

Amphibian Migrations and Road Crossings Webinar Series: Vernal Pool Conservation  
February 15, 2022, 5:00 – 6:30 pm  
Hudson River Estuary Program Conservation and Land Use Webinar Series

1

00:00:02.274 --> 00:00:04.165

Great good evening.

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00:00:04.405 --> 00:00:19.135

My name is Laura Heady and I'm with the and the Hudson River Estuary Program and Cornell University, and I want to thank you all for joining us for today's talk on Vernal pool habitat conservation.

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00:00:20.963 --> 00:00:21.713

Let's See,

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00:00:23.184 --> 00:00:24.294

there we go. hopefully,

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00:00:24.474 --> 00:00:31.134

by now many of you are Webex pros after attending some of our other sessions in the series,

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00:00:31.134 --> 00:00:33.084

but for anyone new to the platform,

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00:00:33.414 --> 00:00:37.673

I'll briefly review some Webex details participants,

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00:00:37.673 --> 00:00:42.293

have options to connect to audio through their computer or through the phone,

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00:00:42.293 --> 00:00:43.673

and we recommend phone,

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00:00:43.673 --> 00:00:47.423

especially if you have a poor Internet connection,

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00:00:47.423 --> 00:00:50.304

or if you're having problems hearing through your computer audio.

12

00:00:52.195 --> 00:01:04.344

If your computer speaker isn't working well, you can select switch audio by clicking on the black circle with 3 white dots down at the bottom of the screen. It circled there on the screen. Now.

13

00:01:04.795 --> 00:01:07.344

Um, and then you can choose to.

14

00:01:07.769 --> 00:01:20.579

Either receive a call by entering your phone number in the call me at Box, or you can just dial in yourself. If you do that, you're going to probably need your unique ID number from the webinar registration.

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00:01:20.579 --> 00:01:32.609

Just a reminder during the webinar please direct any questions for the speakers through the Q and a box. If you have technical difficulties, let us know in the chatbox.

16

00:01:34.165 --> 00:01:44.844

If you don't see the Q and a box on your screen hover your cursor over the 3 dots next to the chat in the lower right corner.

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00:01:45.295 --> 00:01:51.834

And when you do that, you should be able to have the option to select, select the QA box.

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00:01:54.870 --> 00:01:56.305

And just as a reminder,

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00:01:56.334 --> 00:01:56.965

um,

20

00:01:57.984 --> 00:02:02.215

if you have Webex problems or technical difficulties use the chat,

21

00:02:02.275 --> 00:02:03.834

if you have questions for a speaker,

22

00:02:03.834 --> 00:02:05.394

use the Q and A,

23

00:02:05.484 --> 00:02:09.655

we've been getting over 400 registrants for each of these Webinars and with so many people,

24

00:02:09.655 --> 00:02:10.314

um,

25

00:02:10.645 --> 00:02:11.514

on the webinar,

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00:02:11.514 --> 00:02:15.175

it's very difficult to sort through the chat sending questions to Q

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00:02:15.175 --> 00:02:17.064

and A is a lot easier for us to read them.

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00:02:17.064 --> 00:02:30.085

So that's what I'll be monitoring when we get to Q and A, and because of so many people being on the webinar. We do have attendees automatically muted. Um, we wish we could be more interactive, but it is just easier to manage this way.

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00:02:30.085 --> 00:02:43.974

The webinar is being recorded, and we'll make that link for the recording available to you on the website and I'll also share it in a follow-up email that I'll send to everybody who attended tonight's webinar.

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00:02:44.729 --> 00:02:54.090

They'll also be a brief survey at the end. Please click through to that page when the webinar is over, we really value and enjoy getting your feedback.

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00:02:54.745 --> 00:03:09.384

And then finally, we'll be sending out an email confirmation of attendance, right after the event. And that can be used as, documentation of your attendance. Should you need that for municipal trading credit, For example, if you're on a planning or zoning board.

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00:03:09.719 --> 00:03:21.960

Um, and finally, I'd like to thank my colleague at the Hudson River program, Emma Clemments, who will be watching the chat box tonight. Um, sharing some links and assisting anyone who's having technical difficulties.

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00:03:24.354 --> 00:03:37.164

Okay, so now that we've covered the basic housekeeping Webex guidance, I'd like to welcome you all to our Amphibian Migrations and Road Crossings Project webinar series.

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00:03:37.344 --> 00:03:46.525

I'm Laura Heady, the conservation and land use program coordinator from the Hudson River Estuary Program through a partnership with Cornell university.

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00:03:46.525 --> 00:03:48.835

Department of natural resources and the environment,

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00:03:49.465 --> 00:04:03.925

and I started our amphibian migrations and road crossings project back in 2009 in part because of my own fascination and love of vernal pools but really because I wanted others to understand how vulnerable these habitats and amphibians are for

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00:04:03.925 --> 00:04:08.574

them to learn how important forests and wetlands are in the Hudson River estuary watershed,

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00:04:08.574 --> 00:04:15.955

and also to understand how our land use decisions can result in habitat fragmentation that impacts wildlife.

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00:04:16.165 --> 00:04:28.045

It all can be very abstract until you see dozens or more of spotted salamanders, wood frogs and other amphibians making their way across a rainy, dark road.

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00:04:28.045 --> 00:04:40.584

And as we prepare for our 14th year of the amphibian migrations volunteer project, this webinar series has been a wonderful kickoff to the season and a reminder of opportunities. We have to really

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00:04:42.113 --> 00:04:56.634

Up our game and think about how we can increase our conservation impact between climate change, habitat loss and habitat fragmentation, pollution, aquatic pollutants, lack of protection for small wetlands.

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00:04:56.934 --> 00:05:02.694

These all can have an impact on the availability of high quality, breeding habitat for amphibians.

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00:05:02.754 --> 00:05:13.584

And this webinar series was really designed to help us think collectively about how we can more proactively and effectively protect this important group of forest amphibians and conserve their habitats.

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00:05:13.884 --> 00:05:20.783

And it's been really encouraging to see the numbers of people who have been interested in and who've been attending these webinars. So, thank you.

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00:05:22.434 --> 00:05:24.144

The amphibian migrations project,

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00:05:24.144 --> 00:05:28.434

and this webinar series are part of our work at the Hudson River estuary program,

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00:05:28.764 --> 00:05:43.644

which is a unique program at the New York State Department of Environmental Conservation and it's unique in part because we take an ecosystem approach to our work and we cover the green area in the map on the

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00:05:43.644 --> 00:05:45.084

Right, which is,

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00:05:46.824 --> 00:05:49.764

which includes the watershed counties,

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00:05:50.093 --> 00:05:55.793

bordering the tidal Hudson river from upper New York harbor down in New York City to the federal dam in Troy,

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00:05:56.093 --> 00:06:00.983

and our work is outlined in a 5 year Hudson River estuary action,

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00:06:00.983 --> 00:06:01.524

agenda,

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00:06:01.553 --> 00:06:02.064

Hudson,

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00:06:02.064 --> 00:06:02.213

river,

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00:06:02.213 --> 00:06:06.084

Estuary action agenda and all of that is available on the website.

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00:06:06.324 --> 00:06:07.343

If you'd like to read more.

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00:06:08.903 --> 00:06:15.504

Our specific work on the conservation and land use team at the program is also guided by that action agenda.

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00:06:15.504 --> 00:06:22.314

And the goal we're working toward is that lands and waters that are recognized as regional priorities for wildlife and fish,

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00:06:22.343 --> 00:06:23.184

habitat,

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00:06:23.213 --> 00:06:24.053

clean water,

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00:06:24.084 --> 00:06:32.244

climate resilience and scenery are incorporated in conservation and land use plans and policies in the watershed through acquisition.

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00:06:32.244 --> 00:06:46.704

Key sites are permanently protected And connectivity of conserved habitats and natural areas in watershed is achieved. And once again, I'm sharing the details of our goal with you, just to provide greater context for the AM&RC project.

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00:06:46.704 --> 00:06:49.764

And also for the topics we've been exploring this webinar series.

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00:06:50.603 --> 00:06:56.124

So most of our team's efforts to achieve that goal are focused on local land

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00:06:56.124 --> 00:06:58.194

use and conservation planning,

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00:06:58.194 --> 00:07:00.024

and we work with many municipalities,

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00:07:00.353 --> 00:07:00.744

Land trusts

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00:07:00.744 --> 00:07:05.994

and others to advance plans and policies that address these conservation priorities.

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00:07:05.994 --> 00:07:07.553

And if you'd like to learn more about our work,

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00:07:07.553 --> 00:07:09.324

I hope you'll visit our website,

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00:07:09.353 --> 00:07:23.783

which is a clearing house of information about natural areas and biodiversity in the watershed as well as conservation and land use planning approaches, case studies from different municipalities, and different resources to help others with these kinds of

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00:07:23.783 --> 00:07:24.384

efforts.

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00:07:27.384 --> 00:07:38.843

So specifically, one of our projects, the amphibian migrations and road crossings project focuses on the group of amphibian species that are of conservation concern in New York, and really throughout the Northeast.

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00:07:39.113 --> 00:07:47.874

And these amphibians live in a forest, and they migrate to vernal pools for breeding in late winter, early spring. And then they return to the forest.

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00:07:49.254 --> 00:08:00.504

And it's their use of multiple habitats and these seasonal movements between these habitats that really calls for conservation actions. So, first, to raise awareness about vernal pools.

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00:08:01.014 --> 00:08:09.024

Their incredible ecological value and the importance of maintaining complexes of large, far as internal pools. Dr Mary Beth Kolozsvary.

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00:08:09.024 --> 00:08:21.923

gave a wonderful presentation on vernal pools at our 1st webinar and I'll repeat my request that if everyone on the webinar, which right now we're up to over 200 could teach at least one other person something they learned about vernal pools

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00:08:21.923 --> 00:08:24.744

It'll really help in this collective awareness raising.

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00:08:27.293 --> 00:08:40.974

2nd, as I've mentioned before in large, unfragmented natural areas, salamanders, and frogs can move to vernal pools for breeding without ever leaving the shelter of the forest floor. But in landscapes shared with human communities.

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00:08:41.004 --> 00:08:52.673

Habitat connectivity is often lost and these amphibians encounter roads and development and other risky areas that must be crossed to reach their destination. And so many programs throughout the Northeast.

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00:08:52.703 --> 00:09:02.783

Like, our project here in the Hudson Valley help to reduce mortality by having volunteers locate road crossings and then move migrating, amphibians to crossroads.

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00:09:03.058 --> 00:09:09.028

Our speakers in the 2nd webinar Brett Thelen and Chris Slesar talked about

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00:09:09.028 --> 00:09:11.303

Kind of pushing the needle even further,

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00:09:11.604 --> 00:09:12.024

um,

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00:09:12.053 --> 00:09:14.783

on helping road mortality,

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00:09:14.903 --> 00:09:20.364

or helping decrease and prevent road mortality through a temporary road closure in Keene

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00:09:20.364 --> 00:09:21.354

New Hampshire uh,

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00:09:21.384 --> 00:09:21.864

and,

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00:09:21.894 --> 00:09:22.313

uh,

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00:09:22.344 --> 00:09:28.524

Culvert construction in Monkton, Vermont that allows for safe passage of migrating amphibians under a busy road.

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00:09:30.024 --> 00:09:31.014

And then finally,

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00:09:31.043 --> 00:09:42.984

we can work toward increasing protection of vernal pools and forests to support amphibians of conservation concern and really all of the other flora and fauna that use these habitats as we'll learn from Matt tonight,

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00:09:42.984 --> 00:09:44.153

in our final webinar,

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00:09:44.183 --> 00:09:44.543

um,

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00:09:44.573 --> 00:09:47.724

in New York state regulation of small wetlands is limited,

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00:09:48.053 --> 00:09:52.254

there are opportunities for willing landowners to be stewards of these habitats.

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00:09:52.553 --> 00:09:54.984

And in states, like New York with home rule.

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00:09:55.374 --> 00:10:08.514

Municipalities have the authority to create plans and policies that address conservation priorities around will share an innovative local model that main from me, that will help us to consider other opportunities.

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00:10:08.514 --> 00:10:10.374

We can adapt in our own communities.

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00:10:12.144 --> 00:10:20.693

And along those same lines, I just want to throw out a save the date or you can register Now, if you'd, like, I think Emma is going to share the link.

