Prairie Pod Transcript

Season 5, Episode 45: Sheep, Solar, and Satisfied Pollinators

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Guest: Arlo Hark (Producer), Kelly Anderson (MDA), Paul Erdmann (BWSR)

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

Transcript:

((music playing))

Megan: Hey Prairie Pod listeners, I'm Megan Benage, regional ecologist with the Minnesota Department of Natural Resources.

Marissa Ahlering: And I'm Dr. Marissa Ahlering, lead scientist with the Nature Conservancy in Minnesota, North Dakota and South Dakota.

Sara Vacek: I'm Sara Vacek, wildlife biologist with the U.S. Fish Wildlife Service, based out of the Morris Wetland Management District.

Mike Worland: And I'm Mike Worland. I'm a wildlife biologist with the Minnesota DNR Nongame Wildlife Program.

Megan: We are part of the Minnesota Prairie Conservation Partnership and we're here to help you discover the prairie.

Marissa: Discover the prairie.

Sara: Discover the prairie.

Mike: Discover the prairie.

((music playing and sounds of birds chirping))

Megan: Hey, welcome back to the Prairie Pod, it's season 5 all season long and we are so excited that you're here with us. I'm here with my fabulous court-ordered-host. Marissa do you want to introduce yourself?

Marissa: Yes, I'm Marissa Ahlering with the Nature Conservancy. I'm the lead scientist in Minnesota, North Dakota and South Dakota and super excited to be here today.

Megan: It's really nice to like mix it up this season. We got different voices. We've got lots of good experts. I'm enjoying it.

Marissa: Yeah, lots of people.

Megan: We're like halfway through, I can't even believe it. All right, let's jump right in, so pardon the pun but you know I like a good pun. Today, we are going to bask in the amazingness of an emerging prairie partnership between sheep, solar, and hopefully, satisfied pollinators. The solar industry is booming in Minnesota. Right Marissa?

Marissa: yeah, it's phenomenal the amount of growth that's happening in that arena right now.

Megan: I know.

Marissa: And super exciting.

Megan: It's exciting. It's, it's fast which always makes me a little nervous, right? It's fast, but I think Minnesota is leading the way with careful planning and some great innovations that we're going to share with you today. And some of these innovations involve stackable benefits. Everybody knows how I like a good stackable, it's like a Lunchable but it's a stackable. So we've got improved soil health, water retention and infiltration, habitat for pollinators. We could also get forage for grazers and of course, low cost energy production. We can stack all those things together if we do it thoughtfully and with care planning.

Marissa: Yeah. One of the things that excites me about thinking about solar energy and particularly thinking about pollinator-friendly solar is what the stackable benefits for sure, I'm with you there, stackables, Lunchables, but also that from a climate change perspective, I think you can get both of the climate change strategies in there. So you get climate mitigation in terms of renewable energy, offsetting carbon emissions, but also adaptation potential in terms of thinking about pollinators and habitats and putting more habitat for pollinators on the ground. So it's kind of a win-win in that situation.

Megan: Yeah, I like. We were talking about wind energy, just said it's a wind-wind, but we're talking about solar, so I don't have a funny pun for you. All right, let's jump right in. Let's introduce our fabulous guests that we have here with us today. I'm so excited that we have so many great experts to talk to us about solar. So we're going to start in the order that you're going to hear these folks talk. Paul, why don't you lead us off and introduce yourself?

Paul: Hi Megan. My name is Paul Erdmann, I work for the Minnesota Board of Water and Soil Resources. I am a buffer and soil loss specialist and I also assist with pollinator initiatives such as our habitat-friendly solar program.

Megan: Perfect. Kelly.

Kelly: Why hello there, Megan. I am so happy to be here today as well. I'm Kelly Anderson and I work with the Minnesota Department of Agriculture. I've been a grazing

specialist there for about 12 years now, and I also help the DNR in putting some grazing out on public lands. I wear two hats there with both the Department of Agriculture and the DNR. And I'm also serving as the current chair for the Society for Range Management's Targeted Grazing Committee. So solar grazing is something that we deal with quite a bit there, so glad to be here.

Megan: Love it. Arlo.

Arlo: Hey yeah. Hi everybody. Very, very pleased to be here today. My name is Arlo Cristofaro-Hark. I am a solar grazer of a shepherd near Northfield. My wife and I started Cannon Valley Grazers like four years ago now, and yeah, very excited to be here and talk about my experience grazing on some new solar developments in Southern Minnesota.

Megan: See how we provided something awesome for you today? See we brought all these great experts together. We've got scientists, we've got people from the ag community who are land managers and they're managing grazing. We've got, why can I not do this?

Marissa: What are your categories?

Megan: See how these great guests that we've got for you today, we've got scientists, we've got land managers and grazers. We also have ag specialists who specialize in grazing. It's going to be a great show. I'm excited. I'm excited to learn, Marissa.

Marissa: Yeah, me too. I'm super excited to learn from all of them because there's a lot I don't know about solar energy, so excited to dig in.

Megan: All right. So before we dig in, let's give our listeners a little bit of an overview of solar energy development in Minnesota because we just want to make sure we're starting out on an even playing field. So I'm going to start with, you know, what even is a solar array so still we're on the same page when we talk about an array during this podcast. It is not a ray of the sun, although I could understand why you might think that. It's a collection of solar panels that's made up of light-collecting cells that generate power. And so the solar array is the entire power generating unit. And so in our role as the DNR, we typically comment on utility scale solar, when I say utility scale solar, that means sites that are generating 50 megawatts of power or more. And then so the way this works is that the array sells power to electric utility companies across Minnesota, and in order to do that, they need a site permit from the Public Utilities Commission. So that's kind of how it all works together. Marissa, tell me how much solar energy has been developed in Minnesota and how much is planned.

