

## **Podcast Series: Holistic Nature of Us**

### **Episode # 57 : Meet: Mark Shepard**

**<https://www.judithdreyer.com>**

Hi I'm Judith Dreyer,

Thank you for joining me for this pod cast series "The Holistic Nature of Us".

I invite you to a journey with me into a better understanding of the concepts behind our holistic and how that ties us directly to the natural world around us. My intention is to be your guide for this half hour as we begin seeing our world with fresh eyes, gaining more understanding and learning how can connect the dots in practical ways that we are nature and nature is in us.

I feature a broad range of guests deeply concerned about the environmental issues of our time, and that includes us, authors and educators, practitioners and others whose passion for this earth and for all species help us create sustainable bridges of understanding. These folks are innovators, action oriented, creating solutions in a variety of ways that honors us and the planet's holistic nature. I am honored to share their stories, their projects, and their passion with all of you.

And today I welcome back Mark Shepard. Mark is the CEO of Forest Agriculture Development LLC, the founder of Restoration Agricultural Development L.L.C. and the award winning author of the book "Restoration Agriculture", real world permaculture for farmers. Mark has also been a farmer member of the Organic Valley Cooperative, the world's largest organic farmer's marketing co-op since 1995. He is most widely known as the founder of New Forest Farm, a 106 acre perennial agricultural savannah considered by many to be one of the most ambitious sustainable agricultural products in the United States.

Welcome back Mark, how are you?

MARK: Judith, thanks for having me on.

JUDITH: Oh, it's my pleasure and I'm excited about our discussion today. We're going to talk about the tip of the ice berg with forest restoration. I know that's one of your specialties. So how would you like to begin?

MARK:(Laughing)

JUDITH: It's a big topic, I know.

MARK: You just punted to me; that's no fair!

I suppose where we'd like to begin is, I believe last time we spoke a little bit about natural succession. And you know the example I could use of something that most everybody has seen is an old parking lot or an old abandoned field that over time different plants come into that space. It may start as a bare dirt parking lot and then eventually, you know, grasses and weeds come in and then thorny bushes, and then some shrubs, and then some trees and eventually over time, you give it long enough, it will become a closed canopy forest if there's enough water to support that and if there's no disturbance, like a lightning strike, a wind throw or a fire that goes through and sets it back successionaly. I guess part of where I wanted to start, if we're going to be talking about forest restoration, is the fact that a forest isn't necessarily a "thing". It's a phase in time where the plant communities, mostly woody plants, trees, have closed the canopy and there is no longer a lot of grasses growing underneath. There's a lot more shade tolerant plants that grow in the shade of the forest. So, I guess that's where I'd like to start, if we're going to start and talk about forests.

JUDITH: Well that's actually a great definition. Because what I'm getting out of the discussion is it's a phase. It's not necessarily what we think of as an end result or a permanent structure. When we see a forest, we think that's it and what you're trying to educate us on is that it's one of many phases. Do I have that right?

MARK: Yeah it is. It is one of many phases and if we think about, like redwoods for example, a 5,000 year old redwood tree. A redwood forest is a long, that's a long phase that it goes through but eventually the redwoods get replaced by something else or they continue to fall over and collapse and rejuvenate themselves from within. It is a temporary phase. Then you take something like Jack Pine in Northern Michigan and Ontario boundary up there, Jack Pine, if you have pure stands of Jack Pine around, at basically 50 years that's going to burn. It's going to burn to a crisp and then it goes right

back to grassland and eventually Jack Pine comes back. So, there are fast community types and there are slow plant community types and the Redwood was one example of a really slow long phase change.

JUDITH: And here in New England we have the old deciduous forests. We have the maples. We have, you know, some of the pines. And again, because every day I wake up and drive on the road next to the mountain I see the forest, so I kind of think of it as an end result. But I like what you're saying about their life span and they are an ecosystem community, correct?