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00:10:20.754 --> 00:10:26.754

Our next webinar in our monthly conservation and land use webinar series is going to focus on conservation overlay

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00:10:26.783 --> 00:10:27.264

zoning,

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00:10:27.504 --> 00:10:32.604

which is an approach that municipalities can use to protect important areas like source

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00:10:32.604 --> 00:10:32.964

water,

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00:10:32.964 --> 00:10:33.624

watersheds,

106

00:10:33.624 --> 00:10:34.073

wildlife,

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00:10:34.073 --> 00:10:34.943

habitat,

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00:10:34.974 --> 00:10:38.303

and even forest and vernal pool complexes.

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00:10:39.234 --> 00:10:52.494

That will be on March 23rd, and then finally for new volunteers or previous volunteers in need of a refresher we'll be holding a vernal and RC training on February 22nd. And so hopefully.

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00:10:53.999 --> 00:10:57.448

Emma is sharing both of those registration links in a chat box.

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00:10:59.423 --> 00:11:13.073

Okay, well, thanks for listening. So, now onto the main feature I am so thrilled to have 2 speakers today with tremendous experience and expertise in vernal pool conservation to close out our webinar series.  
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00:11:13.553 --> 00:11:25.224

We're 1st, going to hear from Dr. Messenger. Matt is chief sociologist at the New York natural heritage program where he oversees wildlife conservation and inventory projects.  
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00:11:25.974 --> 00:11:37.283

Some of Matt's many accomplishments include helping to describe a new species of Leopard frog along the Atlantic coast overseeing statewide surveys for Rare tiger beetles, Co-authoring.  
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114

00:11:37.283 --> 00:11:50.573

The New York dragonfly and damselfly survey, modeling habitat connectivity and responses to climate change of a variety of animal species, and also helping to design a well monitoring effort for the New York Bight.  
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00:11:50.604 --> 00:12:02.933

But most recently, he led an EPA funded study of vernal pools in New York state, which he'll be talking about tonight, and I will introduce before her talk, which will follow Matt's.  
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00:12:02.933 --> 00:12:17.303

But for now, Matt, I'm gonna make you presenter here, and I'm just going to say, it's always a pleasure to hear your presentations, Matt, and learn about your work and thank you so much for being here. And you should be able to share your presentation. Now.  
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00:12:19.553 --> 00:12:32.153

Thank you Laura and I repeat back at you he said to me, it's always a pleasure to be invited by the Estuary program and its partners to present.  
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00:12:32.874 --> 00:12:46.104

It's a great platform. I love the work that the FDA program does. And you and your colleagues make a huge difference for bio diversity, conservation and Hudson Valley. So I'm very, very happy to be invited to present here. Well, thanks so much.  
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00:12:50.423 --> 00:12:52.224

You should be seeing my slides now. this is,  
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00:12:52.224 --> 00:12:52.673

um,  
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00:12:53.933 --> 00:12:54.563

in some ways,  
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00:12:54.563 --> 00:12:59.933

a very simple piece of science that I want to present to everybody,

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00:13:00.744 --> 00:13:06.504

it's an EPA funded study as Laura mentioned that we completed last year.

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00:13:06.833 --> 00:13:20.634

And the idea in short is just how to determine the vernal pool significance across New York. And the reason it might be useful to determine of what a significant vernal pool is as opposed to just any vernal pool.

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00:13:20.964 --> 00:13:32.274

Is that vernal pools by themselves are not rare habitat type? They are as many of, you know, reasonably common across New York state differently.

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00:13:32.274 --> 00:13:44.394

So, in different parts of the state, and the Hudson Valley, they're quite common and a former staff person in the division of fish and wildlife for the DEC.

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00:13:44.394 --> 00:13:59.063

You said, I heard her say, once you can't swing a dead cat without hitting a vernal pool, some of you on the call will know who that was. And, and the point being is they're not a rare of habitat and so why should we spend a lot of effort to protect them?

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00:13:59.094 --> 00:14:08.033

I don't believe she was making an argument against their protection. Only that how do you distinguish among the best of vernal pools, the most important vernal pools.

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00:14:08.339 --> 00:14:13.678

And many states in the Northeast, in fact, almost all states in the Northeast have some

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00:14:13.678 --> 00:14:27.624

Way to formally designate vernal pools as significant, or of conservation interest. So this was an attempt to do that for New York state. I wanted to give you first, a little bit of an overview of my program just quickly in case

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00:14:27.624 --> 00:14:37.614

You haven't heard of the natural heritage program we are part of a natural heritage network. These are programs that the nature Conservancy started creating in the 1970s.

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00:14:38.903 --> 00:14:46.313

Recognizing the need to track, rarity and elements of conservation, concern. species and habitat types of conservation concern.

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00:14:47.094 --> 00:15:00.323

Those programs were eventually spun off into state governments and universities and overseeing as a sort of umbrella organization who sets the standards for natural heritage programs by nature serve,

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00:15:00.323 --> 00:15:03.234

which is another TNC spinoff back in the 1980s.

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00:15:03.234 --> 00:15:14.153

so, we are currently a program of the College of environmental science and Forestry, the SUNY College of environmental science and forestry, which is based in Syracuse but we are in Albany and we.

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00:15:16.229 --> 00:15:20.759

In normal times, anyway, work out of the offices of the DEC in downtown.

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00:15:20.759 --> 00:15:27.719

Albany. Here, this is not my DEC office - I'm still working at home for the most part. Um, during the covid crisis.

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00:15:29.994 --> 00:15:38.214

So, I'm trying to ignore the chat messages when they come in. It's so hard for me. I get distracted so easily. It's terrible.

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00:15:39.024 --> 00:15:53.663

In any case, the natural heritage program, our main our main work is to track rarity throughout the state university inventory mapping for the state. So we have house the database that that is, um.

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00:15:54.028 --> 00:16:00.389

That is consulted during the environmental review process that the state, and, and our own program conduct.

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00:16:00.504 --> 00:16:14.964

And so that's an important part of what we do and so identifying the most important vernal pools in New York state seems like a natural fit to me in in engaging in that kind of study. This is my disclaimer slide.

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00:16:16.193 --> 00:16:30.413

And these are the kinds of organisms that I work with, and they range from frogs to whales to Moss, to dragonflies and birds. And, and this is my way of saying, despite Laura's kind words, I'm not an expert in vernal pools.

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00:16:31.073 --> 00:16:36.024

But we are very fortunate if you watched Mary Beth Kolozsvary's

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00:16:36.053 --> 00:16:50.514

talk and still available to watch I highly recommend you check out her very thorough overview of vernal pools and their ecology and conservation and we're very lucky to have Dr Aram Calhoun

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00:16:50.783 --> 00:16:53.604

presenting next and she's one of the,

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00:16:53.663 --> 00:16:54.474

the world's experts,

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00:16:54.474 --> 00:16:56.004

I would say on vernal pool.

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00:16:56.004 --> 00:17:10.794

So we're very fortunate to have them there. And I will skillfully deflect all questions to the real experts. But, I wanted to give the very quick overview of the importance of vernal pools for those of you, who might not have caught that talk or who might be new to the topic.

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00:17:11.068 --> 00:17:25.679

Uh, these are small, ephemeral wetlands. They're widespread in the Northeast, but they're critical habitat for a lot of species that rely on the absence of fish and these habitats. These are water bodies that are temporary. Like I said, and they dry up.

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00:17:25.679 --> 00:17:28.739

Uh, most years by mid summer.

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00:17:28.943 --> 00:17:40.374

Or late summer, and they're not connected to other waterways. That means they cannot, they cannot how it's fish and fish are known predators on a lot of these species.

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00:17:40.374 --> 00:17:53.903

So, they can live in a predator free environment, the poster children for the, for vernal pools, or the spotted salamander at the lower left and the wood frog in the middle left. But also the blue spotted salamander and the fairy shrimp.

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00:17:54.239 --> 00:18:04.949

So, because they are small, they are easily destroyed. In fact, they can be hidden on people's land and be destroyed before

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00:18:04.949 --> 00:18:13.588

anyone knows they're there and they're poorly protected in most of the Northeast and, and I would argue in New York in particular.

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00:18:13.588 --> 00:18:26.278

So, because everyone on a Tuesday evening, likes to look at regulatory language. I would show you this piece of the, the environmental conservation law.

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00:18:26.278 --> 00:18:33.598

Which shows the reason we're in this predicament with vernal pools is that New York's wetland law.

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00:18:33.598 --> 00:18:39.058

Uh, call for wetlands of, of greater than 12.4 acres.

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00:18:39.058 --> 00:18:42.058

Um, get added to the wetland regulatory maps.

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00:18:42.058 --> 00:18:45.479

And have some, some regulatory status.

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00:18:45.479 --> 00:18:51.778

Wetlands, smaller than that are only eligible if they are unusual local importance.

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00:18:51.778 --> 00:19:02.153

And what is unusual local importance mean? Well, if it's of course, if it has any class one characteristic well, what are the class one characteristics? Let's dive a little deeper class.

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00:19:02.153 --> 00:19:11.273

1, wetlands are, are ones that are classic critical above where they have an endangered or threatened animal species or an endangered, or threatened plant species.

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00:19:11.483 --> 00:19:23.993

But what, if you're not so fortunate to have a tiger salamander, which is the only place, the only threatened animal or endangered animal that you will find in vernal pools in New York state and they're only on Long Island.

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00:19:24.773 --> 00:19:39.534

If you're not so fortunate to have one of those, but you're interested in being of usual, local importance. Well, look at this category for what, if you support an animal species in abundance or diversity that's unusual for the state, or the major region of the state in which it is found.

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00:19:40.409 --> 00:19:54.179

So, this caught my eye years ago, and I thought what, if we tried to define this with a field study and a compilation of existing data? And so that's what we attempted to do with our EPA study.

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00:19:54.179 --> 00:20:07.733

Um, pardon the pun, but I wanted to show just a quick schematic for why we are thinking about pools at the individual pool level, as opposed to a complex.

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00:20:07.794 --> 00:20:12.324

So many of you are familiar with the fact that

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00:20:12.894 --> 00:20:27.443

Vernal animals often live in what ecologists call meta-populations - that means sort of a population of populations and there might be one big source pool in the center of a complex of vernal pools, and animals might move

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00:20:27.624 --> 00:20:31.074

around between these pools and pools might be important

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00:20:31.193 --> 00:20:40.614

For productivity one year, and then dry out the next. And so there's a lot of dynamism in this system, and they exist in these complexes.

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00:20:40.614 --> 00:20:46.884

But the reality is, you know, there might be tons of frogs in one place and just a few frogs and another.

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00:20:47.278 --> 00:20:51.358

But then, and there's a lot of movement, as I mentioned, I'm, ahead of my

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00:20:51.358 --> 00:20:56.429

Animation here, but the reality of land ownership is that

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00:20:56.429 --> 00:21:00.148

Often these complexes are carved up among land ownership.

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00:21:00.148 --> 00:21:10.644

And so, it might be the case that a complex is that one pool on one person's land and other pool is on public land and other pools on somebody else's private land.

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00:21:10.854 --> 00:21:21.743

And so managing and conserving pools at the level of the complex is very hard. Plus, most available data are available at the level of the individual, isolated pool.

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00:21:22.134 --> 00:21:36.683

So therefore, the unit of conservation is often the pool, and its surrounding uplands. So, we took that approach here, even though in an ideal world, we would be managing and conserving pools as the complexes in which they exist on the landscape.

178  
00:21:37.943 --> 00:21:47.874

And because on Tuesday evening, everyone likes a conceptual model. I thought I would throw this in too. And the point of this is not to have you memorize all these boxes and arrows and things.

179  
00:21:47.874 --> 00:22:02.423

But we know that there are a lot of factors that affect what goes into some characterization of vernal pool quality. And so, you know, things about the landscape context. Is it in an urban area?

180  
00:22:02.423 --> 00:22:07.614

Is it in over bedrock versus over you know

181  
00:22:07.919 --> 00:22:13.048

Uh, some, really sandy substrate. How

182  
00:22:13.048 --> 00:22:16.169

How intact and

183  
00:22:16.169 --> 00:22:20.969

Um, how intact is the surrounding forest and at what age class is that forest

184  
00:22:20.969 --> 00:22:33.509

Is it within a larger complex and those affect the abiotic and biotic conditions you expect at vernal pools so all these to conditions here, like Hydro period depth and area are Really important.

