

Masteller 1 2016

I: We will get started, and today is October tenth, 2016. Interview with Mark Masteller. MASTELLAR.

P: ER.

I: ER.

P: ER at the end.

I: ER at the end. With the DOT and interviewer is Jean Eells. So let me have you just say anything at this point so I can do a volume check.

P: Okay. Well, I did get my car back from the body shop last weekend when I ended up flying home from Michigan. Everything seems to be working so I'm feeling pretty good about that.

I: Good deal. Good deal and it looks like that's going to pick up just fine. So I don't think we will have any problems.

P: Okay. I can see the bars across there too.

I: Yeah, as long as they are jumping this way, then I'm good. So, let's start out with your position with the DOT and if that's changed over time as you've, you know, when we go back to when the kind of the ideas for the program first started or if that was--

P: Okay. Well, my current position is Chief Landscape Architect [coughs] Excuse me. And I supervise the roadside development section. And I've been doing that since 1989. So my job title hasn't changed. We've had people move in and out with re-organizations over time but by and large, we've always had landscaping seeding, erosion and settlement control in rest areas and roadside parks stuff. There was a stretch in there where we did wetland mitigation and got-- obtained 404 permits for highway projects for five or six years. Joy Williams was added to our section in 2000 during our reorganization so we now have vegetation management, herbicide selection for the department. Those kinds of things. What I've-- I didn't always work in roadside development. When I first started at the DOT, back in 1979 in the summer, I worked in preliminary design and so we kind of laid out where roadways were going to go and then I worked for two years, got laid off. Got hired back as a temporary for just a couple months. Then as a-- what's the term, full-time temporary for another nine or ten months, working in mapping and graphics. And then I got offered a job in road design which is roadside development is part of road design. But, I was actually doing final highway design. So I was designing all these two lane, four lane roadways. Bridge projects. You know, those kinds of things. And then in 1986 a job opened up in roadside development and I was-- I worked for just a few months helping with erosion and settlement control

plans and then a job opened up doing landscape architecture work so I did actual landscape design for a little while, up until 1989 when I took over the section.

I: Yeah. Okay. And so the timing then of more of the roadside development, you were probably aware of the peripheral basis because you kind of worked in and out and around some of that, so you knew some of the key players...

P: Right. We-- we knew what Daryl Smith was promoting, we knew what Paul

I: Christiansen

P: Christiansen. Over at Grinnell was proposing and they were in contact with us trying to urge the DOT to go down that path and when I first started working in there we did do sample projects or demonstration projects if we had a large barrow area and we weren't going to give it back to the farmer for farming, we would seed a native mix in it. But at the time, about the only native seed you could get was stock seed farm in Nebraska or can't remember the place in Kansas, but those were the two-- two suppliers. And then, even then it was cultivars and it was limited species selection. But, we thought it was still better than what we were doing. So yeah, we started down that path and doing the demonstration projects, just spots here and there maybe three or four or five spots a year someplace and then when I took over the section in 1989, it shifted. It was like dominoes in the office there but it shifted and opened up a position for a new agronomist, and Ole Skaar came and worked for me. He was a big proponent of the natives as well. Part of his interest was hunting. So you know, he just thought it was great habitat. Not to mention the root systems and the erosion control benefits they offer and those kinds of things. So he and I made the decision that the DOT was going to go all natives on all rural construction projects. So that happened, yeah, about 1989-89 right in there. And so we went down that path, we started getting a few more seed suppliers interested because now there was a pretty stable market for it. And we kind of rode that wave 'till-- boy-- maybe early 2000's. We were kind of-- we knew we kind of wanted to do the local eco-type or at least Iowa oriented type seed and the market place wasn't there for it. We had discussions with growers and dealers off and on for about a two or three year period there and they didn't want to grow it unless we were going to specify it. We didn't want to specify it if it wasn't available because then we would have to write a bunch of change orders and there's a bunch of expense and administrative-- burden that goes with that so we finally bit the bullet and said we are going to start specifying it. We just bit the bullet for two or three years with all of the administrative hassle that goes with change orders and not having the species we wanted in the quantities we wanted and substitutions and those kinds of things. But ultimately, the market place caught up. And now here in Iowa we are the envy of the country when it comes to seed source and local eco-type and numbers of seed dealers and numbers of species available and the quantities available as well, so. You know, I can't take all that credit, I think throughout the years we are probably the driver of the seed market but when you have those years where CRP kicks into effect or a new program opens up or something like that, then the competition for the seed really is stiff and we are in one of those-- we are in one of those situations right now. But they-- by

and large, we are still able to get most of what we want. I think there was like three or four species last year where we had to make some substitutions but for the amount of seed we do, I'll say we are pretty fortunate.