MARK: Yeah, one of the things that was interesting about this, is if you take the historic human thinking and our own personal perspective, if you look at something that is gigantic when you're a little child and then you're now 90 years old and this thing is still gigantic, you think it is like that and always has been like that. It just has a longer life span than you. One of the examples of that was in a place called the Hermitage in Maine. It's a stand of old growth white pine, gigantic like 4-5' diameter white pines that go almost as tall as the moon. Whatever the land management agency was, I think it was a nature conservancy type group, they were going in and they were cutting and removing Eastern hemlock, Canadian hemlocks from the under story from the white pine because they wanted to preserve the old growth white pine forest. That was short-sighted thinking, thinking that white pine, old growth white pine was this thing that was going to be there forever. It's not. White pine requires full sun in order to germinate and grow healthy. So, this gigantic old growth white pine forest, maybe 200-300 years old sprouted when it was all wide open and clean in the sun. Once it creates the conditions of complete shade underneath it, changes of soil chemistry, the soil biology changes completely. The next phase happens to be the real shade intolerant plants such as Eastern hemlock that comes up in the shade under white pine. So, by cutting the Eastern hemlock from under the white pine they weren't preserving the old growth forest, they were actually destroying the next generation of the old growth forest because that's what would replace the pines.

JUDITH: Oh, isn't that interesting.

MARK: You just have to think in longer terms.

JUDITH: Well we do and some of those longer terms mean it won't be in my lifetime.

MARK: This causes problems for farmers. I mean I need to make an income today. I need to feed myself and my family today.

JUDITH: So, tell me more about how you would restore a forest of whatever you've done in your neck of the woods or for other properties.

MARK:(Laughing)

JUDITH: So, you have to come in and you have to do an evaluation to see what's been there, going there, what's coming there, what's the future. Am I right?

MARK: Correct. First of all, we do a site analysis. We send one of our staff to the site to look around. What is your place actually right now today? What are the species that are represented on your place today? What are you surrounded by because what you're surrounded by is going to continually drive your site by dropping seed on it or having animals pass through your particular property. And then we basically figure out what part of the country you're in. What are the basic plant community types and then we'll imitate those, and our emphasis is on food production and feed production for livestock because we can accomplish ecosystem restoration using natural plant community types. We'll substitute improved varieties of apple for example, or hazelnut, or pine weed, a pine nut pine. We'll use agriculturally productive trees and shrubs and bushes and vines, then use animals to be the maintenance workers, you know doing weed control, pest control and disease control and so on. So, we get a full complete, it's a mimicked ecosystem. Your place in Connecticut, if we were to redesign your property would look very similar to what's going on on the park property next to you, similar species and all that, but it would be arranged more conveniently. We can plant it mechanically, maintain it mechanically and actually harvest economic and food yields from day one.

JUDITH: And so, by using the animals, who was it? I read an article where, I think it was the book by Peter Wohlleben from Germany where they found if they put in oxen to take down the trees, they actually managed the forest much better. For some reason the trees responded and stayed healthier longer instead of using the mechanical stuff. So, I'm assuming when you put animals in the field, you know, how does that help with...they don't destroy anything is what I'm getting at.

MARK: Well part of what's interesting, let's just take cows as an example because they get a bad wrap globally because cattle actually have caused a great deal of deforestation and range degradation desertification world-wide but it's not their fault. It's the fault of the humans that are managing them. So, when managed appropriately livestock actually help and benefit that particular system. And if you just think of planting an apple tree in your backyard, if you plant an apple tree in your backyard and let it all go to the weeds, you know the weeds are going to compete for nutrients, for moisture. They're going to take light away from the tree. It would be nice to do a little bit of weed control. One way to get some weed control is to have a grazing animal come in, eat that grass. That helps the apple tree to get more light, more nutrients and more water. Well then, the animal also provides a little fertilizer from urine and manure, so just on that simple, simple level you've got weed control and fertilizer for your crop tree. Now if you leave a cow there too long and the cow eats all the grass in your backyard and doesn't move, because most grazers world wide, most, all of them, are migratory. They eat everything here, all their preferred browse or grass and then they move to the next place where the grass is greener. Then they move to the next place. If you keep that cow in your backyard, it eats all the grass and now it's hungry. Now it goes for your apple tree and it eats your apple tree right down to the root. So yes, livestock in a system like that can destroy the forested system or they can be used to help that system.

JUDITH: But I think the operative word is manage, correct? You know when we as humans are the overseers, so to speak, and we bring in these animals and we're trying to achieve these goals, we can make it work. I think what I'm also hearing from you is that you're busting down some of the old paradigms about how we have to work, you know? For example, the Dust Bowl was a good example. We just let our animals graze. It took away all the prairie grasses, took them down to the nubs and we had nothing to hold the soil together when a windstorm came in. So, we're trying to change that model.

MARK: And if we just imitate nature, how badly can we really screw things up, once you think about it. Right? And so, if we go ahead and imitate nature with our systems now, we're going to try to manage how we interact with those systems. As we see negative results, we're going to change our management right away. We understand that, you know, we're not "perfect" in managing livestock and trees and shrubs, and bushes and vines as a

system. And so, we understand that we're learning, and we have to change. We change our management practices. We change our behavior.