185

00:22:33.509 --> 00:22:44.933

Uh, for determining the Biotic composition of the pool, and then there are elements of a pool that the vernal pools that we're not even able to get into in this study like the macro invertebrates community.

186

00:22:45.203 --> 00:22:59.243

But breeding amphibian community is sort of the typical metric of when a pool quality, and a lot of other states, and a lot of other studies. So, lots of things can go into a definition of quality. We will be focusing on the breeding amphibian community in part

187

00:22:59.243 --> 00:23:00.894

Because that's what many others have done.

188

00:23:01.229 --> 00:23:14.814

So we built this project and in 2015 is when we applied for the funding and started the project in 2016, it's funded, it was funded by the Environmental Protection Agency as part of a wetland program development Grant and here were the project goals we wanted to strengthen the

189

00:23:16.709 --> 00:23:28.558

Regulatory capacity for New York state, to make recommendations for New York state by compiling as much available data as we could, knowing that there have been a lot of studies of vernal pools around New York.

190

00:23:28.558 --> 00:23:31.828

But nobody ever brought them together in one place before.

191

00:23:31.828 --> 00:23:42.598

So you know to fill in knowledge gaps. So, if we knew that there have been a lot of studies, say in the Hudson Valley, where there have been a lot of studies, but less So in the Great Lakes

192

00:23:42.598 --> 00:23:47.909

Region of the state, then we wanted to make sure to do our own field sampling to fill in those gaps.

193

00:23:47.909 --> 00:23:56.398

So we hope to have potential criteria for ULI, which is unusual local importance. You'll hear that acronym again.

194

00:23:56.398 --> 00:23:59.578

The potential criteria for ULI designation

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00:23:59.578 --> 00:24:09.473

In different parts of the state, in different hydrological basins, and in different urbanization contexts, and then to help with identifying potential indicators of vernal pool quality.

196

00:24:09.473 --> 00:24:14.784

So that organizations like the DEC, who have limited capacity to be  
197

00:24:15.148 --> 00:24:23.308

At a vernal pool, right at peak breeding time every year might be able to  
to be able to do surveys at field surveys and other times a year to  
identify

198

00:24:23.308 --> 00:24:26.489

Uh, characteristics of quality pools.

199

00:24:26.814 --> 00:24:36.503

So, here's the cover of the report that we put out in June. I want to  
acknowledge Co-authors from New York natural heritage Program, Laura  
Shappell, who's our wetlands

200

00:24:36.503 --> 00:24:44.753

Ecologist, Leah Nagel who worked for NYNHP but also did her masters  
thesis on this project.

201

00:24:45.028 --> 00:24:53.999

Uh, and her major advisors, James Gibbs from SUNY ESF and finally Stacy  
McNulty who's an ecologist and, um.

202

00:24:53.999 --> 00:25:02.009

Associate ecologist I believe at the Newcomb campus of ESF at the  
Adirondack ecological center.

203

00:25:02.009 --> 00:25:11.394

A lot of experience that she brought to the effort. So all this work was,  
there were a lot more people - you'll see a list at the end that were  
involved in this project.

204

00:25:11.394 --> 00:25:18.022

But these are the, the 4 people who really pitched in and help design and  
implement the study.

205

00:25:19.433 --> 00:25:32.634

We had a lot of data partners, not going to read this list, but a lot of  
people that we asked for data on vernal pools, and they shared those data  
and that was really, really helpful because we wanted to compile the best  
data set of available

206

00:25:32.663 --> 00:25:42.564

vernal data we could and we, we did a pretty good job I think. we ended  
up with almost 4,000 pools in our dataset.

207

00:25:42.564 --> 00:25:51.144

And these ranged you can see different parts of the state have better  
coverage than others. The Hudson-Mohawk region.

208

00:25:51.144 --> 00:26:04.763

These are the wetland regions, so they're based on hydrologic basins and  
we combined a couple down on the lower Hudson and New York City and long



island. We combined into a single region because there wasn't enough data to.

209

00:26:05.308 --> 00:26:20.183

To address those separately, so we wanted to characterize vernal pool, quality by region, and we have good data for some regions. Really Good data in the Hudson Valley, for instance, decent data across the southern tier left. So, in the Great Lakes, not that many pools.

210

00:26:20.183 --> 00:26:21.203

Now, is that because.

211

00:26:21.598 --> 00:26:31.888

People haven't found them and documented them and studied them or is it because they're just a rarer type there. That's a question. We tried to address similar to the Adirondacks where, um.

212

00:26:31.888 --> 00:26:42.509

Where there were some places where pools have been studied, intensively like, Newcomb, like Paul Smith, and then scattered other occurrences, different pools and undoubtedly there are more pools out there.

213

00:26:42.509 --> 00:26:47.759

That really wasn't The goal of the project to compile all available.

214

00:26:47.759 --> 00:26:52.138

pool locations, but that is a product that we hope to be able to.

215

00:26:52.138 --> 00:27:03.209

polish up and make available for people to use as a resource. What we wanted out of these data more than anything were the biodiversity data associated with these pool locations.

216

00:27:04.584 --> 00:27:10.134

And the most common metric was not a surprise, but people like to conduct egg mass counts.

217

00:27:10.433 --> 00:27:22.763

They consider these and scientists consider these a really useful metric of formal pool productivity and, and they're visible and you can, you can go to the pools. You can count.

218

00:27:23.068 --> 00:27:32.368

Big masses with a pretty good degree of accuracy. The species are reasonably simple to Tell apart. These are wood Frogs on the lower right;

219

00:27:32.368 --> 00:27:41.459

Spotted salamander are on the upper left. And so we ended up with hundreds of these pools that had egg mass counts.

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00:27:41.459 --> 00:27:53.753

Uh, count data associated with them. They varied across years they varied across observers, with all that kind of fluff that we have to deal with when we have a big data kind of project certainly applies here.

221

00:27:53.753 --> 00:28:01.044

So we have to take those things into account as we're interpreting the results that there are different methodologies, different people doing counting, different years.

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00:28:01.044 --> 00:28:15.294

And we know there's variations there all that said, I think we can still make some useful inferences from the data. We could compile so we filled in the gaps The best We could around the state.

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00:28:15.324 --> 00:28:29.513

We sampled over 200 pools. We took we did egg mass counts. We took water quality measurements, noted other amphibians and vertebrates, some basic vegetation composition and structure measurements and Hydro-period length, width And depth.

224

00:28:30.269 --> 00:28:41.249

And we had some other fun finds along the way there's a red eft of course, the terrestrial stage of the eastern spotted newt.

225

00:28:41.249 --> 00:28:50.128

On the upper, right Oh, somebody who has who's an expert can tell me now if that's a I put this in here because it wasn't a spotted salamander, but maybe Jefferson.

226

00:28:50.128 --> 00:28:53.189

Or is it a spotted? Yeah, somebody can tell me.

227

00:28:53.189 --> 00:29:03.328

So, Laura, right is one of our field technicians Aaron, with a painted turtle and there's the northern Leopard frog on the on the lower left and then.

228

00:29:03.328 --> 00:29:16.499

I think I hope this will work just a little video of a fairy shrimp, because they're just so beautiful to watch and we didn't run into them all that often. In our study. In part We didn't design the study, We didn't time the study.

229

00:29:16.499 --> 00:29:28.134

For fairly shrimp, we timed it for egg mass counts, but we didn't run into fairy shrimp quite as often as we might have thought. So they're just a beautiful creature that I would love to learn more about.

230

00:29:28.134 --> 00:29:38.693

And there's a few different species in New York and we need to investigate further, whether there might be some rarity in there. There might be some rare species that we should be concerned about.

231

00:29:38.999 --> 00:29:50.038

There's Laura Shappell on the upper left in the vernal pool staring up at the sky and some of some people who helped out with our studies. So, Laura also led a team of

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00:29:50.038 --> 00:29:54.328

others of us at Heritage and other field partners.

233

00:29:54.804 --> 00:30:00.144

In a really intensive sampling of about 30 vernal pools in the summer.

234

00:30:00.413 --> 00:30:11.423

So, they went back to some of the pools where we had egg mass counts and did really, really detailed habitat measurements at those pools again, to try to get an idea of what might be good indicators of helpful biodiversity.

235

00:30:11.729 --> 00:30:15.209

I'll just show you some of the quick results. Um.

236

00:30:15.209 --> 00:30:19.858

very quick results and just a couple of highlights. Really

237

00:30:19.858 --> 00:30:34.644

Um, one aspect I wanted to show you, is the variation in egg mass counts by region of the state, and these letters are just scientific notation for showing that are significant differences from.

238

00:30:34.644 --> 00:30:47.394

If you see all the all the sites with are statistically the same, but the one with a B stands out and you can see that. There's a huge, much greater range of variation in the Hudson Valley.

239

00:30:47.394 --> 00:31:01.973

This is in the Hudson Valley, in terms of its egg mass counts, but also a much greater mean for egg mass counts in the Hudson Valley. So more productive for spotted salamanders in the Hudson Valley compared to the rest of the state.

240

00:31:03.173 --> 00:31:12.263

And the same message for wood frogs, with a slight variation in the significant difference here is only between the Hudson Valley and the southern tier.

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00:31:12.443 --> 00:31:26.153

Otherwise, these, these cannot be distinguished, statistically, but you can see some trend and again greater variation in wood frog counts in the Hudson Valley compared to the other parts of the region. So, the Hudson Valley is a special place.

242

00:31:26.394 --> 00:31:30.473

It's really important for spotted salamanders and wood frogs - I think that much is clear.

243

00:31:33.473 --> 00:31:39.054

One other little tidbit here, LCA is an index and sorry to be

244

00:31:39.054 --> 00:31:48.594

So jargony here but is an index that scientists at natural heritage have come up with for determining the degree of human disturbance.

245

00:31:48.898 --> 00:32:01.739

Um, in the landscape it's called the landscape condition assessment is what it stands for and that was developed for an earlier EPA project. So the greater the score, the more, the higher degree of human influence.

246

00:32:01.739 --> 00:32:15.209

And the index is takes into account the distance from these different landscape stressors, like impervious surfaces and human activity and roads. And, um.

247

00:32:15.209 --> 00:32:20.159

I know those overlap with each other, but roads and urbanization and development and, um.

248

00:32:20.753 --> 00:32:34.824

And so all those things, are taken into account in this index, and you can see that spotted salamander in this graph - spotted salamander productivity, or at least breeding effort declines pretty steadily with increasing human disturbance.

249

00:32:35.723 --> 00:32:43.523

This is not causal. Right? But I think you could hypothesize a lot of reasons why biodiversity or

250

00:32:43.584 --> 00:32:52.193

Excuse me amphibian productivity might go down with increasing human disturbance from loss of surrounding habitat to pollution to roads.

251

00:32:52.709 --> 00:32:58.679

Right, and I, I'm not going to apologize for this.

252

00:32:58.679 --> 00:33:10.888

Slide because it's like, 200 people on this call, which is fantastic. And so somebody out there can help me figure out how to how to make this chart or this table.

253

00:33:10.888 --> 00:33:18.358

Makes sense to people besides me. Right? So, I want to do my best here to, to walk you through what it means.

254

00:33:19.044 --> 00:33:32.993

One of our goals here and then I want and then I want advice. I want somebody to come up with a graphic that displays this in a plain simple way because all I can do with this and I think it's kind of embarrassing. So, and nerdy.

255

00:33:33.173 --> 00:33:41.844

So, the idea here is that we wanted to help come up with potential thresholds of importance.

256

00:33:42.148 --> 00:33:45.358

Whether you're interested in.

257

00:33:45.358 --> 00:33:49.439

AMMA and that's spotted salamander

258

00:33:49.439 --> 00:33:55.648

*Lithobates sylvatica*, which is the wood frog or the 2 species combined.

259

00:33:56.483 --> 00:34:07.973

And this is again guidance for New York state. Ideally. Right and if you're interested in designating the top 30% of pools as significant, or the top 25% or the top 20 up to 10% of the pools.

260

00:34:07.973 --> 00:34:12.353

And if you're interested in a single statewide metric of significance.

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00:34:15.028 --> 00:34:20.398

Versus metrics that are separated by region and in particular calling out the Hudson Mohawk.