Marissa: So currently in Minnesota, we have around 262 megawatts of operating utility scale solar. And so that means as Megan, you were talking about a minute ago, these sort of larger size operations, and we're not talking about the smaller sites like community solar gardens when we're talking about these numbers. But in the next two years, by 2024, we're going to increase that amount of solar development potentially by five times. So 1,400 more megawatts of solar energy development is planned across Minnesota. And so that's why we really wanted to bring this podcast to you all this season because we think this is a really, it's a newly developing area, there's going to

be a lot of it showing up on our landscapes, and so what does that mean for our habitat especially if we're starting to think about putting pollinator-friendly plantings in these areas, and how do these things work together.

Megan: And we're also expecting that increase to be even more because under our current Minnesota plan for energy development, we're expected to be 100% clean energy by 2040, which means we could expect a lot more solar coming online. So it's good to talk about these things now to help you guys think through some of the possibilities because there are lots of possibilities. So just so it's clear too, and I know this is like one of those commonsense kind of things when it was explained to me, I was like oh, yeah, right. One of the questions we get asked all the time is where's all the solar going to go, right? And so it makes sense that a lot of it is going to go across the prairie parts of Minnesota because there aren't as many trees, right? And if you're trying to build an industry around capturing energy from the sun, being in an open landscape is ideal, right? As opposed to being under the canopy of the woods. It just makes sense. So that's where most of the solar energy is going to go. A lot of it goes into agricultural fields, again, not super surprising since agricultural lands make up half of Minnesota's 55 million acres, just over half, and so most of that solar is going to go in those parts of Minnesota. So we're looking at increasing southern Minnesota, northwest Minnesota, southeast, and central. Probably northeast not so much.

Marissa: Yeah. And I would just say it's also when we're thinking about those stackable benefits, it's also really important to think about where they're going because you really get more of those stackable actual benefits from your solar arrays when you're putting them in areas that have already been disturbed. If you put them in areas that are remnant prairie, you don't increase the number of benefits in the same way.

Megan: Yeah, and that's certainly not something that we would want to see happen either just because we all know this is the Prairie Pod and we love prairies and we need it for its intrinsic inherent values but we also need it for all of the things that it's doing, right? Cleaning water, allowing us to breathe air, building healthy soils, and it needs to do that connected and undisturbed to be at its maximum potential. So let's jump right into some of these opportunities. Paul, we keep hearing these phrases, habitat-friendly solar, pollinator-friendly solar, Minnesota was the first state as far as we know to address pollinator protection in the legislature. Can you describe Minnesota's program, maybe give us a little bit of its history, and how it works? What does it mean to be pollinator-friendly solar?

Paul: Yeah Megan, you're right. Like many other conservation programs, Minnesota led the way with our habitat-friendly solar program. In 2016 with bipartisan support, the legislature passed a law that says solar sites can implement practices that provide native vegetation and forage habitat for pollinators, gamebirds, and songbirds. Owners of these solar sites can claim they provide habitat for pollinators and other wildlife if they meet the standards of the habitat-friendly solar program, which is administered by where I work at the Board of Water and Solar Resources. To meet the standards, the owners of the solar sites develop vegetation plans, they submit scorecards, they do project planning, and then they construct the sites. While they're constructing the sites, they're planting this pollinator-friendly prairie vegetation. So on the scorecards, they give

points for things such as percentage of native species, cover on the, how much of that cover on the site is native species, how much vegetation will be forbs or wildflowers, how much plant diversity is going to be there, are they going to have different plants blooming during different seasons, and other habitat components like nesting habitat, clean water sources, and avoiding pesticide use both on and around the site. Bowser and local planners review all of this information, and if a site scores high enough, that is if a site is planning to implement good practices that will help pollinators and birds, they meet the habitat-friendly solar standard, and they can promote their site as being habitat-friendly. And then in addition to the scorecards, there's the program focuses on collaboration with local governments and other partners by providing technical guidance and support to implement habitat-friendly solar on a local level, and something you know all about, Megan, with your work at the DNR.

Marissa: Yeah. So how does the habitat-friendly solar program intersect with DNR's commercial solar siting guidance and the prairie technical guidance?

Paul: Yeah Marissa. The DNR's been a really good partner with us on this program. They have developed guidance for solar developers on where to put and where not to put solar facilities. Something we just discussed a little bit. How to establish native vegetation at these sites and how to maintain them.

Marissa: So more along the lines of how to actually reconstruct the sites and how to go about planting when you say - -

Paul: Yeah, so on our website, and we'll provide a link here with this podcast, there's a whole slew of guidance documents that basically if you're a solar developer, I'm thinking about making the solar sites that I want to have these stack benefits, how do I go all about it. And so it's everything starting from the planning process to the actual installation to the maintenance afterwards.

Megan: And we mentioned, you know, DNR and Board of Water and Soil Resources, but I think it's important to mention too that Department of Ag and Public Utilities Commission and Department of Commerce have all been working together in coordinating as a sub team on solar to figure out how to put these packages together to make it easy for developers to implement these pollinator-friendly solar standards. And we've also tried to make sure that we're all saying the same thing and it's clear what you need to do and how you need to do it. Isn't that nice? People working together. I like it so much.

