

# Episode 14 - Uncuffing Mother Nature with Charles Massy



## FULL EPISODE TRANSCRIPT

With your host

**Hayley Weatherburn**

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Welcome to Thriving with Nature, a podcast that gives you the tools you need to live a modern lifestyle that helps regenerate our planet. And now your host, Hayley Weatherburn.

**Hayley:** Welcome Thrivers, my name is Hayley Weatherburn, and for those of you on YouTube. I'm very excited to bring you a very special guest today. First, I came across Charles Massey here. Welcome Charles. I'm about to talk about you. Welcome.

**Charles:** I'm glad to be here, Hayley.

**Hayley:** Thank you. I was watching a documentary. It was a very short documentary called [From The Ground Up](#) and it was about four regenerative farmers in Australia. And this is where I first saw Charles. He mentioned his book, [Call of the Reed Warbler](#). I don't even know what those words meant altogether. I didn't realize (that) a reed warbler was a beautiful bird. And so, I grabbed the book. And then later, I did Soil Advocacy Training and his book is one of the recommended ones as well and I was already halfway through. It's very exciting. Knowing like that, I've learnt about Charlie. Not only did he do the Bachelor of Science when he first went to university, he came back 35 years later after much experience on the farm and did a Ph.D. in Human Ecology. You've received an Order of Australia Medal for service as chair and director of a number of research organizations and wool boards. He's also been on a TedX talk which I recommend you go and have a look and I'll make sure there's some links around. But overall, you are a great storyteller. Thank you so much. I'm so excited to share everything that you talk about in *Call of the Reed Warbler* as much as we can talk about in the short time that we have. So, welcome.

**Charles:** Thanks very much, Hayley. I'm glad to be here.

**Hayley:** Where is the farm? It's something that you talk about in the book (where) you introduced the different stages. Where's the farm right now at this point in time? What's happening on the farm?

**Charles:** Well, a number of things, but probably not enough is the answer. We're on the sort of rain shadow Eastern side of the snowy mountains in Australia. It's a high dry type of land and we're about to get our first frosts. Because for those of you in the Northern hemisphere, we're going into winter. So this is sort of mid-autumn if you like. Unfortunately, we've dismissed all the rain with a rain shadow effect and are going into our fourth year of drought. And that's when your management of the land tills because from our boundary, 40 kilometers into town, it's all dust. There's no regenerative farming. It's traditional. And when we get a big wind, that dust blows. And so, what we've done is sent out sheep, sometimes run cattle, but it's mainly sheep. We've sent them off what's called agistment, put them on paddocks over the mountains where there is grass, just to let our country not get destroyed and let the beautiful mighty perennials stay down. So, that's where we are with the farm and that's going to be expensive and not much income on top of COVID-19. But it's nurturing the land and saving it for the future. And aside from all that, this time of year here, the switch into winter. Now, our road is beautifully peaceful and the mountain robins have just come down from the mountains to spend the winter and a lot of movement of other birds and wallabies and kangaroos and things coming in. Sometimes for worse, because the kangaroos destroy fences. And, it's a lovely time of year.

**Hayley:** Yeah. Yeah. There's that too by a diversity. You share a lot of that. Now, I wanted to talk about your grandson Hamish. He seems to be quite a pivotal moment in your life when you were driving along and he asked you the question, 'why do we have to kill things to grow things?' Why do you think that that particular time provoked such an exploration for you?

**Charles:** Yeah. He's now 13, but he was only about six or seven. And I was dropped into a local town, Cooma, that 40 kilometer trip with my son-in-law and Hamish. He's my shadow who really loves the farm and the animals. And we drove past a farmer who had a big spray rig out and he was spraying roundup plots. And we've been discussing other things. We're going into soccer for him. But he suddenly said at that age, 'grandpa, why do we have to kill things to grow things?' as you just said. I couldn't answer him on the spot. It was a hell of a question. [Totally.] And the simple answer is, 'We don't. We don't have to kill things to grow things.' We now know we can grow crops equivalent or better than industrial use without any chemicals, fertilizers. Just by doing it differently, sowing in the night pouches, sowing multi-species cover crops which mimics nature, all those sorts of things and we can certainly graze animals and vegetables, fruits within the road cropping and letting nature be the pest controllers. We can do it

without the industrial inputs. And, I didn't explain that at the time to him. I just sort of said it rather stunned because it's profound.

