Essential Aspects of Monarch Habitat

Please stand by for realtime captions.
Good afternoon. Let's go ahead and get started. Welcome to today's webinar about the Essential aspects of Monarch habitat in the Southeast. My name is Jen Ryan and I am the natural resources specialist for the conservation services East national technology support Center and I will be your host.

Finally, I want to remind participants that the use of trade names during any of our webinars is for information purposes only. Mention of a trade name does not constitute a guarantee of the product by the U.S. Department of Agriculture nor does it imply endorsement by the department or the natural resources conservation service of comparable products that are not named. With that, we will now begin. I am pleased to now turn the webinar over to Nancy Adamson. Nancy supports habitat restoration on farms and in communities as a partner biologist for the Xerces Society society in Greensboro North Carolina. Nancy, you may now begin.

Thank you so much, Jen. Thanks to everyone for joining us today. I want to also thank South Carolina state biologist, Sylvia Harris for requesting and helping to develop this series. Finally I want to thank Ray Moran, Dave Thomas and Sudie Davis Thomas for being our guest speakers today. I wanted to just mention not besides an excellent set of resources on the Monarch site, we have put together a set of additional resources that you can download from the today's handouts section of the website and also a copy of the slides and we will probably be going through the slides a little bit quickly because we have a lot to cover in a relatively short time. So just know that you can always take a look at the slides again and let's see. Those will also be posted on the conservation webinars.org site. At the end of today's presentation, any of the questions that we don't have time to answer during the live portion, we will take a look at those and address them and add them to the additional resources and Jen is kind enough to repost once those are ready. If you don't find them for any reason, feel free to contact me directly, at Nancy at I will be happy to email copies. One thing I want to mention about the NRCS website, when you are looking at the resources, it says western coastal Plains, that is actually referring to the Western Gulf coastal plain, that is relevant for all of us today. So okay, I want to go ahead and introduce Ray, Doctor Ray Moranz is the pollinator you call it just for the Xerces Society for invertebrate conservation, Ray also serves as a partner biologist for the USDA NRCS and assess essential national technology support Center, with pollinator conservation work. Ray lives and works in Stillwater Oklahoma, he began studying the effects of fire and grazing on plant and butterfly communities in 2004, and earned his PhD in natural resources, natural resource ecology and management from Oklahoma State University in 2010. Ray, his wife Laura, and their two children reside on 10 acres just outside of Stillwater, they raise chickens, ducks, and fowl. He spends much of his free time creating more pollinator habitats on their land. Ray is my counterpart in the central part of the U.S. and he worked with other NRCS staff to develop all of the Monarch materials that are available. He is the Monarch expert for this region and the central region, thanks so much, Ray. I will go ahead and introduce Sudie Daves Thomas, and then Sudie Daves Thomas will be introducing Billy. Sudie Daves Thomas is a wildlife biologist with the South Carolina natural resources conservation service, she provides technical support, develops guidance, and conducts training statewide for South Carolina natural resources conservation staff and clients. She works primarily on private lands with projects involving natural community restoration, wildlife habitat improvement and management, plant identification, rare plants and animals, and wetland restoration. In addition, she collaborates with many partner groups including the Xerces Society, South Carolina pet and plant counsel and the native Plant Society on outreach and education efforts. Past and present job duties include field surveys for birds, reptiles, amphibians, small mammals, plants, insects, and natural community conditions. She likes to spend time exploring natural areas with other naturalists and her 11-year-old son. She has a BS in biology, that is a bachelor of science in biology from the University of South Carolina, and Masters in biology from California University of Pennsylvania. If you ever visit Congaree national Forest, you will see Sudie Daves Thomas in the introductory film, tagging birds. So, welcome to Ray and Sudie Daves Thomas and Billy, and I will hand it off to you, Ray.
Nancy, thank you very much for that kind introduction. Good afternoon everybody. I am going to start off, material for this webinar by giving a brief recap of webinar one just to make sure that folks are on the same page with some important items. This will be brief. Brief recap that is. Okay. I need to press the next arrow. Oh, excuse me. Okay, here we go. Monarch caterpillars are host plant specialists, many people who are very familiar with monarchs notice, but we need to make sure everybody has this on their radar. Monarch caterpillars only feed on milkweed. The adult butterflies, they are more generalist, they will use a variety of Nectar species from a variety of plant families and by the way not just the 4 plant families shown here.