262

00:34:20.398 --> 00:34:23.668

Because maybe a significant pool in the Hudson-Mohawk

263

00:34:23.668 --> 00:34:34.014

needs to meet a bit of a higher standard than in one of other parts of the state because we know that that's a really productive area for everyone else pools. So, Hudson-Mohawk versus all other regions.

264

00:34:34.253 --> 00:34:48.893

And then if you're in an area of really high development, maybe the standard could be a little bit lower because maybe we want to be preserving vernal pool habitats as much as possible in urban areas. And so you can have a bit of a lower bar for those.

265

00:34:49.313 --> 00:34:51.954

So these numbers then are

266

00:34:53.664 --> 00:35:07.313

Rounded egg mass counts based on the hundreds of pools in our database, depending on your target here. So let's say that the state was interested.

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00:35:07.344 --> 00:35:20.423

We want to designate the top 20% of pools as significant, and we want to do that for both spotted salamanders and wood frogs combined. And we think it's too complicated to divide it up by regions for a single statewide effort.

268

00:35:21.059 --> 00:35:29.159

Well, maybe then you would choose a number, like, 75 and 75 would mean pools that have greater than 75 egg masses

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00:35:29.159 --> 00:35:38.159

Ever really - any count, any particular year that can reach that threshold might be designated as, as a significant vernal pool.

270

00:35:38.693 --> 00:35:52.764

So, y'all can tell me how I did - y'all. I'm not from the South. I'm from Manhattan, but you all can tell me how I did in describing that during the Q. A, and you can help me come up with visual ways to represent this very complex.

271

00:35:52.974 --> 00:36:02.333

But I think really, the crux of our entire study is this and so I couldn't not present it because I think this is the most important thing that came out of the work. We did over 5 years.

272

00:36:03.748 --> 00:36:13.199

So, besides those egg mass counts of the common species - spotted salamanders and wood frogs are not rare species.

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00:36:13.199 --> 00:36:19.708

But they're common, and there are places that may be more important for those common species and others.

274

00:36:19.708 --> 00:36:34.373

There may be other indicators of vernal pool quality that we want to consider. So, here's 4 examples of those. The presence of fairy shrimp at all might be an important indicator of a, of a significant vernal pool. We didn't find very shrimp in many of the pools.

275

00:36:34.373 --> 00:36:40.943

We sampled again of the data we compiled, and the data we collected, were not designed around that.

276

00:36:41.248 --> 00:36:56.123

So, I think we have a bit of an underestimated vernal pool of excuse me various shrimp presence in our study. But I think that could use more exploration and thought we know that very shrimp are obligate vernal pool users.

277

00:36:56.753 --> 00:37:07.733

They cannot breed in the waters That are not temporary to do that then do not dry up whereas spotted salamanders might be called obligates sometimes, but really they're.

278

00:37:08.068 --> 00:37:11.938

That there might be their preference, but they can breed elsewhere.

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00:37:11.938 --> 00:37:16.199

Very true. We know. Are, are not and they're like I said, there's sort of unstudied.

280

00:37:16.199 --> 00:37:22.289

Um diversity within that group that we might want to pay attention to, um.

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00:37:22.289 --> 00:37:25.949

Jefferson salamander, we could come up with a, um.

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00:37:25.949 --> 00:37:33.744

A threshold based on egg mass counts for Jefferson's salamander to all our data set was not as large and so that's something else we might want to consider,

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00:37:33.744 --> 00:37:42.773

especially since they hybridized with blue spotted salamanders there are some places in New York where it appears that they're genetically pure Jeffersons and blue spotted,

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00:37:42.773 --> 00:37:47.364

and that might be something to consider in vernal pool significance on the upper right.

285

00:37:47.364 --> 00:37:53.873

Is that example is meant to look to show a corresponding degree of course, when you degree is something that, that.

286

00:37:54.688 --> 00:38:07.554

Seems to be related to egg mass productivity or egg mass counts. So it does appear - and that's not that surprising. It's good cover for amphibians. It's good

287

00:38:08.423 --> 00:38:14.514

Good places for attachment for egg masses and so looking at vernal pools with high coarse woody debris might be

288

00:38:14.514 --> 00:38:24.623

Another good way to identify significant pools and then I brought back in the Great Lakes, because we didn't find a lot of pools in the Great Lakes there is just a region of the state where there aren't that many.

289

00:38:24.623 --> 00:38:29.664

And so that that could be a place where you might say we want to protect every pool in that region.

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00:38:30.179 --> 00:38:36.900

Regardless of its apparent value to wood Frogs and spotted salamanders.

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00:38:36.900 --> 00:38:40.949

All right wrapping up here.

292

00:38:40.949 --> 00:38:46.710

So, New York is behind and I say this.

293

00:38:46.710 --> 00:39:00.775

And I say this with knowing that some of my colleagues in the near DEC are on the call and I love them and they do great work and it's not their fault because it's really hard. It's really hard to get people to care about Puddles Right.

294

00:39:00.775 --> 00:39:13.315

It's really hard to get people to, you know, we've done so much with wetland protection already where you want to add something to the, you know, the list of, and the tiny little things that are just good for, for slimy critters and shrimp.

295

00:39:13.405 --> 00:39:24.775

You know, so I get that it's a really hard sell. There are people who are trying and my colleagues at the DEC are among them. I wanted to show that, um.

296

00:39:25.079 --> 00:39:39.264

Surrounding states have some measure of this already so in Connecticut, all vernal pools are regulated in Maine as Aram can talk about later. And some of this these data might be a little bit old.

297

00:39:39.264 --> 00:39:49.224

Mary Beth I know Has compiled a lot of information about surrounding states in their vernal pool regulations. So there could be a little bit of this that's out of date. But the idea is that

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00:39:49.619 --> 00:40:02.250

Maine and Massachusetts and Pennsylvania and Vermont and New Jersey all have criteria for what might make a significant vernal pool or a regulated vernal pool. So at least it's.

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00:40:02.250 --> 00:40:09.985

It's recognized and then carries some regulatory heft. Right now in New York.

300

00:40:09.985 --> 00:40:19.945

All we have is the ULI designation and it's hard. and I think we could potentially use these data toward more designations.

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00:40:19.945 --> 00:40:32.934

But I do also understand that, you know, there are changes in the works, potentially for New York's wetland laws that that might render That designation not that important, but that's about as deep as I could go into that topic.

302

00:40:32.934 --> 00:40:35.065

But I do hope that.

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00:40:35.309 --> 00:40:50.184

That we can aim toward a significant certified or regulated vernal pool designation for New York state. And I hope that our data can help with that tons of people contributed to this study. And so I really thank them. And I, thank you for listening.

304

00:40:54.445 --> 00:41:08.934

Thank you so much Matt, such a great project, and I can see how much value it would have to regulators and lawmakers trying to think about ways to expand well, and protection. I'm getting some feedback from aram that She's having a hard time



305

00:41:08.934 --> 00:41:09.565

Reconnecting.

306

00:41:09.565 --> 00:41:24.204

I know she was having a very windy day up in Maine, so I'm going to try my best to field questions and also ask Emma to maybe see if she could reach out to try to help her through the chat.

307

00:41:24.204 --> 00:41:33.684

She's been chatting, but in the meantime, Matt, one question that several people have had is whether or not the report is available to download.

308

00:41:34.019 --> 00:41:37.139

Or to view, or to get a copy of.

309

00:41:37.139 --> 00:41:42.510

You know, I don't think we put it up on our website yet, to be honest. So we should do that.

310

00:41:42.510 --> 00:41:56.664

Um, if we actually put it up on, I went there well, I can tell everybody who's on the call that when I follow up with the link to the recording, I will also include resources related to today's webinar.

311

00:41:56.664 --> 00:42:05.184

And I will include the report. Uh, in some form, if possible, if Matt can help me with that, either through the link to the site, or, um.

312

00:42:05.489 --> 00:42:17.670

If there's a PDF copy yeah, we have a website for the project. We have not yet put the report up. Uh, what happened was we, I finished the report and the next day

313

00:42:17.670 --> 00:42:23.610

Went on vacation for 2 weeks and it never happened. So, let me get the report up here.

314

00:42:23.610 --> 00:42:33.150

And I'll put a link in the chat for where you can go and just see the basics of the study in the meantime. And then we'll get the report up there pretty soon.

315

00:42:33.150 --> 00:42:46.885

I always say a webinar with 240 people is good motivation to follow through on. Yeah, right. No, that's a promise. I don't want to break, right? Oh, no. Now, I'm having low bandwidth. This is interesting. I'm in the DC office and I'm having low bandwidth. Okay, great. Um.

316

00:42:50.730 --> 00:43:02.880

Uh, well, while we check in, on another question, there was whether or not the study included wetlands out on Staten Island.

317

00:43:02.880 --> 00:43:17.550

And then there was another geographic question in terms of why there are limited vernal pools in the Great Lakes area. And I think it's a good reminder to folks that it's not that you did an exhaustive survey to map all vernal pools in New York state. So, maybe you could expand on that.

318

00:43:17.550 --> 00:43:23.400

Sure, there are some pools from Staten Island. Our colleagues at the New York City parks department.

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00:43:23.400 --> 00:43:37.494

Did survey work about 10 years ago 8 to 10 years ago on vernal pools of the city and Staten Island, I think, has the highest concentration of them. So there are some Staten Island pools in the study. Um, I hope they show up on the map. They should have.

320

00:43:39.059 --> 00:43:53.485

But then, the Great Lakes, it's the geology. I understand. It's the lake plain geology was just and this is where I'm going to get myself into trouble if I try to explain it. And I think there are probably people on the call who could do a better job.

321

00:43:54.295 --> 00:43:57.445

But my understanding is that that's a geology that is not.

322

00:43:57.750 --> 00:44:10.260

Um, comport itself to these sorts of ridges and pools and the sandy substrates of the lake plain are just not as suitable for vernal pool formation. So.

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00:44:10.260 --> 00:44:17.730

That plus a longer history of agricultural use. Um, and I think that.

324

00:44:17.730 --> 00:44:27.090

Agriculture is definitely responsible for the loss of a lot of vernal pools in, in the western part of the state. So I think that's it's a combination of those 2 things.

325

00:44:28.260 --> 00:44:34.139

Okay, it looks like Aram is here, Matt. Um, just for the sake of time cause.

326

00:44:34.139 --> 00:44:45.449

We went a little over I'm going to there's lots of questions coming in and maybe you could even look at the Q and a, if you have a moment to answer some but if not, we'll have some time at the end of, um.

327

00:44:47.005 --> 00:45:01.135

The talks to get to more questions. So I'm going to give a little intro here, and then give her presenter mode. And just Matt Thank you again. So much for that project. And also for your presentation.

328

00:45:01.889 --> 00:45:05.460

Okay, so now, um.

329

00:45:05.635 --> 00:45:12.625

Our 2nd presenter, I'm going to publicly admit has always been one of my vernal pool heroes.

330

00:45:14.065 --> 00:45:27.264

She led the way really, in our thinking about how to conserve adequate upland forest around pools and more recently. Now, has created a new locally driven voluntary vernal pool mitigation tool that we're going to learn about today and Dr. Calhoun

331

00:45:28.135 --> 00:45:43.074

is professor Emerita of wetlands ecology at University of Maine Department of wildlife fisheries and conservation biology her research interests include ecology and conservation and wetland policy at all levels of government and her work

332

00:45:43.074 --> 00:45:49.255

stresses the importance of conserving natural resources and or target species on private lands.

333

00:45:49.255 --> 00:45:52.135

By addressing both human and ecological dimensions,

334

00:45:52.465 --> 00:45:55.735

she maintains a website called of pools and people,

335

00:45:56.005 --> 00:46:02.545

which is rich information on ecology and conservation for vernal pools and provides resource materials for local entities,

336

00:46:02.545 --> 00:46:04.074

interested in local,

337

00:46:04.074 --> 00:46:05.275

vernal pool initiatives.

338

00:46:05.275 --> 00:46:16.045

So Aram, Welcome. Thank you For joining us today And bringing your expertise from Maine down to the Hudson Valley, you should be able to share your screen if you're having any difficulties. Let me know.

339

00:46:21.809 --> 00:46:27.840

I'm not hearing you either, and you do have presenter mode, so you should be able to share your screen. Now.

340

00:46:31.530 --> 00:46:35.400

There we go and.

341

00:46:35.400 --> 00:46:39.360

You know what it looks like you're muted, but I'm going to unmute you if I can.