JUDITH: I agree with you and that's part of what you teach and what your company is all about, correct?

MARK: Yep.

JUDITH: Sounds good.

Now you mentioned a couple of trees. I know I'm interested in the hazelnut tree in particular. Can you tell us more about that and it's role in the ecosystem?

MARK: Well the hazelnut actually in North America is a shrub. There are two species that are native to North America, maybe some subspecies that I'm not aware of. But primarily there's the American Hazelnut and the Beak Hazelnut and they are both shrub species, multi-stemmed suckering shrub species that are early to mid succession species.

So, I mentioned that parking lot of an old field that's being overgrown. In the phase when that field is being overtaken by brush and brambles, that's when the hazelnuts would typically really flourish. And if that particular area was disturbed by fire within a certain time period, like between every 5 years to every 20 years at the most, it would kind of maintain itself as a hazelnut shrub land. These are actually very common across the Upper Mid-West and Eastern U.S. in pockets and holes that were knocked down by hurricanes and what not. If the fire came too frequently, like every 3 years or so. It was a grassland and it appeared to prairie and if it was 20 years before a fire came back, some of the early successional sun-loving trees such as hickory and oak, the bark would get thick enough and tough enough that the next fire that goes through it wouldn't burn some of these oak trees. So, you'd have like a park-like wide spread oaks and hickories with these hazelnut shrubs underneath and some wild crabapple and some raspberries and blackberries. And wait a minute, does anybody hear anything in there that might be edible?

JUDITH: Right, yeah. Several of them are edible, so much they provide, all the different nuts, the apples, yes.

MARK: And so, the hazelnuts, being that shrub species in the ecosystem, we can use that as one of the economic drivers for a restoration, if you want to call it that.

JUDITH: Are we using the hazelnut oil yet for biodiesel?

MARK: Well it's worth too much to just put in an engine and burn. The Defense Advanced Research Projects Administration, DARPA, for the Department of Defense, has put a lot of research into hazelnuts for fuel for the military and one of the things that they found is they found a pocket of hazelnuts in Minnesota, Wisconsin, Canada border area that the freezing point, the gel point of the oil was like 30 below zero. So, if you're talking about a fuel that has a real cold resilience and you wouldn't have to add any additives to it, that would be a great, you know a great source of fuel. But it's too valuable now as a salad oil, a culinary oil. It's one of the higher oils in Vitamin E and it's used a lot in cosmetics, massage oils, etc.

JUDITH: Oh, I didn't know that about Vitamin E for the cosmetic industry. That's interesting. And that's a huge, huge industry so I can see what it's very popular for them.

MARK: And I don't remember what the number is, I think it's 20 maybe. So, it's an SPF20 sunscreen just naturally, all by itself. So, you get this high vitamin E, great oil on your skin. You smell like a cookie and it's a suntan oil.

JUDITH: Oh, that's interesting. So that's one of your major trees and I like what you said about the economics of it because when we have good economics and we can make something of a living today, which is what we all need to do, people are more open to this approach or more open to adding some of these trees to their landscape. I personally use a lot of acorns around here. I make my own acorn flour.

MARK: Alright, alright.

JUDITH: Yeah. So, tell us more about your forest restoration. We talked about the animals. We talked about hazelnut a little bit and some of the other nut producing trees, food, food-based trees. What else would you like to add?

MARK: Well where you live in CT in the whole mid section of the New England states, it's a transition zone between plant community types. A lot of the, if you go in far northern New York State, Vermont, New Hampshire, Maine, etc., you'll notice it starts to transition more towards evergreens, the spruce and fir and pine. It's more sub-boreal which you are closer to the Arctic Circle. Whereas down south you'll have more of the oak and hickories. It's a warmer, drier type climate. Well that transition in between you also includes, you have some of the northern species that are coming south and some of the southern species that are coming north. You're in this mixing of plant community types where you are. And if you think about a tree, an oak for example or a white pine for example, if it lives 300-500 years, the roots are constantly exuding certain chemistry into the soil. The leaves are dropping and changing the chemistry of the soil, which is changing the biology of the soil. So, the longest living organisms on a site change the flavor of the site. And only things that are compatible with that dominant tree will actually live in that system. A classic example is black walnut. A lot of people say that things just don't grow under black walnut. Well certain things don't grow under black walnut because they can't tolerate black walnut. In your area, if you look at white pine as one dominant plant community leader, we'll call it and the oaks as another plant community leader, and you look at the other plants that you find naturally out in the wild. The next time you go on a hike next door, when you go out in the woods go to a place that's extra heavy with pines, and then walk around and look and see what other plants you see there. See what under story trees shade. What under story tolerant trees are growing. What they'll find. What kinds of vines are growing there. What kinds of, you know, flowers on the ground. You're probably not going to see a lot of flowers this time of year in February or March.

