Mark Peterson - Host:

I am Mark Peterson, and this is "Before, During, and After: A Podcast from FEMA."

Mark Peterson - Host:

On this episode, we're veering a little bit away from the traditional emergency management topics to highlight and integrate a new approach to some potentially very difficult response situations. Today, we're diving into the One Health approach, a holistic strategy that aims to sustainably balance human, animal, and environmental health. One Health recognizes that the wellbeing of humans, animals, plants, and ecosystems are interconnected and interdependent. Historically, public health emergencies like disease outbreaks have focused on human medical responses. However, integrating human, animal, and environmental health considerations can lead to a more effective solution. So today, we'll explore examples of how One Health principles have been applied to increase resilience and reduce disease threats. And also provide a new perspective on the intersection of public health and emergency management.

Mark Peterson - Host:

One of the really unique aspects of doing the FEMA podcast and learning from all the experts that I have an opportunity to hear from via this platform is the opportunity to hear all about new ways of looking at the problems that emergency managers face. And so, today, I am thrilled to be joined by two very special and unique guests to a FEMA podcast. Joann Lindenmayer, thank you so much for joining me.

Joann Lindenmayer:

Thank you for inviting me.

Mark Peterson - Host:

Joann, before we get to our second guest, go ahead and, and tell me a little bit about yourself and, and your background.

Joann Lindenmayer:

So, I'm a veterinarian by training. I also have a Master's in Public Health degree and I'm a graduate of the CDC's Epidemic Intelligence Service. Worked quite a bit in other countries, Southeast Asia and also Africa for many years. But most of my work has been in public health, where I really quickly realized that public health doesn't really focus, focuses on the health of humans, almost to the exclusion of the health of other animals and the environment. So, I've been pushing for more of a one health approach to public health. Currently, I'm a senior editor for CABI One Health the Journal and also, I'm the vice chair of the Local Board of Health in Uxbridge, Massachusetts. But I've worked at International, national, and State and now local levels on One Health.

Mark Peterson - Host:

Okay. And our other guest, Gail Hansen. Thanks so much for joining me. Tell me about yourself.

Gail Hansen:

Well, thanks for having me as well. Similarly to Joann. I'm also a veterinarian with a public health background. I've done most of my work in state, sort of a state capacity. I was a state public health veterinarian and a state epidemiologist in Kansas for a number of years, and then I went more to a national level. And I've done a little bit of international work, also working on One Health, looking at emergencies as a state public health epidemiologist we dealt with a, a fair number of emergencies, and I've done some international work and, and like Joann have been very involved and interested in, in One Health for a long time. Right now, I just, I do consulting work on public health infectious diseases.

Mark Peterson - Host:

Okay. So, let's get into this. You know, One Health is obviously a topic that is new to me. It may be very new to many emergency managers, but maybe not to all. And so, maybe you could, Gail, start us off by defining what is One Health and how does the approach really contribute to more resilient communities?

Gail Hansen:

Thank you, Mark. And I, I like your teeing this up as being an approach as, as opposed to being yet another discipline. You have to think about how am I gonna incorporate this. Because it really is more of a framework. It's a discipline of some sorts, but it's really a framework of approaching a, a way to approach an issue. And that's bringing together inter interdisciplinary folks. And you're looking at human health, animal health, environmental health, and that's both the built environment and the natural environment. How do they work together? How do all these ecosystems work together? How are they linked and how are they interdependent? And how do you make that part of your psyche, so to speak? And Joann, I don't know if there's anything else that you wanna add.

Joann Lindenmayer:

Yeah, I, I think of One Health as Gail said, as an approach. It's also a basic concept that the health of pe, health and wellbeing of people, it's interdependent with other animals and with the environment as Gail said, both the built in the, in the natural environment. And if the One Health approach, which is multiple disciplines, primarily the health disciplines - human, animal, and environment, but also affiliated disciplines - economics, sociology, law, all of those, and that's the multidisciplinary piece of it. There's a transdisciplinary piece of it, which essentially requires that community voices and representatives be involved. Because ultimately, the One Health approach should lead to policies and programs that are applicable at all levels of government but certainly at the local level. You need to include community voices, and I can give an example later on in the podcast about how something that we'd like to do that the disciplinary approach in Uxbridge would take, is not gaining traction among the community members because they have an investment in something quite different. So, so it's the, the concept of that interdependency of human health and wellbeing with other animals in nature. It's the approach as Gail explained. And then it's also policies and programs at all levels of government.

