

Love Nature: The Biophilia Podcast
North Carolina Museum of Natural Sciences
Episode 2

Narrator: Welcome to *Love Nature the Biophilia Podcast* from the North Carolina Museum of Natural Sciences. Here are your hosts Museum Director Dr. Eric Dorfman and head veterinarian Dr. Dan Dombrowski.

Dan: Welcome everybody to our second episode of Love Nature the Biophilia podcast. This is Dr. Dan Dombrowski.

Eric: This is Dr. Eric Dorfman

Dan: And we're here today to finish up our interview and opportunity to talk to Dr. E.O. Wilson. So, very exciting!

Eric: Yes absolutely, it was such a great first half of that and really looking forward to the next. We'll also be talking a little bit more in depth about E.O. Wilson's newer book. *Half Earth: Our Planets Fight for Life* and the idea of saving half the planet and for conservation.

Dan: What a great idea too, I think you know, as we talk more about biodiversity and the importance of nature to people and getting people into nature, I think we've got to come up with some plans to save nature. Right? I mean, we're losing biodiversity so quickly that I think the first step has to be just kind of slowing that process down and finding ways that we can save nature.

Eric: Absolutely. It's also a really thoughtful take on what it is. You know, it's not just slicing the planet up like an orange and say okay this half is being reserved. It's really taking the best of the best, the biodiversity hotspots that really will make the biggest impact. So, there's a lot that you just want to think about with this. One of the things that I like that we won't be covering in any detail, is in this book, the way that there's a big chapter that really looks at some of the various important places that if we were going to do this, really should be high on the list. He goes through continent by continent looking at the Earth's biodiversity hotspots or in some cases people's favorite spots. You know, he's gone to thinkers in conservation to ask what they think. I was wondering Dan. What's your favorite place if you had to set aside somewhere in the world?

Dan: Wow. Oh, that kind of puts me on the spot. So...

Eric: I didn't think about that. This was not premeditated.

Dan: *laughs* That's okay, that's okay!

Eric: I was just thinking because, I don't know what I would have to say.

Dan: And again, I really do love the concept. I think that not only the idea of 50/50, but that people really relate to it. You get half, I get half. But in this case when we're talking about preserving or conservation that half doesn't exclude people right? So that's a place or those are places where we can co-exist that we let nature take its course and not try to shape it or rule those areas. But definitely people were part of that as far as my favorite, a couple things come to mind. One would have to be a marine habitat, places like the Great Barrier Reef that people should...

Eric: Oh, you picked mine!

Dan: *laughs* Sorry about that, great minds think alike, there you go.

Eric: It's true.

Dan: But yeah, I think we don't see that, you know, people aren't up close to it, but it's so important and there's just so much going on in places like that. And life is so concentrated. There's so much to learn and I just think that we've got to do better about preserving or conservation in these places that we don't always get to see and are a little bit further away. Places like that also with changes in temperature and climate changes that they can really be vulnerable to changes in either the environment or in the climate. And so, I think again that would be my pick or my target area.

Eric: Well, you know so we did, that was absolutely, not that you did ask me, but if you were going to...

Dan: *laughs*

Eric: That is what I would have picked too. And the one thing, it's a great example actually the Great Barrier Reef. Because one of the things that's really hurting the reef is agricultural runoff, right? It's not just climate change. And so, when we think about these things, sure you can set it aside, I mean it already is set aside as a world heritage site. But what about all of the man-made influences, I should say anthropogenic influences that are hurting the reef that aren't being regulated or not being regulated to the degree that they could be. So obviously climate change is its own issue.

Dan: Right

Eric: But how do we deal with agricultural runoff? Which is every bit as devastating to this very delicate environment.

Dan: Some of what we need to do is just get people to start thinking about these things. I think sometimes the connections are obvious when you talk about a habitat that people don't see

and then you talk about these influences or these effects that are from areas or places or activities that are hundreds or thousands of miles away. I think, you know, our job is to help people make those connections and really just introduce them to the ideas and to the potential issues that we need to face or problems...

Eric: But it's also understanding the complex web of influences on any given habitat. Setting aside a place as a reserve is only one step, but we really have to think very holistically about all of the influences...

Dan: Right

Eric: ...that make that place actually secure from the point of view of the ecological systems that are happening around it and within it

Dan: Right

Eric: and that's a really important part of it.