**Hayley:** Yeah. Yeah. We're going to go into quite a lot of human society. You talk about the emergent mind and that was obviously one of the little sort of things on your mind during your own process. You said you started off being an industrial farmer and then had your own epiphany moments that inspired you to shift to that. Can you explain a little bit about that?

**Charles:** Yeah. I was at university in the early seventies. I didn't just do Zoology, but also Human Ecology. It was the first course in Australia of holistic thinking. There were only a few courses in the world. So, I guess that influenced me. And yet despite that, at the age of 22, I had to come home when my father had a major heart attack and take over the farm. And growing up on a farm doesn't mean you know how to manage it. He was pretty ill and so I asked the best advice around. I did a lot of reading. And of course at that time, I'm talking about 1975-76, there wasn't much regenerative agriculture around and all the best farmers and inverted brackets. Some of them were really good farmers and stockmen but it was all industrial. So, I sort of tried to become a good industrial farmer which I did. It's a bit of a shame now. In a couple of years, we didn't even spray chemicals in that. But then, we worked in the late seventies (to) early eighties into a five year drought. And by then, I had a valuable Marina sheep start growing beautiful fiber for the Italians. I thought that was my main asset. Whereas, our natural resources-the land and the soil, is the main asset. But I didn't know that at the time. And so, we kept feeding the sheep and keeping them on the farm. And eventually, I did what I was saying today down the road as we destroyed the pasture and it was dusty. We went into a huge debt. At the end of all that, I'll just walk around and say, 'wow. That was crazy.' We settled ourselves with debt. The land took a long while to recover. And that feels like, as I show in my book, one of the big stimuli of change is those head cracking moments that the live shock. And for me, that was my sort of change moment. And then, I started to explore and research, 'can we do it differently?'

**Hayley:** Yeah, yeah. You talked about that and I'm going to talk about that a little bit later as well in regards to what's going on globally at the moment. But I want to come back to your journey. You discovered that there's five landscape functions, correct me if I'm wrong from my understanding, that even if you just focus on one of those five, the rest will follow. And I was wondering if you could talk a bit more about the five landscape functions for those people that don't even know what that is.

**Charles:** Yeah, I mean it's not like I've invented it. It's there in literature and the knowledge. But the reason I had damaged my country was because I was landscape illiterate. I couldn't read my landscape. I hadn't been taught the ABCs. And in fact, when I was an undergraduate in the 70s when we studied agriculture, only physics and chemistry were taught (and) not soil biology. So when I went back 35 more years later, I was able to sit in on some of the undergraduate teaching and the same story. It was still chemistry and physics, hardly an acknowledgement of soil biology which is the key driver. And it was that. And then, I started to research and look at what the good farmers were doing and I realized I had been totally illiterate. I couldn't read that functional aspect. And so, to summarize it, I'll divide the book into a number of sections, but it hinges around the early part of the book, that five functions with great stories about how farmers might have focused on one. But as you said, if you say regenerate your soil with good biological inputs and multi-species, yes, it's going to increase your soil biology, but it also increases a thousand fold, the capacity of that soil to retain water. And that comes by diversity for pest control. And you'll see a mineral cycle gets working because you've now got the biology bringing in the minerals to make healthy food instead of sort of industrial empty stuff. And so, that's really the ABC of reading landscapes. It's understanding how it functions. And once you can sort of get that, you hit around that. Your whole perception changes and you begin to read whether the landscapes are healthy or not, whether they're changing. How you've got to be more sensitive in reaction and you react a lot quicker if you're managing that sort of thing. And, I was totally oblivious, totally blind before.

**Hayley:** Yeah, it's interesting. I talked in a podcast a couple of weeks ago and it's something that I'm exploring. I feel that I haven't quite been able to articulate it. And I'd love your view on this is that I believe there's a [Force of Nature](#). And so, if you walk along this force of nature, your human health, your nature, the environment, everything thrives. It naturally grows in a succession. Whereas, if they step off of it, as I imagine instead of an invisible force field, that if you stop stepping away from this force of nature, you start eating processed foods or you stop putting chemicals in. I see this image of the body starting to break down and the environment starting to break down. I'm wondering what your thoughts are because it's very magical to me and I am still discovering it. But, do you see this force of nature?

