

Nature's Climate Toolkit: Solutions in Plain Sight

LAURA MARX: When it comes to addressing climate change, there's no one simple fix.

OTIS WOOD: One thing to optimize your land for the climate, you cannot hope to implement one single practice and be like: I did it!

LAURA MARX: We have to do three things at once: transition fossil fuels to renewable energy; help communities adapt to climate change impacts like severe storms and extreme heat; and we need to use nature to remove some of the carbon pollution that is in the air already. Trees, plants, soils and ocean waters naturally absorb carbon dioxide—they literally undo climate change. They've been doing that since long before we got involved, but sometimes, they can use our help.

OTIS WOOD: If you have a piece of land and think, "How can I use this land to best help the natural world and the climate as a part of that?" I think that the thing that you should be chasing most of all is soil biodiversity, understory biodiversity, leaf litter biodiversity, diversity of canopy tree, diversity of mid-story tree.

If you do these things, your wildlife will diversify; your cool, fuzzy, fun animals will diversify also; your invertebrates will diversify. If you have a diversity of age of trees, if your land has more, uh, brighter spread of age of trees, if you have some little things and some great big craggy trees, certain insects only will overwinter and pupate in certain-sized cracks of certain shape, in certain bark of certain trees.

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LAURA MARX: You're listening to *Nature is the Solution*, a podcast from The Nature Conservancy. It's a show about how nature can help solve some of our biggest challenges for nature and people. Because doom isn't the whole story. I'm Laura Marx, climate solutions scientist for The Nature Conservancy in Massachusetts.

And that was Otis Wood, a forester from Longview Forest in Vermont, talking about one important piece of the climate puzzle: protecting and managing land. When we think

about the tools in our toolkit to address climate change, we put that work in a bucket we call natural climate solutions.

Natural climate solutions are actions that protect, restore or better manage ecosystems—like forests, wetlands, grasslands and farms—so that they can store more carbon and keep more of it out of the atmosphere. There are 20 different natural climate solutions here in the US, including planting shade trees in cities, conserving coastal wetlands that protect us from storms and managing agricultural lands in ways that build healthier, more carbon-rich soils and grow better food.

So when Otis talks about managing forests for biodiversity, he's really talking about natural climate solutions at the ground level: decisions about how we treat the land that ripple out into climate benefits, wildlife habitat and cleaner air and water.

Our podcast producer, Jay Feinstein, and I went to Conway, Massachusetts to meet up with Otis and with landowner Jack Lochhead, to dig into what that actually looks like in practice. There was more than a foot of snow on the ground, so on went our snow shoes.

JAY FEINSTEIN: I've never snowshoed before.

LAURA MARX: It's so easy. It's so fun. You're gonna love it.

LAURA MARX: And before long, we were immersed in the woods by Jack's house.

JAY FEINSTEIN: The first thing I noticed being here is just how quiet it is. The only thing that we hear are the birds.

JACK LOCKHEAD: And there are a lot of birds. That is, at one time we had the local Audubon people come out to, they identified 50 different kinds of birds in two hours.

JAY FEINSTEIN: Wow.

LAURA MARX: Jack Lochhead has called Conway home for more than fifty years, long enough to watch the landscape around Western Massachusetts change. In Massachusetts, nearly two-thirds of our forests are in private hands, which means the future of these woods—and their role in our climate future—depends largely on decisions made by landowners like Jack. His starting point is simple: protect land from development so it can remain intact and healthy.

JACK LOCKHEAD: Actually, a huge amount of the carbon that's stored in forest land, or even in fields, is in the soil. And when you do development, usually the first thing you do is you come in with a bulldozer and you push all the soil to the side so you can build foundations and so on, and that probably does as much damage to the carbon sink as does chopping down all the trees.

[music]

LAURA MARX: Forever protecting land from development, as Jack did with the help of Franklin Land Trust, is critical. So is being thoughtful about where we *do* build, clearing only what is necessary and protecting the soil and remaining trees as we build. We also wanted to visit Jack's property to highlight the way he actively manages his forest, and the climate benefits that come with that. Otis explains why this is important.

