

Prairie Pod Podcast Transcript

Pilot: How to Grow a Prairie from Scratch (Restoration / Reconstruction)

Podcast audio can be found online at mndnr.gov/prairiepod

Transcript

- > Megan: Welcome everybody to the first inaugural Minnesota DNR Prairie podcast pilot episode! I'm sitting here today with Jess Petersen and we are launching this 'mazing thing, where we are going to talk through all things prairie and what's going on. So, today's episode we're going to focus on scratching the surface on how to grow a prairie, looking at some restoration and reconstruction.
- > Jessica: It is going to be awesome!
- > Megan: It's going to be awesome! I think so.
- > Jessica: I am SOOO excited!
- > Megan: I am probably more excited! I can't even believe that were here! So just to get you familiar since this is our inaugural episode whose voices are these?
- > Jessica: Right
- > Megan: My word, who is talking to you?
- > Jessica: People need to know...
- > Megan: People need to know!
- > Jessica: People need to know who we are!
- > Megan: So I am Megan Benage, Regional Ecologists for the Department of Natural Resources and I cover prairies, wetlands, sloughs, agriculture land in the southern part of the state. So, that's anywhere to the Iowa border, South Dakota up to Kandiyohi County and creepin' over into southeast Minnesota and Dodge and Mower Counties.
- > Jessica: And I am Jessica Petersen. I am the Minnesota DNR Prairie Habitat Research Scientist, and my role is to do my own research, conduct my own research but, also do

disseminate scientific research that other people are doing so that it is in a consumable format for land managers and anybody else that is interested in the science of prairies.

>>Megan: And that is somewhat what we are going to be doing with these podcasts. We started this because if you're like us we spend an inordinate, that's an awful lot, of time in the car. Just driving around to get to our field site and so we thought that wouldn't it be nice if you could listen to two knowledgeable people chat about a topic that we love, (singing) PRAIRIES!

>>Jessica: I love prairies.

>>Megan: I do love them so much! I mean I am pumped! So, that's what we are going to talk about today and today's podcast we have to apologize a little bit because it's a little bit of a teaser. We are just going to get into our favorite subject prairies and how to grow them but, we're not going to cover all the details because that's a huge topic and want to keep this kind of small for the first inaugural episode.

>>Jessica: Scratchin' the surface.

>>Megan: (singing) Scratchin the surface.

>>Jessica: On how to build a prairie from scratch

>>Megan: We didn't know there was going to be singing, but it happens so I am fine with that.

>>Jessica: You just never know.

>>Megan: You just never know on the podcast, these things happen. Let's talk prairie then. We are going to start with our background here. What is a Prairie?

>>Jessica: Yeah.

>>Megan: Just so that we are all on the same page, I think most of you know that are listening, but, prairies are open communities, right? They are dominated by grasses, they've got species rich, diverse for components and you are gonna hear me say that word diversity over and over again because Jess knows, diversity is where it's at for me!

>>Jessica: Diversity is the key!

>>Megan: That's the key!

>>Jessica: What does diversity mean Megan?

>>Megan: Everything!

>>Jessica: When you say that word diversity Megan, what does that mean to you?

>>Megan: Oh my gosh! I mean it actually gets me a little bit of chills when I think about how amazing prairies are and how diverse they are! So I am going to explain it this way. A climax Prairie, if you think about it, just like a climax forest consists of thousands of different organisms. This could be plants...

>>Jessica: What? Thousands?

>>Megan: Thousands! Thousands! This could be plants, animals, invertebrates, bacteria, soils, soil?

>>Jessica: Soil! There are forty gazillion organisms down there!

>>Megan: I know! Organisms down in the soil! There's fungus...so all these things the diversity components is that that all these things have complex interactions where there exchanging nutrients, moisture, energy flow and all of that it's creating and providing them with food water and shelter that they need to survive and so that to me diversity is the backbone of all of our ecological systems. Without it you do not have a functioning landscape and so when we talk about today how you build stuff back, you got to do it with diversity!

>>Jessica: Yeah, it's the key

>>Megan: It's the key thing. So, we don't very often think about prairies as having like a climax stage but they do and in that stage there just majestic! They're functioning really well they've got all the pieces and those pieces are that diversity component. Why do we care about all this Jess? Why Prairie?

>>Jessica: Well prairie is important! Prairie is historically what was on the landscape right before settlers came in and plowed it up for important purposes, right? For food, for people. To feed people and animals.

>>Megan: I like to eat. I like food.

>>Jessica: Right. People like to eat but, it use to be covered with prairie thought. Right, so this prairie harbored all of these critters and plants for habitat and it's gone, right? We have lost most of our prairies. We have lost...

>>Megan: I am starting to get emotional!

>>Jessica: almost all. We have got...

>>Megan: I am starting to get emotional...

>>Jessica: We have got (giggles) 1% left.