**Charles:** Yeah, you've articulated it. It's like some of that Eastern mysticism. You can describe a particular, not picture or an action, four or five different ways and that's why

I'm doing it. The best way I can describe it is now you can imagine I went back in my late fifties to become a student again. I have been away for all that time. I had a lot of catching up to do. And the time I'd been away, mind you with all these young undergraduates around me, I knew I had to cut the corners a lot better than I did even though it wasn't as computer literate but that's part of the part. I had a lot of catching up to do because since I'd left the university, we'd had the electronic age, the computerized systems thinking and then, soft systems thing which transformed the way we think about how big systems work. And then, I discovered key biologists around the world who'd worked in the soft systems area and the concept of systems thinking beautifully describes the complexity of how our natural system works. And it's called *Complex Adaptive Systems*. I've had to get my head around it to teach in the masters and third year students, and I'm not going to blow people silly now, but it's about 12 characteristics of a complex adaptive system. And look, a complex adaptive system is one that can be the worldwide web. It can be a city. It can be a landscape or a natural system. It's just incredibly complex and the reactions and interactions and adjustments basically. In biology and in nature, there's a few key characteristics of these complex systems which have taken millions and millions of years to evolve the species, the interactions, and how they work. And, the two that really hit me in the eye, is that if you start to work positively, again with a destabilized landscape, you're taking the handcuffs off her and enabling her to self-organize back to the healthy state that she's been working towards or had previously. And how does she do that? Nature does that because residing within, say, that landscape or that farm and that could be dormant microorganisms or a few earthworms or whatever it is, if you start to take the handcuffs off nature and let her get on with what she's good at, that's self-organizing. Those properties that she uses are called the *Emergent Properties*. They're there and they're allowed to be released. And in a short burst and I cover this in the book without getting too heavy, but that to me, we're not going to hit around that. It just explained it. So, the minute we start to simplify any one of those functions, badly manage it, we're shutting that whole process back down again. But the minute we start taking our first steps to let nature do what she's good at, that whole self-organization process will get going and the positive elements. And then, you get disease resistance and health and lots of nutrients in your food and the whole box and dice. Yeah.

**Hayley:** Yeah. It's so interesting. I did a little presentation about how when we try and do what nature does, we don't understand the huge complexity of it. Like, there's farmers out there trying to replace the soil food web and it's so complex and we only know the tip of the iceberg right now. In 1996, we only learned about globulin. It's fascinating. When we go, we don't need to know it all and understand and all, but I love

how you put it, you take the handcuffs off of her. She has the knowledge to nourish and support her. I think you said, we just have to nourish things and use that unconditional love and treat it with that respect. It will do it all. We don't need to know it all. It's stepping out of that ego and surrendering to that.

**Charles:** Absolutely right. And it's seeing ourselves where we sit within nature and that's not on top. It's just one of a myriad of species. And, I often start talks now to students just to get them thinking that the definition of regenerative agriculture is the enablement of self-organization to work. In other words, us stepping back, stopping the dominance, doing things to enable, that co-evolve long history to get going again and that the emergent properties and the whole thing.

**Hayley:** That's so true. I think it was the Weatherstones in Lynnfield park. You tell so many stories. There were just so many from Africa, America, all of Australia, which was really good for me as an Australian to just see what is going on in there. The Weatherstones in Lynnfield park that you talked about. I think it was John John Weatherstone, is that right? [Yeah.] He said, I just have to listen to the land. Respond to its needs. Be prepared to change. And, just completely surrender to what it is. And he said just stepping away and watching and observing. I talked about [Observation](#) in my last podcast on Friday about how I have this image. You talked about it. Every morning, you're just observing. You're looking at what insects there are, what the birds are. I asked you this morning. You know what's going on and you're reading it. You're reading. You're starting to read the landscape. You're understanding, 'okay, if bees are here, that means this is flowering now.' I'm observing. It's fascinating. It's magical.

**Charles:** It is magical. I think most of us sort of made this shift. It's that interaction with nature that gives the true joy and meaning in life in a way. It's actually about humility. I mean having been an industrial farmer made the mistakes. There's an arrogance if you like. I don't want to denigrate if you want industrial farming but there's good and bad and there's tools and methods there that we need to use. But, let's talk about myself as an industrial farmer. There was arrogance. I thought I was in-charge. I could control and dominate, say, you plow or whatever. You simplify things so you can put in a monoculture crop. You're in control. But you're actually not. You actually de-stabilize in this system. And it's only when you realize that you're only a minuscule part of this enormous sort of universe that humility comes and you realize that, 'wow, the best I could do is get out of the bloody way really.'