Dan: I think too that you know, an approach that includes nature is including us, right? We've got to figure out how we fit in where we fit in, how we could do this.

Eric: Yeah

Dan: From a united front. It can't just be like you said, you can't just protect that hundred acres and cut it off from the rest of nature. You've got to think about how it connects, there have got to be corridors. You have to have access, whether it's other forms of life or resources. You've got to limit those things, the anthropogenic influences or things that cause impact. You've got to, I think, look at that big picture and it's all related and will connect.

Eric: That's fact, that's one of the reasons that island biogeography went from being physical violence in the middle of an ocean to land-based Islands where that's the last bit of habitat under a regime of highly altered landscape. And look at what those impacts are and how those things work is really it's a complex algorithm of processes.

Dan: I can't wait. I think Dr. Wilson will be here shortly.

Eric: Yes!

Dan: I have some questions and I have some questions for you too.

Eric: I know, tons of questions. * laughs* Thank you.

Dan: Yep.

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Narrator: And before we get into our second part of our interview with E.O. Wilson, here is our sponsor statement, whatever that may be when it comes and now back to part two of our interview with Dr. E.O. Wilson.

Eric: Well, you know, thank goodness for Google because as I was reading, especially *Half Earth*, I would be constantly looking up some of these things that you were talking about. Like invertebrates that I had no idea what they were, so I've actually learned a lot. It's been great fun! Something that I wanted to ask you, it's a hard thing to think about the pandemic right now, but when you were writing *Half Earth* in 2016, it was a very different world for 2015 I guess you wrote it, and published in 2016. A very different world from now. And do you think that the pandemic will play any part in how people view nature and our place within it?

E.O. Wilson: Can we come to love a war? I don't think so. But what I think is when we can come to and have much more interest in the largely unexplored world of viruses.

Eric: Right

Dan: Yeah

E.O. Wilson: The least parts of the world today and even leaving the scene we were working on a minute or two ago the least studied are bacteria and viruses. There is a wonderful career open to young scientists who will pick up on the study of the variety and the biology of bacteria and viruses generally a field on its own. Its dependence is in part on molecular biology and it desperately needs closer attention.

Dan: The other part of that too is that we live in an environment. It kind of takes this idea back to people being a part of nature, this pandemic. A lot of these zoonotic diseases that we can pass between people and animals and the environment and I think we're going to have to look really closely at our role in the environment and start thinking a lot more about it in those terms too, just for human health reasons as we move forward with our populations the way they are.

Eric: And it could cause us to be perhaps a little more humble about our ability to control our environment.

E.O. Wilson: Well said, there's that layer of motivation for putting much more emphasis on knowledge. The prokaryotes on the organisms that are below the level of incompleteness and were earlier in evolution than most of the organisms we study from are very badly needed if we have the types of knowledge we need for viruses. Some of which incidentally prey on bacteria and we have much fuller knowledge of bacteria, especially those that make up a large part of life in the soil. We would be able to draw from it many more practical applications not only in the prevention of more pandemics, but also in the best most effective way of managing our

natural environments hopefully leaving them alone. But also, agricultural lands to get maximum productivity and security.

Eric: Thinking about what's happening with the pandemic to the other phenomenon unrelated to this conversation really is the fascination and maybe even the joy people are having when they see wildlife coming back into the cities, you know? If you think on social media, they've gone wild to see boars and deer and things traveling down major streets that are empty of traffic and turtles coming in and re-establishing on their breeding grounds.

E.O. Wilson: Yeah, I think part of urban planning is also to have parks with ecosystems, if you have enough land. Like Central Park in New York, having not just a park but of having wild areas within the park that are left alone as much as possible except for a large number of people going through and sitting on benches looking around. It can take the reintroduction of a large part of wildlife. They already have that with migratory birds and could allow other animals, ones not dangerous to people but part of nature as they ordinarily would not see unless they could travel out into the country.

Dan: That kind of brings up a question. I've been dying to ask you about in this in relation to *Half Earth* and the concept of; let's set a goal, let's call it half, 50/50. We all understand 50/50. How does that apply to people's yards or their backyards? You know, do you think if we could get everybody to set half their yard aside to be a wild place. What significance do you think that would have in the bigger plan?