JUDITH: No, just princess pine.

MARK: Right, and that's actually quite an incredible plant right there. The lycophyll pollen from that, what the heck was it used for? There was a few years that I actually harvested the little pollen producing, I forget what they call them on those little princess pines, and I was selling them to a medicinal herb company for some kind of supplement. I don't remember what they were using it for. There are all these different species that if you are wild-crafting, you have to make sure that you're not degrading the resource base. But if you're going to design your own system at home on your own

property, we want to include as many of those things as possible because they have markets and they belong with the white pine.

Blueberries are another example that you'll find quite commonly with white pines, and service berries which are also called June berries. Different kinds of cherries from you know the wild black cherries, the pin cherries, the choke cherries, well what could we substitute for a wild black cherry? How about a Montmorancy pie cherry or a Nanking cherry which is a sweet cherry grown on a bush? Quite commonly in your ponds you'll see raspberries. You'll see grapes on the edges. You'll see high bush American cranberry, lingonberries growing in the shade. A whole host of plants that are useful, edible, useful as animal feed, industrial ingredients products, etc. So, we go ahead, and we can design a pine ecosystem and then in CT the pine that we would use to anchor that would be a Korean pine. And Korean pine it's a five needle pine. It looks like a white pine. I'm willing to bet a nickel that 90% of your listeners would not be able to tell the difference between it and white pine you see all over the place in CT.

JUDITH: And why would you choose that? Excuse me.

MARK: You do that because that produces the big pine nuts that you can buy in the store to make your pesto out of.

JUDITH: Really?!

MARK: Yep. And most Korean pine, pine nuts are coming from Korea and China right now into the U.S.

JUDITH: But that seems to be a big no no. Because we're talking about bringing in a foreign species. Are bugs adapted to it or do they have any pests that we can't handle?

MARK: How long has the Korean pine been living in North America?

JUDITH: I have no idea.

MARK: Hundreds of years. It's been here since people have started moving stuff all around.

JUDITH: Okay.

MARK: Yeah, we do use substitutes for species. You know the substitutes that we use are generally more productive of a crop and that causes some issues with people who are, you know, just dead set against anything that's not a native.

JUDITH: Right.

MARK: But what we don't do is, we don't for example, because I have the opportunity right now. I was contacted a couple of weeks ago. These folks in Poland asked me if I would import this particular kind of kiwi vine that produces wild kiwis in a very northern climate. Well although I might really, really like to kiwis all over the place, believe it or not kiwis are somewhat rampant and invasive in places like CT and MA, Southern New Hampshire, especially if you go on, if you take any of the rail lines in MA, at least in MA, I just see the vines climbing all over the place because the birds love them and they poop the seeds all over the place.

JUDITH: Kiwi vine?

MARK: Yeah, it's like an edible kudzu. Why don't we over-harvest our kiwis instead of declaring it an invasive species? But anyway, so stuff like that. If there are species that have shown invasiveness, you know we don't use those in our systems.

JUDITH: Yeah but you're also talking about being practical too. If there are some plants that have been here for a long time, for example the loosestrife. There was somebody doing research on the 684 NY State corridor and found that maybe the life cycle of that loosestrife is more than 7 years. It might be 27 years. It might be 54 years. And once it's done, they're starting to see the loosestrife leave the area because it's done its job. And from what I understand it's a very good plant to clean up the toxicity around our waterways.

MARK: So, what you're observing there is succession. Because what happens is plants will come into an available niche. All of a sudden whatever the resources are that that plant needs or that animal needs, their populations build up to you know pretty high levels. Then either it changes the conditions of that site or it uses the resource that it needed and it's no longer there available on the site and it changes the condition so that it can no longer tolerate living there and it eventually peters out and gets replaced by something else. That's the same phenomena as I described earlier with

the white pines being under grown by Eastern Hemlock, is that after 400, 500, 600, 800 years of being there, the white pines have just pined it to death you know, and there's nothing left for a pine there. The trees are all old. They start to fall over, and the hemlocks will come up underneath them and they'll replace them eventually. It's the same phenomena and that's one of the things that as a student of ecology and natural communities, etc., one of the big challenges that I see anyways is with these species called invasive species, well what is their life cycle? What happens if we let them run their course and then what comes after it? We don't know in many cases because the first thing we do with an invasion is we go fight the invasion. And we keep it set in that early phase and it keeps wanting to come back, come back and come back instead of letting it run its course and then peter out.