Monarch adults do show preferences and Sudie Daves Thomas is going to talk about many of the plants that the adults prefer. Another important aspect of monarch biology, to transmit to everyone is that there are three main populations in the lower 48 states. One rest -- west of the Rockies, one out here out West that spends the winter in California, one in South Florida, that is there just about all year round, and one in the eastern U.S., that spends the summer, spring, summer, and fall here. But then heads down to Mexico for the winter. At least most of them do. Billy will touch on that topic later. I want to talk a little bit about the migration of monarchs up for Mexico to give you a handle on when you can see monarchs in the Southeast. In early March, this map is from journey north which is a phenomenal community science program, where you can enter your data. About when you see monarchs and in March seventh of 2017 people had been seeing monarchs along the Gulf Coast, and down in Mexico. Summer spending the winter on the Gulf, or some had just come up. And then, by April, they had flown from Mexico and the deep south into Texas,,, Arkansas, and Louisiana and a few other southeastern states. So, this is a good time of year to see monarchs in much of the Southeast. In May, even more so, but obviously some are heading up to the Midwest and the mid Atlantic states. In June, they made it to the Great Lakes and the true Northeast, New England. Five -- by July, they have gotten throughout their whole range of into Canada. By July people tell me, there tend to be not many monarchs in the deep South and that is true for Oklahoma as well and that was true for my experience for living 10 years in northern Florida. But then in the fall, this graphic by journey north is depicting fall migration in 2019, in fall, we have got monarchs heading from the Northeast down along the appellations and monarchs heading down along the coast. So fall is another fantastic time to see monarchs and that is an important time for folks in the Southeast to have nectar plants. For their monarchs. Lighted the NRCS work on monarchs ? One of the things that instigated it, was this data set which was published about five years ago. This bar graph represents the abundance of monarchs overwintering in Mexico, and as you can see the abundance is very high in the 90s, and moderately high in the early part of this millennium. And then it plunged. We had quite a plunge of abundance, especially during this period, it has gone back up a little bit of sense, but nowhere near the levels it was in the 90s. And not even to these levels. This triggered work of numerous agencies to try to conserve the monarch. How do they help with conservation? The farm bill programs. By helping farmers and ranchers conserve resources on their land. And there is a specific program of the NRCS which is a partnership with the U.S. Fish and Wildlife Service to some degree, it is called working lands for wildlife. The monarch has been chosen as one of the species that working lands for wildlife focuses on. And working lands for wildlife has a special allocation of money to assist with monarchs conservation and that money gets spent in these 10 states. These 10 states were deemed by NRCS about five years ago to be the highest priority at that time for conserving monarch habitat. But I want to make it clear, the NRCS conserves monarch butterflies throughout the lower 48 states, there are programs and practices that NRCS field staff can use to conserve monarchs in all of the lower 48 and it is happening more and more in the East and West, not just in the central U.S. So that is it for my recap. Now I am going to talk a bit about milkweed as monarch host plants. I am going to talk a lot about it. Milkweed's are extremely important. Without milkweed's we will not have monarchs. Many books you will read say that monarchs only use plants in the juice squeak BS, that is false. Female monarchs lay their eggs on milkweed's in a variety of genera, at least six genera, and some of them are right here. They lay on Asclepias. There are close to 100 species of Asclepias. But they also lay eggs in the gondola was, Otilia, and battalions, six different genera at least of native milkweed's that monarchs lay their eggs on, and the caterpillars can succeed. Now I have to say that we don't have proof that monarch caterpillars do well on every single species of milkweed. In these genera. But, we do have evidence for some, for many of them, that these plans are good for the larvae and we encourage you when you are out in the field to take a look if you do find milkweed's, take a look to see if you find larvae. We would love for you to, I would love for you to shoot me an email if you find larvae on Gonolobus or Matelea or Pattalias in particular. Excuse me, milkweed's are famous for having milky sap, they are famous for having seedpods that have fluffy structures called, that help the seeds fly just like the seeds of dandelions but they are also famous for being poisonous. It is important to know that not all milkweed's have cardenolides. Some have none whatsoever, and species differ very greatly in their amounts of cardenolides. That include species in the Southeast. My Masters research at the University of Florida looked at milkweed card and allied contents, and thank you for help with the pointer and what I found were some had none whatsoever and some of our species were among the most toxic milkweed in the world. Those plants grew within a few miles of each other. So it is quite diverse. Now I am going to get into the nitty-gritty, of talking about different milkweed species. We will talk first about broadly distributed plants. The most broadly distributed milkweed species in the Southeast is butterfly milkweed, it happens to be my favorite plant, I have done a lot of research on it, haven't published it yet, need to get that done, maybe Christmas vacation, we will see. This plant gets its scientific name, the two barrettes apart from having large tuberous roots. These are two plants that I received as a gift, this spring and you can see the roots are large

fat tubers sort of like a carrot, but they get much longer than this, I think they can get three or four feet long. It helps the plant live for a long time, in a dry landscape, but if you try to transplant this plant and cut the taproot, that would be a big problem. Butterfly milkweed typically grows in well-drained places, it tends to love sandy soils, this plant has very low levels of cardenolides. Some people contend that monarchs don't lay eggs on butterfly milkweed and my former mentor, Doctor Lincoln wrote that up in a paper. 50 years ago. However, he is wrong. Yet this study by one of his protégés, Doctor Tori, now at the University of Alabama, this paper provides evidence, some evidence that monarchs don't like to lay eggs on this plant very much. This bar graph, down at the bottom are acronyms for milkweed, nine different milkweed species and on the Y axis we have the number of eggs laid per plant, the average number, and you can see asclepias tuberosa, I am going to go ahead and get the pointer, asclepias tuberosa has a very short bar. Not very many monarchs laid egg on that plant. I actually got to see that experiment in action, it was very impressive. And yet in my years of fieldwork in Oklahoma, Kansas, Missouri, and Iowa, I have found monarch eggs and larvae, hundreds of times on literally hundreds of plants in those states. So something is strange, I admit that they seem not to prefer lay eggs on it but I think what it is, if this is the only plant that is out there, the only milkweed, they will lay eggs on it very readily. Tori and her colleagues posted this paper looking at the survival and development of monarch caterpillars on those same nine milkweed species. And when we look at these bar graphs, and once again I will get to the bar for these, I will use my arrow, you can see that it got a very good result. At 77.8, almost 78% of the caterpillars survived to the people stage and 75% survive to the adulthood. The best result of any of the nine species she tested. Feel free to plant a asclepias tuberosa in your conservation. Clasping milkweed, this is recognized most easily by its very curvy leaf margins. That is shown here. As you can see it is very broadly distributed, it hasn't been found in every county, it is not quite as common or abundant as a butterfly milkweed. This plant often grows in dry places, well-drained woodlands and savannas, once again it has very low levels of cardenolides. Unfortunately the seeds of this species are not commercially available in bulk quantities, and it is somewhat difficult to grow the transplants. It would be a great place to have in conservation plantings but not readily available yet. Red ring milkweed, I think this plant is fantastically beautiful, I was first shown it by the amazing botanist Angus Golson down in Chattahoochee Florida, and the nature Park just down the street from his house which is now named after him. Take a look at this plant. I mean this is a wonderful thing to have in one's garden, it is fantastically beautiful. It is a good monarch host plant. Its habitat typically is upland of woodlands and forests, unfortunately the seeds are not available in bulk quantities, you can buy this at native nurseries, but it would be hard to plant, get a few hundred of these plants on these properties anytime soon. Swamp milkweed, large robust plant, as you can tell from the name it likes wet areas, beautiful pink flowers, it really occupies marshes more than it does swamps. Once again, very low levels of cardinal Ides -- cardenolides, the seeds of these species are available in bulk and is commonly planted in conservation plantings in the Midwest and Northeast and I suspect it is getting planted in the southeast as well. It tends to do well in areas where it gets enough moisture but there is an interesting problem with the species in the Southeast and that it is not really native perhaps two areas in the southeast, it has a very peculiar distribution, very much up in the north, in the Midwest and the Northeast. And in Florida, but not so much in the deep South. I don't know why that is, I would love to hear the explanation. But I wonder if it is an appropriate plant to be planting in central Mississippi or central South Carolina for instance., Milkweed, this is the most well-known milkweed in the country. It is extremely abundant and common in the Midwest and the North. Many monarchs use it. Large floppy leaves, big pink pom-poms flowers and this plant once again we have an issue with the range. More of the northern plant, not many records at all in the south and I know I believe it is the state botanical Garden of Georgia and some other institutions in Georgia suggested that they don't want people planting the species in Georgia, there are some rare populations of it way up here and they don't want to bring genetics from other parts of the country into this state for this plant. Interesting problem. Sad problem because this plant is a very good monarch host plant. To other species that are highly widespread our world milkweed and green comment milkweed. Now we will talk about 2 milkweed species that are mainly in the western part of the region, this is the one that is by far the most abundant where I live, I am up here in north-central Oklahoma now, I used to live in north central Florida, but this plant is phenomenally abundant, there are literally billions, billions with a B of these plants in the southern Plains. There are probably many millions in Missouri, Arkansas and perhaps Louisiana. I thought first down here in North Florida, but you can see naturally occurring here on the Atlantic coastal area. This plant has very high levels of cardenolides, it is very toxic. Because it is so toxic, it does great in cattle pastures, cattle very rarely if ever eat it, because it is so toxic. So it thrives in pastures and rangeland. Green milkweed, once again a species more of the Western division of the FCC for instance, monarchs do like it quite a bit, I don't know anything about its cardenolides at this point. There are a few species that occur in the appellations, and more than they do anywhere else. One is Polk milkweed, it resembles that of Polk weed, it lives in the forests of the Northeast, and the