>>Megan: Oh my gosh

>>Jessica: 1% . Even today were losing more, even today we are losing more. so that said, it's a sad thing. We have the capacity to build it back. So that's what we're here to talk about today! There's still grass on the landscape and and we can add more. we can convert land that has been converted to agriculture when we can create that prairies back. We can get it back.

>>Megan: Close.

>>Jessica: Kind of.

>>Megan: Kind of.

>>Jessica: We Try.

>>Megan: We try.

>>Jessica: We are tinkering.

>>Megan: We are tinkering, a little bit.

>>Jessica: Yep!

>>Megan: We are trying. I mean you all know it's much easier to take the original and just keep it how it is.

>>Jessica: Sure.

>>Megan: When Jess says we can build it back we have some capacity to do that but we're still learning the science of restoration is so new and it would be incredibly conceited for us to think that we have all the answers because we don't! Nature's complex! It's hard! But, we gotta build prairies and the reason why we have to do that is because when we lose jess talks about just 1% left we started losing that were losing the diversity of our prairie and that makes up the fabric of Minnesota that makes up this rich natural heritage that we hold here we always talk about how the lakes we have right? Ten-thousand, twelve-thousand, fifteen-thousand however many it actually is but, those lakes were built with Prairie along the southwestern corridor of the state and up into Northwest Minnesota like this is this is a Prairie landscape this is part of what makes our culture and the fabric of Minnesota so rich and so anytime we lose habitat like that we lose function; so I am going to quote Aldo Leopold here. I said I wasn't going to do it on the first episode but, how do you start, I mean how do you start a DNR podcast without quoting the father of conservation?

>>Jessica: He's the man!

>>Megan: Yeah, He is the man! I don't know or was...we should say.

>>Jessica: Right.

>>Megan: But, I don't know how you do it. So one of his main principles, like one of his famous quotes is that "to keep every cog and wheel is the first precaution of intelligent tinkering," and so think about that. Have you ever done this like when you build a Lego? I mean I don't because I can't build a Legos, but let's say that you did you start to build a Lego and you get to the end and in your like, I'm missing piece!

>>Jessica: UMHMM!

>>Megan: My battleship was almost and now I'm missing a piece!

>>Jessica: You gotta call the company!

>>Megan: You gotta get a new one, you gotta find where the cat took it! It's under the radiator! I mean it just doesn't feel right

>>Jessica: No...

>>Megan: Without that last piece and so that's part of prairies being a piece of this landscape. Minnesota wouldn't feel right to me without them.

>>Jessica: Right!

>>Megan: We need them

>>Jessica: And we talk about building prairies. And we talk about, we often think about, well at least I do, I know other people do to, we think about what was planted right, that is all we have to do. Now if you just plant it and build it and they will come. But, prairies are so much more than just the plants, right? We're losing, we're losing habitat, right? Which means we're losing plants but, little by little were learning that were losing so much more, right? So, we have lost some of big critters. We don't have bison around. We don't have so many badgers and things like that but, were starting to lose the little guys to, right? We're losing skippers were noticing finally we're waking up to smell the coffee that that we've lost functionality, we're not just losing habitat. It's a bad scene.

>>Megan: That is absolutely true! That's a bad scene. So let's talk a little bit about, just so we are on the same page, and I know like when you when you work in conservation so often you get to this point where you are like "of course we need Prairie" and we forget how to explain it to people we forget why it's so important I mean habitat loss and function that's one piece right? But prairies are also an important part of our farming community. You can graze grassland, you absolutely can. There's lots of complexities involved with that, there's lots of debates about the right way to do that but, it can contribute to sustainable agriculture it certainly can. and then the whole reason why we converted prairies in the first place is because they have a phenomenal tremendous amount of organic matter in them. they are the key example of soil health at its best and so when we talk about that and agronomic system

were talking about building soil health agriculture to mimic this amazing natural system that did it right the first time they also think about Prairie roots.

>>Jessica: (making swooshing noise)

>>Megan: Think about prairie roots.

>>Jessica: Man!

>>Megan: I know. It gets me. It's crazy!

>>Jessica: They are big!

>>Megan: They are big roots! We kinda throw out this number that what you see above ground you have about 75% more below ground. Think about how tall a bluestem plant is. It's tall enough it just covers me up in the prairie, you can't even see me. I got to carry a flag on my backpack so people can see me in the field, it's ridiculous! There's a little orange flag bobbing behind me! (giggles) It's terrible. But this is what happens when you are short and you work in the great beautiful landscape of Minnesota. So, you have 75% more roots going vertically and horizontally that is your soil health bank right there! And those roots are working hard they're not just building organic matter, they're filtering water they're providing wildlife habitat for our soil organisms it's, there's amazing stuff going on. Jess talk to me a little bit about some of our wildlife and prairies, especially some of our smaller wildlife like you talked about earlier.

>>Jessica: Yeah, so this is mostly where my brain lives, right? I'm a pollination ecologist by training and so I think about the little guys I'm always rooting for them and checking them out when I'm out there on the prairie right and putting them in vials and bringing them to people sometime to show them and sometimes people get a little creeped out.