342

00:46:39.360 --> 00:46:43.650

I can't. Oh, there we go. Good. I was, I was saying to you I.

343  
00:46:43.650 --> 00:46:49.289  
Oh, let's see what happened.

344  
00:46:49.289 --> 00:46:58.710  
Hold on you're muted again. Okay.

345  
00:46:58.710 --> 00:47:04.139  
You are, hey, can you hear me? I can hear you now and I can see your presentation beautifully. Excellent.

346  
00:47:04.139 --> 00:47:15.000  
Okay well, thank you very much for inviting maine to your pool party and I'm very inspired to hear of all the great work you folks are doing in New York.

347  
00:47:15.000 --> 00:47:26.820  
Um, it's very exciting. So, what I'm going to share today is a little bit on what we're doing in Maine to address the very issues that you raised. Um, Laura in the beginning.

348  
00:47:26.820 --> 00:47:30.929  
Of your talk this evening and.

349  
00:47:30.929 --> 00:47:34.170  
Without further ado I'm.

350  
00:47:35.909 --> 00:47:39.000  
Interested in, as you just alluded to.

351  
00:47:39.000 --> 00:47:43.500  
Um, how do we connect pools and forests through

352  
00:47:43.500 --> 00:47:56.400  
Private lands, so before I go any further, I want to acknowledge, I can't give you all the names, but there's like, 25 years worth of graduate students and undergraduate students and colleagues.

353  
00:47:56.784 --> 00:48:11.755  
And federal and state agencies and towns and residents at large who contributed and made possible all the research that I'm going to allude to, that has informed our management strategy. So there's a fleet of people.

354  
00:48:12.059 --> 00:48:17.130  
Behind what I'm presenting tonight, and I'm grateful to all of them and the vernal pool species.

355  
00:48:17.130 --> 00:48:27.599  
So, today's talk, I'm just going to give a little bit of a main definition. Mary Beth did a great job of describing from poor ecology, which you have recorded. So I'm not going to go over that.

356  
00:48:27.599 --> 00:48:36.000

Science behind what we're presenting as guidelines, the challenges which listening to Matt I see. Are.

357

00:48:36.000 --> 00:48:45.780

Probably global, and our way forward what it, what it is that we in may think we can do to help meet some of those challenges. Some of the very ones that.

358

00:48:45.780 --> 00:48:53.519

That Matt brought up in his talk. So briefly in Maine, these are dynamic wetland ecosystems.

359

00:48:53.519 --> 00:48:56.550

Ephemeral semi permanent, um.

360

00:48:56.550 --> 00:49:00.059

So Maine has no size minimum for.

361

00:49:00.059 --> 00:49:04.409

Regulating a vernal pool no permanent in water outlet.

362

00:49:04.409 --> 00:49:07.889

No breeding fish. Um, so fish.

363

00:49:07.889 --> 00:49:15.989

Are an issue and we need pools to be semi permanent so we don't have those and even green frogs and bull Frogs will.

364

00:49:15.989 --> 00:49:22.949

Decimate the egg masses in a vernal pool so we, we do not like to have those in the pools either.

365

00:49:22.949 --> 00:49:29.130

We don't define vernal pools by the vegetation. Um, we have forested wetland, shrub, swamps meadows.

366

00:49:29.130 --> 00:49:35.699

All of these can be vernal pools in Maine. We define them by the breeding amphibians that use them and by fairy shrimp.

367

00:49:35.699 --> 00:49:41.489

So, I won't go into them, but we, I'm just telling you what we have. We have wood frogs and spotted salamanders

368

00:49:41.489 --> 00:49:44.730

And the blue spotted complex in Maine.

369

00:49:44.730 --> 00:49:49.739

And the fairy shrimp, and those are the creatures that we've been focusing on in our research.

370

00:49:49.739 --> 00:49:54.119

We also have an obligate the only advocate vernal pool.

371

00:49:54.119 --> 00:49:58.860

Um, plant that we have is featherfoil so.

372

00:49:58.860 --> 00:50:11.670

I heard you talking about how do we sell these pools that people think are little mosquito breeding holes and how do we sell this to the public?

Well, we've been thinking about that a lot and.

373

00:50:11.670 --> 00:50:21.000

We've, we've come up with some greater forest functions beyond the slimy amphibians that I was horrified to learn that a lot of people don't even like to touch.

374

00:50:21.000 --> 00:50:28.710

So, in Maine, it's habitat for threatened and endangered species like the spotted turtle and the Blanding's turtle.

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00:50:28.710 --> 00:50:32.909

And even some invertebrates, like, the ringed boghaunter.

376

00:50:32.909 --> 00:50:47.849

So, they have value for those things, but of course, when we're doing server surveys, those animals are not in the pool. So they don't count.

Um, but the big thing for people of all flavors is carbon export, organic sugar if you will.

377

00:50:49.679 --> 00:50:54.929

If you look at this list of species that use vernal pools

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00:50:54.929 --> 00:50:59.190

To get sugar, you'll see that. Some of these are in yellow.

379

00:50:59.190 --> 00:51:07.530

And if you weren't over 200 people, I'd ask you what they are, and you would say, oh, those are species that people like to hunt.

380

00:51:07.795 --> 00:51:08.605

Or eat,

381

00:51:08.994 --> 00:51:17.485

and so suddenly vernal Pools have a greater value to the general public and you can see from this little schematic that they,

382

00:51:17.545 --> 00:51:18.445

the adults,

383

00:51:18.445 --> 00:51:19.375

the fairy shrimp,

384

00:51:19.375 --> 00:51:20.364

the eggs um,

385

00:51:20.364 --> 00:51:23.454

the larvae these are all sources of organic sugar.

386

00:51:23.730 --> 00:51:29.969

And in years, like, this is last year in my backyard when we were having a drought.

387

00:51:29.969 --> 00:51:41.820

There's a tremendous amount of carbon and nutrients in the spring when things are really hungry at the end of the season. If we have premature drying, there's another influx of lovely food.

388

00:51:41.820 --> 00:51:49.650

Um, when we were looking for disease, a lot of these larvae are snapped up before you can even go and see there's been a mortality event.

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00:51:49.650 --> 00:52:03.059

So, they're fast food oases and they provide dining in and dining out this work by one of my graduate students who had a camera trap on the vernal pools shows a Fisher visiting a pool in winter.

390

00:52:03.059 --> 00:52:08.909

Um, obviously waterfowl it's one of the 1st places to thaw out in the spring.

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00:52:08.909 --> 00:52:14.610

Great blue heron there have been reports of owls

392

00:52:14.610 --> 00:52:19.170

Taking spotted salamanders out of the vernal pools and their talons.

393

00:52:20.730 --> 00:52:24.869

Deer, as promised to the hunters Fox.

394

00:52:24.869 --> 00:52:36.510

In the summer bear will go down to the last moisture and eat green shoots and things like that. That's very common. I have a little pool in my backyard that bear frequent.

395

00:52:36.510 --> 00:52:43.500

Bobcat, and then if you don't wish to dine in vernal pools are wonderful for takeout food.

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00:52:43.500 --> 00:52:50.460

Um, a lot of the animals that we had radio transmitters on ended up in birds of prey.

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00:52:50.460 --> 00:52:58.289

And in garter snakes, so we know that there is a lot of delivery of all of that carbon to the forest.

398

00:52:58.289 --> 00:53:12.690

So, the science behind the management strategies are meeting the challenges that I want to go over. It's very brief. It's 25 years compressed into just a few major points that I think will resonate with you folks in New York.

399

00:53:12.690 --> 00:53:23.579

We, we did a lot of studying on the vernal pool and what is required for breeding of amphibians and vernal pools. I had a graduate student who.

400

00:53:23.579 --> 00:53:26.579

Don Morgan who

401

00:53:26.579 --> 00:53:38.760

Was very excited about really digging into where egg masses were being laid and I'm going to say something to Matt that actually it isn't easy to count them. Don found that.

402

00:53:38.760 --> 00:53:42.809

We thought would frogs all laid their eggs attached to things. She found them just

403

00:53:42.809 --> 00:53:56.639

As often, just laying on the leaf litter bottom. So it's, it's clear that we underestimate numbers of eggs, but we wanted to go beyond that because a lot of people have studied requirements for each of the different species for breeding habitat. And we have a good handle on that.

404

00:53:56.639 --> 00:54:01.050

So, what the lab focused on for a couple of decades.

405

00:54:01.050 --> 00:54:07.500

Was where are these guys going after the breed? Um, where are they going for summer Habitat the spotted salamander

406

00:54:07.500 --> 00:54:10.500

Wood frogs heading up to forest

407

00:54:10.500 --> 00:54:18.900

Um, coming back to breeding pools, but then again, wood frogs and blue spotted, salamanders may spend the summer in forested wetlands.

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00:54:18.900 --> 00:54:22.409

And we wanted to know where the juveniles were going as well.

409

00:54:22.409 --> 00:54:30.659

And when we got this information, we thought, well, if we can nail down the post breeding habits of these creatures, we will be in a better.

410

00:54:30.659 --> 00:54:40.349

Stance to give guidelines to homeowners or to towns who want to know well, what habitat do you want? How much of it do you want where to go? Where, where should it be?

411

00:54:40.349 --> 00:54:52.110

So, we took this creature and tortured it for a number of years by putting radio transmitters around their waists. And we conducted a study in mid coast Maine

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00:54:52.110 --> 00:54:58.409

And then we thought we would switch context and we did a study in the Western maine mountains. Each

413

00:54:58.409 --> 00:55:06.929

Red dot that you see there is a location of a wood frog. And what I want you to notice is that in the valley where the breeding pools were.

414

00:55:06.929 --> 00:55:13.230

You can see that in the summer the wood frogs even climbed over mountains and went over to the other side.

415

00:55:13.230 --> 00:55:18.960

So, we know that they're going much farther than we had imagined in much drier habitats.

416

00:55:20.099 --> 00:55:23.369

Then we decided to move our context to suburbia.

417

00:55:23.369 --> 00:55:30.659

And we followed wood frogs around in neighborhoods, each colored line that you see there is a different individual.

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00:55:30.659 --> 00:55:37.170

Each red dot that you see is a fix on the frog by the students.

419

00:55:37.170 --> 00:55:45.869

And we, we took all of these data all these 3 contexts to come up with some idea of what would frogs need when they leave.

420

00:55:45.869 --> 00:55:50.909

The pools, we followed them through hibernation into the fall.

421

00:55:50.909 --> 00:55:55.079

And then we looked at where they hibernated and asked.

422

00:55:55.079 --> 00:55:59.579

Are they selecting specific hibernation sites? Just like they select.

423

00:55:59.579 --> 00:56:12.659

Specific vernal pools and return to those pools 95% of the time. Well, we found out that they yes, they go back to hibernation sites and hibernation sites are statistically different than.

424

00:56:12.659 --> 00:56:16.920

Non hibernation, selections going the same distance.

425

00:56:16.920 --> 00:56:20.039

So, these guys are attentive to microclimate.

426

00:56:20.039 --> 00:56:24.449

We then switch to our unisexual.

427

00:56:24.449 --> 00:56:28.980

Um, complex of blue spotted salamanders - all of the girls or the females.  
428  
00:56:28.980 --> 00:56:33.929  
And follow them around to see what their post breeding habitats were. So.  
429  
00:56:33.929 --> 00:56:42.750  
That's it in a nutshell. Um, but I want to share with you, what we learned, and then tell you how we apply that to our latest tool.  
430  
00:56:43.829 --> 00:56:48.030  
We learned what you already know that they have complex habitat needs.  
431  
00:56:48.030 --> 00:56:56.429  
Wood frogs are have summer habitat in wetlands, blue spots have summer, habitats in wetlands, but they need uplands for hibernation.  
432  
00:56:56.429 --> 00:57:00.030  
And these particular.  
433  
00:57:00.030 --> 00:57:03.780  
Pieces of their habitat can be all over the place.  
434  
00:57:03.780 --> 00:57:10.170  
So, what do you do with that? We also learned that from a pool these animals.  
435  
00:57:10.170 --> 00:57:16.440  
Migrate hundreds and hundreds of feet from the pool to get to these other habitat features.  
436  
00:57:16.440 --> 00:57:21.420  
And we know that the juveniles go much farther than that and we were limited by.  
437  
00:57:21.420 --> 00:57:25.920  
What we could do, we can't put transmitters on them, so it was all pitfall traps.  
438  
00:57:25.920 --> 00:57:29.250  
And they, you know, let's just say, they go, they go kilometers.  
439  
00:57:29.250 --> 00:57:36.150  
Well, that's pretty daunting when you think about putting that into a regulation, particularly on private property.  
440  
00:57:36.150 --> 00:57:41.670  
So, what we do know is that they need to travel around landscapes.  
441  
00:57:41.670 --> 00:57:50.550  
And we know that people get permits for houses all over the wood frog landscapes or vernal pool amphibian landscapes in general. So.  
442  
00:57:50.550 --> 00:57:56.699

The big question is, how do we mitigate that? Fragmentation is the big issue.