Appalachians. And then we have got for leaf buckwheat -- 4 leaf milkweed. This plant once again is a plant of the Appalachians, but also the Ozarks. Now to talk about the coastal plain, the area of the country I love the most, I used to be a botanist in the Ford Panhandle. -- Florida Panhandle. One of the first milkweed I learned was sandhills milkweed in dry pastures down near Gainesville also known as Pinewood's milkweed. You would recognize this based primarily on the strong contrast and color between the leaves and the veins. The veins tend to be white, or bright pink or purple. Also believes tend to, the branches tend to lie along the ground. And here is the plant, you can see those branches being somewhat prostrate, and just like the info over here says this plant likes sandhills like this one, zero woodlands and xeric pastors, it has extremely high levels of cardenolides , it does great in cattle pastures, cattle tend not to eat it because they taste the bitter cardenolides. The seeds of this are not commercially available. Few flower milkweed, it likes wet areas in the coastal plain, usually just one or two plants wherever you find it, and it doesn't have many leaves. So there is not a lot of food on this milkweed for monarchs. Aquatic milkweed on the other hand, it likes really wet areas, and tend, tends to have a lot of leaves, this is a plant that I have growing here in Stillwater Oklahoma, beautiful white flowers, monarchs love to nectar on flowers by the way, here is the seed pod. This plant has a really neat distribution. North Florida, rivers along the coastal plain all the way to Texas and then up the Mississippi River and partly up the Ohio. This plant, aquatic milkweed, loves to grow in the rivers but it does great in regular garden soil. With regular amounts of water and it does fantastic in pots. For gardeners out there, strongly consider planting aquatic milkweed. For conservation purposes, I am guessing this plant is only going to do well along river systems. But monarchs do love it and they will talk about it later. Now we have got a vine, I was about to say it's old name. This fine lives only on the coast, right at the Cottone between upland habitat which is this and salt marsh such as this. Literally the band of habitat can literally be as narrow as three feet, two or three feet wide. Some odds and ends. Primarily the vine, this maroon Carolina milk vine is a plant primarily of forests, in the Piedmont, and monarchs apparently like it quite a bit. White wine vine is a species of South Florida, that is a good monarch host plant. And honey vine is a plant in Oklahoma and the Midwest but also in some places in the southeast and this plant is an ugly looking weed, I have to say, most people who see it think it is unattractive and it grows where they don't want it. It grows on fences and through your shrubbery but monarch caterpillars love it. Probably quite important for monarchs. And one species we don't want you to plant when conservation plantings is tropical milkweed, it is in introduced species, monarchs love to lay eggs in it, but there are some problems with this plant. If you do grow it in the South, we ask that you trim its branches down to the ground, in the fall. Good news, milkweed transplants are often available. You can go to native nurseries and by them. That is, a few of the species are available as both seeds., Milkweed is available, butterfly milkweed is available in the Southeast, but as I mentioned earlier, these two species, it is questionable whether they belong in many parts of the Southeast. The good picture here is we need to work with nurseries, with the seed industry to try to get them to provide, to grow and harvest more speeds -- more seeds. Milkweed's are just important for monarch caterpillars. They are important as nectar sources for adult monarchs but they are also amazing attractants for pollinators as a whole. Such as bumblebees, and rare butterflies. So please do what you can to put more milkweed on the landscape and do what you can to work with the seed industry to get more scenes ready for production. And now, I almost forgot about this one. If you want to get more information on milkweed's of the Southeast, there are many resources but some that Nancy and I helped work on are these roadside milkweed fact sheets, by the Xerces Society. Please search the web for these. Now I will turn it over to Sudie.

Hello, thanks, Ray. I love hearing all about the milkweed species. I will follow you along with important nectar plant species for monarchs. This is a list of species that Ray put together, and he consulted the Xerces Society monarch nectar plant database, so monarchs might use a lot of different species but these are the most often recorded plants that monarchs have used. So, they find them via chemoreceptors and visual cues, and they tend to choose plants that are brightly colored, they grow in clusters, and they stay open during the day and have sort of flat surfaces from the monarch to land on, and keep in mind as we go through these plans, that they are not only good for monarchs, they are good for many pollinators and beneficial insects, for the wildlife, birds, you know the monarchs are nectarine but they are also pollinating these plants that then produce fruits and feeds for wildlife and they provide shelter and larval host plants, so monarchs are benefiting the ecosystem. So, most of the plants preferred by monarchs, most of the herbs are in the Astor family, so Astor's have a composite header flowers, they had a lot of flowers all in one place, so that monarch doesn't have to go far, they can land and nectar on a lot of flowers. These tend to be some of the plants are fragrant and they bloom during the late summer and fall, or a lot of them do. I am just going to run through these based on alphabetically, the first one is Biden which is a take seed fund flower -- take seed sunflower, it grows sort of an open wet areas, the most common one I see, there are a lot of other Bidens species across the Southeast and they have these little sees -- seeds back they can help tagalong and