Paul: Yeah, it's really been a team effort and a lot of smart people trying to, again, provide stacked benefits for renewable energy in Minnesota.

Megan: Absolutely. So you mentioned this in your overview, but I want to make sure, you know, I had a college professor once who said if you want somebody to remember something, you need to underline it three times. This is my version of underlining it three times in a podcast, by making you repeat. So I want to make sure it's very clear what are some of the best management practices that are recommended in order to attract pollinators at solar sites. And I know you mentioned some of them, but I want to make sure we say them again so that everybody's clear on it.

Paul: Yeah, so first off, we want to see a large percentage of the sites actually planted with native pollinator-friendly plants. So we talked about the array areas, that those are the big parts of the site, but there's also access areas in places where there's not solar arrays, there's stormwater detention basins, stormwater infiltration basins, so there's opportunities there to also put in pollinator-friendly vegetation. Projects also get more points if they have a lot of diversity, so you can meet the standard if you put in 20 different species of forbs, of grasses, but you can get more points if you're putting in 29 species of plants or 35 or different species of plants, so we want to see that a lot of diversity on these sites. We also give extra points if they have flowers blooming in the spring, so we know spring is a critical time for queen bees coming out from a long winter, ready to start a new cycle of life. So we want to see flowers blooming in the spring, flowers blooming in the summer, you know, that's when the majority of our flowers bloom, and that's usually not an issue, but also critical is the tail end in the fall to provide fall blooming esters and goldenrods and things like that to give a little boost to some of these pollinators so they can survive the winter. There's also extra points for milkweed, if they have a certain percentage of milkweed, which we know we need the milkweed plants for monarch butterflies. So those are the kinds of things that we're mainly looking at. And if you think about it, this can really be somewhat of a challenge because a lot of our prairie plants are pretty tall. Big bluestem, Indiangrass, some of our forbs can be six, seven feet tall, and those plants aren't going to work in the solar array areas because they are going to block the solar arrays. So their palates is really limited in the shortgrass prairie species, and we're finding that those work really well, and a lot of these people doing this work are perfecting these species and getting the mixes just right, so they can both work for wildlife habitat but also still work for maintenance and things like that when thinking about producing solar energy so they're not blocking the solar panels.

Marissa: Yeah, I imagine that's a tricky balance that's had to be weighed. I'm wondering, so you said Minnesota is the first state to kind of enact legislation along these lines and it's been kind of pioneering this field, this arena. I'm wondering how many projects are actually using this scorecard now or how many pollinator-friendly projects are out there at this point. Do you know?

Paul: Yeah, that's a good question, Marissa. We've just recently revised the scorecards in 2020, we're working on another update in 2022. It's going well. We have about 50 solar sites throughout Minnesota in the habitat-friendly solar program that's totally about 1,200 acres of land that are provided in both wildlife habitat and renewable energy. As you mentioned, Marissa, other states have contacted us and they've started similar programs, but we know of those 50 sites that there's other sites that are putting in this habitat-friendly solar vegetation and aren't necessarily using our standard or our program, and also we know that some sites are, that 50 sites, as we talked about, there's tons of sites going in, solar sites going in right now, and we aren't hearing from all of them. So we're always looking to grow the program, make more people aware of it, we want to work with local government units because these are being reviewed by local planners, and really stress to them, you know, they're going to protect their groundwater, they're going to protect their surface water, they're going to create wildlife habitat, they're going to mitigate for climate change, not only putting in renewable

energy, but these deep-rooted prairie plants really store a lot of carbon, and if you think about it they're really going to make a lot of benefit. Last March, we held our second in our second habitat-friendly solar summit, and this really brings in people from all across Minnesota and even other states to discuss not only pollinator-friendly vegetation, but grazing is your other guess you're going to talk about. All of the different stacked benefits that these sites can provide, and if people are interested, those presentations are posted on our website and the Bowser website, and that's included in the link to this podcast.

Megan: Awesome. You mentioned a lot of really great stackables, and I want to make sure to highlight one of them that I think is one that we don't think about as often, and it's about increasing organic matter and water holding capacity of soils, and just improving overall soil health. We mentioned earlier that a lot of these sites are going into agricultural land, and they have the option to remove or to be decommissioned. And what decommissioned is, is that they're no longer a solar array site anymore, they now go back into presumably what they were before. And if they're going back into agricultural land, having 20 years or some amount of years in this permanent native vegetation is going to do wonders for building back organic matter and improving soil structure and just making those soils overall healthier. And so I want to make sure that that point is not lost on our listeners, because that's a huge deal. And of course, if they continue on and they aren't decommissioned, they still get to provide really excellent pollinator habitat, which is something that we are striving for as we look at these stackables.

Paul: Yeah, Megan. So especially with small solar sites, we get to comment on again, this five-acre solar site isn't going to provide habitat for much. But really if you think about it, the site will be there for 25 years, which is the standard lease agreement between the landowner and solar provider, and if it's planted as native vegetation, it'll provide more habitat in 25 years than real crop agriculture, turf grass, or gravel wood, which is normally planted at solar sites, and it's all the while going to provide clean, renewable energy. So in addition to the benefits we've already mentioned, there's other beneficial insects besides pollinators, there's raptors that use these sites. In some cases, these sites can provide habitat for amphibians, reptiles, small mammals, waterfowl, and more. In the next phase of the program, we're really looking to expand these co-benefits. I'm glad you brought up soil health 'cause that is an emerging field, and everybody's very aware of what we can do to help build our soil back up. So it really goes beyond the birds and the bees. The solar sites can be assets in many ways to the local community and really to all the residents of Minnesota. And we look forward to continuing to support partners and local governments to help ensure these projects are a success.