I: Yeah, yeah, the story with all those growers and everything has been real interesting one. Evolved a little bit with the DNR at that time that-- that some of that was shifting around. That definitely-- definitely makes a difference. Good to hear that Iowa, you know, that we made some progress in that arena.

P: Well, you know. Now with the issue and the Monarch butterfly potential listing as a threatened species coming up, there's this big national effort driven by a presidential memorandum to-- that instructs all federal agencies to, you know, basically all hands on deck to get some habitat out there. We do not want to list this species. And so, all these states are not being urged nationally, federally, by the public as well as by the government to get habitat out there. Nectar sources, you know, milkweed for reproduction, those kinds of things and so they are kind of scratching their head because they are were we were twenty-five thirty years ago, so we get calls all the time. "How'd you do this? How did you do that? What caused this?" At this meeting I was at in Michigan last week, a gal from the Illinois DOT is on a fact finding junket to the Minnesota DOT to find out about their seed and those kinds of things. And I said, well you know, if you need help, give a holler. She goes, well I do want to go to Iowa because you have already-- you already have seed dealers, you have a law in place, that encourages use of native species, your situation is different than ours. They thought Minnesota was more like them and so they wanted to go up and visit and strategize a little bit.

I: Talk a little bit more about the law in place that she's referring to. We'll pick up that thread and run with that.

P: Well, I'm not exactly sure of the year, maybe 1987 or 88. Legislature directed us to conduct a study of how we manage roadsides. You know, all through the-- all through my childhood growing up, everything was mowed from fence to fence and then in the 70's-- early 70's we had the gas crisis and DOT's just couldn't afford-- 'cause gas prices went so high. DOT's couldn't afford, budget wise, to mow like that anymore. So they went to reduced mowing and I don't think they really liked how it looked. I mean, it was a harsh learning curve for 'em. They had weed issues, they had brush issues. Those kinds of things. So all this leads up to the request for this study on how to manage roadsides. What's appropriate? How can we manage this resource, which in Iowa, just the DOT manages about two-hundred and sixty some thousand acres. When you throw in all the county roads and the city rights of way, I think it's over seven or eight hundred thousand acres, so it's a big land resource in the state. Like two or three percent of the whole state I think. And, you know, what can we do to better manage this resource, so they hired George Butler and Associates, I should say we hired George Butler and Associates and, you know, they looked around at-- they did their due diligence. They worked with universities, and talked to universities, talked to land managers, they talked to DOT's, and the results of that report were that ecologically it made sense to

encourage the use of native species, that you really don't need to be blanket mowing or blanket spraying the entire rights of way each year. Economically it doesn't make sense and ecologically it doesn't make sense. So this study recommended that, you know, an integrated approach to roadside vegetation management be implemented by the state. It recommended that a law be passed that kind of states that-- gives direction to the DOT on how they should be managing the roadsides and that same law established the Living Roadways Trust Fund, I shouldn't say the same law, but at the same time, they passed that law to establish that Living Roadway Trust Fund and they came up with resources of income for that-- that would help with the implementation of this integrated strategy across the state then. I think the thought process was that-- I don't think they wanted to mandate counties had to do it, but if they saw that the state was doing it that it would maybe catch on and become a state-wide practice on all levels of road service then. So they set-up. They passed that law, they required the DOT to establish a position to kind of become a coordinator for that. And that same person then could run the Living Roadways Trust Fund, manage that fund, and Steve Holland was the one that was hired for that. He was currently working in the DOT in our maintenance office. So he was already working on vegetation management and he just shifted over and started in, you know, coordinating or leading this effort. So.

I: How much of the background, positioning, strategy, key people are you aware of that were helping to get that in place? I think the legislation is a key piece.