E.O. Wilson: I think it could be very important if you could have wild areas to breath in if you have a fair amount of property. But many people do and not just wealthy people in cities but also other people who are making their livings off of the land, there are areas where they have to live in places where the plots are pretty large, but these lots can count if left alone. They can manage to have a manageable amount of plant and animal species. They can certainly count as micro-reserves to be added to that half total that I recommend, and I know that might sound extreme one half of the Earth for nature. It has taken hold as a principal in conservation by organizations around the world and has been seen by most people as seriously feasible, all the questions that arise about its practicability have many solutions available. Congress has just passed versions, well just about passed, certainly passed the House of Representatives, a wildlife boundary conservation act which makes available ways for animals and plants to traverse the borders of settled areas including the United States and basically most countries have the ability around the world to set up natural areas simply by making them natural areas and with no necessity in most cases, of causing people to leave. It becomes an incentive for people already living there or close to it to actually participate in setting those areas. Right now I'm working with a group centered in Mobile Alabama to have a new National Park established for the Mobile Tensaw Delta, which is an old huge area of almost undisturbed bottom land next to the city of Mobile and among the incentives for having that new National Park besides it preserves a lot of natural environment, much of it beautiful, is the large number of species of plants and animals that live there, independent economic instant analysis of the income that a park like that could bring in in surrounding commerce the kind that go with national parks

people love them. It's on the order of a hundred billion a year, so I think we're going to get our park.

Eric: And this sort of brings me what you've been talking about and progress towards Half Earth, you know, you started thinking about this or well you wrote about it five years ago, and I was just sort of wondering what our national and international report card is along these lines after 5 years. Do you think that we are following the trajectory you would have expected if we were going to succeed?

E.O. Wilson: My impression is that the idea of half to nurture, I just picked that because measurements show that an area increases by one half if left to nature and has an increase up to 85 percent of the species that were there before even though the area around this particular area is altered so that those species doesn't appear. That's an established principle and it's one that's quite attractive. This has been, when I introduced it, *Half Earth*. I just selected that because it seemed to me to be the right measure to have. It was very quickly accepted by most of the conservation organizations that I made contact with. We were, shortly after publishing that and it was being read, at the International Conference on public parks, national parks, and it was universally accepted already. I don't know how much in terms of acreage around the world it's resulted in, but it certainly has been accepted as a principal worldwide. Once people understand that you're not making people who are in the best areas for such parks move, but quite the contrary to have them be agents if they will, of preserving it.

Eric: Well, then this is where things like sustainable farming come in That was something interesting that you mentioned too actually in *Half Earth*, was the idea that the same Anthropocene driven concept of mixed-use is not what you're talking about. You're talking about letting nature do its thing really. So how do we deal with that part of the equation?

E.O. Wilson: I think it's by utilizing the land that has not yet been developed and there is over the world a large part of land in most countries that has not been filled in yet, still natural or mostly natural and those are the ones that you put together. So, this requires new kinds of mapping. I don't think it's too difficult to do we have a lot of land in the United States. For example, it could be added to this country up to a half of the nature goal if we make that a goal. The new act as I just mentioned is before Congress, would not only make it possible for wildlife and species of plants to migrate across the borders, but also could make land everywhere affected by attention to wildlife crossing which this act in Congress intends to setting aside as much land as possible along boarders for a long time. I think that establishing means of crossing, highway overpasses and so on, allowing plants and animals to move back and forth across these boarders. All the land to do that is there or a large part of America's highways and byways and made into local parks for our nature. We achieve not only the purpose of the act in terms of guiding or improving traffic and protecting wildlife crossing roads, but also could be fragments which put together by definition is a step toward a much larger protection of wildlife in general.

Dan: When you talk about this half that we set aside for nature. You're not excluding people from that. Right? Like, this is like letting sort of the native wildlife drive the area not the people, but people are still a part of that. Is that right? Am I right?

E.O. Wilson: Yes, I would say quite the opposite, I just encourage them. If you have for example in the case of fishing and you have under water reserves which we have, areas that professional fisherman or farmers and hunters and so on make use of in ways that are amenable to keeping the area natural, so that it could actually be better to keep in many cases. Maybe most cases people living there stay there and are doing what they were doing before that. For example that is what happened with our greatest national park in the United States. And that's the Great Smoky Mountains National Park. Where the people that have been living there for generations were allowed to just stay where they were.