dispersed because they stick onto your clothes. They bloom sort of in the Midsummer. They are commercially available. Car Severus -- this is another Gina, we have several different species or many species across the Southeast, they are really pretty, I see this one, and sort of open farming habitats, we have several others, this one I see, the same sort of habitat, they have the vanilla sent to the leaf, this one is available commercially and then there is some that grow more and drier habitats in the sandhills and Piedmont so if you want to plant this plant you can probably find a species within that is appropriate for your region. The monarchs prefer thistles, so a lot of native thistles, the yellow thistle is important, we have a Sandhill Thistle in South Carolina and the Southeast that is also found in the coastal plains. Tal thistle is really tall just like its name, way over your head, but the pale lavender flower, if you want to find out more about native pistols, Xerces Society has this really great guy that you can download for free. We don't want to go without mentioning to that we don't want to promote which is musk or nodding thistle and bull thistle, they are exotic and they will invade and infest an area and decrease habitat quality. The mist flower is still blooming, I have it in my yard and I see it in the ditches and it always has a lot of insects all over it, it is really easy to pull up in one spot and stick it in another spot. It is kind of an easy species to promote. We have a lot of this in the Southeast, this one is Lance shaped leaves, if there are other species around that monarch prefer they tend to overlook the species but this is a really widely available species by seed and plant that can be included in mixes, it is helpful to tell if you have a successful planting attempt because it comes up really early. This is sun sets, we have many in the Southeast, this has the leaves were it looks like the stem is kind of going through the leafs. It is commercially available. There are a lot in the open areas, you can find them in habitats like we see right here. They are being included in seed mixes more and more, these are just some that I see often out in the fields, they have the round leaves, this one is really common, and ICDs in the more far maintained habitats. This is a cool little short shrubby growing, it used to be in solid anger but it always has a ton of insects all over it. So a good one to promote and is being included in some seed mixes. Joe Pye weed, there are several that grow all over the Southeast, and some like the coastal plains and some you can find in the mountains but you always see insects all over it. Blanket flower is historically sort of a sand dune plant, sort of in the maritime forest, but it is easy to establish and it is widespread now, in seed mixes and you can buy it from local nurseries. And it is sort of like coreopsis , monarchs might overlook it. It is good to have in a mix to draw them in, and to, it is one of the early, earlier wants to establish and it blooms early so you can tell if your planting successfully. Sunflowers are really important. Swamp sunflowers are still blooming in my yard, I see it in the ditches, really really pretty, tall, and then there is some that you might find more of in the mountains, woodland sunflower, and they are widely commercially available. This is what swamp sunflowers might look like in a garden setting. So it is easy to pull up in one place and stick in another place if you want to spread it around. Blazing star is one of the most gorgeous natives asters, I see this most often out in the field, this is probably the most widely available commercially, but like I said about some of these other generous, there is probably a species that is appropriate for your region. Climbing him fine is a species that I see often when I am out and about and it always has butterflies and bees on it. It has been known to be used by monarchs so if you find it, it is great to encourage it. Packer a, it is commonly known as butter weed or ground so, this species grows in the swamp, it is sort of a winter annual, it really blooms early in March and April and it helps the monarchs during that early spring migration. And then there is this more upland species, packera, this one was promoted after a fire went through this area. So, black-eyed Susan's, I know this is really familiar for a lot of people. We have the orange coneflower widely available commercially but sort of in not category where a monarch might skip it to go to something it performs more but it is good to have a mix because it is easy to establish and it might brought bring them in with the bright colors. This is like a native Helianthus, it is available commercially, it is just another nice robust sunflower type species. Then, but Goldenrod is really important for monarchs and many other beneficial insects and just remember this is not the one that is making you sneeze, that was ragweed. This one over here is available commercially, this is Seaside Goldenrod, and I have that in my yard and I had a monarch on it a couple weeks ago. These are probably noticed in bushy areas, we have calico Aster, Harry White Oldfield, this is some of the most preferred. Some of them have more purple color, really pretty in new England, New York, they are widely available via seed and plant. Wing stem, these grow wild in wet areas and they have this, they have these wings along the stems that you can see in the bottom right, I lost my pointer there for a minute, and it it is extra plant material that looks like a wing. It helps with identification. This is another wing stem that grows in the upstate and Piedmont area. It blooms a little bit later. Iron weed is really great for monarchs and other pollinators. This one is giant iron weed, it grows in the ditches, I took this picture a few weeks ago, and then we have some others that grow in more shaded habitats and this is tall iron weed which is not very tall, and it has very linear leaves. Some other species that monarchs prefer are in the midst family and they have these clusters of flowers which draw them in. This is really important, it is kind of a wild Bush that grows in wet areas, I don't think it is commercially available

but you can promote it where you find it. Horse meant you sort of see on the roadsides and maintained habitats, it has this interesting color, the flower is actually the yellow part. It is beneficial to a lot of different beneficial insects. Wild bergamot is widely available commercially, planted in gardens and it does great in seed mixes. We have mountain mint which is becoming more and more available. This is another species, this one likes more open farming, and then we have some standouts amongst the woody shrubs and small trees. The ground sultry -- this tree quit blooming, it is shrubby, it grows along the outer coast and they think it has been said that his friends by hurricane wind, it kind of grows all over now. Monarchs love it in the fall during fall migration and a lot of other species do as well. The birds eat the seeds. Button Bush is this really cool shrub that likes wetlands and it grows in wetlands, it can germinate underwater, but it will also do just fine in your garden. You always sees tons of insects on the flowers, so it is really easy to grow and widely available commercially. This is one I took a picture of I found this early spring, Dorf which alder that grows in that he could tone between wetlands and upland's, and monarchs have been known to use it during spring migration, and I did buy some and plant it in my yard. Is commercially available. American plum is really important, it blooms really early, monarchs use it during spring migration, widely commercially available and really good for wildlife. And Hercules club is this interesting plant, that supports the monarchs during spring migration as it blooms really early. And I know that was a whirlwind but you will be able to look through this later and then Nancy is going to talk a little bit about some cover crop species.

Well, thank you so much, Sudie, that was wonderful. So cover crops mostly are non-native, we do have Partridge P that is a native cover crop, but they are used in agriculture to support soil health and pest management as well as pollination, and many of them also support monarchs. So in terms of pest management, natural enemies of crop pests are things like ladybugs and flies and wasps. Especially for soybean or cotton farmers, that might be an extra important value of these plantings more than pollination. You can find links to all of these resources in additional resources. Let me see. So, flowering species that provide nectar include buckwheat, clovers, and many flowers that could potentially be cash crops. Instead of simply covered, such as zinnias and other annual flowers that can be cut for fresh market sales. I added this insect replanting for the Mexican sunflower, it makes a beautiful cut flower but it doesn't hold up well and so it would be best for insect replanting's and those are plantings that are providing nectar for monarchs, but they are providing pollen and nectar for B's and other predatory and here's a toyed insects like wasps and flies and then they also provide seeds for birds and other insects. So, that is it. Back to Sudie.