Gail Hansen:

Yeah, and I think I'd also add that it really gives a, maybe a slightly different perspective on how you can really build resilience into your communities and, and how to act on that before you have an emergency as well as during an emergency. So, I think it fits in very well with FEMA's goals.

Mark Peterson - Host:

Yeah. And, and, and certainly you know, our audience, we really strive to make some of these principles that maybe local and state emergency managers are new to, we try to make them, you know, particularly relevant to them. And so, you know, Joann, if I were an emergency manager at maybe the county level, I feel like it's pretty relevant to a county level. How, how can it be integrated into sort of the day-to-day responsibilities of those emergency managers?

Joann Lindenmayer:

For example, I'm a veterinarian and I'm the vice chair of the local Board of Health. I've been able to bring a different perspective, not only to emergency management and have been quite deeply involved in our comprehensive emergency management plan which now includes measures to allow individuals who have to evacuate to take their pets with them. It includes at least a nod to wildlife and wild animals. If you don't have someone with expertise in animal health and also conservation at the local level, if you don't have them involved in your emergency management operations, then they probably won't be considered. And, and I think the big takeaway message here is that disasters of all kinds involve not only human health and loss of life, mortality, morbidity, and loss of economic resources, property and those kinds of things, but it also involves tremendous loss of wildlife in some cases.

New Speaker:

So, for example, the black fires in Australia in 2019 and 2020 killed 3 billion animals, wild animals. And we, we depend for our own health and wellbeing on biodiversity, but it also destroys large swaths of, of territories. So, whether it's land which we know more about, or aquatic environments again, humans depend on you know, the availability and the quality of natural resources to survive. And so right now, when we track the impact of disasters, we only track it on people. And the international database, which is located in Belgium at the Université catholique de Louvain only monitors human mortality, human morbidity, and economic loss. It does nothing to monitor wildlife, domestic animals, livestock loss of, loss of habitat. So, I think that's a huge problem and unless we make an, a concerted effort to include them, whether it's international response or a, or a local response, we won't think about what are the impacts on them, and then ultimately, in the long run, how do they impact our health and wellbeing.

Mark Peterson - Host:

Hmm. And we're gonna talk a little bit later about some of the recommendations for bringing in some of those interdisciplines to the conversation. But you know, maybe just to highlight the point and probably the example you wanted to get to Joann, maybe you could talk a little bit about your experiences at the local level working through this in Massachusetts.

Joann Lindenmayer:

Again, as a veterinarian on the Board of Health, and most, I've only known one other veterinarian on a local board of health, of course, Gail has had great experience in Kansas and there have been a few examples of veterinarians in state levels as the state epidemiologist. In fact, our state epidemiologist is a veterinarian, I'm happy to say, with ex, great deal of expertise in wildlife. But the local level, it's harder. And I know you know, veterinarians are usually, you know, they're extremely, extraordinarily busy if they're in clinical practice. They don't have time and they don't think of themselves as being public health experts, but in fact, or anything to do with public health really, but in fact, they do. A great deal. So I, I think I've been able to bring a unique approach and some expertise to our comprehensive emergency management plan, to to a number of other initiatives in Uxbridge.

New Speaker:

But the thing that I really wanna get to in 2000, and I think it was nine, no, 17, 2017, Governor Baker at the time started an initiative. He gave $2 billion to any municipality in the state of Massachusetts, and there are 351 of them, that wanted to assess their vulnerabilities to climate change and begin to plan to take measures to mitigate those. And so, the town of Uxbridge, I think most, if not all towns in, in cities in Massachusetts, have applied for those funds. We are currently in the process of applying for a third one. But there are a couple of, a couple of ideas behind that. One is that there are, there are eco environmentally vulnerable populations, the elderly, the disabled, people who are perhaps in poverty, living in poverty, people who are more vulnerable because of by where they live and it may, those areas may be more prone to disasters such as flooding.