**Hayley:** Yeah, exactly. Rather than trying to swim through the waves that get crushing on you, surf them, come back. I see this and as an Australian, I used to grow up in the last years you've seen the drought and what it's doing. And actually, when I first saw that documentary *From The Ground Up*, I was Googling something. And literally on that same day, the four of you were doing regenerative agriculture and there was an article in one of the Australian newspapers of four farmers struggling with drought, not knowing. And I was like, 'how does this (happen)?' And the energy of the people that are really struggling, it feels like there. Like you said, the mono crop there, you're trying to control it. But it's actually, you're trying to push against a wall that this force of nature is not going to ever give. And when you finally, there's relief. I imagined that once you started going this path, did you feel this sense of relief of like, 'okay, I just have to understand these languages?'

**Charles:** That's true. And I think when you're invested in a dominant and control approach, and then things go wrong with droughts and foul crops, there's a huge mental health component that goes with that. And I'm not saying this, we're going to have a fourth year of drought, but I'm on top of things. But there's so many positives to keep you up rather than, 'okay. We're not going to make any money this year, but we've got a healthy family, a lot of healthy food coming off vegetable gardens and nature is still functioning and we're not looking at dust blowing like some of the neighbors. The mental health aspect, reflecting back on my previous period, is quite significantly different.

**Hayley:** Yeah. Well, I was about to say before we step up and we go quite global, how do you compare the last drought that you went through which was during your mechanical mind you talked about and now, you've got this regenerative emergent mind? How would you compare the two?

**Charles:** I look vastly different. I think this drought's worse and yet, we've got grass cover and native seeds seeding down and stuff probably, we've got a bit of data. When you do say regenerative grazing, which we are, it's called *Plant Control Grazing*, whatever you want to call it. But you've got some really excellent tools that allows you to estimate how much grass or feed you've got. And then, you calculate termites, the animals are going to eat and see you get very precise tools, especially when you read the landscape better. That allows you to sell your animals as your production declining. So, you're selling well, three-four months before those that are hanging on and feeding and belting the land. So, you're selling when the markets are good and the animals are fat and you're putting that money away. Whereas in my first big droughts, I saw it when

it was too late. The animals had slipped in condition. The markets were disastrous. I remember sending 500 sheep into the markets in that first big droughts and I had to send a check with them because the transport costs more than the sheep.

**Hayley:** Oh, wow. Yeah.

**Charles:** So, there's a lot of co-benefits that come with it. But this year is currently only our second drought. We've had that two or three in between. This is higher. But the difference is we've learned to make those early decisions. And, it was a result of the drought after that first one, when my mind was shifting that we said, 'okay, that's it.' And so, what we did was we held a big clearing sale, a big public sale with all our industrial equipment, big tractors, big combines, spray machines, trout fading gear. And because I wanted to be firm about it, it was like Cortez landing in Mexico and scuttling the boats, I wanted to make sure that I can't say no to retreat.

**Hayley:** No going back.

**Charles:** That's true. That was symbolic and that we were already on the journey.

**Hayley:** Yeah. Wow. That's really good to hear that, I mean, it's not great to hear that there's drought and unfortunately that's part of the Australian climate, but it's really awesome to see that there is hope for farmers during this time that can really help them manage and go through that. I want to take this a little bit global, as you and I both know, no one on this planet has escaped the COVID-19 experience. This huge shift that's happening globally. And I'm curious to see you talk about the Anthropocene crisis, and I'm wondering how this all fits into it and what's going on right now as far as what you've researched and seen and what's happening?

**Charles:** Yeah, the key question now for our very survival. Until about the 1950s or let's go back maybe the late 19th century with the industrial revolution, we'd had this unique phase of Earth's history called *the Holocene*. It's about 12,000 years after the ice ages. It's when the earth moved into this unique phase of the ideal temperatures, the ideal carbon dioxide levels, et cetera, for a lot of nature to thrive. And that's why within a few thousand years of the end of the ice ages, agriculture began. It's like humans, if you think about Western agriculture in that further or the Middle East, I found some weighty cereal plants which were domesticated as their modern cereals. They domesticated