Okay, we just wanted to let you know where to find some of this information, NRCS has a field office technical guide and you can go to the technical guide and put in your , where is my era? Put in your state, and the best way to find it is to just put in your, put in a word search, and I put in the monarch and it brought up these 4 documents that I read for our clients. You can download those, and this is an example of a plant list for nectar sources preferred by monarchs, which is being updated, and then some establishment guides for monarch habitat in particular with host plant species, and then this is just a way to contact your local service center if you want to get some technical assistance from the USDA NRCS, you can Google or search for USDA service center locator, put in your state, click on your county, and it will bring up the information. So, yes. Now, for the good part! This is everybody hang around for this, this is Billy McCord is going to talk about some local monarch research and so I am going to introduce him. Billy is an ecologist naturalist and wildlife biologist that has been setting migratory monarch butterfly since 1996 and has tagged over 48,000 monarchs. Mostly in coastal South Carolina. For the last several years he has led studies of wintering monarchs and documented and studied reading populations at several coastal sites. In addition, he studied native and evasive crayfish, migratory fish populations and conducted plant and animal inventories and worked control for the invasive Beatles and is associated fungus that causes disease. So a few years Billy helped me, a few years ago he helped me with an eradication project in Beaufort County and did an educational video, which is pretty cool. When he has the time he works with private and public land managers in South Carolina as a consultant, he shares his knowledge and love of coastal butterflies, wildflowers, and ecology with schools, church, and natural history groups and he leaves major outings and the Carolina wildlife polish by the South Carolina DNR. He received both undergraduate and Masters degrees from Clemson University, his degree, Masters degree is in wildlife biology and his minor for both undergraduate and graduate at Clemson was entomology. So last year I was lucky enough to get out to the swamp with Billy in the manager of the national wildlife refuge, Craig, to look for aquatic milkweed and monarch larva and we had a great day on the river and we found monarchs and larva which was pretty cool. Take it away, Billy!

Thank you. So as you said I have been tagging monarchs, this is the 25th year that I have been tagging monarchs. I have talked over 45,000 monarchs. So I have been around a few monarchs in my time. So the fall migration, as Ray spoke about briefly, everybody learns that the monarchs go to Mexico but in fact there is lots of data from tagging studies that shows that the monarchs that migrate along the Atlantic coastal zone

generally do not go to Mexico. So this is the peak of my monarch catches at Folly Beach South Carolina which is a coastal burial island, you can see the peak of abundance is typically in the last couple weeks of October but some years, it is actually in the first couple weeks of November and that is the fall migration period. So, this shows some of the recoveries I have made generally at Folly Beach for monarchs that were tagged elsewhere, so I recovered one that was tagged in Ontario Canada. I didn't get to the date of tagging so I don't know how many days it took it but it moved approximately 1000 miles. This one up here was on the shore Lake Erie and upstate Pennsylvania. 680 miles in 19 days. It was moving pretty well. I also have some additional recoveries that I have yet to receive information on. The Monarch watch people have a lot of work to do, so sometimes they are not as quick as I would like them to be as far as getting the information on recoveries. So this shows the recovery rates for monarchs migrating to different portions of the country, and the Midwestern monarchs which have been pretty much determined based on tag recovery information, they pretty much are all going to central Mexico. The thing about that, a lot of people don't realize they are going to high elevation cloud forest areas where the the winter temperature is around 40 degrees Fahrenheit, and the high during the winter would be the mid-50s. Actually, that is very similar to conditions along the central coast of South Carolina in the winter. But, you will see that for the coastal South Carolina, less than what fat 1/1000 of a percent or something like that, incredibly low numbers are pretty much isn't significant. I want to point out that for me, personally, I have tagged almost 29,000 monarchs along the South Carolina coastal area and I have had one reported recovery from Mexico. Insignificant. It appears that most of the monarchs that come the coastal area are headed to South Florida and some even go to Cuba and the Bahamian islands. The ones that migrate through the upper portions of South Carolina certainly on the western side of the appellations, those butterflies probably are going to Mexico. So this shows the recovery that I have had so I have had eight recoveries from Florida, one from coastal Alabama just west of the Florida Panhandle, but the gulf coast of Florida seems to be the destination for most of the monarchs mighty migrating in the coastal area of South Carolina. Again the one from Mexico, which for me and three for all of the ones Titans South Carolina, I think there is a chance those were even counterfeit reports because there have been no other recoveries from Mexico, despite the fact that I have tagged many thousands of monarchs since. Since 2001. The other thing that is different for this Eastern migratory monarch area, is the monarchs that migrate to the Midwest are in reproductive dial falls, they show no interest in sexual activity, whereas the migrate coastal area east of South Carolina, are definitely not in reproductive by a pause. I have netted monarchs from 407 million pairs at Folly Beach alone and I have seen many many other meeting pairs and it is seen and caught many males in what I call patrolling behavior, where they are searching for females, and chasing any other butterfly that comes in their path particularly other male monarchs. So the wintering is an interesting thing that I actually first, when I first started tagging monarchs back in 1996 I caught a few monarchs during the winter, that I started focusing on not more and more recent years but I can't over 5000 individual monarchs, in the winter period, which I call 1 December through 31 March. About 5% of those individuals of butterflies that I actually first captured in the last two weeks of November. Apparently in the latter part of November a lot of the monarchs start to kind of settle in and stay for the winter. In the winter of 2011, I tagged over 1100 monarchs, most of those were at patriots point in the Mount Pleasant area near Charleston, and this is an indication of how those butterflies remain in the same area for winter, you can see I caught almost 50% of those butterflies after I had tagged them. So some of the valuable winter nectar plants are the wild plants which these are in vases on dandelion, hen bit, and South Issel, but the wintering monarchs use a lot of landscaping plants, and part of that is because he coastal areas of the Southeast are very much, very heavily developed. There is a lot of landscaping plants. In late fall, they use bottlebrush very heavily, and then in early winter and late fall, they use loquat quite a bit. Of course anytime Lantana is blooming, they use that. There is a species of viburnum that is used a lot. It blooms in February which is a bit unusual. Monarchs go to it when it is in bloom. I catch a lot of monarchs that are doctoring on viburnum. Then just like in Mexico, we have occasionally winter kill events along the coast of South Carolina. This was winter storm Grayson back in January 2018, a lady at the beach photographed this, she said there were probably as many as 200 monarchs dead on the forest floor, so we had a storm and that was followed by a few inches of snow and it lasted for days, so the butterflies couldn't handle that. My catch rate went down as if to sleep following that storm. -- Went down precipitously following that storm. This is from 1996 to 2014, all based on my own observations, hard of that was when I was doing surveys of ecological surveyors of coastal islands, that is why I have a few scattered spots where I found monarchs, one or two monarchs and then beginning in 2015, the resources got a grant through the U.S. Fish and Wildlife Service to study this wintering behavior along the succulent to coast to determine the extent of it, we started in late November because again a lot of those butterflies in late November ended up staying for the winter, and we moved through the first two weeks of April to try to maybe get some information on dispersal, spring dispersal of these wintering monarchs. So this is the current knowledge based on the five years of these winter projects, with volunteer help, we now