New Speaker:

And then the second real principle here, besides the idea of of environment, environmental justice populations, is the idea of nature-based solutions. So, I'll get to that in a minute, but Uxbridge and our very first municipal vulnerability preparedness grant, which was awarded in 2018, I believe was a grant that we assessed, well, actually even before that, we had a community workshop. So, we got as many community members, local political representatives, everybody we could think of involved in a workshop to identify what people thought were our climate change vulnerabilities. And those turned out in Uxbridge to be flooding, mostly flooding, and then winter storms. So, a lot of the activity and a lot of our planning in Uxbridge has been about how to prepare for flooding, given that we are currently experiencing climate change.

New Speaker:

So, the very first MVP grant that we had, and I'm just gonna read off a list of things that we were able to do with that. It assessed water vulnerability hazards. We looked at 130, we assessed 91 out of 135 road stream crossings, and found that 15% of them were vulnerable to flooding at high risk for flooding. We assessed 20 dams in town, most of which were there from the industrial era, because this is the area in, in the, in the country really where the industrialization era started. And of those 20 dams, 25% were found to be at high risk for failure. We conducted a green infrastructure assessment of 31 properties in the town, and we listed 10 as high priority and made plans to modify those so that we could deal with water runoff and storm water, those kinds of things.

New Speaker:

And then we assessed water quality and quantity and the, the presence of certain contaminants such as PFAS and manganese in order to, to plan for the future to see whether we had adequate quantity and quality of water. And we could expect that in the future. In the, the second MVP grant that we got, between the first and the second one, we had an outbreak of Eastern equine encephalitis. And we, we get that not every year, but it's often accompanied by West Nile virus. And we had a horse in this town that was diagnosed with triple E - Eastern equine encephalitis. And so, because of that, we took a somewhat different approach from many of the other municipalities in Massachusetts. And we based our whole second one on an integrated vector born disease control program. And so, for that, the state of Massachusetts previously had one surveillance site for West Nile virus and Triple E in the town and we increased the surveillance sites to 10. And largely because of that, one of the sites that we started up was able to identify West Nile virus in town. Mass Department of Public Health would not have identified. And we were a, the, the, as a result of that, the state was able to raise our risk of West Nile virus from low to moderate. So, that was one example. Another thing that we did through that was we identified the Department of Public, well, the Department of Public Works department, they had a lot of open canisters and barrels, and they were collecting rainwater. And we identified that as the site for mosquito breeding. So, DPW actually cleaned up their site. We held a regional mosquito control workshop because there is, in, in the state of Massachusetts, there are regional mosquito control programs, but they're very expensive and poor towns, or relatively poor towns like Uxbridge, don't have the funds to be able to devote to those. So, we held a regional conference. Uxbridge hosted it, and we found that there was great interest in regional approaches to mosquito control and the kinds of things that they settled on were increased surveillance and education. We provided plans to replace a road stream crossing that actually went over a cold stream, which is a site for real biodiversity and, and aquatic life and some endangered species. We provide, we identified there was a, a culvert there that was all blacked up, all blocked up, a very old culvert. And it was a great site for mosquito breeding. So, we identified that as a high priority for replacing it with a box culvert, which is a nature-based solution. We inventoried 159 vernal pools, surveyed 21, and 10 of those actually qualified as being of biological significance for wildlife habitat.

New Speaker:

And that wildlife was a spotted salamander and a wood frog. We had updated the town's open space plan, and then we also identified gaps in emer, in our emergency communication system. So, we eliminated duplicates, we did more education in town about how people could sign up for emergency alerts, and we did some training of people involved in that. So, those two grants have been really, really important in terms of us taking human health animal, other animal health and environmental health approach to the whole issue of climate change vulnerabilities.

Mark Peterson - Host:

So, Gail, I I, if I could, I, I just wanna like break that down just a little bit 'cause I think there's a number of things, Joann, in, in sort of that case study, if you will that are gonna immediately jump out to a number of members of our audience. And one, the first grant and inventory the risk from potential failure of dams which we're seeing around the country even right now. But, you know, just the, the vulnerability of their culverts, which are almost always going to end up being a public assistance infrastructure project, you know, in the event of a federally declared disaster that you always see those pop up, but inventorying those risks, but then also taking it a step further to not just say, well, is this going to impact the the transit, right, like the ability for people to get from point A to point B, but then to look at it, how is it affecting the, the environment? How is it affecting the biodiversity in the area? How is it potentially, you know, maybe the failure of those culverts, how are they leading to standing water that can add diseases? Am I capturing that right?