P: You know, the study itself that led to the legislation was not our idea. I mean we were sympathetic with that cause and we agreed with the approach that was being proposed, but we as an agency did not request that that happen. So I think that it was Daryl Smith and Paul Christiansen are the drivers behind that through their local legislators and that's I-- you could go back and find who sponsored the legislation and that would probably tell you for sure, but my reconciliation is that's where that mostly came from.

I: Yeah, because working from the inside I know it's-- you are in a much different position on being able to provide--

P: We can't lobby.

I: Right. You can provide information, but you can't lobby.

P: Right.

I: 'Cause I know, Roger Landers mentioned people like Buzz Brenton and having done lots of talks to Garden Clubs and things like that which were all pre-cursor to anything else that happened later, certainly 87 because he left Iowa in the 70's so yeah. 79-80 in that range. So his work was definitely a pre-cursor to anything that came later but...

P: Dr. Landers work, you know, even in-- I'm going to say it was in the 50's (1960s per Landers), the DOT commissioned research from Iowa State to look at a couple species of native grasses, particularly switch grasses. We have this scenic overlook area out on

interstate 680 it's only open seasonally, it's closed during the winters but there are several acres out there and there might have been other spots but that's the one spot I know of where some of that research took place. And they had great success with switch grass. Which was really the only native grass widely available in any kind of quantity at the time but you know, even in his research, I read through those in the past and they saw where those native grasses were out competing thistles so where there were large robust thistles to begin with they seeded these natives in there and at the end of the test period, those thistle plants had diminished in size and vigor. Not totally got rid of, but you know, they weren't becoming a problem like they were before. So you know, the my ancestors at the DOT, I think, kind of knew that this was the way to go but the resources really weren't there and you know, mowing was so cheap. Blanket spraying was cheap. The conditions just weren't right to make that jump at that time so...

I: Talk to me a little bit about the public support or lack of or you know, what you've seen over the years and kind of read on public reactions.

P: Well, it's kind of funny because you know, like I mentioned since the mid-80's we've been using native species on all new construction and when you see following new construction, people don't really get involved or invested in the vegetation that's coming up just yet. So generally it's either acceptance or its lack of objection, I'm not sure, but we didn't have issues we established natives in the rights of way that-- in the late 1990's when we started experimenting a little bit with re-vegetation, which is where we go into an existing road side that has non-native vegetation, probably brome or fescue we kill it all out. Probably mow it and kill it all out and seed the natives back in there. That's when we started getting some push back on use of native species. It's not that those people were necessarily against natives. I think what drove it was when we killed that existing vegetation it opened up the seed bank and weeds could become an issue again. Weeds that the farmers thought were controlled, and when in reality I think they were there, they just weren't as prominent as when you get rid of the vegetation and really open things up. And the other thing that I think we knew it was going on all along, but that really brought it to the forefront was haying or harvesting or rights of way and there's a large number of farmers in the state who look at that road ditch along their farm or in front of their house as their property. It's theirs to manage and maintain. When in reality, you know, the Iowa Code does not support that. So it's not unusual to see the farmer out mowing-- see the farmers out spraying, even harvesting hay. They will mow it and bale it and take it off and feed it to their livestock or sell it or whatever it might be. So when we started these re-vegetation projects, that's when we were starting to impact these farmers lives and livelihood to a certain extent. We, yeah. We got a lot of negative feedback on that. So the way we addressed that is when we-- and we still do some re-vegetation projects. We don't do them as extensively as we once did, but when we do that, we go door to door, up and down the roadway and tell all these people, you are going to have a project through here, this is what we want to accomplish. Do you support this? Or would you allow it in front of your house? I don't think we use the term allow because-- it's-- we are just looking to not cause problems. It's not that they have the authority either but-- and basically if somebody is you know, dead set against having