have records of monarchs along 179 miles or 96% of the 187 mile Atlantic coastline of South Carolina. So we also have a few reports from northern Georgia, my suspicion is that this behavior extends at least some distance down the Georgia coast line as well. So this shows some movements of some of these monarchs, and lack of movement like this butterfly even though I caught it first in early November, I caught it eight times at the same site. The interesting thing to me was there were 10 consecutive freezing nights in that area and the butterfly survived. This one moved, I tagged it in the fall at Folly Beach and I caught it on Folly Beach about two and three-quarter miles southwest, 117 days later in April. Excuse me, March. This is one that moved from Folly Beach to patriots point in Mount Pleasant which a lot of monarchs, as I should before, after moving to patriots point I caught it there eight times through the winter into February. This one actually I tagged at Folly Beach, I caught it twice on Folly Beach in February, and then I caught it at Fort Johnson on James Island 118 days after I initially call caught and tagged at Folly Beach. This one moved from patriots point to botany Bay plantation which is down in southeastern portion of Charleston County, right near pedestal Beach, so it moved about 25 and half miles. This one is one that moved to patriots point, I caught at patriots point and continue to catch at patriots .16 times after I tagged it. So, through 8 March. So that is pretty good information on wintering behavior of monarchs along the South Carolina coast. Then, in the spring, apparently these monarchs breed using primarily Gulf Coast swallow wart, which is also a very valuable host plant for the Queen butterfly. But, this is a view of Folly Beach Island, and the sites where I have located this plant and breeding monarchs, I will focus in on those sites a little bit more closely, so they can see there is quite a bit of the plant and I have talked almost 100 monarchs at the site over the last couple of springs. Than in central part of Folly Beach, there is another site where I found a significant population and I have also recorded monarchs there, and seen a lot of monarchs I didn't catch, my Earl spry Charlie -- Mills -- males primarily. Near Charleston County Park, the one side there is particularly interesting to me, because I tagged, I am having trouble with the pointer again. Oh, well. Right in the site right there in the center, right here, this yard has a big stand of tropical milkweed, yet female monarchs over posited on the Gulf Coast swallow wort. They also probably got the tropical milkweed as well. Interesting that plant is primarily a spring, a couple of breeds in the spring, and they apparently disperse elsewhere, I don't have a whole lot of data on that but this is one example of a butterfly tagged at Folly Beach and I caught it the next day about five miles north. Then I had a couple other I tagged at Folly Beach in May, and they moved about 16 miles to the Northwest to an area that actually has a big population of aquatic milk. -- Milkweed. I have done some tramping around in the national forest looking for monarch habitats and I have recorded the site records for different species of milkweed in the national forest, this is mainly in the northeastern portion of the forest, and each site is at least 10 meters from any other individual site that I recorded. You can see that I have recorded larvae on 4 species, but without a doubt, the most utilized species of milkweed in the national forest is in these swamp forests which has a large population of aquatic milkweed. So again these are the species I have found monarch larvae at some point in time associated all of these species, few flower milkweed not in recent times but in the fast -- past I found larva on that plant. This is the aquatic milkweed, I will talk more about that, it grows mostly in ball swamp, bald cypress swamp forest, Ray showed it before, it has beautiful white flowers on it. It is a very important Nectar plant for monarchs in these swamps as well as other pollinators. This is the area I am going to focus on these in here, you can see the one place, this is the refuge where Sudie and I went, as Sudie mentioned, I found aquatic milkweed and other portions of that area, I wouldn't be surprised if there is monarch populations associated a lot of places I have not looked in detail. So this is the national forest, the Greek system called Wambaugh Creek and you can see I found over 3000 records of aquatic milkweed there, site records, and the creek is very difficult to access, I actually made a trip on Halloween day, and was primarily looking for monarchs but it got kind of cloudy and I wasn't seeing a lot of monarchs so I walked three quarters of a mile down a road closed to vehicular traffic, made it to the swamp, walked three quarters of a mile in the swamp and everywhere I went I found aquatic milkweed. That is this red area here. So, my suspicion is there's probably at least 300 acres of habitat, I want to make some other access sites but I found it everywhere I looked. So you can see I have also found lots of larvae and even chrysalis's, 143 chrysalis records in the swamp, that is because the aquatic milkweed is a fairly low growing up to maybe a foot and half to two feet and when the swamps flood, the larvae get stranded, on the plant and it can't go to higher areas to make, to form the chrysalis. Sometimes the chrysalis is only a few feet off the water if that. They are kind of out in the open and very easy to find. So this shows you some of the other, in the same area I found monarch larvae here and way over here on Tularosa, these are scattered around this area but the monarchs are pretty much everywhere around that swamp. I found them mostly on Nectar plants along U.S. forest service roads. So, this is another site, I want to mention it briefly because I found quite a population of aquatic milkweed there, and I have caught a few monarchs but I haven't had the time to study the area in detail, my suspicion is there's probably a population of monarchs associated with that population of milkweed. The interesting thing is in the national forest area, and the

swamp area, I catch monarchs even into early December. And starting again in March and April. So, and then it is continuous throughout the spring and summer with multiple generations of adults. So this is an area with also a huge population of aquatic milkweed, this is in southwestern Charleston County, not too far from Metropolitan Charleston area, and you can see I have caught over 1300 monarchs there, tagged over 1300 monarchs and even on February 15 of 2020, I found 21 monarch larvae without even looking really hard. So it seems like they are attempting to colonize that area year-round almost. I catch monarchs there just about every time I go I see monarchs or larvae or over. Now I want to mention briefly that I have also found some populations of monarchs associated with longleaf milkweed, along forest service road shoulders, this one area I talked over 166 monarchs, from spring of 2019 through the fall of 2020. 73 of those are reared from larvae that I found on the longleaf milkweed. Found another slide or two with monarchs associated with it as well in the national forest. So these are just some unusual monarchs I have seen over the years, and taken photographs of, the one on the left is a bilateral hermaphrodite, I have never seen anything like that. The white monarch which is considered to be a sub species, nivosus. It is common in Hawaii, but less than 1% in the continental U.S. Interesting there. And that is all I have.