Joann Lindenmayer:

Absolutely. You are. And thinking about transit, the transit of aquatic animals through those culverts, across those dams, you know, especially if you have animals that are endangered or at risk of being endangered aquatic animals. So, absolutely, you know, these kinds of disasters that relate to climate change are not only a human health issue, but they're also another other animal health issue and an environmental health issue. And unless we incorporate thinking, at least thinking about those things into our, into our plans whether a local or an international or a state level or a national level, we aren't going to be taking that into account. So, our, we, we established a core team that has been with us through, from the very first MVP grant, still in operation, and it includes not only the major departments in town, including the Board of Health, but also the Conservation Commission, and then me in my capacity as a veterinarian. And, and I involve other veterinarians in town as well. So, yes, I think you have captured that very nicely.

Gail Hansen:

Yeah, I think I'd like to just sort of reiterate that, that, and sort of recognize that disasters are all sort of, there's a lot of interrelationship, and they're layered, if you will. So, there, and there are different vulnerabilities for people and different populations with within people, also with animals and, and for the environment and, and to really have a solution and a response that makes sense, you really need to get a voice from all of those sectors, both during planning as you're talking about figuring out where are your vulnerabilities and to really have a successful response. So, it really, you know, that that's One Health, figuring out how to make it work for, for everybody. And when I say everybody else, I mean animals other than us and the, our environment.

Joann Lindenmayer:

Yeah. And I just, I, I wanna just add one quick thing. I agree, agree completely with Gail, just with what Gail just said. We have one dam in particular in this town, and, and often we don't even know who the dams belong to. They were built a hundred plus years ago. We can't even find out who owns them. We have a dam that's at risk of failure. And downstream from that is what we would consider to be an environmentally vulnerable community. It's a senior housing, housing for people who are elderly, disabled. But the problem is that behind the dam is a lake and there are people who own waterfront property around the lake, which is highly valuable because of where it's located. And we are trying to work out, this is where community voices becomes extremely important. You can't just have a disciplinary approach to these kinds of things, because if the community is not gonna accept it, it's just not gonna happen. And this is a real, real point of contention right now in Uxbridge. I'm not sure what we're going to do about it.

Mark Peterson - Host:

I do wanna talk about some maybe strategies, but before I do, I want to talk about collaboration with other disciplines, 'cause You know, just expanding it beyond emergency management. And immediately, you start thinking of groups or agencies within a community that need to be involved in this but what are some of your recommendations? You know, if you were to maybe be coaching, if you will, an emergency manager who's thinking about, oh, how do I expand this approach? How do I, I fully like, realize it and offer that effective collaboration among all the interagencies that might be needed to, to come together. Because after all, that's the heart of emergency management. That's what we do is bring people together to, to, to try to solve problems. What's the, what's the advice to bringing in people that, you know, you don't even, you don't know who you don't know, right, like you don't know all the people that you need to bring in, but how do you start uncovering who those, who those individuals are?

Joann Lindenmayer:

I'm gonna turf this to, to Gail for more of a state perspective and maybe national perspective, and then I can talk about it at the local level. So, Gail, is that okay?

Gail Hansen:

Sure. And you know, certainly running emergency drill exercises helps, you know, obviously before, before you have a, a crisis and, and your folks know this probably better than anybody else. And when you do those drills, you know, making sure that it, sort of looking at it from a One Health perspective, that you've got someone looking at the human health, the animal health, the environmental health so you've got and the comm, you know, also, as Joann says, the community. So, make sure you've got a community member. You've got somebody from the health, public health, which are sort of two different entities, veterinary health, if you have a wildlife expert, which often your departments of natural resources or whatever, whatever the agencies call locally.

New Speaker:

And environmental, you know, sewage as well as getting economists involved, you know, to look at what are the, what are the economic local economies? What are, what are the, you know, what does this locally have? And after you've done with it, it's like when you do your sort of after action of, of who else, who else does anybody here think we need to involve? Who did we forget about? Or did we say, oh my gosh, we forgot to get to figure out what the legal implications are. So, we need to get a lawyer involved. You know, as you do these, it's, you know, they are cyclical, so as you do the, the drills, you say, okay, who else do we need to bring in? And, and, and who it is sort of a who do we need to have rather, not just who, who would be nice to have, but who do we need to have to really make this make sense?