Marissa: That's great. I mean, in terms of raising awareness, what's the first thing a company should do if they're considering doing some pollinator-friendly solar habitat plantings with their arrays?

Paul: That's a great question, Marissa. We have a clearinghouse of information, as I said, on our website, the DNR also has quite a bit of information. But really the first step should be to contact Bowser or the DNR to learn more about the program. Certain

counties, Stearns County has been doing an excellent job, so oftentimes you can also contact your local planners. Solar companies are really great at the nuts and bolts of energy production. You know, they know where to put these things how to maintain them, how to get the most energy production out of a site, but oftentimes, they don't have that expertise in vegetation management. So oftentimes, we're recommending them to work with native vegetation companies that have experience in this area. These vegetation companies are becoming experts in this emergent field. Solar developers should keep in mind some maintenance is required for these native plantings to thrive. We all know listening to the other podcasts working in prairies that if we're restoring a prairie, building a new prairie, we can't just seed it and then it's done and it's going to be a prairie for 100 years. The same thing is this prairie vegetation on solar sites. First three, first, second, and third year really critical for maintenance to make sure that the prairie plants thrive. Also, these sites are limited in what kind of maintenance you can do because they prescribed fire is out of the question. So we know that we like to use prescribed fire to maintain our prairies to set back the woody vegetation to deter weeds. That's not possible because we don't want these solar arrays to go up in flames. So that's out of the question, so often mowing is used and now more and more often grazing is used. And as your other guests are going to talk about today, this is really a growing field and can be a win for the solar companies but also the grazers and the companies that are maintaining the sites.

Megan: That's a great segue, Paul. It's like you've done this before.

Paul: Thank you.

Megan: Our next section. So to kind of frame, we're going to shift to a little bit of the management view, how does grazing factor into these solar sites. Then we're going to frame that conversation with a comment that we get a lot, and this question is for everybody. So we hear this all the time, right? There's a grazing seed mix and there's a pollinator-friendly seed mix, and they're often talked about like they're these two separate intangible things, right? And that they're two separate goals. We maintain that you can do both, that you can absolutely stack these things together. How do you guys see this working? We'll start with Kelly and then go to Arlo.

Kelly: Sheep are really great animals for helping to maintain solar sites because instead of cattle that like to eat grasses, sheep really prefer to eat forbs, and they get a large part of their diet from eating forbs. And that's what pollinators tend to be is they tend to be broadleaf plants that, you know, that we call forbs. So sheep are going to be a good fit for that, and when you talk about stacking benefits and the soil health potential to have soil health benefits on these sites, the best way to really ramp that up is to add livestock because you need to have microbes to have a healthy soil and the best way to feed those microbes is to do it through the gut of a ruminating animal. So what the sheep are going to do is instead of, if you use sheep instead of like a mower or, you know, something that's just going to come and cut the vegetation, the sheep get to process all that vegetation and then put it out the backside, and along with that comes all the lovely rumen microbes that are going to help to feed the soil and build up that soil health and soil fertility, so like I said, when you talk about stacking benefits, you really need to get some livestock in there to make the most of it.

Megan: Arlo, what do you think? You're our resident grazer.

Arlo: Yeah, I'm all in, all of it, yes. I can't agree more that sheep are the solution for these pollinator systems underneath solar arrays. You know, Kelly mentioned a little bit about cows, they don't work, they're too big. They rub. Goats don't work. They jump up on panels, they're really great for, you know, managing buckthorn and wooded ecosystems, woody ecosystems. Sheep really are kind of the optimal, you know, ruminant for the job. They are, you know, they're low-lying, they don't like to jump, they don't chew on wires, and a lot of these traditionally managed systems, when you're mowing, you're not actually removing any biomass from these systems, like a really important part of why burns are so effective in prairie ecosystems is because you're actually removing a ton of biomass, you're removing a ton of thatched down grasses, a ton of old forbs, all the woody stuff, you know, sheep are able to turn that into kind of a nutritious food for the microbes in the soil, and able to really kind of effectively go from a like an operations maintenance perspective really, really effectively manage the vegetation. You know, if you think about, you know, mowers coming through on these sites, can't mow underneath these panels. If you see how these racking systems are set up, a lot of the times, there's big, underneath the panels, there's, you know, these huge weed systems, you know, systems that aren't managed and sometimes they get sprayed, sometimes you have to pay exorbitant amounts to have people come in and spring trim. Sheep are able to move freely underneath these panel systems, target all the vegetation uniformly across an entire system. So yes, I am a big advocate, as you can imagine, for this practice.

Megan: One thing you both said that I just want clarification on because I think it sparked in my mind right as you said it, that sheep really like forbs. And so we all know from what Paul just said, that pollinators really like forbs. And we certainly know that pollinator-friendly plantings, right, aren't just forbs. Pollinators also need grass. Those are their nesting sites, those are their homes. They just are often foraging on forbs. Like the alliteration? It's nice. Foraging on forbs. But if you say to me sheep really like forbs and that's why they're really great on these sites, how do I know that those sheep aren't going to be taking too many forbs away from the pollinators?