sheep and goats and they'd like cattle. And from that kind of the rise of agriculture. Ironically, from that rise of agriculture came modern civilization. And then, post sort of the great scientific revolution and the Renaissance, we had this extraordinary period of human cultural development, the enlightenment and all that. But in some respects it was all a wonderful phase of human culture, but there's also part of it was a dis-enlightenment. Because what it did and the American, I can't think of the death of nature, her name will come. The book that really influenced me, an environmental ecological historian, 'by the death of nature', she meant in the face of that extraordinary cultural revolution from, say, the 1700s to the end of the 19th century. We had the rise of the scientific method thinking, the rise of capitalism. It's divided the Western civilization from what's called the *Organic Mind* where we didn't see ourselves as separate to mother nature, all our religious festivals, our very being. We knew we were intimately tied to her. But once we'd separated, *Caroline Merchant* is the author of the *Death of Nature*, once we'd made, the end result of that is two or three centuries was this industrial mind where we see ourselves as separate from nature. Nature is there to be dominated and controlled. So what I'm leading to, that's a huge schism and it's why we are in the deep mess we're in today. And so from the end of the industrial revolution, we just started to pump out more and more carbon dioxide, fossil fuels in the atmosphere. And initially, coal and then, oil. But what's happened post the second world war is now what is called the *Great Acceleration*. So if you look at all the indicators, say the social economic indicators, they all show an exponential graph rising, human population, GDP, the things we build to service all that industrial population. And if you look by a physical, once as well, they show exactly the same exponential rise. The humans have precipitated the sixth greatest extinction event ever on earth. We're walking out half of species left on the planet. We're consuming huge amounts of water. We're pumping up the methane's, not just oxides and the carbon dioxide, which is destabilizing the climate. If anyone wants to question that, think about our summer and the droughts and so on. So, that's what's now destabilized our earth system. I often show in my talks that famous photo of the blue planet that Apollo 11 or whichever went on top, which was a metaphor changing shift. And everyone talks about climate is the problem, but there's actually nine integrated earth systems just to sign that exclusionary envelope that keeps life on earth: the water cycle, of our diversity, climate, land use, phosphorus-nitrogen interaction and all those sorts of things. That's where that thing about the chemicals. And so, what's happened with that combination of things and climate that the fossil fuels, the carbon, earth has now lifted that safe Holocene ideal period. And we've moved into this new phase of destabilization called the *Anthropocene*, human-made anthropology. And the longer we're going into it, we'd probably a few decades already into it, the more things that are going wrong, climate, global temperature and all that sort of stuff. The amount of carbon we're putting up, I

think, I forget the stats, it's something like 70 billion times and we can only go down about 20. Those sorts of things. It's sort of starting to spin out of control and really good thinkers like Paul Hawken, I'll have a lot of time for when I worked with him with his drawdown and it's long history of social activism as well. He and many other good thinkers are saying, 'we've only got one generation, 25 years to turn this around.' And Kevin Naudain is another spinoff of that great acceleration. Too many people eating the wrong food in close proximity, all those sorts of things, climatic issues. And that's really what's driving me on this constant talking and speaking and writing thing is that our generation has some responsibility and that we have the solutions. And we'll get onto that later. I'm sure Regenerative Ag has some of the best solutions, but that's the overall picture. It's not bullshit. It's so much evidence. There's a lot of denial. And I'll just finish by saying the reason the denial is there. If you look at that long course of human history from hunter gatherers to the first civilizations right through to now, every great civilization tells itself a great story. It could be the King and queen. It could be the emperor. It could be a religion. Ours is suicidal. It's economic rationalism. All the leading governments subscribed to it. Therefore, all the policies subscribe to it, the government departments, the research institution. So, the power right through society is driving this suicidal view and things like regenerative agriculture and home food gardens and organics is a real kickback to try and turn that around. But that's what we're up against. It's like the wrong story. We tell ourselves as a modern culture.

**Hayley:** Yeah, it's fascinating that we've come this way. I have this belief that we're just like a child that doesn't know to pull things off the table until they learn that it's terrible where we've pulled. We're starting to awaken and go, 'hang on. What we've been doing isn't right.' And you talk about there's a bit of shame that comes with what you've known now, but you didn't know any better before. There's this understanding that you knew what you knew at the time and you did the best you could at that. But now, what we're becoming is we're becoming awakened. And there is no excuse for this Anthropocene crisis and COVID-19. And that's actually something I wanted to say. Do you think that the COVID-19 is enough of that, what did you call it, mind changing shock that could inspire change? And if so, how do we make that connection for people to realize that this situation is, I mean we all know it's severe, the whole world is inside right now? I'm curious to see how you think we can connect that to drop that in for people.