New Speaker:

And it makes, you know, granted, it makes it a lot tougher. The more people you have, the harder it is to come up with, you know, solutions that, you know, you, you're probably not gonna be able to satisfy everybody, but at least have those voices on the table so you hear about them. So, it isn't like, oh my goodness, we should have, you know, we should have thought about this one thing. You know, if you've got someone at the table who says, yeah, well, did you think about the fact that if you get rid of all of the insects in the area, then you've got no pollinators. You know if you get rid of, you know, if you flatten all the trees, then, you know, what is that going to do? If you work on the, the health of individuals, how is that impacting what the public health or what individual physicians do? What are the veterinary thoughts on that, both for domestic animals and for wildlife, so livestock, pets and wildlife and sort of really bringing all those, those together. So, it really is sort of doing these exercises, figuring out who else to incorporate, bringing them in and, and knowing that, you know, everybody's, there's only 24 hours in everybody's day but the more people you can bring in the, the more robust your response is gonna be.

Joann Lindenmayer:

Yeah, I agree with everything that Gail just said. And I would say at the local level, at least in my experience and this is, we belong to some regional initiatives now as and I'm pretty familiar with most of the public health departments in, in certainly some of the surrounding towns, it's not natural for public health officials, especially at the local level, to reach out to people with expertise in animal health, people with expertise in environmental health, to some extent, those individuals, and, and it's not really natural for people, veterinarians necessarily, or people with expertise in environmental health to think of themselves as public health experts, although they are. And, and the work that they do certainly contributes a great deal to the health and wellbeing of people. So, I would say that for, for example, for our board of health to consider when, when something isn't strictly a human health issue, for example, it's an issue of access to care or something like that, to, to, and, and not just to think about environmental health as something that affects our health, but it affects the health of other animals as well and their wellbeing and therefore indirectly affects us.

New Speaker:

I would say for boards of health, departments of health, to actively start to recruit people with expertise in animal health and environmental health. In many towns, there are conservation commissions, reach out to them. We, until this MVP program came along, I don't think we had a lot of cross-inter, interdepartmental, you know, cross fertilization and, and, and initiatives. So, I would think, I would say in the part of the health departments, think more broadly about how the health of people is affected by animals and the environment. Not just because, not just, not just as a way to sort of shut and down other animals and the environment, but as a way to improve their health and wellbeing because it affects us, and it would say in the part of veterinarians and environmentalists, consider getting involved in your local public health in, in your, whether it's a department or a board or whatever it is, go to their meetings, you have input that can be very valuable. And for the point of view of town managers, try to get your different departments to work together, you know, to, to bring them together. You can have some really interesting conversations and they can be really beneficial to everybody involved.

Gail Hansen:

Yeah. I guess there's a sort of a practical thing of you know, they, for FEMA, for the emergency managers, do you know who your public health officials are? Do you know who, do you know your sort of, there's almost always a local veterinary board, a local health private physician group. Have you reached out to them? If not, now's a good time to think about it.

Mark Peterson - Host:

As I hear you explain this, it to me, it seems as though probably for rural communities, this is a relatively intuitive approach. And I could be wrong here, but maybe not so much on the urban front, although, you know, certainly there's a lot of waterways that and biodiversity. I live in Chicago and, and, you know, you know, the impacts that we have on our lake and our river systems. But I'm wondering if you're seeing an emergence or need for communities to, to utilize this approach for the, the towns that are on the cusp. Around the country, I think, I think I read that warehouse space is somewhat of the largest commercial real estate growth in the country and so there, there's this move to develop farmland that had historically, you know, been utilized in agriculture and now, you know, we're, we're sort of building into these spaces and so towns are changing very quickly in some ways. And so, are, are you seeing an increased need to look at things more broadly like this?

Joann Lindenmayer:

Let me give you an example. It's something that happened in the town next to us, next to Uxbridge. And the town is called Hopedale. And about three years ago, there's a, a, a railroad, it's not a local road. I, I don't know, not sure it's a state railroad. It involves a couple of towns around here. The owner of the railroad, who had claim to it from over a hundred years ago, wanted to expand the facilities and clear cut a hundred acres of land because he could. And there was a, an uproar in that town. And that whole thing continues to this day. He did that. But in fact, people were very aware of the fact that this was, and I believe, I absolutely ascribed to this, that trees and open space and, and, you know, forest and all of these things, they provide public goods.