>>Megan: Sometimes it is a little creepy!

>>Jessica: Sometimes people are a little excited! There are a lot of people that don't pay much attention to them. They are are a lot of people that don't pay much attention to them, they are looking at that birds are there looking at the plants and they forget about the little guys. But, the little guys is where it's at! There's so much diversity, insect diversity on our prairies. Prairies provide habitat for all kinds of things, fungi even, close to little guy we forget about oftentimes. They are essential to prairies! I am a firm believer that that fungi are where it is at! That we have to be focused on the little guys! So prairies prairies provide I just encourage everybody next time they are out on the prairie Megan is laughing at me, I want people to notice the insects! Next time you are out and about you don't even have to go out on the Prairie, you can do it in your front yard! I have prairie plants in my front yard, I do this all the time, I will look at the little guys because they are so cute! So,

>>Megan: It's part health right?

>>Jessica: Well, yeah. But, they are cute too.

>>Megan: But they are cute too. They are adorable with their long antennae and their giant eyeballs looking at you. With their little cute wings.

>>Jessica: One of my goals in life is to get people to notice the little guys. Right, it starts but yes! Megan's right. They have an important purpose but, I want people to notice them and value them for what they are not necessarily for the role that they play. Right. Pollinators they are moving pollen around, they are doing amazing things for our ecosystem. They are also aerating the soil, right? Most of the pollinators that we see on the prairie are solitary, so they are digging down into the ground and aerating our soil, they do amazing things, they do so much.

>>Megan: I know. You don't even think about them digging down there like it's one of those things were like when your little kid you like it's raining outside you know you look out your window and you're like mom where do the dear go?

>>Jessica: MMhMMM

>>Megan: Like when it's raining, whose house do they go to? That's kinda like pollinators. Where do pollinators go in the winter?

>>Jessica: Yeah

>>Megan: And as you start understanding all of these little bits and pieces of what makes a Prairie so amazing you can finally begin to have a grasp on how your recipe is gonna come forward for how you are gonna even attempt to build it back

>>Jessica: A lot of ingredients.

>>Megan: There are a lot of ingredients that you are going to need.

>>Jessica: MMMHHMMM.

>>Megan: It's true.

>>Jessica: What happens if you leave one out?

>>Megan: Oh gosh

>>Jessica: It's not good.

>>Megan: It's not good

>>Jessica: It's not a pretty picture.

>>Megan: This leads right into my soapbox there will probably be one every podcase. I will try I'll try not but this this is our soapbox moment as we move into how do we build a give you an overview for that so I just want to say this as the caveat We do not have all the answers. There is still so much to learn. I mean as soon as you think you got this all figured out, nature throws a curveball at you. there's all kinds of weather things that are just out your hand you can plan how you're going to do a reconstruction to the best of your ability and then nature just throws curveball at you and

>>Jessica: Drought.

>>Megan: Drought.

>>Jessica: Flood.

>>Megan: Flood, whatever it's very complex and so it's incredibly difficult to put these things back. It's much easier to protect what we have but we are in a situation in this landscape where we're working towards doing the just that to the best of our ability trying to put it back so you won't always be looking at that native prairie and like Jess was saying earlier, look at the little guys look at all those pieces and components and figure out how you're going to entice those things to come back to this piece of ground that you're going to try to build back to a prairie. And I mean if you spend any time looking at a native prairie they are majestic right? They are fascinating! So it's easy to get lost in their Majesty so when we're building something back we do look at the plant community because it kind of all starts with the seed mix in our site evaluation and so one thing I want to say here is that if you look at the plant community you are going to find that there are very distinct groupings and this is the way the plants grow. I'm going to refer to these in this next section as guilds. So when we restore a Prairie if we miss one of these guilds okay this is where we are talking about cool season grasses, warm season grasses, forbs, legumes, you need annuals, perennials these kind of things if you miss one of these guilds are setting yourself up for failure.

>>Jessica: Let's back up a second.

>>Megan: Yeah, I am ready.

>>Jessica: I have a little anecdote. I was on, I was on the phone once a long long time ago when I was doing my Masters degree. I was on the phone with a land manager and I was asking some questions

>>Megan: That was a long time ago!

>>Jessica: That was a while ago. (giggles) And I was asking some questions about where these various roadside prairies were. This was in Iowa. An I was about 15 minutes in the conversation and I kept using the word forb. And the guy goes I don't know what that word forb is. I hear you say that but, I don't know what that is and then it occurred to me that none

of what I had said and made any sense because I was using jargon. So let's define some terms. You used a couple terms forbs, legumes.

>>Megan: I did.

>>Jessica: Cool Season. Let's get those defined. What is a forb Megan?

>>Megan: It's a flowering plant.

>>Jessica: Oh, a flowering plant, OK! So, one that flowers?

>>Megan: Yes, yes. One that flowers.