Actually, I hadn't heard that about loosestrife. That's really neat. Thanks.

JUDITH: Oh, you're welcome. And I know another grower, herb grower out in Western NY State, there's 40 acres of land that has Japanese knotweed in it and they go in and harvest about 500 pounds a year and it's not taken over the area. It's been managed and they keep an eye on it and they've been doing this for 25 years and it hasn't taken over the town. It hasn't taken over the community. We don't have a Sci-Fi movie growing out there, you know?

MARK: Right!

JUDITH: Which I think people get concerned about, especially because here we see something like bittersweet take over and so we get very concerned about our trees and plants that they choke.

MARK: And one of the things about the Japanese knotweed is that it's the #1 herbal remedy for Lyme disease. When you think about where is Lyme disease rampant? Well it's right near where they throw knotweed at you. So, you've got the cure right there. Why not over-harvest the knotweed by curing Lyme disease?

JUDITH: Yeah, I agree with you. And Nature provides, you know, if we just pay attention more.

So, Mark, before we end could you give us three tips that the homeowner might find practical in their everyday planning, especially with spring is almost here and we're thinking about our gardens and all that good stuff.

MARK: Well a couple of really significant ones are – **first of all identify the trees that are on your property.** You know if you have had walnut for example, or hemlock, or pine, or oak and sugar maple, silver maple, red maple you’ll learn a lot about what plants go with that. I don’t know where in CT you might find it. I know in Wisconsin it’s called Wisconsin’s Natural Communities. If you just do a search for you know your state wherever you are – blah, blah natural communities and then you look for the dominant tree type that you have and there’ll be lists of these other species that grow with that plant for example. What you can do is you can look at, if I’ve got a lot of pines I want to find all the different...maybe I want to focus on edibles. I want to focus on edible trees, edible shrubs, edible bushes, vines, canes. Maybe I want to focus on flowers because I want it to be really beautiful for flowers and so you look at all the different flower species that are compatible with the pine that naturally occur with pine and you think about herbs. If I plant my own herb garden of the herbs that I want because I want these herbs, but they’re not compatible with pine, I’m going to be calling the radio shows 5 days a week trying to figure out how to keep my herbs alive because they’re trying to live next to a pine and they can’t do it. Whereas if you plant the plants that are compatible with your dominant plant community type, it’s almost hands-free work because they’re happy living together.

JUDITH: That is a great tip, thank you! Anything else? I mean that’s a really wonderful tip.

MARK: That would revolutionize gardening in most places in the country, yeah.

JUDITH: Okay. Well I can’t thank you enough. What I’d like you to do Mark is give us your contact information again and how people can reach you.

MARK: Sure. For ecological site design and consultation it’s [www.resorationag.com](http://www.resorationag.com) To buy edible woody plant material go to [www.forestag.com](http://www.forestag.com) that’s Forest Agriculture Enterprises. We specialize especially in hazelnuts and chestnuts and pine nuts. Those are our big three. And you can contact me through there and that would be easy enough. If you’re interested in a copy of my book, “Restoration Agriculture” go to [www.acresusa.com](http://www.acresusa.com) and just type in Restoration Agriculture by and it will take you right to the page.

JUDITH: Oh, that's wonderful. Well I know you are a very busy man and you are creating incredible solutions out there and you're helping and inspiring so many of us with the work that you do. So, all I can say is thank you again and I appreciate your help.

MARK: All right. Thanks again for the invite!

JUDITH: This is Judith Dreyer. I'm the author of "At the Garden's Gate", book and blog. My book is available through my website [www.judithdreyer.com](http://www.judithdreyer.com) as well as several distribution arms such as Amazon, Nook, Goodreads and more.

I want to say thank you for joining us at the Holistic Nature of Us pod cast and remember that there's a transcript for every pod cast. Please like and share so that we can support each other and get the word out.

And remember, **now** is the time for practical action and profound inner change so that we can value our world once again.

Enjoy your day.