New Speaker:

They help to fix carbon. They help to put more oxygen into the air. They help to maintain the soil, which is a microbiome in and of itself. We can't look at these things as just something to be eliminated because they are a public good, even if they're owned by individuals or, or by corporations. So, I think you're beginning to see that regardless of where people are, whether it's a, a town like the, the towns around here, which are small towns, but you know, not far from urban centers, I think you're going to see that people are beginning to be more aware of how important these natural resources are, that they do provide public goods, and that they're not there just to be used because some corporation or some corporate entity wants to make money out of them for their own purposes.

Gail Hansen:

Joann's talked a lot about smaller towns, right, and I've lived in smaller towns. Right now, I live in Washington, DC, which is not a smaller town, so sort of thinking about, you know, you're asking about how does this, how does this affect a more urban area. And we know that that tree cover changes the temperatures of, of urban areas and urban areas that have fewer green spaces, have, have higher heats in the summertime, and that has health impacts to people. Even though there's not, I mean, we have no agriculture in Washington DC, but we have a lot of people with pets, and we have a lot, we have several people who now own chickens, and so when you're thinking about how to, you know, how to mitigate after a disaster, you've gotta be thinking about what about everybody, you know, the pets that are, are around. What about the places where you may have standing water that is promoting mosquito development? Do you need to get, do you have to, do you wanna get rid of all of that? You know, what other things can you do to, to mitigate the problem of, of diseases, but provide for, you know, once again pollination both for the trees and people who have, you know, plants in their backyard. So it, it isn't, it isn't something that, that people who live in cities can say, well, that's, that's a rural issue. I don't need to deal with that rural issue, forgetting about the fact that that's where our food comes from and where much of our recreation happens. But, but we really do have, have to be thinking about this in a, a One Health concept, no matter where you live.

New Speaker:

And like I said, I can certainly see that in Washington DC. I've lived in New York. I've lived in rural Kansas as well. So I, I've sort of seen it from different, sort of the different viewpoints and, and I've seen One Health work, or the potential for One Health, and what happens if One Health is not considered, and the unintended consequences that you have for, for not including something other than, you know, what's the immediate economic outcomes for people and how do we, how do we rebuild their houses if, if you've got a tornado, you know, yeah, you have to think about that but you also have to think about, as we're doing this, can we make it more resilient for the next time a tornado comes by or the next time we have a flood, because there will be one, and if not exactly in that town or that city, it'll be the next one over that the emergency manager is going to be , be dealing with. So, it really, it really does behoove us to, to think about what are those interrelationships that happen.

Joann Lindenmayer:

Yeah. And, and if I can just invoke a line from Joni Mitchell's "Yellow Taxi," paved paradise, you put up a parking lot, when you pave everything over, that increases the risk of stormwater runoff and the, and the, the possibility of a flood. So, you know, I think Gail's talking about green infrastructure and nature-based solutions, those are important whether you're living in rural Kansas or rural Massachusetts or in a city. We have to be thinking about that. And I'm sure you know, Mark, people are putting up more trees. They're recognizing the value of these nature-based solutions, because as Gail said, cities are cooler when you have trees. There are other solutions to those kinds of things that will in ultimately mitigate the impact of a natural disaster.

Mark Peterson - Host:

I'm very familiar with that example of paving paradise and then you know, you, you do have those problems. And, and certainly we look at that within FEMA and in the emergency management community about, you know, the increased risk of flood, obviously with our, the flood insurance rate maps and, and thinking about those impacts. But it, it is nice to start thinking about, or maybe to introduce the concept of thinking about, well, it's not just rain runoff that is going to flood a home or a business or an area. It's also maybe toxic, you know, chemicals that might be affecting rivers and streams and things like that, that are not treated before they're entering the, the ecosystem. So, thanks for that example. And always reminding me of Joni Mitchell. That's very excellent.

Gail Hansen:

It also is relevant to the Olympics and the swimming and the sun.

Mark Peterson - Host:

Fair enough. And, and so for emergency managers who are really looking to get a better understanding of one, the One Health approach, what resources are out there, are there any trainings that they might be able to take or, or explore?