that out there, we just-- we'll just skip that section of roadway and go seed someplace else. So after we took that approach, the negativism really really waned and hasn't been really an issue since, so. Lot more education. Lot of more up front contact with the public. You know, because a lot of the times the first question is well, what's it going to look like? What kind of species are you using? Is it species that my livestock can eat? Is there anything here that can be invasive into my corn or soybeans or hay field or pasture even? And you know, those are the kind of concerns that pop-up when we are out there doing that work. And I think once people have seen that-- what the final projects look like, I think aesthetically most people are still on board with that. There's still a handful out there that think everything should be mowed but it's becoming a smaller and smaller contingency all the time. The the a-- thing we are working on now is-- aren't there-- are there seed mixes out there that we should be using that are more favorable for grazing or for forage. And will those species still provide us with the services we need for the vegetation. You know, we are looking for storm water infiltration we are looking for erosion control, we are looking for plants that are, I'm not going to say aggressive but can out-compete weeds and weed invasion, even brush to a certain extent without being invasive into neighboring properties and those kinds of things. Oh and then, I probably forgot the most important one. Snow control. A lot of those native species stand up under the way of snow in the winter time. So what we've found is if we include a certain number of those species or predominance of those species in our seed mixes, we have less snow blind either across or drifting onto the roadway. No there's been research out in Wyoming Dr. Kabler who has shown that snow blowing across pavement hyper-cools that pavement and so if you are right around freezing level or frost level, having any vegetation in your roadside ditch can actually make the difference of wither that roadway freezes or doesn't freeze. Which was kind of an eye opener-- for me. I, you know, not that I wouldn't think it was possible, but I never would have thought along that line.

I: Right. The research shows that-- how.

P: And so you know, when we tell our maintenance guys that not only will it help you with blowing and drifting snow, but it could also keep your pavement temperatures a little higher and saves on wear and tear there, they are pretty much all in for that. And it's funny, the other thing I didn't really think of when it comes to snow drifting, I always think about during the storm even itself, you know, the white out conditions and the blowing snow and where the drifts end up after that first night or that first storm, but what the maintenance guys tell me is the big expense is going back after those storms and catching all those areas that sift. You see that little sifting that blows across all that new snow. It comes out, ices up the shoulders, sometimes extends out onto the pavement and causes frost and ice and they sometimes have to make six or seven trips up and down those roadways for just sifting control when the storm event is even a single or two pass thing. So they say all the resources are spent after the storm. Not really so much during the storm.

I: Interesting. So really, the natives have so many multiple benefits there--

P: Yeah. Absolutely.

I: That's yeah. Snow control, certainly. I'm real mindful of that. When I-- where I live and grew up. So. Let's see, here, let me finish my handwritten note here. So talk to me about how you see the role of the educational efforts you know, that Steve did and Troy is continuing but that how much impact do you think the educational efforts have made in public acceptance and or general public support. It's probably-- it may be a little hard to see it from your-- where you sit but on the other hand...

P: Yeah, that's a tough one. You know, we basically early on developed our educational terms based on the questions we were being asked. And you know, the native plant community from a roadside perspective was just a small component. If you are into restoration, if you are into habitat, you know those are things that kind of go beyond just the transportation corridors to a certain extent and that-- you know, that-- it's not really our job to try and educate, for those purposes so we've always tried to keep the native species, educational materials, promotional materials kind of grounded around transportation so a lot of it is based on identification and it's producing materials that are small enough that people could have them in their glove box. So if they want to pull off the road and look at something, they can. So first of all, we want people to know what they are looking at. So identification of species is key. I think the very first brochure we did was kind of an identification piece it unfolded like a map, fits right in your glove box just like the state map did. But it had pictures of some of the more common species you see growing in Iowa's roadsides. We've printed hundreds of thousands maybe even over a million of those brochures over the years. And then Steve kind of got wind of this Mark Mueller the artist over the Iowa City area and he had a little more artistic way of showing that and creating these wall posters. So that's not something you carry in your car, so it's not really motorist driven but where we found those were really desired was in classrooms. So particularly Science teachers, but other curriculum as well. Those things went like hot cakes. There was a set of six posters and on one side was these drawings almost like paintings of the different species and its not just plant species but it's everything associated with that kind of a prairie. So there's a dry prairie poster there's a mezi prairie poster. There's wetland prairie poster. The Savannah. So the different types of landscapes out there. On the backside of each poster is really where the educational stuff comes from, so people are-- their eye is caught when they look at the front side with all the bright colors and flowers and those things and then if you can get them over to look at that, then you can flip it around and that's where you get the information about, you know why they are important, how can they be used in transportation, those kinds of things. We've sent-- we've sent field requests for posters, we've sent them overseas. We went them to the United Nations. All those-- yeah. They go every place.

I: That's cool.