Arlo: I've got a really interesting response to that, and I think that Kelly will agree with what I'm going to say. And it reminds me a lot about a previous episode of this wonderful podcast that I listen to. Yeah, it's the how, not the cow with Mr. Kent Solberg and really, really an important part of this is not just putting sheep on these sites, but really thinking about sheep as a tool to effectively manage for a targeted benefit, right? So, you know, when I think about bringing sheep on to a site, you know, if I bring ten sheep on to a 50-acre site and leave them there for the summer, yeah, of course they're going to select for the tastiest stuff. But when you're talking about bringing hundreds of sheep onto a small site for a very short amount of time, you really get to control how they eat, what their behaviors are on these sites. By controlling the variables in these targeted grazing systems such as stocking densities, such as duration of the graze, we're really able to control it, you know, control the practice, and achieve, you know, a specific end result. Yeah.

Kelly: Yeah. When we're talking about grazing these solar sites, it's not about using the site as a like you would a pasture for your flock of sheep. We're talking about using those sheep as a tool, and that's what targeted grazing is, and that's really what we're doing here. So what targeted grazing is, is you're using livestock in different ways in order to achieve some sort of vegetation management goal. Here in Minnesota, we see this a lot of times where people use, they'll use goats to control buckthorn, you've probably seen that in some other parks in the Twin Cities and around southeastern Minnesota. A lot of grazers have been bringing in goats, you see it a lot out on the West Coast, where they're using sheep, goats, and even cattle to do grazing around like housing developments in order to prevent wildfires from coming from the wild lands and into the housing developments. They call it the WUIs or the wild land urban interfaces out there. It's a huge business out there where they're using sheep to come in, sheep or goats or cattle, to come in and take off some of that vegetation. That's the kind of thing we're thinking about here. It's a tool and we're applying those sheep as you would any other tool, whether it be fire or mowing or haying, we're applying the sheep like a tool. So one of my favorite things, especially when we're talking about using sheep to improve the pollinator friendliness of a site is what we can do is we can actually, you know, Paul was talking earlier about how extending the flowering season is a really big thing for pollinators. We could use sheep to do that. So if I'm managing a solar site and my job is to take some of the vegetation off of there, if I start my sheep on one end and like Arlo said, use a huge number of sheep, high stocking density so that they don't really have a choice what they eat over there, they're going to eat what's there, and what they don't eat or what they can't eat, what the things that might be unpalatable to them, they'll trample it. So I'm going to start on that one end. What's that's going to do is it's going to set those plants back maybe a few days, maybe a week depending on how long I have them there, and then I'm going to move them off and I'm not going to let them back there again. So that particular side, you know, that's going to be delayed a little bit in its flowering, and then I'm just going to slowly move those sheep along the development and it's going to progressively delay the flowering of the plants as we go across the development. So what that does is you've got plants now that are staggered in their flowering and in their, you know, their different growth cycles, which, of course, we were talking is great for pollinators because now we have, we've extended the growing season, we've extended the flowering season for those pollinators.

Megan: So you're talking about heterogeneity getting the structures on the site - -

Kelly: I guess I am, yeah.

Megan: - - I was just using fancy words, you know, just throw out, make ourselves sound super smart. Heterogeneity. You know, it's too bad there's not a great rhyme for like the how not the sheep, it's too bad about that. How not the cow just rolls off the tongue a little bit easier, but if you can come up with something like the I can't, I don't have anything that rhymes with sheep that's appropriate.

Marissa: Yeah. I was just thinking my daughter has a book called Sheep in a Jeep but I'm not sure that that helps out much. (Laughing) It's not going to work maybe.

Megan: That's not the slogan we're going to use here.

Marissa: So you guys have definitely convinced me that sheep are a really good tool for this and why, and how to actually use them can be a really good pairing for thinking about managing for pollinators as well. But I'm wondering, Arlo, if you can talk about some of the logistics around this, like how did you actually get started grazing sheep and how does that work for you all, and maybe a little bit about the logistics of like a grazing lease or how you actually operate your sheep and rotate them from site or site or within a site.

Arlo: Yeah, so like I mentioned in my introduction, my wife and I started Cannon Valley Grazers four years ago with the intention of not only having kind of a farm business by selling meat and wool products, but also we knew that we wanted to have some sort of positive impact on the ecology of Cannon Valley, our area here in Rice and southern Dakota County. And so, you know, initially what that looked like was bringing our sheep into, you know, invasives, into ecosystems that have a lot of invasive species, so, you know, working kind of in more goat-y environments, right? Like in those woody shrub systems, and kind of eventually then branching out into some different kinds of pollinator and prairie ecosystem we worked with. We worked with somebody over near Lonsdale that has a six-acre prairie that was totally overgrown with goldenrod. Super aggressive. And over the course of a few years, we were able to use our sheep to kind of target that vegetation, that particular species, and kind of try to bring a little bit more biodiversity into kind of the ecosystem in that particular site. So, you know, as we were trying to kind of figure out how we were going to build our business, continue to build our business up, I was in touch with a woman by the name of Lexi Hayne of the American Solar Grazing Association, she's done a ton of work in the eastern part of the United States, kind of help shepherds like myself gain access and provide resources for kind of solar grazing, you know, budding new enterprise that a lot of farmers are using to diversify their income stream, their farm income.

Kelly: She's shepherding the shepherds, right, Arlo?