Dan: This is maybe a little bit of a silly question or a little off of the seriousness we've been on, but I would love to talk to you about my second favorite author or cartoonist. So, when I was in college this kind of got me through those long nights at the lab table reading Gary Larson and you actually wrote a foreword in *There's a Hair in My Dirt* and that was another place that we saw biophilia mentioned. So, I was just gonna get your sort of take on that or what do you think about that or do you remember that book by Gary Larson? *laughs*

E.O. Wilson: *laughs* Oh, yes, I loved him. I was so unhappy when he stopped. Apparently, he felt that he'd run out of good ideas. The humorous cartoons he had were very much diverted to engage with other scientists. The scientists loved to say anything, they posted his published work on the walls and that gave us a lot. I thought he was terrific, I don't know what happened or why he stopped. Maybe he went on to other things, probably did all that bringing humor into scientific and technological endeavors. The things in life that most people take is a very serious program.

Eric: I think it becomes a very quickly dire situation if you can't laugh at it, sometimes thank goodness ecologists have a good sense of humor. It's interesting thinking about that. You know, I was reflecting that the Earth's human population between your book *Biophilia* and *Half Earth* essentially doubled from 3.7 billion to 7.7 billion in that intervening time, and it's... I know...

E.O. Wilson: We can still handle that number but it's getting tougher. I mean to leave a large part of the world to nature, but it's getting tougher and tougher. And runaway human population is fundamentally the greatest threat that the rest of life on Earth is facing and there's no reason why we shouldn't continue in different ways and refer different reasons to move runaway population. We should find ways of controlling it so that everyone can have a family, but they also can have an environment worth living in.

Eric: And you didn't talk about how you felt the algorithm would go. That when we reach about 9 billion something like that, it will become self-regulating, the human population. Which is an interesting thought, you know, that we will just naturally decrease over time and that's the other thing that I wanted to mention is how you thought climate change interacted with the

idea of half Earth, right? If the places that we choose, well there's this wonderful chapter in *Half Earth* where your colleagues from around the world chose their favorite or their I suppose favorite places that we should take care of but the quality of those places may change especially mountainous areas and coastal areas as the climate changes. How do we account with putting aside half the planet, how do we account for a changing climate?

E.O. Wilson: Climate change is certainly the worst thing we're doing to the planet and it could ruin everything in time if just are allowed to continue without some way of stopping it.

Eric: And do you think that will change our choices of what to preserve?

E.O. Wilson: Oh, you mean what the best one half would be?

Eric: Yes, exactly.

EO Wilson: I think, you know that's a very interesting question. And I don't think that we have done enough or made enough progress on climate change, or the of changing minds, and the changing of economies and religions and we haven't made enough progress in mapping the Earth's biodiversity and I said most of this remains unknown to make a good judgment of what the long-term impact will be by either allowing land to be used up by our growing population or by selecting the right or wrong areas to preserve. We have to take each part of the available in turn and evaluate it another reason that incidentally for more and more young people coming into science to participate in the sense of saving of the plants, animals, microorganisms the biodiversity of those parts of the world that can be set aside and those parts for the world that are not being set aside but need evaluation in terms of how they can be best managed with reference for the rest of life.

Eric: Well, it's that the classic idea of the wicked problem, isn't it there so many different elements to it that it's really hard to get a handle on how it all means but

E.O. Wilson: We've got to make a decision before too long because of the population growth on the increasing industrialization of the world is in the way of the natural products including especially forest and arable land are being taken up to support the growth the economic the population growth, the economic growth going with population growth. We have to move on, and we have to do it now. If we really had a couple of offers recently upon climate change and what we have to do about it and do about it now. Now they use a phrase I like a lot: climate warming. We are approaching the last assent and that's what we're doing to with biodiversity. Biodiversity and the saving of all of the other species, the 10 million or so that we think are out there. It's got to be done, as such going to be next big things coming in the environment. The big thing in environment protection study and policy now is climate change getting that under control, but that's only one of three environmental crises that I think we have brought on ourselves. Oh, the second one is a shortage of fresh water. That's going to receive a lot more attention soon, around the world it is creating potentially terrible problems and loss, the using up of freshwater. But the second or the third rather is the destruction of biodiversity and the

resulting collapse of natural environments. We don't know yet because we haven't done the science to figure it out what the consequences will be as we allow more and more species plants and animals and although we don't know as much about it, microorganisms go into extinction, or at least a very low population. We know from at least a few studies that after a few key species are diminished or at a lowered abundance, a large part of the whole ecosystem can collapse. So, we're facing a future in which more people haven't even had any thoughts about it. As more and more fish have become more and more rare or even extinct and that's what's happening. The natural environments that they occupy will be disturbed and may be destroyed in some important way.