OTIS WOOD: Many of us grow up thinking of the forest as sort of a deep, dark eternal place that can be let to grow wild, and in many places far removed from human civilization, that is true. The fact of the matter is, human civilization is just covering much of the globe at this point and we no longer live in a time where we have the luxury of letting our land be and hoping that it will be healthy. And that's not really a message of despair, there's still a lot of strength and resilience in these woods, but they need our help because of the mistakes of the past several centuries made by the human race.

LAURA MARX: Two years ago, Otis was a leader in the NextGen Project, a partnership between The Nature Conservancy and the Forest Stewards Guild. Otis led three apprentice foresters as they spent time in the record-breaking heat helping 10 landowners across Massachusetts and Vermont. The idea was to grow the next generation of trees, and also of foresters. As a conservation-minded landowner, Jack was eager to be one of the participating landowners and get help controlling invasive plants on his land

JACK LOCKHEAD: I love knotweed honey, it's the best, but only honeybees will deal with knotweed flowers, and there are—I don't know how many native species of wild bees are there—I think it's dozens, if not hundreds. And they absolutely will not feed off knotweed. So if there's a lot of knotweed around, it kills off—basically kills off—the local wild bee population. The commercial bees that make honey, they're very happy, but nothing else is.

JAY FEINSTEIN: So if I'm understanding correctly, the idea with invasive plants it's not just that they're not from here—that they're not native, that they're not from this

area—it's also that they're really good at competing, and they're really good at reproducing, and they outcompete native flora.

JACK LOCKHEAD: Yeah, there are lots of plants that weren't here sometime. I mean, if you go back far enough, nothing was here, it was glacier. But the ones we worry about, the ones we try to get rid of, are the ones that just outcompete everything around and take over there. There are plenty of things that didn't, probably weren't here 200 years ago that we're still happy to have around.

OTIS WOOD: There's a difference between introduced and invasive, essentially. Introduced means from somewhere else. Like, most of our grasses are from Europe. Almost all the grasses you know and love—you're American grasses—are not American; they're European. Plenty of stuff's introduced, but it plays nicely, and it works in the ecology, and it just doesn't kill everybody else. There's like 20 things, or something, around here—pretty short list—that it is now classified as invasive. That's the difference. You're absolutely right.

LAURA MARX: Jack, you know, you and I—I think—met each other way, way back at a Forest forum meeting. Like, we were sort of in the same sphere but didn't know each other. But I am curious why you said yes to the NextGen program. You know, when we reached out and you invited Otis and the apprentices on your land—I don't know—that's sometimes, that's a hard thing for a landowner to have someone come and use chemicals and everything. But what made you say yes to that?

JACK LOCKHEAD: I've been fighting the invasives here for a long time, and there're certain areas that I'm sort of overwhelmed by, and so getting some help—some free help—was great. But certainly—probably—the fact that there was an education element to it and you were training people to do something useful in the forest. I mean, if it had been a totally different topic that had nothing to do with invasives, I still probably would've gone with it.

JAY FEINSTEIN: Otis, do you wanna talk about your experience coming here with NextGen and coming what that was like coming here and—

OTIS WOOD: Sure, yeah [laughter]

JAY FEINSTEIN: —Inspiring the next generation, essentially?

OTIS WOOD: Yeah, yeah. We—yeah, it was hot—we about killed 'em a few times. Not really; they had a great time. I don't know if you've heard of type-two fun; that's the type

of fun that's only fun in retrospect. I would classify this as that; you know, invasive work is tough, but also, it's a great industry. It's a great thing for kids to learn how to do. I can say firsthand; you can make good money doing this. It's hard work, and it's skills-based work, but it's very, very valuable.

So it really felt good because when they started, they were various levels of education, and all of 'em were sort of interested in the woods, but none of them were really, like, *in* this world. Some of those kids couldn't identify a plant when they showed up, and their plant ID was just rock solid by the end because there's a difference between taking a class a couple times a week and studying for a test, and just, plant ID and understanding how to work with the woods is your life. I think, for any level of land manager, a good place to start is sweating profusely, crawling around in the dirt, trying to do some kind of good conservation work.