**Charles:** Yeah, that's a good question which probably can't be answered until another year goes by, I suspect. But it's interesting because I'm currently trying to write an article for an international journal. I'm getting a few different writers to put their perspective on the current moment. I've sort of half lost my thread of thought there but

there's some interesting patents developing locally, our local organic shop in a little country town. It's had its busiest period of trading ever since they began 20 years ago suddenly. People are buying, we've tried to buy some laying hens, what we call chicks. And the usual suppliers sold out months and months and months ahead. Luckily, I had got onto some in Sydney. And then, the style of vegetable seeds for home grown food. There's indicators around that there's a shift starting to come from being locked up inside, isolated, reliant on supermarkets with crap food and some nations have run around panicking about toilet paper as if we're going into a major crisis. It could be intriguing what happens in America. Just seeing the news last night with the collapse of big production for communities running food, we could be on the edge of social chaos and some of those big old industrial cities. But other ways, at the end of this, I hate to use the word, I hope. But I hope that the message will come through that we can not keep doing what we're doing. And this might be the sort of first stroll on the camel's back that might start to get that message through because the evidence is out there about what we're doing. The globe as a whole with the Anthropocene, but the powers. We have this, ironically, we have these key world leaders who are all skeptical about climate and almost as other issues, the worst being Trump. But our own government here is very right wing and economic rationalist. And so, it goes on around the world at the very moment. And including in Brazil, guys like that and want to clear the rainforest. It's ironic but maybe they're going to help cause this tipping point and people will react with disgust at the end of it.

**Hayley:** Yeah, it's really interesting. I noticed the first thing when I first got told about this and my friend was starting to say, 'let's just prepare for the worst.' She was running like the societal expectations run and go get the non-perishables. And I was like, 'I'm going to go and get more seeds.' I was like, 'if we're in this for the long term, I need to be more self-sufficient.' And at Kiss the Ground, I did a podcast last week, reintroducing the victory gardens. Now, I wasn't around when (they introduced the) victory gardens and I only know a little bit about the concept, but I believe it was during World War II, I think it was. Everyone was inspired or advised to grow their own vegetable garden which helps the system. And I see this leaning towards such a great opportunity and realizing (it). And I put it in such a crude way that at the moment when everyone was rushing to supermarkets and worrying about them emptying is that we're suckling on the teeth of the system of supermarkets when it's actually, you can have your own growing vegetables forever and not be stuck or dependent on the system is probably what I mean. Yeah, it is exciting to see these seeds where I've heard that around Australia, because I'm in a few groups that are growing veggies, that people are running out, like

stocks are running out of seeds. They're running out of all sorts of chickens that you said. So, that's inspiring.

**Charles:** It is. I mean one of the things I didn't mention before, and it's just reminded me, I think it comes in here a bit, is that those exponential rises of socioeconomic and the biophysical that I was talking about that led to the 100%. If you look at the modern health diseases delayed by a decade and a half or two is exactly the same exponential trajectory. And I wasn't there and say, in the early part of the 20th century, the ADHD and the autisms and the obesity and all that sort of stuff basically aligned, we're now now on the contradictory by the mid-2030s, one child in three will have autism. Well, that will destroy that economic analysis on a similar track. And without doubts, this is where I'm leading with the food issues. Without doubt, it's what we'd done to the food by stripping out the biology and also things like glyphosate getting into our stomachs along with the nutrient empty food and triggering the wrong what's called *epigenetics*, the wrong switching on and off of the genes of the microbiome. It's directly connected to what is metamorphosis. And if I can just illustrate it with one practical example. If you look at an industrial sized cereal plant versus a regenerative one in the soil, you won't find any other really valuable root fungus, the micro-housal fungi. While I'm mentioning them is that they have this partnership with plants that the plants photosynthesize. They give them sugar at the root tips. And they have this symbiotic bargain with the plants that will go off and source all those nutrients and micronutrients and phytochemicals, which there's hundreds of thousands, just the part of it. But if you go and spray these industrial crops, you've got no fungus doing that. And they are waiting for their daily drug dose pretty much daily, but they're waiting for their industrial inputs of nitrogen, phosphorus, et cetera, et cetera. But if you then look at the other side, that really healthy soil, in one cubic meter of that soil, you could have 25,000 kilometers, the microchips from the fungi working away to put those nutrients into that plant and that food. So, the implications here of growing your own food and farming on the biggest scale of regenerative, of having biology to do the work, it's just enormous in terms of human health, well-being, let alone, all those diseases.