>>Jessica: Beautiful flowers.

>>Megan: Beautiful flower.

>>Jessica: Ok, legume? Ok, what do you got for legumes?

>>Megan: They're nitrogen fixing.

>>Jessica: Nice, important.

>>Megan: That is important so it's a category they usually are forbs like most of our legumes are forbs.

>>Jessica: Right.

>>Megan: But it's a special kind.

>>Jessica: Peas, people think of them as peas.

>>Megan: Yes.

>>Jessica: Right.

>>Megan: That's what we tend to think of that's most common group that we think of as nitrogen fixers but there are lots of other prairie plants that wouldn't necessarily be a pea but they might be in the bean being family they are in the legume family, they are nitrogen fixers.

>>Jessica: I might be going down a little bit of a rabbit hole here. Maybe we need to tell our listeners what our future plans are working to go through this stuff? Superficially today and then in future episodes and delve into these specific topics in more details, right?

>>Megan: Yeah, each of these components that we are about to discuss because it takes a while to go through prairie reconstruction. You can't just do it in 30 minutes,! There's no way! And so we are going to go in and we talked about guilds a little bit and so now I want to talk about kind of the steps that you go through as you're building it. So we are going to list these

and then we are going to say a few words about them. Just so you get the list. First thing they should be thinking about, diversity. Right?

>>Jessica: Number 1.

>>Megan: Number 1 thing you should be thinking about and your cycles! The second thing is where's my seed going to come from? Seed sourcing, I want to think about that. Then I want to think about okay how am I going to build my seed mix? How am I going to do that? And then I have to think about how am I going to plant it? What equipment are you going to use? What technology do I have? and then we start going into these management phases, so there's an establishment phase, which is generally anywhere between 1 to 3 years or 1 to 5 depending on what's going on with your site and then we have long-term management and then after that is where Jess really comes into play how are you going to evaluate what you did to know if it's working and giving you the functionality that you hoped it would be or is it just pretty? Did you just make it pretty without making it functional? That's something my colleague Lisa Gelvin-Innvaer always talks about like it may look real nice but if it's quiet and there's nothing living there what did you really do? You just put a picture on the landscape instead of putting habitat on the landscape. Oh man, that's good. That's a good analogy.

>>Jessica: You're missing some Lego's. You're missing a whole bunch of Lego's.

>>Megan: I know.

>>Jessica: You're missing a whole bunch of pieces.

>>Megan: I know, a whole bunch of Legos! So now, step into those just a little bit and Jess and I are both going to talk about those pieces. So we are going to start with diversity in your cycles. Alright, this is the thing, there is no one way to build a prairie. If somebody tells you that they do not know what they're talking about. I just said it. There is no one way to do it. There are wrong ways to do it but there's definitely no one way to make this happen. So it's kind of like making a cake. There are hundreds if not thousands of cake recipes, right?

>>Jessica: Sure!

>>Megan: But at the end of it you still get this delicious cake if you follow the recipe. So I'm going to argue that anything that you layout to do when you're trying to put a prairie habitat back is that you have to have diversity in there because if you don't you have already missed the biggest ingredient in the cake. You missed the sugar people! IF you don't have the sugar the cake is just going to be horrible!

>>Jessica: It is not going to taste good.

>>Megan: It is not going to taste good. So you want to think about diversity which also think about your goals right? In the Department of Natural Resources we have all kinds of different goals for habitat sometimes we have land that we have multiple goals usually, right? Like we

have land that we know hunters are going to want to use so we want to make sure that it's functional to them that we bring in game birds but we also want to build we don't do single species management we want to make sure that it's good for all the species that are out there and so we have to try to juggle and there are limitations with that. Jess, what about seed sourcing? Talk to me a little bit about that.

>>Jessica: Man I am deep in it and you are going to have to make sure I don't go down another rabbit hole

>>Megan: Brief today, it's brief today, brief overview...

>>Jessica: I know, it's brief today. Seed sourcing is a big topic right now! So many people are thinking about seed sourcing. I had a big meeting yesterday I haven't even told you about it

>>Megan: I know!

>>Jessica: It was a great meeting with a bunch of research colleagues talking about where the gaps are in our knowledge are about seed sourcing and as it relates to prairie reconstruction. So it's an exciting time to be thinking about seed sourcing as it relates to things like climate change um but there's so much that we we um still have questions about so you know there's a variety of places you can get your seed and I I continue to push this diversity envelope from a seed sourcing perspective. We want we want to get diverse genetics when we think about seed sourcing to set that seed up for the best possible future, right? So we got to get diverse seed. We got to get seed from lot of populations of been collected at different times under different water situations that can give that seed the best chance to grow and live under current climate conditions as well as future climate conditions. So,

>>Megan: So, you're talking about resiliency?

>>Jessica: Oh, for sure, resiliency!

>>Megan: So, you're talking about making sure you have resiliency?

>>Jessica: Yep, yep, resiliency

>>Megan: Which is the ability of a habitat to withstand change?