Thank you, Billy! This is Ray again, I will finish this out with a few more slides, and then we will do question and answer. If folks are looking for resources to find more info on plants, search NRCS monarchs and at that website you will find links to guides like these regarding monarch plants. These are a few societies -- Xerces Society has guides called regional monarch Nectar plant guides. We have one for the southeast, and we have one for Florida, so do a web search please for Xerces Society monarch plant list. And very importantly, for us to do a good job of giving recommendations as far as what plants to put out there, we need your observations. We don't have a lot of observations of plants in the southeast. Please send us your data. Please! I am begging you, if you have ever seen a monarch vectoring on a native plant in the Southeast, email me. Feel free to email me your observations. We need your data. Take away messages of this talk, monarchs use a wide diversity of milkweed's, they also have strong preferences for certain Nectar plants, unfortunately only some of these plants are commercially available. We need to work on getting more of them available. But, please contact your NRCS office to get guidance as far as how to find these plants, and how to grow these plants, and to get technical assistance and financial assistance on putting these plants on your land. It is a big part of what NRCS does. It is the main role , to help farmers and ranchers! We want to acknowledge people who helped us with this event, quite a list of folks here. We are very grateful. We at Xerces Society are a donor supported nonprofit organization. So we very much appreciate our members and appreciate people becoming Xerces Society members, that helps keep us going and we have to think , gratefully thank our sponsors, our many sponsors. I want to point out we have a third and final webinar, Wednesday, December 2 at 2:00 PM Eastern, that talk will focus on habitat creation and habitat management, so not lots of details of monarch biology, not lots of details on plants, more focused on how you can create habitat, manage habitat, with things like prescribed fire, and grazing, using NRCS practices. So, we want to thank you for attending! Again, we would all love to hear from you, you can see our email addresses are here, I strongly encourage you to take a picture of the slide so you can email us questions in the future, we are still going to take some questions right now, but please take a photo or write down some email addresses, we want your questions! Nancy's email is down here. Billy is over here. At that point, we are ready for the question and answer portion.

Thank you very much everyone. I just want to point out that all of our email contact, I tried to include all of the links that are in the slideshow in the additional resources, so if you download that small document monarch, and other resources, all of those links are available. That includes all of the plant lists, and it also includes the observation sites. So, Ray would love to hear from you and he will help put those observations into our database, but you can also do that directly and that would be a huge help for us to help understand more about our natural committees. So, we are going to go now into the question and answer session and there is a big variety of questions. Just so that I don't miss anything I will probably just go down the list rather than trying to jump around. So, the first question is really I guess well, I think you guys can decide who will take it, it is from Maryellen, she said we are in Central Florida, we have tropical milkweed that currently has caterpillars feeding on it, I know we should trim it back but what do we do with the caterpillars?

This is Ray, Maryellen, try to find somebody who has got some native milkweed that are still going, and transfer them to that. For instance, you might have a aquatic milkweed growing in wet areas nearby, I know it grows in Central Florida, I found it there last year. Or you can call native nurseries and see if they have any native milkweed plants in stock. Or, if both of those fail, bring the caterpillars, put them in a cage perhaps, bring some of the plant material in and cut the rest of the plant back. So that you don't get any more eggs late this winter.

I would also like to mention, this is Billy McCord, you need to cover those steps of the plant, once you cut it back, I use an inverted pot, like a plastic landscaping pot stuffed with leaves, pine straw, something, that puts the plant in darkness so it doesn't tend to put out new growth and I removed those covers in the spring. The plant will then start to grow at the same time as the native milk needs. That helps to control, it helps prevent the winter use of the plant by monarchs, females laying eggs, and it protects the plant and stops it from growing until spring.

Okay.

Paul Kennedy asks do the migration packs follow upper air currents, jetstream?

This is Ray, I don't think that is typically the way they do it, certainly they travel a lot more based on the wind. So where I am, Oklahoma, they ride the Northwind down from Nebraska and Kansas, and Billy I bet it is true that they migrate more rapidly along the Atlantic coast on the Northwind, is that correct?

Yes they usually follow cold front and once the went kind of subsides a bit, a couple days after the cold front comes through and it is out of the north is when they do most of their moving, they also take advantage along the coastal zone and also along the eastern slope and Appalachian, the use the atmosphere because of changes in the temperature from the water to the upland and high-altitude to lower elevations in the mountains, it creates upwelling so those are the same primary migratory patterns of birds of prey, for the same reason, they can stay aloft more easily because of the upwelling's from temperature change.

So, Marlena, if you could please describe the process of tagging a butterfly, and Paul Kennedy earlier had asked what a tag looked like and then he found the monarch tagging information and I am not 100% sure if everyone can see the Q and a or not. But, so ...

While the tags are disc-shaped and they are self adhesive, they are designed for the butterflies, there has been research done on migration since the 1970s, the Thai design has evolved quite a bit, so a tag is about half the surface area of what it was when I first started tagging monarchs back in 1996, and I came up with this idea of using a platform like to hold the monarch securely while I am working on them but I also measure their wings and do some other things that other people would not necessarily do before I tag them. So it makes it easy to handle them, if you put them on the platform like I had in the PowerPoint slide.

Anna Smith from South Carolina DNR asked can it be routed from cutting some planted in more areas, it would be nice to get local to add it to their yard borders.

I think it is probably especially in brackish soils, it is in the transition zones, it is between the saltmarsh and the upland, sandy soils, I actually have some in a pot in my yard on James Island, it is doing quite well and it hasn't had any brackish soil for quite a while. But, it generally is a specialist right along the coastal area.

But, the other species that is more inland, Ray, you're going to have to jump in here, that you thought looks a little bit meaty. I think it is that people confuse it with bindweed. They see it and they think it might be field bindweed but that grows readily in upland areas and I don't know that much about its use by monarchs. Ray, can you jump in with the correct name or Sudie? Or Billy?

Sorry it took me a while to unmute. That one is honey vine, and monarchs certainly use it quite a bit in my region, very heavily actually. Most people say it is easy to grow, some people say it spreads out of control. So to some people it really is quite weedy. It looks like fine weed, but that is a good one for people to try and the aquatic milkweed, despite its name, it does pretty well in soil with moderate moisture. It doesn't have to be growing at the edge of a river.

Right.

You do need to be careful and make sure a species that is native to the area.

That is right.

Right. Anna Smith also asked any issues with kinetic swapping of local milkweed if we order native seeds from a nursery that aren't from the same area, so she was thinking along the same lines as you, Billy.