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LAURA MARX: A few weeks later, Jay and I sat down to debrief that day in the woods—to talk about what we saw on Jack's land, and how it all connects back to natural climate solutions. We also turned the mic around, so Jay could ask me some questions about what we've been learning through our work at The Nature Conservancy.

JAY FEINSTEIN: So we're here to talk about natural climate solutions, but I wanna zoom out and ask you what is that? I think that's probably a term that not everyone's heard of.

LAURA MARX: Yeah, sure. So natural climate solutions are actually what they sound like, right? You can use nature to solve all sorts of problems. The whole name of this podcast is *Nature is the Solution*, and natural climate solutions refers to using nature, specifically, to solve the problem of there being too much carbon pollution in the atmosphere. So the textbook definition of natural climate solutions is ways to protect, better manage and restore our forests, farms, wetlands and grasslands in order to reduce and or remove carbon emissions.

JAY FEINSTEIN: Gotcha. And natural climate solutions, that's essentially the opposite of something like an industrial solution, like reducing fossil fuel emissions from concrete production or engineered solutions like direct air capture?

LAURA MARX: Yeah, they're very complimentary. The biggest thing that we need to do, of course, is to reduce fossil fuels, but because there's so much carbon pollution in the air already, even if we stopped burning fossil fuels tomorrow, we would still need to

pull that pollution out of the air. And all the things you mentioned are great, you know, people are looking at all sorts of technological innovations and solutions to pulling carbon from the air, but right now the only thing we have that does it at cost and at scale is, as you mentioned, nature.

I'm really excited that people are using all the tools that we have to think about climate change, but there's really no comparison to something like improved forest management in Massachusetts and a giant bank of carbon capture machines. Trees do this for us day in, day out for essentially free, even though we might have to initially put some money into planting them or to keeping them healthy.

JAY FEINSTEIN: So improved forest management, that gets us exactly to our trip with Jack and Otis. We had a great time a few weeks ago, and this is an example of natural climate solutions in action. It was great to see all that land stewardship. Talk to me, why did we go there and how does this play into the bigger picture?

LAURA MARX: Yeah. You know, natural climate solutions in Massachusetts come down to private landowners because most of our land is owned by individuals and families. And so, Jack is this great example of a landowner who has cared deeply about his land for a really long time, and has tried a lot of really interesting things to make sure that his forest is healthy and that it's providing all sorts of things from wildlife habitat, to clean water, to—in this case—clean air, right? Climate benefits as well.

JAY FEINSTEIN: A lot of times when people think about conservation, they think of national parks, state forest, state parks. They think of land that is held by the government in order to preserve and protect it, but a lot of land in this state, and around the country, is held by private landowners, and a lot of that land is still forested. A lot of that land still can contribute to storing carbon in trees and can have a lot of environmental benefits.

LAURA MARX: I think sometimes when I talk with landowners, maybe they've been led to believe that all this stuff is new—you know, that they have to suddenly start thinking about climate change and that natural climate solutions are something very unfamiliar to them—but in reality, a lot of the natural climate solutions have just made good sense for a long time.

So people have been carefully and sustainably harvesting their forests in Massachusetts for ages, right? And if you are growing more timber over time, being really careful about some of the things that Otis talked about—like having a diversity of tree species,

thinking about forest health and removing invasives—you're also gonna be adding carbon to that forest over time.

So in many ways it's not as hard as people might think. A lot of it is just, you know, one degree away from common sense. And in some of the agricultural spaces it's the same thing. Farmers know that the health of the soil is something that is critical—it's critical to the crops, it's critical to the environment, it's critical to their bottom line—so some of the natural climate solutions around agriculture really get into ways to add more carbon, more water, more bacteria and biomass to the soil, and that also helps it to sequester more carbon over time.

JAY FEINSTEIN: So I wanna bring this back to the listener. I think a lot of listeners maybe don't have acres and acres of land to protect or to manage. What can the everyday person do to advance natural climate solutions?

