Science Forward--Urban Ecology

[0:01] [music]

Flora Lichtman: [0:11] What would you consider to be natural? Take a look at this environment. There's been a lot of landscaping by local residents, by Castor canadensis, the North American beaver.

[0:26] Their landscaping tool of choice? Their teeth. They gnaw branches and trees. They create dams, and in doing so they create new habitat for amphibians and fish. They also displace residents that used to live there, insects, mammals.

[0:41] Few organisms on this planet can change the landscape the way that beavers can. Humans, of course, are another notable example.

[0:50] There's a course of study devoted to understanding this interaction between the human-made, built environment in the city and the non-human residents. It's called urban ecology.

Regina Alvarez: [1:02] The definition of ecology is how organisms interact with each other and with the environment in which they live. Urban ecology is how organisms interact with their environment in an urban setting.

[1:16] If you had learned about ecology several decades ago, you'd be going to the rain forest in South America or some natural environment somewhere. No ecologist would have even dreamed of doing anything in the city. That's not where ecology happened, apparently.

[1:34] Ecology happens everywhere. People were always separated from nature. That's part of what's gotten us into some of the trouble we're in right now.

[1:43] Ecology was seen as being done somewhere remote, pristine, natural. People were not part of the ecology.

[1:52] We've learned in the last bunch of decades that that's just not right. That's now how it works.

[1:57] People are part of the environment. We are part of the ecosystem. Ecology does happen in urban areas. It's very important for the landscape, for us, for everyone involved.

Mary Pearl: [2:09] Ecosystem services refer to all the benefits that a healthy, functioning ecosystem brings to us.

[2:18] We drink fresh water in New York City that really is basically unfiltered in many cases because the water has been cleaned by going through the ecosystems north of the city.

[2:31] Pollination is another ecosystem service. One third of the crops we eat are pollinated by insects and birds, the others by wind, which is another ecosystem service.

Regina Alvarez: [2:43] In ecology we're learning the urban environment is just as important as any other environment.

[2:48] A scientist is someone who goes out, learns things, is curious about things, and then comes up with questions based on observations that they've made.

[2:58] In the case of an urban ecologist, me for instance, I go out to parks here in the city. I go to natural areas in the city. Just walking around the city. There's ecology everywhere.

[3:11] We have major influences on the urban ecosystem. We change the environment around us. A lot of the natural processes that happen get altered.

Flora Lichtman: [3:20] One of the subjects urban ecologists study is species composition. In other words, which species live where and what factors influence those populations?

[3:30] American Museum of Natural History post doc Mark Weckel studies that question here in Van Cortlandt Park in the Bronx. He's specifically coyotes and what role humans have played in their recent immigration to NYC.

Mark Weckel: [3:43] Van Cortlandt is one of several parks that my colleagues and I have been monitoring for several years. We use camera traps as our main tool, which is basically a camera that's triggered by the movement of a warm bodied animal. It basically takes pictures of whatever walks by.

[4:02] In this case, it runs all night, all day, and there's no delay. It takes a picture any time an animal's triggering it. It also takes five photographs in a row.

[4:13] What the beautiful thing is is we've gotten almost what we call near video photography of images of coyote moms with their pups. I have pictures from the Bronx of deer sparring, which I think is pretty cool.

[4:24] Where we're standing right now in the Bronx, back in 1609 when Henry Hudson was sailing up the Hudson River, there would have been an eastern wolf here.

[4:32] Over time, as the colonists, followed by early Americans, cleared the forest they also eliminated most of the large predators, including the eastern wolf.

Flora Lichtman: [4:43] There's even a specific terms for this.

Mark Weckel: [4:45] Humans defaunated the landscape is a nice way of saying it. Got rid of the fauna, especially these large predators that were seen as competitors and vilified, to be honest with you. Earlier in our history they were seen as evil.

Flora Lichtman: [4:57] By the 1960s, in the northeast of the United States there were no wolves left. Meanwhile, the western coyote was having almost the reverse experience.

Mark Weckel: [5:06] What happened since that time is that the western coyote has actually done quite well for itself and expanded its range.

Flora Lichtman: [5:13] Over the past 150 years, western coyotes moved east and north from their original home range. Weckel says one of their expansion routes was through Ontario in Canada.

[5:23] He says this is where western coyotes began to breed with eastern wolves and possible other canid species. Their offspring are what we now call the eastern coyote.

[5:34] These eastern coyotes have also expanded in range, moving east and south into the northeastern United States.

Mark Weckel: [5:40] When the eastern coyote showed up via Ontario they found a landscape ripe for the taking.

Flora Lichtman: [5:45] There were no competitor wolves and instead of farmland, the eastern coyote found suburbia.

Mark Weckel: [5:51] The eastern coyote that we have is quite adaptable to that landscape.

Flora Lichtman: [5:55] In the last few years, coyotes have been spotted in Manhattan, Queens, and right here in Van Cortlandt Park in the Bronx, not far from where this story began.

[6:04] From the camera traps, Weckel gets insight into what species live where and how animals interact with this urban environment.

[6:12] Tammy Lewis, an environmental sociologist, is interested in how people interact with their environment.

Tammy Lewis: [6:18] We are at Brooklyn Bridge Park, which is built on the old industrial piers that are here along the waterfront on the East River.

[6:27] One of the reasons I'm interested in this park has to do with urban sustainability and has to do with amenities that are created in cities that can be good for both nature but also humans.

[6:44] As an environmental sociologist, I'm interested in how we create urban spaces that improve quality of life for human beings that are part of the ecosystem.

Flora Lichtman: [6:59] One of the things that I was thinking, as you were talking about trying to figure out whether this park is sustainable, is how you turn that story of this park into something you can study, quantify or compare with other stories. How do you approach that in a scientific way?

Tammy Lewis: [7:16] That's a really interesting question. Social scientists use data just like natural scientists do. And so, one of the things I'm interested in looking at is what happens when you have a place like this that used to be a wasteland.

[7:36] After the industrial use was over, it laid fallow for many, many years. How do you look at before the park came and after the park came?

[7:49] One of the things that social scientists often use is census data.

Flora Lichtman: [7:53] How do you pick which parks to study?

Tammy Lewis: [7:56] That's a really important question because that's an issue of sampling. You want to be able to pick, first of all, a park that's representative in some way.

[8:08] I don't just study Brooklyn Bridge Park because it's special in a lot of ways. I need to look at the population that I'm interested in.

[8:16] For example, if I'm interested in understanding New York City's parks, all of the parks in New York City are my population. One person alone can't study all those parks in depth so I have to figure out how to generate a sample of parks.

[8:32] If I just look at Brooklyn Bridge Park in depth, then I can provide a nice history of the development of a single park but I won't be able to generalize in any way because it's just an "N," a case, of one.

Flora Lichtman: [8:47] Data from parks and other parts of the urban environment can be used to guide conservation efforts.

Chanda Bennet: [8:53] We can't conserve anything unless we can include people. People have a very tied connection to the environment and so we need to make sure that we're not just working on the ecosystem but we're also working with people.

[9:08] New York is traditionally categorized as a hard concrete environment. The fact remains that it is also very biologically diverse in terms of the different types of habitats and ecosystems that are represented in New York City as an urban environment and the biodiversity that exists here.

[9:28] I think it's time for us to really start thinking about and revisiting what it means to live in an urban environment such as New York City and start integrating our natural landscape, our natural wildlife, with our average city life.

[9:42] It's not separate. They're really very much integrated. The more that people can start to think about their relationship with nature in New York City, the better we can be as a community in the conservation effort.

[9:55] [music]

Transcription by CastingWords