443

00:57:56.699 --> 00:58:01.590

One of the things we learned from our study in the suburbs.

444

00:58:01.590 --> 00:58:13.469

Is that some of the issues are a lack of sufficient migration cover when they're going from a pool in the middle of the development out to the forest they need to get to lots of mortality events by lawn.

445

00:58:13.469 --> 00:58:18.480

Lawn mowers, Pets, sewer drains and lawn chemicals.

446

00:58:18.480 --> 00:58:25.079

A lack of hibernation sites because what's left in suburbia often it's the forested wetlands.

447

00:58:25.079 --> 00:58:38.969

And they can't hibernate and forested wetlands because they're too wet. So, we need to think about conserving upland habitats around suburban landscapes as well. And then, of course, there's fragmentation as they're trying to get to their wetland rest stops, which they use.

448

00:58:38.969 --> 00:58:42.119

As they're heading to other habitat elements.

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00:58:42.119 --> 00:58:50.159

Road salt, there's studies coming out about that increased bloating of our frogs when we do our, our road surveys.

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00:58:50.159 --> 00:58:55.500

Implications for diseases and connections with susceptibility to ranavirus.

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00:58:55.500 --> 00:59:03.630

We know that vernal pools in the summers are becoming warmer. We have higher incidents of of ranavirus.

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00:59:03.630 --> 00:59:12.059

And we know that green frogs in suburban landscapes are more abundant, because they're coming out of the detention basins.

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00:59:12.059 --> 00:59:20.670

They carry chitryd and ranavirus to the vernal pools and so we have high higher incidences of diseases.

454

00:59:20.670 --> 00:59:31.949

In wood frogs because of proximity of an unnatural level of both bull frogs and green frogs, which are in suburban detention basins.

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00:59:31.949 --> 00:59:35.519

So those are a lot of issues, um.

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00:59:35.519 --> 00:59:40.889

And then, of course, we know that our amphibians are hibernating in the winter.

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00:59:40.889 --> 00:59:46.440

But we have a roller coaster of temperatures in Maine. We've been.

458

00:59:46.554 --> 00:59:58.255

-20 -18 and then the next week it's been 50 degrees. We've already had some of the animals wake up and I'm getting emails from concerned citizens. I found a spotted salamander. I found a wood frog. It's a nightmare.

459

00:59:58.255 --> 01:00:08.394

The rain comes in these animals, because we have reduced snow cover. They have reduced insulation, they are coming out and then the other issue is that.

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01:00:10.289 --> 01:00:24.925

The forest is now solid ice, which is suffocating so we have some issues with climate change that we need to deal with salamanders come out and they can, these guys don't freeze like the wood frog. So, once we go back to -15.

461

01:00:26.250 --> 01:00:37.889

As we did the next week they die and their pools, this is a pool in my neighborhood. That is still completely frozen. It's not appropriate for making your way to that pool.

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01:00:37.889 --> 01:00:41.400

The other issue we have with climate change is that.

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01:00:41.400 --> 01:00:53.190

That pools are being dry at the time that the animals are coming out. This is from my colleagues in Rhode Island, who are telling me that the amphibians are coming and laying in dry beds.

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01:00:53.190 --> 01:01:00.480

Um, or in parking lots where there used to be vernal pools, there is such Natal fidelity that it seems.

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01:01:00.480 --> 01:01:07.710

More important than the conditions of where they're actually laying. No one's. They are adorable, but no one ever said they were horribly bright.

466

01:01:08.094 --> 01:01:19.945

Um, the other issue is that if the pools don't dry before egg laying - This is also last year. Remember we had a very droughty beginning to the summer and then we had a deluge at the end of the summer.

467

01:01:20.514 --> 01:01:23.695

These was in a semi permanent pool in the back of my house.

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01:01:23.909 --> 01:01:34.469

And it's, it was a complete loss in terms of hatching animals. It was a great feast for a lot of other creatures, but that pool was a loss. And that was a very productive pool.

469

01:01:34.469 --> 01:01:40.380

And then, at the other end, obviously pools drying before the animals can get out.

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01:01:40.380 --> 01:01:50.789

It has another function. I, I get calls from people saying, should I save all of these guys but, because of disease and because they do serve a function of feeding.

471

01:01:50.789 --> 01:01:56.309

Other wildlife, and of returning carbon to the pool. I always tell people not to move them.

472

01:01:56.309 --> 01:02:00.269

So, in summary, Laura already covered this.

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01:02:00.269 --> 01:02:08.820

What do we need to deal with when we think of what conservation planning we want to do and how we do it. we need to think of habitat fragmentation.

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01:02:08.820 --> 01:02:15.869

Changing climate, which means changing temperatures and changing precipitation patterns and changing timing.

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01:02:15.869 --> 01:02:27.059

Of those things we need to look at the synergistic effects of fragmentation and climate change and fitness. We have more susceptibility to

476

01:02:27.059 --> 01:02:33.329

Ranavirus, less ability to deal with the stresses of fragmentation.

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01:02:33.329 --> 01:02:40.889

So all of these things combined together are making it very difficult for these amphibians.

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01:02:40.889 --> 01:02:48.840

So, I'm going to speak directly to how do we manage for resilience in the face of

479

01:02:48.840 --> 01:03:03.474

Climate change and habitat fragmentation. Well, you can find some old stuff in the literature that gives a hint about that. We did a study of converting amphibians species written richness in Acadia National Park in

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01:03:03.929 --> 01:03:14.130

Beaver modified landscapes. Acadia is very mountainous and we discovered that a lot of vernal pool amphibians were making use of.

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01:03:14.130 --> 01:03:24.690

Young Beaver, who made mistakes and dammed up streams up on the hill sides and made lovely vernal poles. And also in the convoluted pools.

482

01:03:24.690 --> 01:03:29.550

Down in the lowlands that had lots of nooks and crannies that weren't open to fish.

483

01:03:29.550 --> 01:03:32.639

Nancy Character, and um.

484

01:03:32.639 --> 01:03:38.190

James Gibbs from your next neck of the woods, did some great work on beaver as

485

01:03:38.190 --> 01:03:51.929

Habitat for these species, so we have one clue that vernal pools aren't the only breeding habitats that can be successful and then recent data on this and what we do with this is a 2021 article.

486

01:03:51.929 --> 01:03:59.010

Um, are telling us about climate resistant vernal pools and we've all thought about well, which pools should we conserve.

487

01:03:59.010 --> 01:04:04.230

And I'm not for conserving just the longer Hydro period pools because.

488

01:04:04.230 --> 01:04:09.539

They're not exactly sure what's going to happen. So, I'm, I'm going to advocate that.

489

01:04:09.539 --> 01:04:15.840

That we have a portfolio of pools cross the landscape ones that support.

490

01:04:15.840 --> 01:04:19.320

Very short Hydro period breeders like fairy shrimp.

491

01:04:19.320 --> 01:04:26.639

The moderate Hydro period, like the, the wood frog, and then the longer Hydro period pools for the spotted salamanders.

492

01:04:26.639 --> 01:04:32.309

We're I don't think we're knowledgeable enough yet to let those other pools go.

493

01:04:32.309 --> 01:04:38.130

So, in in the current time, I would have a portfolio of duration of flooding.

494

01:04:39.449 --> 01:04:47.190

I am advocating for a landscape scale approach in order to pick out those pools.

495

01:04:47.190 --> 01:04:50.610

You need to be looking at a wide variety of pools and.

496

01:04:50.610 --> 01:04:54.329

The mapping that you folks have started in New York, is your 1st step.

497

01:04:54.329 --> 01:04:57.780

For doing this I worked with 13 towns in Maine.

498

01:04:57.780 --> 01:05:03.809

To map, all of their potential vernal pools and vernal pools and so those 13 towns already have a database.

499

01:05:03.809 --> 01:05:15.985

That they can use to do this. So the other thing we can do is think about alternative habitats to have in our portfolio at the end of the day. Um, Beaver.

500

01:05:16.014 --> 01:05:22.434

They're my wetland heroes, the engineers of wetlands a lot of these habitats.

501

01:05:22.650 --> 01:05:30.119

They provide this is, this is actually my very own provide wonderful breeding habitat.

502

01:05:30.119 --> 01:05:36.090

4, and we need to think about making connections to Beaver.

503

01:05:36.090 --> 01:05:43.980

I have a friend from Vermont. Maybe you've heard of Skip he's the beaver deceiver guy Laura you may know him.

504

01:05:43.980 --> 01:05:49.710

He says, look at all of the dead trees. Those are places where beaver used to be.

505

01:05:49.710 --> 01:05:53.730

And we should focus on getting the hydrology back in those places.

506

01:05:53.730 --> 01:05:59.159

And then slow moving streams in our Downeast forest.

507

01:05:59.159 --> 01:06:12.360

Are habitat for pool breeding amphibians. Um, they hold water for a long time. They're cold. They've got a lot of shelter so we need to start thinking about connecting our existing vernal pools with some of these alternative habitats.

508

01:06:12.360 --> 01:06:16.920

And I put this slide here. You've seen it before?

509

01:06:16.920 --> 01:06:20.639

But it's very important to think about context. the one thing.

510

01:06:20.639 --> 01:06:22.644  
To show how far we've come um,  
511

01:06:23.155 --> 01:06:24.744  
when we started our project,  
512

01:06:24.775 --> 01:06:26.005  
we were working with,  
513

01:06:26.034 --> 01:06:26.485  
um,  
514

01:06:26.514 --> 01:06:31.525  
James Gibbs and Ray Semmelich and we did a project trying to nail down  
wood frog,  
515

01:06:31.554 --> 01:06:31.914  
Post-  
516

01:06:31.914 --> 01:06:32.215  
breeding,  
517

01:06:32.215 --> 01:06:33.235  
habitat needs,  
518

01:06:33.505 --> 01:06:38.184  
and we had a project in Missouri and South Carolina and Maine.  
519

01:06:38.184 --> 01:06:43.855  
And we were so ignorant, we thought that we could figure out habitat  
needs and combine all the data and have the answers.  
520

01:06:44.159 --> 01:06:52.885  
Well, it turns out even in Maine, depending on where you are mid Coast  
Central Maine, the Montane area, they have different post breeding  
habitat needs.  
521

01:06:53.094 --> 01:07:03.985  
So I really encourage if you're at universities start having your  
students study, the specific post breeding habitat needs in different  
contexts. Our wood frogs.  
522

01:07:04.230 --> 01:07:08.639  
In montaine Maine guess where they spend the summer? On the top of the  
boulders.  
523

01:07:08.639 --> 01:07:14.639  
In mosses getting invertebrates or right around the edges where they hold  
water.  
524

01:07:14.639 --> 01:07:19.050  
Who would think of wood frogs crawling on top of these glacier erratics?  
525

01:07:19.050 --> 01:07:23.579



So getting to the management now that you, I hope I've.

526

01:07:23.579 --> 01:07:30.329

excited you about get to know what your amphibians needs in their post breeding habitat and break out of.

527

01:07:30.329 --> 01:07:43.739

All of the pioneers who got us started in the first place, there's been so much work done on the systematic salamanders, but ask questions and look in different contexts so that we are sure to conserve the right habitats.

528

01:07:44.244 --> 01:07:58.885

So, Here's what our challenges in Maine, our current regulations, the federal government you all are dealing and seeing what's happened with the Clean Water Act. They're only calling it a federal area of concern. They don't even want to commit to this being

529

01:07:59.159 --> 01:08:03.840

A special habitat, so it's been weakened. Um.

530

01:08:03.840 --> 01:08:07.170

Because of certain administrations. In Maine.

531

01:08:07.170 --> 01:08:14.940

We have a state permit zone of just 250 feet and, as you recall, the amphibians go way farther than that. Um.