LAURA MARX: There's a lot of things that the average person can do and I agree, there's relatively few landowners in Massachusetts, so it's always dangerous to make people feel like they have to own or manage land in order to participate in natural climate solutions. I think one analogy might be going back to the earlier episodes of the podcast that talked a lot about people's choices in terms of food; like what oysters you eat and where you, you know, get your food from. Anyone in Massachusetts can participate in natural climate solutions in a couple ways: One is supporting your local land trust, however you can do that, is so critically important because it gets at that very first natural climate solution of protecting land. And I think some listeners might be surprised to learn that in a lot of cases there are more landowners looking to protect their land than we have, you know, staff and resources collectively to help them with that. So the desire is definitely there.

The other thing that I would say people can do is if you are in a position where you do need some wood for your house or you're building something, Massachusetts is not necessarily the best place to get giant pieces of structural lumber, but there are a lot of wood products. There's flooring; there's paneling; there's—we've built boardwalks on some nature conservancy preserves out of local wood. There's all sorts of wood products that you can get locally that are supporting that local forest products economy and supporting the sustainable forestry that happens here in Massachusetts, as opposed to bringing wood in from elsewhere where maybe you don't know how it was harvested and whether or not it was done sustainably.

The other thing that I think is, you know, we talked a lot about forests in this particular podcast, but there are natural climate solutions relating to agriculture as well. Some

people may have the opportunity to buy local food or to support a farm that is using regenerative agriculture—so cover crops and being more thoughtful about their application of fertilizer, and a bunch of other ways to protect and bring back that soil health—and that's also a natural climate solution that people can directly participate in, even when they go to their farmer's market or grocery store.

JAY FEINSTEIN: Laura, thank you so much for chatting with me. I learned so much.

LAURA MARX: Thanks, Jay—me too—this has been great.

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LAURA MARX: For a very long time, natural climate solutions were referred to as “the forgotten solution”, because when we talked about climate change, nature was at best an asterisk. Reducing fossil fuels is the biggest climate action we need to take. Here in Massachusetts, we're on our way to reducing emissions by 85% below baseline in the next 25 years. But by itself, reducing fossil fuels is only one side of the equation. That is how you stop adding carbon pollution to the air, while nature is how you subtract carbon pollution from the air.

Some of my colleagues at The Nature Conservancy were instrumental in making the case that natural climate solutions are not only a good idea, but the only idea we have right now that actually cleans up the mess we've made of the atmosphere. So Jay and I invited one of the first leaders to use the term “natural climate solutions” to close out this podcast. Peter Ellis grew up in Massachusetts, but is now the director of global natural climate solutions science for The Nature Conservancy.

PETER ELLIS: I love thinking about natural climate solutions, not just because they're practical things that enable us to have a livable future for biodiversity and people; we need to rely on the powerful technology that nature has evolved over literally billions of years, and that's photosynthesis—the first form of carbon capture and storage that solved the last levels of toxic carbon dioxide in the atmosphere and created a livable planet for species to thrive.

LAURA MARX: Peter was an author of a 2017 study that outlined the need to incorporate natural climate solutions to meet global climate goals. Yes, *global* goals. Nature can provide nearly one third of the greenhouse gas emissions reductions and removals that the world agreed to under the Paris climate change agreement. Even here in relatively small Massachusetts, we think nature can remove an additional 1.2 million metric tons of carbon dioxide equivalent per year—similar to taking more than 250,000

cars off the road. Jay spoke to Peter a few weeks ago about what it takes to make this happen.

JAY FEINSTEIN: Is there anything surprising that you've come across in your research and your work?

PETER ELLIS: One of the things that I feel I still need to learn a lot about is why exactly aren't we doing certain things that would make a lot of sense. The answers are never as clear cut as you might think. So to give you a specific example, I do a lot of research on what I call “reduced impact logging”. So that's um, when you go into a forest being more careful, not to damage the trees in the forest as you pull the wood out that you need, that's all it means.