Eric: You mentioned in the book you had the quote that you can't do just one thing in that you can't take away a species from a collection and expect nothing else to happen. It's critical for this and of course, we're taking out species and unprecedented rates. So yeah, it's quite sobering.

Dan: One of the, I think dilemmas with species conservation and you called it the hundred heartbeat club, is I feel like we wait until it's so late for some of these species and they're so rare but then other common species like at the same time or also becoming rare and we're sort of losing biodiversity on both sides of that. What do you think about those species or where efforts really need to be focused?

E.O. Wilson: Well returning to our earlier theme, it's another argument for having training for more specialists. We need more expert on different groups of organisms. Because the experts know which species are at risk they know where they are, and they know what measures might be taken or must be taken in order to save them. You're quite right if you think, well, there's a book entitled, and I can recommend it's called *The Rarest Birds In The World*, which does go through the list of bird species around the world that have been judged to be extremely rare and getting rarer and on the verge of extinction. Species after species covered in that book. I suspect for birdwatchers, international birdwatchers increases after species have been studied enough by bird watchers and locals to know even how many individuals are left and one after the other found to be still located in only one to two limited places in the world with only a very small number of individuals left. Some cases only a few hundred or even less. So, we need expertise, we need the knowledge and we need the recommendations made by specialist increasingly on different kinds of plants and animals and eventually microorganisms to keep them as one service to help keep them from going into extinction.

Eric: And then we also need the political will to enact that protection once we were able to articulate it.

E.O. Wilson: I think this I will to save wildlife or you all the biodiversity the natural environment of the United States ought to be made one of the most important subjects for debate and planning in the forthcoming and election.

Eric: Agreed

Dan: This all started with the study of ants and the idea of superorganisms. I think it was in *Biophilia* talking about ants that farm fungus or maybe the fungus farms the ants. And my question is really like, what did you learn from these super organisms that we can apply to sociobiology and people?

E.O. Wilson: I'm bringing out a book in the next few weeks from publishing company W.W. Norton and Live Right, that I wanted to avoid mentioning it just for ordinary ethical reasons. But the book coming out is titled *Tales From The Ant World* and what I've done is to get my own history of how I got into the study of the ants how I was encouraged to advance as far as I could while at the University of Alabama. And then on to Harbor where I've been for many years. I take case by case all of the rarest ants and how I hunted for them and the different kinds I studied. Also, a description of the extraordinarily strange ways of ant life and answer that in the course of their 150 million year evolution that includes the fungus growing ants. There are calves that cut leaves and other calves carry them, another calf that protect the nest and so on and the ones cut the leaves bring it into the nest and the processors, another calf process of it and the quality of this is able to continue growing the one food and lives on which is a kind of fungus that grows on the process material process my ants. Yeah, and they are among the most successful animals in the new world, ranging all the way from Argentina to the Southern United States.

Eric: Sounds like a fantastic read so really wonderful. So, Ed this has been such an amazing time and you're so generous to have shared your wisdom and ideas with us. It was an amazing conversation, as I knew it would be amazing! Is there anything else that you feel like you'd like to share before we finish up?

E.O. Wilson: Oh, no I greatly appreciate you allowing me to enter subjects that mean a lot to me. Thank you very much.

Eric: Thank you. The founder of the concept of biophilia is sharing his ideas with us and allowing us, you know to hopefully have this be a really successful podcast and I am certain other opportunities to connect.

EO Wilson: Well, I thank you for the opportunity and I wish you all success!

Dan: Thank you!

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Narrator: Thank you for listening to *Love Nature The Biophilia Podcast* production by Eban Crawford. This has been a production of the North Carolina Museum of Natural Sciences. If you are in North Carolina, please visit us at beautiful, downtown Raleigh.