Arlo: That's right dude. She's really a phenomenal leader. I will continue to follow her leadership wherever it goes. And so, you know, providing a lot of resources and kind of helping network and get us in touch with some of the solar developers in our area and our region. And so kind of over the course of the last few years, you know, very slow process of kind of building relationships with these developers and kind of continuing to pitch and repitch and a lot of, I noticed that there's been a lot of hesitation from the solar industry about this. It's a really unfamiliar thing. But kind of through some really wonderful relationships that I've built and kind of grew how the narrative is shifting and continues to change around solar grazing in the country, we've actually developed a ton of interest that a lot of the developers are really eager to work with. So that's a little bit about how we got started. As far as the logistics, you know, we're set up in a way right now where we are moving our sheep from site to site. We're trying to do high-intensity short-duration grazes, and so the idea is that we're going to be, you know, over the next couple of years as we continue to build our flock, we're hoping to. When we're working on community solar gardens, bring 200 sheep or so to a site, 150 to 200 sheep, and leave them there for maybe three to four days, depending on kind of what the vegetation looks like, and then move them along to the next site. So really, really super fast duration where they graze very intensely, and then move along to the next site. So

kind of like how Kelly was talking about, you know, on larger sites, how you can subdivide these, you know, developments into different paddocks, move your sheep through. We really think about our portfolio of solar gardens kind of over a, you know, 100-mile radius thinking about each of those as little paddocks, right? And so we might not have, you know, as you think about how you want to bloom times, I've really been thinking about it on a macro scale where, you know, it might not be onsite that you have, you know, staggered times, but when you look at an 80-acre portfolio, you can see which sites will be blooming when and what species will be blooming.

Megan: So in order to get there, I'm assuming you need some type of grazing lease or agreement. Kelly tell me a little bit about how do we make grazing at these sites possible. What's the basic recipe of what we need? And I don't mean the recipe of grazing because we all know that there is no one recipe, there's no one size fits all if we're being adaptive. I mean the recipe in order to actually make this a possibility to have sheep on a solar site.

Kelly: Right, I swear the more I learn about grazing, the more I realize I don't know, and it's really a lot more of an art than a science. But when it comes to putting together a lease, now we're talking about legal stuff, and there's pretty good checklist of things that need to be included in that. And the first thing is, is to just look at what is the solar company asking the grazer to do. Now, as I mentioned before, there's some things that sheep might not eat. You know, they like their forbs and they like a few grasses here and there to balance it out, but there might be some plants in that pollinator planting that sheep aren't going to eat. And the first thing to consider is will the grazer be responsible for that vegetation that the sheep aren't eating. So that would be considered like a comprehensive contract. The grazer is in charge of taking care of the vegetation no matter how it gets done, the solar developer would say hey, we need this all cut to a certain level, do it, figure out a way to get it done, whether you use the animals or use some other mechanical means. A limited contract would be something where the grazer's only in charge of the grazing. So that contract is going to be based on what the animals are going to eat. So it'll say, you know, they need to come in, they need to graze it off, and then we'll just take care of whatever's left. And that might be individual plants that the animal isn't going to consume or it might be areas that the animals can't access. You know, there might be some parts of these solar sites that you just don't want the animals in there. So in a limited contract, somebody else is going to be in charge of those. In a comprehensive contract, that's going to be the responsibility of the grazer no matter how it gets done. So then, of course, we get into all the different things that need to be considered when you're getting into any kind of contract. The big one would be indemnification and liability. Like who's going to be the one who gets in trouble when the sheep get out or if the sheep get out. What happens then or what happens if a sheep gets into a bind and God forbid dies while they're out there. Who's in charge of that? You know, all those things need to be written into the contract. Who's allowed on the site, when can they be there, things like that. And Arlo had mentioned Lexi Hayne and the American Solar Grazing Association. They have been a huge resource and they've done a really good job putting together some of these sample contracts that go through that list of all those things that a potential grazer or a solar developer should consider. So instead of me trying to sit here and regurgitate everything and just say I'm

just going to say take a look at the resources that they have on their site because it's a really good start. And I know a lot of people have used those contracts as well.

Megan: That's super helpful. A point of clarification for me. If folks are running into these contracts things like we want the vegetation, you know, grazed to a certain height, you know, at a certain time or whatever have you, it would be really important to make sure that they're including refugia on an individual site in order for it to still be pollinator-friendly. And I totally appreciate what you're saying, Arlo, when you're like I'm looking at a landscape, I'm looking at all of these sites and how they're working together and how they're connected because that's ecology. Like that's what ecologists do. But from an agency perspective, in order for us to make sure that something's working and at that individual site that's permitted is meeting its pollinator-friendly solar standards, there have been some refugia on that site with flowering forbs so that we're making sure that we've got some habitat always for those pollinators.

Arlo: Yeah, absolutely, and I think that's especially critical on the larger sites, you know, I think when you start thinking about sites that are, you know, 20, 30, 40, 400 acres, you know, that's definitely a really important part of things. And I think that's there's also definitely ways to create that sort of, those sorts of spaces where there are the sheep are limited. I mean, I think that, you know, limited from accessing. And I think that, you know, one of the things about sheep, though, that is interesting and, you know, is that I think that pollinators can coexist with these livestock, right? You know, like you go around the sheep and you can see that it's kind of like a gentle wash comparatively, you know, compared to a mowing or things like that. It feels, yeah, you know, there's a lot more opportunity for kind of pollinators and pollinator insects to kind of coexist in these spaces versus when you're burning or when you're mowing these types of things. And I would say that's also true of non-pollinator habitat as well. I was at one of the sites that we were at this year, at a neighboring site, and I happened to be there while it was being mowed and there was bunny rabbits running everywhere, and there was this and that and the other thing, and, you know, insects, birds flying out of ground, nesting, you know, it's just so, there's definitely a lot of, you know, I think that when we're thinking about kind of refugia as you say, the sheep, I think the sheep do a really good job of kind of building that in, you know, on a smaller scale. They're less intensive of management practice and so there's more ability for those, you know, those benefits and I'm not saying that right but you guys understand what I’m trying to say.