Turns out a lot of the logging in the world, from Massachusetts to Indonesia, ends up doing a lot of unnecessary collateral damage. People cut down trees that turn out to be hollow and then they don't end up using the wood. They end up banging the trees with their skidding equipment or the big equipment they use to get it out along the way, and implementing these reduced impact logging practices could save those people time, money and frankly, actually lives. Logging's the most dangerous profession in the world, but they're not implementing them, and I actually am still trying to figure out *why*, even though it would provide measurable NCS—natural climate solutions—benefits, as well as all these other things.

JAY FEINSTEIN: That's such a great example. So in a case like that, what do you do? Is this education? Is this resources? How do you implement the solution here?

PETER ELLIS: Yeah, so interestingly enough, The Nature Conservancy is asking that very question, and I am so proud to be part of an initiative that's very brave and bold. We've actually purchased two logging concessions in East Kalimantan, Indonesia—Borneo, the island of Borneo—to basically figure it out for ourselves.

So why aren't people implementing these practices? And we can only really answer that well if we try ourselves and understand it, and what we're discovering is it's a lot of boring stuff, just trying to get, like you said, the trainings in place so that the people know what to do; the incentives for the loggers so that they actually continue to do the right thing; the equipment that uses low—that incentivizes lower impact; making sure that that equipment is maintained well enough. All of these things are just part of this sort of intricate network of resources necessary to actually move the needle at scale and get people joining the movement.

JAY FEINSTEIN: I think this is really interesting and a really good example because it really showcases that NCS is happening on the ground. We can talk about “what is it” and “what counts as NCS” and “how do we quantify it”, but, in the end, the work is being done by people probably who've never heard of the word “natural climate solutions”.

They're doing their job, they're trying to do their job in the best way possible, and there are just little changes that can be done on the ground to make things better, make things more sustainable, contribute to our climate goals.

PETER ELLIS: Yeah, you nailed it, Jay. It's important we not get to attach to the words and names themselves. It's the actions that really matter and, just as you said, it's those people on the front lines, the real stewards who may not use the word “natural climate solutions”, but they have the potential to implement them.

And so we need to learn from them, work with them at the human nature interface to, as I said, continue to build an exciting movement that everyone can feel like they're part of. So a name might be helpful there, but it doesn't matter, in the end, as long as people know that they're contributing to something that's bigger than them.

JAY FEINSTEIN: What do you think we haven't talked about in our last few minutes?

PETER ELLIS: I just want to, in the final minutes here, share my enthusiasm and an invitation to everyone out there who is excited and inspired when they interact with nature. When you go out into your backyard and look for birds; when you go for a walk in the forest; when you meet a friend at the park; you are constantly being bombarded with information and all kinds of powerful tools that are available to us as a human, nature biosphere to solve the single greatest challenge that faces us collectively. So if you enjoy being in nature and you enjoy thinking about nature, that's great, let's harness that joy and enthusiasm towards something that can actually enable us to continue to have that joy as we continue to get old, and leave a better planet for our kids so they have the same opportunities.

LAURA MARX: Unlike when we were out on snowshoes, as we sit here in the studio, spring has finally arrived. This is the season where the trees and plants around us are turning green, taking a deep breath in and soaking up so much carbon dioxide that we can even see it in satellite images and measurements from space!

As Peter noted, what we are actually seeing in that case is the impact of hundreds of thousands of Jacks and Otises and farmers and loggers and consumers around the world making common sense choices that will help nature take in an even deeper breath next

spring. The planet has a little less carbon pollution to deal with, and we get to benefit from clean air, fresh water and clear heads. That's a great segue to our next episode. In our last episode of the season, we'll dive into how environmental change shapes public health and well-being, and how nature can help.

BILL FRIST: There is no question, from a scientific standpoint, that the planetary health, the health of the environment around us, shapes our health and well-being, and there's no question about that...And just have the conversation that way. And when you do that, you will see that an element of hope springs up because people say "Oh, yeah, I sort of get it. There are things that I can do and become a part of a mission that's much bigger than myself."

LAURA MARX: *Nature is the Solution* is a podcast from The Nature Conservancy. To catch our next episode, be sure to follow our show wherever you get your podcasts. Thanks for listening to *Nature is the Solution*. I'm Laura Marx.