**Hayley:** Yeah, I've heard a few farmers say they're not farming cattle farming, they're farming microbes. Like at the end of the day, it's the microbes. It is getting away from being the one who's trying to decide and work out what inputs we need to put into the many where they have the innate intelligence to find the thousands of nutrients that that plant needs. And this brings it to human health like you say. I'm cringing every time we're washing our hands too much. It's because we're getting away from some of the good microbes as well. It's funny what I've been doing. I'll go out if I have a mask and I

do the alcohol but I'll come home and then, I'll stick my hands in the soil. I'm like, 'come on, good guys, get back on my skin.' I'm worried because there is that direct link (with nature). Back in the day, you talked about it in your book when you were a kid, you'd run off and you'd sneak some veggies from your mom's garden. Then, you run up to the mulberry bush and the juice is running down your mouth and all those amazing microbes and a bit of dirt in your mouth. And that is where our gut floor becomes so strong and the immune system and we're seeing the crashing down of people's immune systems through the world right now because that hasn't been able to happen. And like you said, not only are the nutrients missing, but also the microbes are missing from our fruit and vegetables because of all the chemicals. It's so directly linked. Right now especially with COVID-19, because if you have a strong immune system, yes, you may contract it, but you may not even get symptoms. You may get a little bit of a cold. But because your immune system is stronger, you are now stronger against the virus.

**Charles:** And the other side of that coin you've just described, sneaking up the mulberry tree and eating an old heritage mulberry. I mean it tastes like an explosion in your mouth, let alone the vegetable. And that's also another part of the problem. The nutrient empty food coming off industrial landscapes is also exacerbating this whole thing because it's not just the way we treat the soil with chemicals, et cetera, it's also the modern breeding approach to take taking cereals that might've been as high as a human, reducing them to draw off weight. So, all they do is have maximum production. We've lost the drought resilience, the disease resilience, the capacity to access all the nutrients. All those sorts of modern breeding and transgenic work interfering with complex nature, all that sort of stuff, it's all part of contributing to this negative picture that we have.

**Hayley:** I could talk to you for hours, but I know we're coming to the end. Let's talk about how, I'm already excited and on the train of Regenerative Agriculture, studying Soil Advocacy Training with Kiss the Ground, but Regenerative Agriculture on the larger scale, the 100s of thousands of kilometers, to your [backyard] veggie garden, there's so many benefits of stepping out of the way and coming back to nature. Can you share a little bit about the benefits of regenerative agriculture?

**Charles:** And they're very exciting. One of the guys I've worked with and I'm working with is Paul Hawken who I've mentioned before. A few years ago now, he got sick of asking climate scientists what are we going to do about it? And the majority said, 'we don't know. We're just crunching the numbers.' So, he set out and co-opted, enlisted

toward whatever, ideal 90 top analysts to come up with how we can pull carbon dioxide out of the atmosphere. And I fully coated 80. And eventually in the discussion with him, I said, 'well, look, if you look at the top 20, the 20 best methods of drawing down carbon and then permanently putting it away in the soil or the ocean or wherever, 10 of them are regenerative agriculture.' And he said, 'Oh shit, you're right.' In other words, the very best method of addressing climate change is healthy regenerative agriculture, pulling that carbon down which is what it does. And that's now, without getting onto the human health aspects and turning around the water cycle with, I mean this talk in Australia that aren't we great with 25 million people, we feed 60 million? No one's ever asked what costs are the Murray darling basin, et cetera. And the reason it's in strife isn't just obviously irrigation for crazy crops that shouldn't be gone. It's the fact that our landscapes have dried it out because we've so degraded them. And they're not absorbing and holding and reticulating in the water. So, regenerative ag through all those functions and across most of those, they stabilized earth systems has some of the very best solutions. And that to me, that's incredibly exciting because it means what you're doing for your job, you're usually contributing to a global situation and human health at the same time.

**Hayley:** Exactly. There's this global effect as well. We went through the seven-week course and not only does it when you align and if you manage it right, it can be more profitable. That small documentary shows (about) the farmers how you all have made it because it takes away a lot of the inputs and the costs and the overheads. But it's human health, the climate change when we talk about carbon (and) the water absorption. Now, I'm not going to remember the number and I should. But is it 26,000? I can't remember if it was liters.

**Charles:** There's a number of research projects, research work. But one of them summarizes it and there's higher figures. But it's actually a farmer up in the North coast doing his masters. We can put just 1% more carbon back in the soil that's sort of in store more than an extra 140,000 liters of water. It's sort of a no brainer stuff in a dry continent.

**Hayley:** I know, right? It's insane. And because of that, because it's absorbing and going down and refilling out aquifers and things, it isn't rushing and washing away our top soils and causing floods in some areas. And then of course, the temperature. We touched on the last week, it was the cycle where forests can actually bring rain, and I'm

probably not going to remember the right word, but there's a smaller cycle of rain and it can bring.