Megan: So stackables.

Arlo: Stackables, that's right. Stackables.

Megan: Yeah, prairie evolved with grazing and fire, we know that.

Marissa: I really like your gentle wash analogy that it was like oh, gentle wash. I can get that. It's like a slight breeze versus a tornado.

Arlo: Right exactly, that's what I'm saying, exactly.

Marissa: So I'm wondering, Arlo, what products you're able to market from your sheep.

Arlo: Great question. Well, sheep are great. They're super utilitarian. We have a breed called Rambouillet, and the reason I'm telling you guys about this is because Rambouillets were developed in Spain, I believe. I'm going to fact check myself right there right now.

Megan: That's fancy. Rambouillet.

Arlo: The point is that they were developed for their fleece, so they've got a really, really fine fleece, and so right now my wife is in the process of developing a value added wool garments company that we're going to be launching this year. We're also selling meat to our local co-op, lamb products. We've got all different kinds of things. And to our local co-op and also direct to consumers. And but really, I have to say that the solar grazing is really the keystone of our operations for a lot of reasons. You know, when we're thinking about how we make our money and what, you know, what those different kind of income streams look like for us, the operation wouldn't be possible without solar grazing and the operation is really built around that targeted grazing model, right? We don't have a land base, we don't own land. And so there's, you know, I think that, you know, there really is a trifecta of kind of how our business operates.

Megan: There's two things I want to say there. So in a way, it might be I don't want to say easier 'cause nothing's easy, right, when it comes to managing habitat. Nothing's ever easy. But it might be an opportunity for new farmers to come on the scene because some of the limiting factors are usually owning land or having access to land, and so this might be a way to expand opportunities for new and beginning farmers because there's a land base opportunity there and some agreements to be made, and you don't actually have to be the landowner.

Arlo: Yeah, absolutely. I absolutely agree and I think that part of what that means it's really important that, you know, as people in this industry, we're really doing a good job of doing that outreach and education, right? Like this is not just like growing sheep on, you know, on the pasture. This is actually requires skill and it's important that people are coming to this industry are well-equipped with the tools and the resources to be effective in their vegetation management. And so I absolutely agree huge potential for a young, you know, new and beginning farmers, and I am one of these people that has been able to build a business, you know, with this company, you know, with targeted vegetation management on solar sites. And yeah, I think it's great. We should keep - - if you keep bringing out people, there's going to be more than enough land for everybody that wants to graze to graze.

Kelly: If I could add to that, I would just like to reiterate a lot of the things that Arlo just said, like yes, this can be an excellent way for a beginning farmer to get started without having the huge overhead of having to purchase land. That's one of the biggest things keeping people from getting into farming today, but this model does allow for the opportunity for somebody to start in with some livestock and do that on land and actually get paid for doing the grazing. It's very important that when people are doing this, providing this service, that they are not doing it for free. It takes a lot of labor and a lot of knowledge, and I would just caution anybody that's thinking about this and oh, free grazing, this will be great, wonderful, I can get paid to bring my sheep around. It's not for everybody and Arlo is kind of understating the vast amount of knowledge that he and

his wife have about ecology and all of that knowledge that goes into this. You definitely need to have an understanding of plants and plant science and soils and all of that in order to be effective at this. And that's something that I really caution as people are trying to get into this that be careful and don't just go at it because you think it's going to be free grazing because there's a lot of work involved and a lot of knowledge that goes into the planning of it.

Arlo: I absolutely agree. One thing that that makes me think of is just some of the wonderful partnerships we've been able to develop with some of the people that some of the companies that doing the installs on these sites.

Megan: Two things I want to know real quick. Is the Rambouillet sheep, is their fleece as white as snow?

Arlo: Whiter.

Megan: Is it?

Arlo: It's the whitest, it's whiter than white, it's so white, so pure. (Laughing)

Megan: Okay, so that's one thing. And then too, what's the best thing about being a sheep herder.

Arlo: For me, that's my question? I love my connection with the land. I feel so, so lucky to have a job where I get to be working with livestock to have an impact on the land and the ecology in the state. And I also really love my relationship with the sheep and I really, they're really sweet. And I know that's kind of cheesy and a lot of big-time farmers would probably laugh at me, which is totally cool. If anybody's listening to me. But yeah, I really love my sheep.

Megan: Well said. We like ecology too. All right, now it's time to move to our next section.

LET'S SCIENCE; TO THE LITERATURE!

SCIENCE!

Megan: All right. This is the part of the podcast where we recommend a book, a blog, or a paper, and we've already mentioned these as we've going through the podcast, but we want to hit it really quick so that way you guys have all of the information. Of course, we'll put these up on our website. Kelly, what is your pick for the day?