>>Jessica: Yep

>>Megan: No matter what changes thrown at it. Because we can't predict the future. We can with the best of our ability with the best science tools that we have but, ultimately nature throws us curveballs so we needed to be resilient to ask withstand those extreme weather events rights

>>Jessica: Right.

>>Megan: So, we need it to be resilient to withstand those extreme weather events, right? So if we are talking about extreme drought or extreme rainfall that leads to flooding we need to be able to withstand that, and that is what resiliency is.

>>Jessica: So I think about that at the species level right we need diverse communities from the species perspective we need a lot of different species in that mix but, we also need each of the species to have come from a diverse seed set. So seed sources is going to be big it's going to play into those goals that you were talking about Megan know where you get your seed or how you get your seed how you source it is going to depend on what your goals are of your site reconstruction so lots to talk about for the seed sourcing it's just the next step in this process of how do we build prairies.

>>Megan: So once you kind of decide and this is kind of a little backwards because the way I do it or the way we do in the DNR is we usually build a seed mix and then we decide what's available and how far we're going to go to source our seed so maybe it's a little bit backwards

>>Jessica: But the process

>>Megan: It's a process. So when you are building a seed mix again, I mentioned those guilds that you're talking about fulfilling you need to make sure that you've got cool season grasses, warm season grasses, you need to make sure they got different types of forbs in their legumes and then in general we've done the science we've done the research we know that you need to be shooting for a target for most of our pre-habitats of the minimum of 40 seeds per square foot and if you're not doing the math with seeds in square foot, switch now!

>>Jessica: (laughter)

>>Megan: It is the best science that we have you we've got to start retraining our brains and it just makes sense think about it. if you take a couple of rulers and you lay them out on the floor so that they make a square foot you're picturing your envisioning how many plants are going to grow within that seeds per square foot that's what you're doing when you're building a mix. I don't care how many pounds you have I want to know what's going on in that square foot of ground and so when you think about it that way it just makes a lot more sense and you're going to get better results see one thing about that there's lots of debate about how what percentage of forbs should I use versus grasses and sedges, let's not forget about sedges...

>>Jessica: Everybody seems to forget about sedges.

>>Megan: I know it was.

>>Jessica: There are some people thinking about sedges. They are the low man. They are like the poor little forgotten teenager or something.

>>Megan: I know.

>>Jessica: I don't know. We gotta get em, we gotta get the sedges!

>>Megan: Well just tell you what. Tell you what, after you listen to this podcast for a while you will get this disease it's rare disease, it's called sedge fever. Once you get it you cannot stop looking at sedges and once you get it, you cannot stop looking at sedges. They will just they will frustrate you and fascinate you at the same time because they are amazing plants

>>Jessica: I think people are scared of sedges.

>>Megan: I mean, I mean yeah. They are a little scary. Anything I can't identify without a seed head on it is a little frightening but they are an important part of a prairie and they would be in a prairie normally. So there are ratios, right? I'm a big firm believer of trying to get to at a minimum of 50/50 50% forbs 50% grasses. I think that builds you a really solid mix there's lots of things to consider we have species that are really competitive and outcompete so you need to try to limit their ratios in the seed mix. There are other species that we call restoration conservative species. These are species that you could plant pounds and pounds and pounds of them and it's not going to translate to that once you plant it. It's just not going to happen because there are species that are not very aggressive, they might be difficult to establish, things like that there's lots of things we need to talk about when we talk about seed mixes.

>>Jessica: It's going to be a big episode!

>>Megan: It's going to be a real big episode!

>>Jessica: This is Megan's favorite part!

>>Megan: I know I get really excited I get excited I like all the math I like sorry okay say somebody said this to me other day they said there's so much work and planning that goes into trying to match a seed mix to your specific site conditions looking at your soils, your topography, moisture, all this, right? But, if you think about it you get one chance

>>Jessica: Yep, one chance, well

>>Megan: to build it.

>>Jessica: Maybe, for the most part.

>>Megan: in general

>>Jessica: In general

>>Megan: you get this one chance so it's worth it! Ok, I am done! I am done going down the rabbit hole, talk to me a little bit about how to plant this stuff! What do we have to think about?

>>Jessica: There is a lot that goes into thinking about doing that too. This is a big process! It is worth taking the time to plan it all out. Think about it and I am going to get a little bit on my

soapbox here and document it! Because we are going to get down here to the end and we are going to talk about monitoring and evaluating and if you didn't document this process, I have a real hard time coming in and saying what we could've done better so

>>Megan: Or what worked!

>>Jessica: or worked

>>Megan: Because you don't know what ingredients you used.

>>Jessica: If you didn't write it down, it's real hard.

>>Megan: Yeah, the cake might be delicious but how did you make it?