Gail Hansen:

At a local level? There's, there are fewer than I'd like to have, if I could put it that way. Certainly, even WHO has put out how to deal with emergencies at a local level and it's, it's written for high income, low income, middle income countries, but there are pieces that, that you could pull out of that. Because I come from a public health background, I tend to think of CDC has some excellent resources on how to, to deal with emergencies and they've also sort of worked with the, within the ISO framework. So, it's, you know, thinking about the American Veterinary Medical Association has information of how to deal with, with, with emergencies like the Sierra Group has, how, how to deal with an emergency so I, I mean, one of the things that that popped into my head is as we're doing mitigation, if you're doing it at night, sounds like something that I wouldn't have thought of, but someone said, well, if you've got all these light, bright lights at night, what are you doing to the insect population and the, the animals that are, this is mostly for an urban area, what is that doing to the populations that, that live the way they do because of the lights? Are you gonna, you know, are you gonna lose all your birds? Are you gonna have, have insects be completely discombobulated? And what does that do? I had never thought of that until I started bringing in some other people who have One Health perspective.

Joann Lindenmayer:

Just an interesting example, Gail, because at a recent town meeting in Uxbridge, we had an, an slightly elderly woman who got up and spoke about the loss of lightning bugs because of all of the lights that were on in Uxbridge overnight. And so, we're seeing a decrease in the lightning bug population, and I had never thought about it either, but I went up to her afterwards and I, I, you know, thanked her for bringing that up. Sad to say it was met with some scorn, but you're absolutely right. You know, there are impacts of lights on all the time. In terms of at the local level I mean, anybody can take a course. FEMA has some wonderful courses on incident command system. Our board of health requires us to take a number of them, and I would say that probably every couple of weeks I get, I get a, an email from the Mass Emergency Management Agency, MEMA, about courses that they have made available. So these, I don't believe you have to have any type of affiliation with the Board of Health or conservation or any of the other things to take them. I really would urge people to take advantage of them. They're great offerings.

Mark Peterson - Host:

So, FEMA was engaged this year in a year of resilience, and so we're really working hard to incorporate concepts of resilience throughout all of our grant programs and our infrastructure programs and, and frankly, even on the individual level for the individual survivor. So, in thinking about the year of resilience, what are some practical ways or some strategies or maybe some advice that you have for communities around the country to start thinking about a One Health approach and potentially fully integrating it into their response plans for the future?

Gail Hansen:

Well, certainly strengthening local capacity whenever you can is, is just critical so that all the sectors have skills, the competencies, they know each other and sort of how to deal with emergencies and really local groups and, and even their social networks can help really strengthen that, both the information dissemination and, and response. So, I would suggest that I, I recognize that'll take time and resources and time and resources are two things that are sort of finite, but I think those are, are, are very important. And, you know, obviously we've talked about building communication with other sectors and doing that, you know, as they say that it, and I'm sure you guys use this all the time, that the, the time to, to learn who your community leaders is, is not the day of the, the emergency and, you know, running the, running the drill exercises and, you know, working with other community organizations also just to build trust within within a community before an outbreak. If FEMA and other leaders are seen as being trustworthy, the public's more likely to, to do what they say, you know, if they have, if they had, if they give advice, if it's the best advice in the world, but they have no believability, it doesn't matter.

Joann Lindenmayer:

Yeah. And I, I would add a little bit to that and say you know, you bring up the issue of resilience and you're absolutely right, Mark, it's you know, there are you know, the resilience of individuals, but the one formal definition is the ability of a system to continue functioning and recover from disturbance. We live in ecosystems. We are, humans don't live in a vacuum. We live in an ecosystem. And so, when we think about our ability and the ability of the ecosystem as a whole to recover, we need to be thinking about that more broadly and not just in terms of human, human health and, and wellbeing. I would say that for residents, citizens, one of the most important things that people can do is to get out, know what's going on in your local meetings, in your boards of health and your conservation commission, in your town meetings, vote and vote because people have expertise and not just because they have name recognition, which is often a problem in these, especially in these small towns.

New Speaker:

Be aware of what's going on in your community. I, it, it saddens me to know that in this town, fewer than 10% of people actually vote in our local elections. And a lot of that, I think is due to the fact that we don't have good ways to communicate on a local level, especially, you know, with the dearth of local newspapers, you don't know what's going on. So I, I don't really have an answer to that. I think the only way you can really find out about what's going on is to actually attend meetings in your town or your city and, and be there and you know, and vote for people based on their expertise.

Mark Peterson - Host:

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