Canons might not sound very nice, but that's what it is. And a bird might sound nicer, but that's what it is. And so without over interpreting what they represent, because that's the problem representation. I guess.

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FJO: It's interesting, though, because how are we defining music? Cage's final definition of music is simply "sounds heard." I'm aware that plants can make sound, but are they cognizant, are they sentient of the sounds that they're making? And do they hear them? And if they do, then by Cage's standards -- and this is by no means colonial, in fact, it's very anti-colonial -- indeed, it is music

MG: And that's exactly the point. Plants have their own music making flavor. And that's why they don't need ours as the human intervening, taking some other signal that is not their music. There is nothing that does not have sound and that does not make a sound. And everything is listening in one way or another. We now know that you don't have to have ears to hear. And snakes listen through the bones of their jaws, and other animals listening other ways, even within the animal kingdoms. We don't know how plants are listening in terms of, how do they process those signals that arrive in the form of acoustic waves? But we know the behaviorally, they respond to it, and they change what they do based on what's arriving and what's coming. So they're definitely aware that there is a sound that contains information that is relevant to them for their lives. We don't know the mechanistics, but that's always the case. So it's okay. We'll find out. Maybe.

FJO: I think it's interesting to compare the work that some of these composers have done using plant sources to manipulate them. Like I'm thinking of [Mamoru] Fujieda's work. If you didn't know that *Patterns of Plants* was derived from plants, if you didn't read that, there'd be no way for you to know. You'd see the musicians on stage, you'd hear the music they're making, you'd say, oh, that's lovely. But you wouldn't necessarily get where it's coming from. With Miya Masaoka, if you just heard it, you know, maybe you wouldn't know where it's coming from, but if you see it, you see all these plants and see how she's connected all this stuff to them. And then with Cage, there it really is the sounds of those plants just kind of being because he's not putting any restriction on it. He's not shaping it in any way. He's just letting those sounds be. And it's the earliest of the examples that I came up with here. But in a way, it's the freest. And it's interesting to compare that with what Kamala is doing in the opera, because it sounds like there she is, letting those sounds be. And maybe she's constructing other things around them, but they are existing on their own terms, which is very interesting. It sort of brings the history of this human interaction with plant based sound full circle.

MG: Which is beautiful. I guess the use of technology, as always, is an extension of our limitations. So we need to, I mean, I'm wearing headphones, you know. We use microphones to amplify something otherwise we would miss. And so we are extending our own capacity to be able to hear more. -Cage already basically proposed exactly everything that was needed to be said, and then we've gone around trying to synthesize and do all sorts of stuff, and then we are in full circle again. And that's why I'm very excited about this opera, because it gives exactly

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what you said, the space for the sounds to just be what they are. And you can also add around. But those ones are not being overpowered by what we would like to hear.

FJO: Among human beings, if we only listen to each other closely and non judgmentally, which is what a true listening to music allows us to do, we would solve a lot of the problems we have. The majority of problems we have in the world is that people can't stand listening to difference and they fight over it. They kill each other over it. There are wars over it. You see how this is playing out everywhere. Pauline Oliveros, who talked about deep listening and how you need to listen to all the sounds that are around you, not just the ones that are being intentionally made, but all the unintentional sounds as well. If you're truly listening to everything around you, you're doing something good. I think if I'm to use a moral word here and so I can only see good coming out of attentive listening to what the sounds are around us.

MG: I totally agree it's beautiful. And it actually reminds me of another quote from someone else. This is one of the essays by Mary Oliver, and it finishes like, "attention is the beginning of devotion." And to me, that's exactly what you're describing. It's like just paying attention to everything that is present. Then you can devote yourself. Devotion to me carries this sense of appreciation for what's there. Then you're not judging because you can't be devoted and attentive if you're judging and deciding not this one, but this one. And I totally agree. I think that with that attitude, basically to words the world around you, then you care, you have to care. You care more. But it's true. Care not because you want to overpower someone else or impose your perspective on someone else or others, a group or whatever. But just because you realize that everything that is there has the right to be there, it's there because it's there. And you are there to collaborate and relate, not to overpower and make it yours in some way. And the moment when you're collaborating and relating, it is yours because you are part of that wave, and then you're part of those relationships.

FJO: I've often said and have gotten into huge debates with people about this, but ultimately listening is an act of submission, voluntary submission. And what's so interesting is when you're dealing with other life forms and the further away you get, and plants are about as far away as you can get from human sentience in terms of life forms. Right. Because with a bird, the bird has eyes, the bird has a mouth, the bird makes sounds. There are all these things that we can make analogs for and explain and kind of humanize, personalise. Whereas with the plant, you really kind of have to accept it on a larger level. So that's what gets me really excited about this, because if people really listen to this piece and devote themselves to it and spend those 10 hours focused on this, you know, what a wonderful metaphor for us being able to do something way simpler, like get along with each other in this world.

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MG: It's amazing that the piece is so long from our perspective. I'm even commenting like, wow, 10 hours. That's a long time. But from the perspective of the trees, it's like, "oh did something happen?" So, it's kind of inviting people to really like, for you, 10 hours might belong. So for some people, maybe even 3 hours is already long or an hour, it's already long. But the invitation that is kind of like, yeah, you need to sit here and enter a different time scale, which is not the one that you are used to is not the one that you think is the right one. If you really want to appreciate this piece, you need to slow down and you need to take the time that it takes to be here with this. For those who actually, yeah, put that devotion in, and say okay, I'm going to sit here and really take the 10 hours to really do it. I would love to know what happened when they come out of it. I reckon this is a transformational experience, and if a lot of people could do it, you will have a very different Brooklyn by then.

MG: The project that I'm working on, it's called Resonant Earth, and it's all about sound and sound as a tool for regeneration of all of it, like from the human spirit, because we know as much as especially for the musicians. This is like it's no brainer. We know that music can heal us. The way in which music touches us, the way in which sound touches us, I don't think anything else touches us the same way. The same piece can make you cry and it can make you laugh within 5 seconds. I just need to change a few notes and then the whole space changes. So, Resonant Earth, I think it's going to be a long term project for me. And it's about using sound as a tool to regenerate the human spirit, but also, of course, nature and literally interfacing it with some science and trying to create a prototype for the future.

FJO: You reminded me about something that maybe I should mention that's coming up. I wrote a piece for orchestra that was done earlier this year by the South Dakota Symphony Orchestra about this current moment, of the horrors of the pandemic, but also the weirdness of time not seemingly not moving. How do you create music that is about time not moving when music exists in time. The piece is called *Already Yesterday or Still Tomorrow*, and it's being done later this month by an orchestra in Italy, in Bari. And it's tricky. You said this before music touches the emotions in a certain way. I frequently say to people, the reason why music is so powerful is it doesn't mean anything specifically, but it means everything. It cuts through verbal syntactical language to something beyond that we don't completely understand.

MG: Maybe it's a good thing that we don't completely understand. That's why it touches us so deeply.

[music interlude]

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DV: *The Last Stand* runs from Thursdays to Sundays starting at 8am through 6pm from September 18 – October 10, 2021 in Brooklyn's Prospect Park. Creative Time projects are free and open to the public. No tickets or advance registration is required. Visit creativetime.org for more information.

This podcast series is produced by Patrick Smith. The music for this podcast is excerpted from *The Last Stand* by Kamala Sankaram.