>>Jessica: Right. So, planting prep, you know, we have to decide, you have to write it down, you have to have a plan, talk to a lot of different people. Equipment and technology are ever changing and becoming on becoming friends know we have to start embracing the technology that farmers are using to do their precision plantings in our are planting so we can talk more about that. Megan and I are getting excited about a field day we are planning this summer that's really gonna touch on this issue of technology and using equipment and that the best way we can

>>Megan: right, how you translate your plan that is on paper to real-life field situations. Because everybody knows even the best laid plans, once you get out the field, is like oh this soil is wet and my maps says it is supposed to be dry I got to adjust.

>>Jessica: Yeah

>>Megan: so there is facing with planting you got the seasonality right you can do it in the fall you can do it in the spring you can do it in winter and you can broadcast seed you can drill it there's lots of different ways and so we'll touch on that as well. Then after you do that what are you going to do for this establishment phase management? What are your choices? You have lots of tools in the toolbox! one of the ones that we use a lot is spot spraying. We are going to talk a little bit about that. I'm a little nervous about how much we spray and just how much just sheer hatred there is towards Canada Thistle because you have to think about every management choice in the long term. So I'm not saying it's a bad thing to kill Canada Thistle but, what I'm saying is if doing that ultimately damages the majority of your forbs, or flowering plants, in what you just planted what have you really gained? So you have to think about when you make your management choice how are you going to keep that functionality? We will have some guest speakers on to talk through that because as you know, lots of people make different choices with this for their establishment phase management how they think what they think is going to give them the best results and there's not necessarily one right answer. And the problem is like Jess is saying you don't necessarily know if the answer is right or wrong until you get further down the road

>>Jessica: There are so many factors

>>Megan: There are so many factors

>>Jessica: So many factors and that's why the science has had a hard time keeping up or even attempting to document some of these different variables that can play a huge role in whether or not a prairie looks good at the end or not.

>>Megan: Looks good and is functional.

>>Jessica: Looks good and is functional, right.

>>Megan: So, and then there's long-term management that will get into a little bit about prescribed burning, grazing, haying, spot spraying, some using of maybe rotating and food plots with cover crops like there's lots of other like weird stuff that's going on that is innovative and exciting and I think we have to remember that when you think about all these different types of tools in your toolbox whether it's 10 head a cows or it's a drip torch, you have to think about not just okay I am going to burn in the spring, I am going to burn in the spring, I am going to burn in the spring. If you do the definition of insanity is doing the same thing over and over again and expecting a different result. So when we think about managing our prairies long-term. Whether they are reconstructive prairies or native prairie you have to think about how are we going to mix it up? How do we mirror the unpredictability of nature? How do we do that and still meet all of our other goals of what we have for that site? So that's going to be real interesting to talk through that. Jess, talk to me just a little bit about we already touched on evaluating your plantings but I think this is just such a huge piece and everybody who has been doing this for any amount of time says I need to know like how do I know if I did a good job like how do I know my next step is I feel like I'm guessing.

>>Jessica: Yeah, that's huge, it's huge and there's some really cool initiatives going on that are trying hard to get at this evaluation piece. There's the grass monitoring team, there's the prairie reconstruction initiative these are different things that we'll highlight as we move forward you know that ways in which we can all work together one big happy family.

>>Megan: I like working together.

>>Jessica: I know. We are stronger together, right?

>>Megan: I mean nobody has, I am going to quote Lisa Gelvin-Innvaer again, nobody has all the knowledge know how tools this is a loose quote she says it much better but, nobody has it all and so when we work together we get the kind of combine all those really interesting ideas that we have and great idea then we come with a better outcome because we get combine all of our experiences.

>>Jessica: Yeah!

>>Megan: I may have been doing this now, I am ashamed to say it, for over 15 years. I've been in this field of prairie restoration and I certainly am a much better restorationist than I was 15 years ago and the choices I make now I would like to think are better informed by the science and I also have under my belt lots of failure where I can point to that and say I don't want to do that again! So if you combine everybody's failure together you get a better likelihood of success, and I love that!

>>Jessica: Yes

>>Megan: And I love it!

>>Jessica: It is an important step that's often overlooked although people are starting to value evaluation so, we'll talk about that! I'm excited, it's my favorite part of course.

>>Megan: I know it's your favorite part. That's when we are going to hear Jess talk a little bit little bit more about things and she'll just be so excited I won't be able to contain her!

>>Jessica: No, you won't!

>>Megan: Jess, it's time for a, now that we have given you a little time for a section of the podcast that we call

>>Megan & Jessica: (screaming voices) Let's science! To the literature!

>>Jessica: This is exciting, this is my favorite part of course because I am a scientist! That's where I live, it's in the science realm. Megan is a scientist of course as well but I read, over and over and over again, I read and it's wonderful! I like to tell people about what I read.

>>Megan: I would just like to clarify for everyone listening that I also read. Maybe (laughing) in case it is not clear. Because it seems like Jessica is saying I don't read.

>>Jessica: I am not saying that, I am not saying that.