532

01:08:14.940 --> 01:08:19.739

We've created human laws of convenience. Our 250 foot

533

01:08:19.739 --> 01:08:26.789

Area of consultation is based on shoreland zoning, because we knew people were used to that number.

534

01:08:26.789 --> 01:08:30.989

So, we have a lot of political definitions and So do

535

01:08:30.989 --> 01:08:42.864

You in New York. We have, and this is uh, speaking to Matt here, because you're talking about identifying significant vernal pools and I'm gonna just share a few of the pitfalls that we had.

536

01:08:43.435 --> 01:08:51.954

We had, we were told we wanted less than 50% of pools to be significant. So we came up with these numbers, 4,20 and 10 for these different animals.

537

01:08:53.130 --> 01:08:59.279

Well, it turned out in the end that it covered less than 20% of all vernal pools.

538

01:08:59.279 --> 01:09:06.600

And that's how we got into trouble. Um, we, we aimed for 50% and we got 20%.

539

01:09:06.864 --> 01:09:20.185

Okay, and the other issues that we have challenges is land owner perceptions of vernal pools. I love this. It's not if it goes Postal. If this goes a vernal pool, it could cut me out of the house lot \$30,000 or even \$50,000.

540

01:09:20.185 --> 01:09:24.564

this was, I work with a social scientist Dr Jessica Jansowicz

541

01:09:26.130 --> 01:09:40.739

She is doing the human dimension, part of our vernal pool work and she works with our stakeholders and she finds out what their opinions are and what they would like to see. And this is a quote from one of her people and it's one of my favorites. If this goes vernal pool.

542

01:09:42.295 --> 01:09:49.975

We also have misnamed vernal pools, isolated wetlands and when you think about isolation or depression, they're all negative terms.

543

01:09:49.975 --> 01:09:58.314

I wonder people don't like pools if we call them cherry pools or very connected pools, people would have a better reaction to them.

544

01:09:58.590 --> 01:10:02.310

So, we had a vernal pool working group that got together.

545

01:10:02.310 --> 01:10:09.989

My God a long time ago, we ended up with lots and lots of publications, but the whole point was to publish papers showing.

546

01:10:09.989 --> 01:10:15.029

That geographically isolated wetlands are not in any way isolated.

547

01:10:15.029 --> 01:10:18.479

Hydrologically, nutrient transfer,

548

01:10:18.479 --> 01:10:30.239

Carbon, ecologically, and we were trying to change the name of Geographically isolated wetlands, but it has never happened. And I still see people using that term.

549

01:10:30.239 --> 01:10:39.630

So, if you see it, change it so here, so that's the background. Okay. We have the science. We have a handle on post breeding.

550

01:10:39.630 --> 01:10:45.930

We have sort of a map of what we want to do to conserve pools that works anywhere that you are in the country.

551

01:10:45.930 --> 01:10:49.739

So, our particular project is.

552

01:10:49.739 --> 01:10:57.989

An offshoot of our community or community vernal pool mapping project I alluded to earlier where we did a complete mapping using.

553

01:10:57.989 --> 01:11:05.579

Um, participatory science to get these digital maps of potential vernal pools and assess vernal pools.

554

01:11:05.579 --> 01:11:11.369

It wasn't working because we were still going on a pool by pool basis.

555

01:11:11.369 --> 01:11:17.369

Dealing with regulations that were different at the federal and state levels, having developers really upset.

556

01:11:17.369 --> 01:11:20.909

Um, having vernal pools pop up where they weren't expecting them.

557

01:11:20.909 --> 01:11:25.829

So, we put together a stakeholder group.

558

01:11:25.829 --> 01:11:31.739

Um, and it took us 7 years and over a 100 meetings to come up with

559

01:11:31.739 --> 01:11:40.229

The new tool that we have developed. And this new approach is local and I call it an eco-based. We have to remember the.

560

01:11:40.229 --> 01:11:45.689

Root of economy and ecology are houses and economy and ecology are together.

561

01:11:45.689 --> 01:11:50.760

So, we've linked them together we wanted something more predictable than federal and state rules.

562

01:11:50.760 --> 01:11:54.300

We wanted it to be flexible to be used.

563

01:11:54.300 --> 01:12:00.750

In a commonsensical way, and we wanted it to be proactive, not a mapped pool on a map that.

564

01:12:00.750 --> 01:12:04.619

Planning people pull out when they've got a development coming up.

565

01:12:04.619 --> 01:12:10.260

We developed what's called a special area Management plan. It is available

566

01:12:10.260 --> 01:12:13.800

To all New England towns.

567

01:12:13.800 --> 01:12:21.390

It is a plan managing sensitive resources that's available through the Army Corps of engineers. It considers economics.

568

01:12:21.390 --> 01:12:27.060

It includes in the plan policies and mechanisms for implementation.

569

01:12:27.060 --> 01:12:33.449

So, that stakeholder group was made up of the relevant federal agencies, 5 state agencies.

570

01:12:33.449 --> 01:12:42.630

2 proactive towns, the orange are people that don't usually get invited to the table when we're talking about formal conservation. Economists.

571

01:12:42.630 --> 01:12:51.270

Developers and planning consultants, and this is why it took 7 years because we had to have a consensus document, but it was worth it.

572

01:12:51.270 --> 01:12:55.619

If you're interested in learning about the nuts and bolts of that, there's a publication on this.

573

01:12:55.619 --> 01:12:59.369

That you can look to for more details, but basically.

574

01:12:59.369 --> 01:13:05.550

We chose 2 proactive towns from that group of 13, who had all the maps already.

575

01:13:05.550 --> 01:13:13.380

And we developed this alternative mitigation tool. We got it approved by the U. S. Army Corps and our state agency.

576

01:13:13.380 --> 01:13:20.699

We got it adopted and this tool is available to all New England towns because we're all in region. 1.

577

01:13:20.699 --> 01:13:25.319

So, the key is that we're in the Maine general permit.

578

01:13:25.319 --> 01:13:31.680

Or home rule like New York so we towns got partial delegated authority for vernal pools.

579

01:13:31.680 --> 01:13:37.079

And the municipalities, this is a voluntary optional tool.

580

01:13:37.079 --> 01:13:44.579

They pass a town ordinance and it allows them to have these overlay regions and every town wants it because.

581

01:13:44.579 --> 01:13:49.710

It's voluntary and the, and the fallback is the regular existing regulations.

582

01:13:49.710 --> 01:13:52.710

So, we work with a developer.

583

01:13:52.710 --> 01:13:57.180

The land trust, or some 3rd party agency and the rural land owner.

584

01:13:57.180 --> 01:14:03.840

And the way it works is in Maine, if a town has a comprehensive plan, it's got a growth area and a rural area.

585

01:14:03.840 --> 01:14:08.039

The all the blue dots you see on that map are vernal pools.

586

01:14:08.039 --> 01:14:14.789

Holes in the growth area and what you see around it is our 250 foot state

587

01:14:14.789 --> 01:14:18.840

Critical zone, okay. That you can get a permit to build in.

588

01:14:18.840 --> 01:14:24.539

All those pools, a developer can go into the growth area without getting.

589

01:14:24.539 --> 01:14:32.970

A state permit without getting a federal permit without waiting to spring to see if it's a significant vernal pool. In return

590

01:14:32.970 --> 01:14:41.819

They give a fee that goes to a land trust and we buy 2 pools and 70 acres in the rural area.

591

01:14:42.234 --> 01:14:48.625

So, we're, we're taking money from vernal pools that are going to be toast in the growth area.

592

01:14:48.774 --> 01:14:58.045

They may make great urban wetlands, but they're not going to be functional vernal pools and we're putting that money and we're paying rural landowners to conserve their pools.

593

01:14:58.260 --> 01:15:02.520

So the community outcomes are certainty and predictability.

594

01:15:02.520 --> 01:15:08.670

Compact development, because it encourages development in

595

01:15:08.670 --> 01:15:15.689

in town growth areas that have most of the services.

596

01:15:15.689 --> 01:15:18.960

It supports municipal visions for rural lands.

597

01:15:18.960 --> 01:15:25.170

It gives remuneration for landowners, which reduces calls of a takings.  
598

01:15:25.170 --> 01:15:30.810

By wetlands rules, conserves pools at the landscape scale.  
599

01:15:30.810 --> 01:15:36.930

It concerns connectivity because the pools you're conserving are part of  
a greater landscape now.

600

01:15:36.930 --> 01:15:43.319

And all of this is on our "of pools and people" website.

601

01:15:43.319 --> 01:15:47.310

And if you go to the SAMP tab.

602

01:15:47.310 --> 01:15:54.359

You can learn about the samp - the manual is there and there's a  
PowerPoint explaining how it works in detail.

603

01:15:54.359 --> 01:16:03.930

Um, so there it is, there is the site, and if you're interested, if you  
are a regulator, as Laura said earlier, you can emulate.

604

01:16:03.930 --> 01:16:11.550

These tools, and in fact, Army Corps region one was hoping that this  
might get spread to some of the other regions.

605

01:16:11.550 --> 01:16:14.550

As a tool, because it makes a lot of sense.

606

01:16:14.550 --> 01:16:17.789

Because we develop this with developers.

607

01:16:17.789 --> 01:16:21.359

And economists, it makes economic sense.

608

01:16:21.359 --> 01:16:26.579

And the developers are the ones who are really in support of this now.

609

01:16:26.579 --> 01:16:34.140

So, it's very important to bring those stakeholders in. We didn't bring a  
plan to them and say, will you sign on to this? It took 7 years.

610

01:16:34.140 --> 01:16:39.630

Because it took that long for us to trust each other and to figure out  
something that worked for everybody.

611

01:16:39.630 --> 01:16:42.779

So and finally,

612

01:16:42.779 --> 01:16:52.470

We are developing signage for land trust. Or towns or landowners to use.

It says that this land conserves vernal pool wildlife so that we.

613

01:16:52.470 --> 01:16:56.579

Can spread the word and get people interested in doing this at the local level.

614

01:16:56.579 --> 01:17:05.789

I wanted to leave time for questions and there's the website please visit it. if you wish there's a lot of good information on there.

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01:17:05.789 --> 01:17:09.899

And Laura, that's it and I love to welcome some questions.

616

01:17:10.645 --> 01:17:21.954

Great. Thanks so much around. That's wonderful. And just so everybody knows a lot of the references and websites that have been shared throughout the presentations will be part of the follow up email.

617

01:17:21.954 --> 01:17:30.234

So, if you're not able to copy everything out of the chat box, don't worry about that. So, let me see.

618

01:17:30.539 --> 01:17:43.470

I can make you no longer sharing or couldn't stop sharing yourself but just give me a second I've got too many panels open to find where there we are, where you're at. Okay.

619

01:17:43.470 --> 01:17:49.470

And there's been lots of questions coming up, which is great.

620

01:17:49.470 --> 01:18:03.359

Okay, yeah, so that's really inspiring. And just to help people who aren't familiar with EPA regions, we're not in the same EPA region as the New England states.

621

01:18:03.359 --> 01:18:10.020

Army Corps okay, I don't believe we are. Somebody can correct me if I'm wrong there, but I'm not.

622

01:18:10.045 --> 01:18:16.585

No, that's the problem you're not in my region. I didn't think. That is the problem. It's one of many.

623

01:18:17.215 --> 01:18:29.965

Um, so, let me start for one just more general question for either you or Matt, somebody asked for more elaboration on the virus you've been talking about.

624

01:18:31.409 --> 01:18:39.630

That is affecting amphibians. Yeah, it's called ranavirus. Um, it's been around for a long time.

625

01:18:39.630 --> 01:18:48.689

Um, and can you hear me? Okay? Yes. Great. Yeah. Okay. And and Matt, if you know more about this, please, please jump in. Um.

626

01:18:48.689 --> 01:18:57.210

I had a student who studied these viruses and I haven't had one studying it recently, but we do know that even back then.

627

01:18:57.210 --> 01:19:03.960

When we had warmer summers or created vernal pools that had warmer summer temperatures, we have lots of.

628

01:19:03.960 --> 01:19:09.149

Mortality events cause once ranavirus hits it's generally an entire loss of.

629

01:19:09.149 --> 01:19:16.229

Of that breeding group. So that's all I can tell you now, because we haven't researched it recently. We're just going by.

630

01:19:16.229 --> 01:19:20.130

Uh, what we saw that study and what we're seeing more of now.