**Charles:** It's just going to come to that actually.

**Hayley:** Yeah.

**Charles:** It's critical. If you want to go back quickly into the domestication of agriculture, once we started to overgraze and plow, we were taking the first steps to creating deserts of desertification. And if you look at Australia where the wrong techniques have evolved for a moist, rich soil with a lot of rain and soft rain, those techniques were devastating in Australia. We've done more damage in 200 years, anyway. What's happened is that we've taken out the regional, local small water cycle with a lot of mists and fogs and we're naturally functioning well. In the evening, you've got about a foot of moisture. It's about 99% relative humidity and on most nights, you're absorbing one to two millimeters of rain. That's an extra 12 to 15 inches of rain in a year. That's all gone. Complex in Australia because not just bad farming, but we got rid of the small burrowing marsupial to spread the fungus who are key for that water of sorts. Once you lose the small water cycle, all those missing folks that impact the larger water cycles. Instead of big hydronic pumps bringing in moisture off the ocean to well-vegetated landscapes, we're exporting moisture off our landscape back into the ocean. So, we've reversed both cycles. It's crazy stuff. And still, every time you see bare country, plowed, followed or overgrazed, that's a sign of desertification. We're just in denial. No one wants to talk about desertification.

**Hayley:** Yeah, well I think with the recent bushfires, I feel that was another moment that hopefully activated a lot of people into working with the indigenous and the cold fires and bringing back that cold burn cycle as well. I could go on. But just to tie this off, I mean, regenerative agriculture on all levels really can solve us from our own human health. If you want to feel healthier this time and build your immune system, grow your own veggies. But also if you can't grow your own veggies, it's reaching out to farmers like yourself. I don't know if they have CSA in Australia where you can get your regenerative farmer, you can get your veggies delivered and start to have a bit of soil. If I know it's coming from a regenerative agriculture farm or an organic farm, I'll eat it without washing it because I want those microbes.

**Charles:** That's right.

**Hayley:** My last question for you is, one of my favorite quotes is by Buckminster Fuller and he said,

*'You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.'*

[Yeah.] And so, what do you suggest (to) the everyday person or even the farmers listening to this, what do you think the first step is to creating that new model that we can all start to move across to change?

**Charles:** Yeah. And interestingly that the new model also includes the old. Hasn't agriculture around the world been so-called peasant? I've done it with nature before industrial agriculture for a long while. I think the advice for the consumer, urban people, start to grow some of your own. But if you want to have really healthy food for your family and yourself, start sourcing it as much as you can from farmer's markets or organic sections, et cetera. I'd probably rather trust a farmer's market than big industrial retailers' organic section, by the way. From the farmer's point of view, because this is a challenge to a major paradigm and we don't want to check everything out of the aisle, just do your homework. Go and visit some of these farms and talk to the farmers. See what they're doing. Really, burrow in on the finances. And is it as good as it's cracked up to be good? Inevitably, the enthusiasts in any new shift will tend to over exaggerate at times. So, go to the best operators and see what's happening and just do your homework. But, I think once the shift is made, whether you're the consumer or the practitioner, you'll find it is so rewarding and it's so much life. Instead of dealing with a lot of negatives, you're dealing with a lot more positives and it's exhilarating. There's an exciting network that you're interacting and learning. It's also about constant learning as you know the Kiss the Ground and those sort of people. There's a lot of terrific stuff out there. Get on the web. Have a look at YouTube and everything and just find out what is out there because it's quite remarkable.

**Hayley:** Yeah. And look, the first place to start I would say is to grab, *Call of the Reed Warbler*, Charles' book. Not only does it have great stories, we really connect with what's going on with you on the farm. You take us through your own journey of growing through from industrial to your own emergent mind. There must be about 50 different farmers that you visited and stories inside there and their experiences because they've all got different ones and different farms. So, it's a great place to start to understand not

only from the ground level, but also on a global level, especially when you talk about the five landscape functions and the Anthropocene crisis and everything. I will put links below. Thank you so much for your time, Charles. I am just so grateful I could have spoken to you for another few hours. There's so many more things I would have loved to have talked about in the book. Maybe, we'll have to connect again another time. But thank you so much for your time.

**Charles:** My pleasure Hayley and keep up the good work. Regenerating earth is really important.

**Hayley:** Yeah. Thank you.

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