>>Megan: But she definitely, I mean this is her jam. I fully, I ask her for this stuff all the time because, she reads all the time.

>>Jessica: I am published in science.

>>Megan: Me too, but we are not going to start wheeling out all of our papers and certifications

>>Jessica: Really.

>>Megan: Why do you say it like you are so surprised? This is the thing when you work with people for a real long time, they put you in a category of what they think you are. Jess has put me in my little category of land manager.

>>Jessica: No

>>Megan: So she is surprised that I have published papers. Surprise! I am a scientist, too! OK, continue. Tell me about this because this is exciting.

>>Jessica: I try I try really hard to follow literature and then try to try to distill it down to some management recommendations from the new papers that are coming out. So one that I have been really excited about is this Sluis paper that came out in Restoration Ecology.

>>Megan: Can you spell Sluis for me?

>>Jessica: S-L-U-I-S. William J Sluis I believe is out of Illinois somewhere. Yep, Morton Arboretum in Illinois. If you haven't been there it's a beautiful place!

>>Megan: I almost worked there!

>>Jessica: It's a nice place. So this is kind of why I was questioning the whole you have to do it right the first time. So, one of the big outcomes of this paper was that they found that restoration to had repeated establishments over time, so not just a single you know seeding or a single planting, those that had multiple seeding events whether it was interseeding or additional plugs through time. These are really old. Morton Arboretum is really old planting, prairie planting. And they found that those plantings that had repeated introductions of species were more like they had diversity that was more similar to the remnants than those that just had single you know this the single first planting. So, that's why I was questioning that. I would like to ask these authors a little bit more about what those you know what those repeated establishments were like. Were they interseedings? How were these interseedings done?

>>Megan: Were they plugs?

>>Jessica: Were they plugs?

>>Megan: Were they plugs because that would make a huge difference.

>>Jessica: yeah.

>>Megan: Plugs being established plants like you get a flat of pansies in the store and like each individual pansy that you get, that is a plug. appointed native plants there way deeper roots

>>Jessica: Right, but it also highlighted this paper one of the implications for practice was that were missing a lot of these big guilds and so this get back to this functional group thing we're missing *C-3 Grahamanoints* we're missing those sedges and the early flowering grasses and then we're missing early flowering forbs as well in our plantings compared remnants. And we're missing native woody species so those led plant and what else New Jersey T things like that we are missing in our seedings. Why are you making googly eyes?

>>Megan: Oh I was just thinking of prairie rose

>>Jessica: Oh

>>Megan: For another woody species.

>>Jessica: Prairie rose, that's another one. Yeah. So we got to fill all those guilds and were not doing a great job with that in our prairie restoration.

>>Megan: So, we are going to talk about that in the building a seed mix episode because that's where I get real excited and we get you do have to have early, mid and late blooming things and you absolutely that's why we talked about cool season grasses earlier. Because if you don't have them you are just always going to have brome. You are going to be fighting a brome bound because you have nothing in the prairie to fight that fight for you. Continue.

>>Jessica: So, that's one of my papers that I have been referencing pretty frequently here recently. Megan, do you want to talk about the tallgrass prairie restoration handbook?

>>Megan: Oh!

>>Jessica: It's the bible.

>>Megan: It's probably my favorite book! It's the Bible of prairie restoration, that's the truth! So this book is a mix of science and personal experience and so I think both are valuable especially you cannot discount somebody who has spent their entire life learning about this. Whether it's in a published paper not so you don't these all help to build our understandings. So, It's called The Tallgrass Restoration Handbook for Prairies, Savannas and Woodlands at the Science and Practice of Ecological Restoration it's by Stephen Packard and Cornelia F Beutel they're the editors, it's \$50 new. Okay this is the best \$50 you will ever spend! If you can see my copy of this book is like my cousin's a librarian and it breaks all of her rules for how one should treat a book because it has been carried with me to the field so many times! it has so many dog ears and it it's got weird brown marks in it that I don't know if there like dead bugs are like dirty hands or I don't know! But, you need to read this book because some of the stuff that we talk about it being groundbreaking now everytime I go back and read chapters from this book I am like these people have already figured this out. I am like why are we still taking so long to get up to speed on the science and so this does a great job of compiling literature and personal experience from experts in the field and so I think it's really invaluable.

>>Jessica: And then Chris Helzer's blog, we read. We read pretty frequently. I have it come to my inbox which is kinda convenient and then I don't have to go stalk the website. But it has kind of a cool following I think. There is tons of good information on there. It is called the Prairie Ecologist Blog and he says we have a quote here "conserving prairie species in tiny prairies is like trying to catch falling popcorn in a coffee cup." What was that? What was he talking about there, Megan?