631

01:19:21.210 --> 01:19:35.489

Um, okay, so there's some questions specifically about the SAMPs. So how long have the SAMPs been in place in the 2 towns and have you seen any drawbacks or obstacles and implementation?

632

01:19:35.489 --> 01:19:38.699

Yes.

633

01:19:38.699 --> 01:19:44.130

Um, so that's such a great question. The two towns Orno and Thompson.

634

01:19:44.130 --> 01:19:50.520

Um, have had the SAMP for a year, and we are still trying to negotiate the 1st projects.

635

01:19:50.520 --> 01:19:56.850

Um, we had one that was almost done, but failed and we have learned from that and.

636

01:19:56.850 --> 01:20:10.439

Here's the interesting thing. Um, Matt, you referred to being over 200 people help. Well, what, what our obstacle has been is not that developers don't want to use it, but in some towns, there's a great fear of.

637

01:20:10.439 --> 01:20:16.949

In perpetuity, conservation easements and so I currently have a graduate student.

638

01:20:16.949 --> 01:20:20.670

Megan Leech working with my colleague, Jessica Jansowicz.

639

01:20:20.670 --> 01:20:25.979

And I, to work with landowners.



640  
01:20:25.979 --> 01:20:31.680  
And land trust to figure out how we can make conservation easements.

641  
01:20:31.680 --> 01:20:39.659  
More appealing to rural landowners who have the best of intentions, but are afraid of in perpetuity and things like.

642  
01:20:39.659 --> 01:20:43.829  
Short term conservation easements are being bandied around.

643  
01:20:43.829 --> 01:20:46.979  
Um, so the obstacles have been.

644  
01:20:46.979 --> 01:20:50.729  
Just getting all of the parts together, the land trust.

645  
01:20:50.729 --> 01:20:55.079  
The municipality and the land owner to make that transfer.

646  
01:20:55.079 --> 01:21:01.590  
Um, developers, part of the problem is Covid and a lot of projects were halted.

647  
01:21:01.590 --> 01:21:05.640  
And just as we had gotten those towns on board, Covid hit.

648  
01:21:05.640 --> 01:21:11.220  
So, we're very anxious to get those first

649  
01:21:11.220 --> 01:21:25.439  
Projects made in the SAMP team is working hard at it so it looked it took me 7 years to get the SAMP done. I am a very patient woman. I'm retired, but I am still working full time on this, and we will have good.

650  
01:21:25.439 --> 01:21:30.989  
Model towns that there's nothing like a model town to get other people to sign on. So.

651  
01:21:30.989 --> 01:21:34.020  
I wouldn't be surprised if we have a successful product.

652  
01:21:34.020 --> 01:21:41.699  
Uh if anyone has experience with conservation easements

653  
01:21:41.699 --> 01:21:46.170  
We would love any suggestions that you have for helping to work with landowners.

654  
01:21:46.170 --> 01:21:54.420  
Um, well, I'm assuming we can all count on the "of pools and people" website being updated as.

655  
01:21:54.420 --> 01:22:08.039

Some of these products are implemented and you have some case studies. That's great. Um, we really rely on kind of model communities leading the way to here, as examples of what can be done. Um, so.

656

01:22:08.039 --> 01:22:08.789

Uh,

657

01:22:08.814 --> 01:22:10.225

there was another question too,

658

01:22:10.225 --> 01:22:11.305

so about the Samp,

659

01:22:11.515 --> 01:22:14.725

once the growth and rural areas have been defined,

660

01:22:14.725 --> 01:22:23.635

can they be redefined? this individual said it makes them worried that the growth area would just keep enlarging and then protected vernal pools in the rural area could lose protection.

661

01:22:25.590 --> 01:22:29.909

Right. Um, the, the work, so, yes, they can be.

662

01:22:29.909 --> 01:22:33.090

Be defined by the town's but.

663

01:22:33.090 --> 01:22:38.069

The vernal pools that are conserved through this program cannot be changed.

664

01:22:38.069 --> 01:22:41.189

So, that can't happen, but towns.

665

01:22:41.189 --> 01:22:45.539

Um, will through comprehensive planning they will eventually.

666

01:22:45.539 --> 01:22:55.590

Expand their growth area, if that's what the town wants to do, when they renew their comprehensive plans. But any work that we've managed to do with land.

667

01:22:55.590 --> 01:23:00.689

Um, for the trade offs are immutable they are in perpetuity.

668

01:23:02.039 --> 01:23:09.510

Great somebody also asked some more general question. Um, if you could just explain what you mean, when you talk about uplands.

669

01:23:10.529 --> 01:23:17.399

Yes when I'm talking about uplands from an amphibian perspective.

670

01:23:17.399 --> 01:23:20.909

It's the soils that aren't poorly drained.

671

01:23:20.909 --> 01:23:25.500

Uh, poorly drained and very poorly drained soils freeze and the wood frog.

672

01:23:25.500 --> 01:23:33.300

And then the spotted salamanders in particular, the spotted salamanders are in, and they're not going to the shrews aren't going to be borrowing.

673

01:23:33.300 --> 01:23:44.159

In soils that flood in the spring and the wood frogs in Maine make shallow depressions in the leaf litter in those areas of poorly drained and very poorly drained soil.

674

01:23:44.159 --> 01:23:51.000

Often have water in them that freezes and the wood frogs wouldn't have the ability to go early to breed.

675

01:23:51.000 --> 01:23:54.989

So those aren't suitable hibernation sites.

676

01:23:54.989 --> 01:24:00.960

So, to me, uplands are areas that have somewhat poorly drained in better soils.

677

01:24:00.960 --> 01:24:04.590

That are drainage soils, but like, more well drained soils.

678

01:24:05.725 --> 01:24:19.194

Well, just even somewhat poorly drained it is. Okay. And for those that are not considered soil, stay away from Hydric soils right? Right. Those drainage classes are actual soil survey terms.

679

01:24:19.194 --> 01:24:20.904

Very poorly drained poorly drained,

680

01:24:20.904 --> 01:24:23.755

somewhat poorly drained and anybody in the Hudson Valley,

681

01:24:23.755 --> 01:24:26.755

if you look at our Hudson Valley natural resource mapper,

682

01:24:26.755 --> 01:24:27.925

which is an interactive mapper,

683

01:24:28.255 --> 01:24:37.944

those different drainage classes are on that mapper to basically help you find where there might be other kinds of small wetlands and Emma,

684

01:24:37.944 --> 01:24:41.784

if you're able to maybe you could share the natural resource map or link in the chatbox.

685

01:24:42.564 --> 01:24:56.845

Um, I wanted to also, Matt there was a question. Oh, no, no. This was actually for Aram too. It's so hard between the chat and the Q and a, there's a lot going on and I'm trying to see the chat questions, but they're really buried under a lot of chatting. The.

686

01:24:57.149 --> 01:25:08.489

The radio collared would frogs. Uh, they asked how you were able to. I, I can't find the question by remember it. They asked basically how that works that how you're able to do that with their sensitive skin.

687

01:25:08.965 --> 01:25:23.154

Yes, that's a great question. Um, there were generations of graduate students who improved it over time. They pretty much had to figure it out themselves and we ended up at one point. We used belted, waist belts and they're very flexible.

688

01:25:23.154 --> 01:25:25.944

And what happened was the graduate students, um.

689

01:25:26.250 --> 01:25:34.229

Um, Rob Baldwin and Luke Growth and Tom Hastings are all ones who have had to build these things.

690

01:25:34.229 --> 01:25:40.350

They would do regular checks, so we'd go back and check for abrasions and by doing that.

691

01:25:40.350 --> 01:25:44.279

Um, frogs that were abraded the things were taken off of, they learned.

692

01:25:44.279 --> 01:25:48.270

Just from experience how tight to make the waist belts.

693

01:25:48.625 --> 01:26:03.505

And so they were very flexible with little beads on them, and it was basically grad student expertise that eventually they were able to put belts on that weren't abrading. But that said, we would only change belts twice. So we only could follow them through

694

01:26:03.810 --> 01:26:08.880

Hibernation, which is a limit of these little animals, because the transmitters.

695

01:26:08.880 --> 01:26:13.439

Run out, so some of the, you know, extensive data we don't have is because.

696

01:26:13.439 --> 01:26:23.189

We wanted to take their belts off, so but that's a great question. It was really learn as they go and the grad students getting expert at attaching the right

697

01:26:23.189 --> 01:26:34.614

Um, the right tightness because it slips off their little legs. They don't have any hips. Right. Um, so it looks like there's been a lot of questions Matt that you already answered.

698

01:26:34.614 --> 01:26:48.625

I don't know if you want to address any themes or questions that you had. Um, you know, just to the audience that's still on. I know there was a lot of specific questions about why there weren't pools in particular geographic parts of New York.

699

01:26:49.170 --> 01:26:55.560

Like, the Taconics-Rensselaer area you already addressed the Great Lakes situation.

700

01:26:55.560 --> 01:26:59.789

And I think you met, you did talk about Long Island, right? Or was it Staten Island?

701

01:27:01.140 --> 01:27:06.510

We talked about Staten Island, right? But we long island as vernal pools and it has.

702

01:27:06.510 --> 01:27:09.689

Sort of a, uh.

703

01:27:09.689 --> 01:27:13.500

A critical cousin that we call coastal plain pond.

704

01:27:13.500 --> 01:27:19.260

They're not, I don't think they have the same sort of hydrology that The vernal pools have some. They have some of the same animals.

705

01:27:19.260 --> 01:27:33.835

And then they have really, really poor Sandy substrates. a lot of these very coastal seasonal pools. So, we, in our study, we, and there's another class of vernal pools that occur in the Pine Barrens.

706

01:27:33.835 --> 01:27:43.225

So because their ecology is pretty different. We didn't focus on them in our studies. they exist and we map them with the natural heritage program.

707

01:27:43.590 --> 01:27:49.500

Let me know about them, there is a long island vernal pool working group.

708

01:27:51.085 --> 01:28:01.555

Seatuck is the organization that's heading that up. And so they've had a few meetings and trying to gather additional data on the front end for long island.

709

01:28:01.585 --> 01:28:11.034

So there's some momentum there, which is great because that's a place where there's been obviously, so much development. And so much fragmentation.

710

01:28:11.310 --> 01:28:24.420

I'm happy to see that otherwise. Yes geology or geology and land use. Those are the, those are the reasons that the vernal pool presence varies so much across the state.

711

01:28:24.420 --> 01:28:29.760

Yeah, the big states to big variable state. I mean, it's very, very important.

712

01:28:31.104 --> 01:28:41.845

Um, well, we are just pushing up against 6:30, and I wanted to answer a question too, that keeps coming up more broadly that this is being recorded.

713

01:28:41.845 --> 01:28:53.545

We will make it available on our conservation webinar webpage at the DEC site, the New York state DEC site. But I'll also be sending an email out to everybody who's on the.

714

01:28:54.180 --> 01:29:08.395

Um, the webinar, everybody who registered with links to some of the resources we talked about with as well as a link to the recording to this webinar and the recordings to the other webinars I'll include those as well because there's been interested in those.

715

01:29:08.725 --> 01:29:09.265

Um.

716

01:29:09.539 --> 01:29:22.284

We are going to, I will try my best to filter through some of the questions We didn't get to answer and try to follow up with folks on those. But now, just to keep everybody on schedule.

717

01:29:22.284 --> 01:29:30.774

I do want to just extend a really huge thanks to Matt and to Aram for joining us tonight for sharing so much great information and a lot to think about,

718

01:29:30.805 --> 01:29:31.255

um,

719

01:29:31.284 --> 01:29:34.704

but it's exciting to have resources that we can use to like I said,

720

01:29:34.704 --> 01:29:39.564

start upping our game and getting better at vernal pool conservation across the Northeast.

721

01:29:39.564 --> 01:29:49.164

So thank you both again. And thanks to everybody for joining this webinar and for joining the other webinars, it's really been encouraging and I'll just send you off with the closing words.

722

01:29:49.164 --> 01:29:55.345

Don't drive if you can avoid it on a warm rainy nights coming up and, um.  
723

01:29:55.409 --> 01:30:01.680

And if you can teach somebody else that wasn't on the webinar or  
something about verbal pools, that would be fantastic.

724

01:30:01.680 --> 01:30:08.760

So, thanks everybody. Thank you. take care. Bye. Bye.