Yes I have big concerns about the eco-type thing because actually a native species to me is a local eco-type. So for instance if you get 2 seeds from Pennsylvania, it is a different eco-type, they evolved under different climatic conditions and the ones in the southeast. So, it is basically not a native species. If the source is from populations well away from the local eco-plate, the eco-region.

Okay. So what are the primary predators of monarchs, I want to just mention that we did cover that a little bit more in the first webinar, but did one of you wants to just cover that briefly?

Well spider certainly, most invertebrates, the toxins affect vertebrates primarily, so praying mantis is for instance I have seen roosting colonies of monarchs with praying mantis is going through monarch after monarch they are at an all you can eat buffet. And sex, assassin bugs, any predatory insects will feed on monarchs. I've rescued in and tagged a number of monarchs that were in spiderwebs for instance. They are killed by spiders and other invertebrates primarily.

Thank you.

Monarchs across Georgia is a good resource and they are included in the additional resources that we provided. They are wonderful. Let's see. Morgan Harris asked do you have any good resources for effects of increasing pollinator habitat on farm productivity?

Nancy you are the best person to answer that.

[Laughter]

Well, it is hard to measure, we do have some research on that and Xerces Society has cooperated with the big agricultural project called integrated crop pollinator, and many of, there are a bunch of really good videos on the website, but the research that comes to mind is mainly for blueberries and so that, that study was actually done in Michigan, but I think it would be safe to say it is relevant for down here, they found that after it was just three years, they got the return on investment from having pollinator habitat. And then some other research that just looked at leaving follow areas, so in our current agricultural areas, sometimes because we have chemical fertilizers and some herbicides that are plant specific, we can sometimes use land, and you know every corner of the land that may be in the past we would've let go fallow, and so in this one study, all they did was take out patches of land from, this was on canola, they took out not just along the outer edge, but they took out patches within the canola field and they found that when only 70% of the cropland was left, but there was just fallow left, that they actually had higher yield than in the area that was 100% crop, because of the impacts, not only of pollination, but probably also of pest management in that system. So I hope that is enough of an answer. Please contact me if you want more resources about that! Let's see. Maggie Park asks, are there any efforts to increase accessibility to native plants in more rural areas?

This is Ray, I am going to try, the question was two other efforts to increase accessibility in rural areas?

So accessibility to native plants in more rural areas, and so that is a little bit outside the purview of our work, we can promote the planting, and most of the NRCS plantings are with seed and so we are able to order seeds from regional seed suppliers, and then you as a consumer can help support increase accessibility of native plants by requesting those from your local markets, but also a lot of our regional native plant societies, state and native plant societies, they have efforts in many of our natural, our nature centers, they often will do local projects, but Xerces Society supports campus USA and I am going to put in a little plug, they are doing all sorts of work to help raise awareness and that would be a great group to find who is close to you or maybe start an effort locally. Did you want to add anything else, Ray, or Sudie? Sudie, you probably have something to add their.

No you did a great job covering that, but I don't know what state she is in, but I have a lot of resources, I can provide information on vendors that sell native plants or local plants if she wants to email me.

Okay, thanks. Let's see, Carolyn Smith asks, my understanding is that asclepias is not native to North America at all and that is right, we try to make that clear , if you look back at the slides, you will see one of the other questions we got earlier was about commercial availability, and both Ray and Sudie tried to label their slides to mention that. So, when you have a chance to go back and review the slides, I think that will be clear. So, Carolyn, she said it is disappointing how many nurseries and seed companies are selling it as a native. This is something that Billy brought up to us when we were preparing this, this program, and I don't know, do we end up including that slide in the last program, Ray? But I really appreciate you, Carolyn, bringing this up. Did you want to address this, Billy? The fact that they are now often times calling the asclepias , butterfly milkweed. People think they are buying a native milkweed when in fact they are buying the tropical milkweed which is native and further south of here, and in some of our territories.

That indeed has happened. I know several people who have bought what they thought was called butterfly weed and it turned out it was asclepias, the tropical milkweed. That is a marketing ploy , so you have to be wary of that.

Okay. Dave Miller asks, will aquatic milkweed grow in a garden near saltwater marshes on barrier island to South Carolina?

This is Billy, I doubt it.

So I am just going to chime in that it is not native to me in Greensburg, but I also plant it in a container and it has been doing great. It is worth trying. But unless, if it is not native in that area, it doesn't occur along the immediate coastal area, freshwater swamp species. It may grow in pots.

Yes. Yeah. Okay. And then Diana said how do you collect monarchs repeatedly without damaging them?

I suppose that is for me. Monarchs are more sturdily built than are most butterflies. Which is one of the reasons. And also just a matter of knowing how to handle them. But they are much more sturdily built than the typical butterfly. So as long as you get them out of the net pretty quickly and try not to get any kind of vegetation in the net with them, they tend to hold up pretty well.

Can I ask about the, I know there is some effort to when you are tagging, to use some tape to get a sample from their abdomens to test for OE, is that still happening?

I am not aware, I am sure it probably is. I am not aware of it right now. I did that in the past, I have not done it recently. Sometimes there are initiatives to try to get skills from the Monarch bodies to do an assessment of OE. I am not aware of that happening right now but it could be.

People are still doing that as part of project Monarch health. Out of I believe the inner city of Georgia.

Okay, Emma, I hope I have your pronounced nation -- have your name correctly. She said it is native to coastal Georgia and may do well near a marsh but is quickly threatened in Georgia, so there may be restrictions. Yeah. In terms of threatened species, we want to be really careful about collecting seed, and you want to really work closely with folks locally, yeah, we don't want to encourage you to collect those seeds, but if someone is growing it in their garden in a native Plant Society and can share seeds, that would be wonderful. Let's see, I think that is all the questions, and it is just 3:30 PM, so that is perfect timing, thank you everybody, and again, I hope you all got copies of the presentation, we hope to see you for the December program. I just want to point out, that one is more targeted to NRCS conservation planners than the first two webinars. So, just be prepared for that, if you are not working with NRCS .

But everyone is welcome!

Everyone is welcome, for sure took it might be a little bit more technical, just so you know. Okay. Did you want to say anything else, Ray, to close things out?

I want to remind folks that you see our email addresses, we would love to hear more questions and again, please send us your observations of monarchs using plants in the southeast! Or anywhere in the country for that matter!

Okay. Well, thank you very much and thanks again everybody.

Thanks everybody! We appreciate your time. Bye-bye!

[Event Concluded]