>>Megan: He's talking about how when you lose so much of the landscape being covered in prairie like when you're down to 1% it is difficult to ask that prairie to do all the things that we want it to do. And so Chris is great! He works for the Nature Conservancy, I've never met him personally, our goal, one of our goals is I guess that we can get him on the podcast and pick his brain because I think there would be some lively discussion. You'll learn that there's always lively discussion between me and Jess. We don't always agree but, those points where you get to have those really constructive arguments, discussions, whatever you want to call them, makes us better scientists and better restoration practitioners. And that's what the goal of this podcast is to get us up to speed and do that but Chris also takes amazing photos! So, if you have ever seen his blog he always has a series of photos in there and he really captures the details of a prairie so things that you don't necessarily see it's not just all a bunch of grass.

>>Jessica: He cares about the little guys!

>>Megan: He cares about the little guys and that will come through his blog and he also his blog is a forum for these types of discussions happen too, so it's great!

>>Jessica: Megan, take a hike !

>>Megan: I would love to! I would love to take a hike! It's beautiful outside, the sun is shining, it's a beautiful day to take a hike. So, we are in our segment of the podcast called Take a Hike.

>>Jessica: Take a Hike

>>Megan: And, Jess just wasn't being mean to me and this is where we're going to feature some land's, public lands, these are your lands that you can visit and so on the docket today is Red Rock Prairie. This is a Nature Conservancy property it's about 601 acres. There's also the Rock Ridge Wildlife Management Area it's 158 acres administered by the DNR. Then there's Rock Ridge Scientific Natural Area, 203 acres also administered by the DNR and then to roll out this complex, to finish is out, is Jeffers Petroglyphs which is administered by the Minnesota Historical Society. So, I just want to read this Jeffers Petroglyphs quote because I feel like it captures some of this majesty of what we're talking about. I will try to say it in my most majestic voice.

>>Jessica: I mean...this landscape...this landscape is beautiful!

>>Megan: It's beautiful! That's why we are calling attention to these prairies.

>>Jessica: I fell in love with it! The rock, outcrops and quartzite it's just amazing!

>>Megan: Okay, yeah! it's part of I mean so it just like talking about, this is all part of the Red Rock Ridge Prairie Landscape, that's what it's called. And so this is all of these properties that

we just listed are a series a prairie preserves that are along a ridge of Sioux Quartzite outcrops and they are just phenomenal!

>>Jessica: Right! and it's just so amazing that these landscapes have survived and survived in part because of the rock right, because they couldn't be farmed but it's just beautiful that this is there's this landscape that's connected through all these different partners that are that are working together to create a functioning landscape.

>>Megan: I know I also love that our first take a hike series includes all these partnership pieces.

>>Jessica: yeah.

>>Megan: Because isn't that about what that the Department of Natural Resources is doing? Rollin this together and so I like that were going to highlight not just DNR public lands but, we are going to highlight these other properties as well.

>>Jessica: And they work together. This WMA, the Rock Ridge WMA I believe worked with the Nature Conservancy parcel that's right next door adjacent to it to source some of their seed from those adjacent prairies. So, it's about this partnership that that's what it's all about when were not just a single entity working alone out there on the landscape.

>>Megan: No, we can't we've got a lot of partners. I am going to read this amazing quote. Well, I think it's amazing but this is pulled right off the Jeffers Petroglyphs website. This will give you an image of what you will see if you take a hike. "Amid the prairie grasses are islands of uncovered rock, where American Indian ancestors left carvings-petroglyphs-humans, deer, elk, buffalo, turtles, thunderbirds, atlatls, and arrows. They tell a story that spans more than 7,000 years." Now I've had the opportunity to go out to the petroglyphs and to explore that landscape right at sunrise or sunse.t

>>Jessica: This is the most perfect time to go.

>>Megan: I'm not a morning person.

>>Jessica: Do not go at noon.

>>Megan: No.

>>Jessica: You won't see anything.

>>Megan: I mean, I am not a morning person so it was a struggle but to see the sunrise over this landscape it's going to change your whole life. Like it's going to change your appreciation for prairie and help you better understand this part of Southwest Minnesota, at this Red Rock Ridge area. It is one of our most important prairie complexes. We have lots, I mean let's face it all of our prairie we can say is most important because we have so little of it left.

>>Jessica: Of course.

>>Megan: But it's just a nice! It includes native prairie. Prairie that's never been plowed and it also has reconstructions, prairie that has been built back. So it is, you just got to go.

>>Jessica: It's beautiful.

>>Megan: You have to go see it.

>>Jessica: In the evening or morning.

>>Megan: Or morning or anytime, just go. Like we are not going to, just get out there and go.

>>Jessica: You have an opportunity.

>>Megan: So, that's it. This has been our first inaugural podcast. We really enjoyed being here with you today! We're going to get into more of the nitty-gritty and the science behind all this stuff on our next episode! I just hope you guys catch us next week on prairie Tuesday that's when these episodes air.

>>Jessica: It will be great!

>>Megan: It's going to be real great!

>>Jessica: Yep, I am real excited! Thanks Megan!

>>Megan: Thanks Jess, this was super fun been under this table with you!

>>Jessica: Next time.

>>Megan: Till next time, bye you all!