Kelly: My pick for my favorite piece of literature around this topic is the Targeted Grazing Handbook. This was put together by the American sheep industry back in 2006 and it's a really great overview of what it takes to be a targeted grazer. And it really gets into the science of how to target different plants and different landscapes and how to apply targeted grazing for different objectives. Right now, they're working on the second version of this handbook and I guarantee there will be some pieces in there on solar grazing because this industry has really blossomed right along with the solar industry in the past five or six years. So you will definitely have some articles about solar grazing in the next version, which is to come out probably in the next year or so.

Marissa: Great, thanks. Paul, what's on your list?

Paul: Marissa, my Let's Science pick is as I discussed during the podcast here, on our website, we have our Minnesota habitat-friendly solar program webpage, and everything that you want to know about the program and more is listed on there. It lists all of the sites that are in the program. When you're driving by, you can say oh, there's one of the sites that are in the habitat-friendly solar program. It's going to have the presentations from our two habitat-friendly solar summits, all kinds of steps for meeting the requirements, question and answers, and all kinds of guidance from Bowser, the DNR on others all about habitat-friendly solar.

Megan: Perfect. Arlo, what's your pick?

Arlo: Well, I love this study that was done by the American Solar Grazing Association in conjunction with Cornell University Atkinson Center for Sustainable Future. It's all about solar grazing and I think it's a great spot for people that are interested in solar grazing to start a ton of research into kind of what goes into it, how to do it effectively, and yeah, just like a great starting point for people that want to learn more.

Marissa: Hey Megan.

Megan: Yeah Marissa?

Marissa: I think we should take a hike.

Megan: I like that you said we. It's nice that we get to take a hike together. I like that. Prairie people sticking together. So this is the part of the podcast that's probably my favorite, shouldn't have favorites, but I really enjoy talking about where we can go explore prairie, and I love hearing what prairie places are special to you. Kelly, let's start with you. Where are we hiking today?

Kelly: Oh, boy. Well, if I'm going to see the prairie, I'm probably going to do it on horseback. See, I came to own horses late in life, so I'm basically reliving my childhood from horseback because I didn't get to as a child. So I love the places that are close to me, that I can just take off after work, take my horse out, and just go enjoy the prairie, and for pure prairie goodness, I absolutely love Glacial Lake State Park, it's not far from me, it's beautiful rolling hills, some nice prairie potholes, just a really nice open scenery, nice to ride through but every once in a while I like to have a little bit of forest in my life and on those days I'll go over to the Runestone County Park, it's west of Alexandria, north of Kensington and it's just got some beautiful trails for riding, hiking, biking, whatever, and there's some – there are some restored prairies there but then there's also some beautiful wooded sites, it's lovely maple trees that just turn a brilliant orange in the fall time that I just love to ride through, so those are mine.

Marissa: That sounds great. I've never been to Runestone, so I might have to go check that out. Paul, where do you like to hike?

Paul: You know I like lots of prairies. I live in Bloomington though and I'm walking distance from Hyland Park in the west part of Bloomington. And so I like to go walking over there and if you go to the Richardson Nature Center and go north just a little ways through the woods, there's I wouldn't say a large prairie but it's a decent size prairie and

just love to do that loop and I found blue-eyed grass out there, lots of blazing star, gentian in the fall and it's just a nice little reprieve from you know, you can sit out there and not know that you're in the middle of the metro, and so it's just a nice little get away.

Megan: A nice little prairie escape. I like it. Every patch of prairie matters at this point. So small prairie, big prairie, we like prairie, period. Arlo, what's your pick?

Arlo: Yeah, I love, so I lived in Northfield and there's a lot of really great places that have beautiful prairie around here but I think one of my favorite lately has been a place called Kester Prairie, right by Dennison. It's a wilderness, excuse me, a wildlife management area in Rice County. It's not humongous but it is, there's a lot of good space to run. I love bringing my dog Frazee up there and playing ball with her. She loves it up there too.

Megan: I love it. Man, I can't believe we're done. These episodes just fly right by and I still have so many questions I want to ask all of your, but that's it, thanks so much for being here. Next week we're getting our feet wet, just a little bit wet 'cause we're talking about Minnesota shallow lake coming in at depth under 15 feet deep permanent and sometimes semi-permanent water bodies are a critical habitat component for Minnesota's wildlife. We're going to be joined by John Lindstrom with Duck's Unlimited, Nicky Hansel-Welch with the DNR shallow lakes program, and Scott Mackenthun area fishery supervisor with the DNR. We're going to discover these important habitats and the role they play across the prairie landscape. Now listen, we take our shallow lakes seriously. Remember, don't tell a joke to a frozen lake, it might crack up. I'm just pausing there so that our listeners could laugh and not miss the next part of what I'm going to say. So for all of the links and resources that we talked about today, you can find those on the web at mndnr.gov/prairiepod. This episode was produced by the Minnesota Department of Natural Resources Southern Region under the Minnesota Prairie Conservation Partnership. It was edited by the fabulous Dan Ruiter and engineered by the fantastic Jed Becher. And what should we say, I still don't have something for like how not the sheep to say bye to you guys.

Marissa: Sheep in a jeep.

(Laughter.)

Marissa: That's all I got.

Paul: Sheep in a jeep.

Megan: All right, bye everybody. Thanks so much for being here and if you see a sheep in a jeep, we want to know about it.

Paul: Thank you. Thanks for having us. This was fun. Thank you.

Kelly: By Megan.

Arlo: Bye, thanks so much.

((sounds of birds chirping and wind blowing))