P: You know, these aren't things we are just mailing out. These are people requesting it. So they've seen it someplace and just that word of mouth. We don't really advertise it. It's on our website, but the average citizen is not perusing the DOT website. So you

know, talking with educators at conferences, at continuing education for educators, participating in those kinds of events, that's where that's where the demand for those has really come from.

I: Touch on the gateway program into the cities, the visioning community gateway aspect of that.

P: Well, the legislation that established the Living Roadways Trust Fund and laid out IRVM goals for the department actually had a component in it about working with communities to work on their entryways or their gateways and ways to spruce them up and I think what we found over the years is that that's-- well conservationists and native plant enthusiasts might be involved-- they are not the drivers of those projects. Those are economic development groups, Chambers of Commerce, the cities themselves are the ones who are really looking to make that statement. That visual statement when you come into a community. So the trust fund is kind of a convoluted path through here, but we use the trust fund as match. Got some federal money and came up with some early entryway projects for communities. The trust fund itself also funded some community betterment projects but over time, when Iowa State University, when Julie Badenhope got here, fresh out of Harvard and came to Iowa and was an Extension Landscape Architect at the time-- she came and talked to me about, you know, what I-- sitting in my role as a public practitioner rather than a private practitioner, what is-- what do I see as the issues when it comes to landscape architecture and landscape design in the state. One of the things I mentioned was that all these communities want to do something to spruce up, either their downtown street-scape, main street, their entryways, they want more paths, biking paths, those kinds of things but most of these small towns don't have staff that can do that work and they don't have the budgets to afford consultants to come in and do that work. You know, they can barely keep their streets and sewers running. So she and I kind of strategized a little bit about well maybe we should come up with some kind of way that we can help these communities and first through some federal funding and then later the DOT just took over the funding on our own rather than use federal money. We started this community visioning program. We included Trees Forever because their mission is in line with what we were working on. They had a presence in four hundred plus communities in the state already with Trees Forever committees and local efforts already underway and that's-- their staff became facilitators for these processes and the process has been tweaked almost every year for the last twenty years. It doesn't look the same as it did twenty years ago but now it's a kind of partnership between Trees Forever, between Iowa State University Landscape Architecture Department, between the DOT. Federal highways still supports it. It also includes private sector landscape architecture firms that are coming in to help these communities with not only their planning and designing ideas and issues but also come up with an implementation plan. So these communities can figure out, you know, how do we get these projects on the ground. How do we get this constructed? Where can we get grants? Where should we look for specialized expertise? Just those stumbling blocks-- or things that used to be stumbling blocks and so, yeah I'm not even sure how many communities we've done-- it's probably been-- I'm going to guess three or four hundred-- I don't know for sure. This is the twentieth year of

the program, and next month is the twentieth year celebration so I'll probably have more information then.

I: Yeah. Wow. It's been that long? K. That's good. That's good. I'm going to stop, just to take a pause here. And--

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I: All right. Session two. Mark Masteller, Interviewer Jean Eells on October 10th, 2016. What we haven't necessarily talked about a lot-- we've touched on it a little bit, but what are the kinds of questions that you are getting from other states in terms of how you got it started? What are some of the things that you are answering that you may not have touched on yet-- what are the--

P: Well, I think what we find is our counter parts in those other agencies, other state agencies, intuitively know that using native species makes sense ecologically, environmentally, economically, all those kinds of things. But they just don't have the support from their legislature or their management. So the questions, I often get are things like, "How do you get management to buy in on this?" "How do you get your legislature to support that." And I said, "Well, you gotta make it their idea." Really, that was a brilliant, whoever strategized that back in the 90's, that was brilliant. Make it the legislation's idea to do this. Then, nuts and bolts, "How do you deal with contractors?" "What kind of specs do you write to ensure success?" "What kind of equipment do you specify?" "How do you develop your seed mixes?" "Are you trying to like mimic the native prairie as far as percent grasses versus forage", you can't mimic it when it comes to diversity or number of species but you can sort of mimic it when it comes to grass versus forage stuff. You know, then the other big question is, "Where does the seed come from?" "How you'd get such a great seed industry in your state?" Of course, they all want to do it next year, and I said, "It's not going to be like that." You know, we've been at this twenty some years and you know, it didn't just happen because somebody flipped a switch. There's all kinds of growing pains, and each state's going to be different. You know, you get into the states like for instance, I gave a talk in Clarksville Tennessee at Austin P College earlier this year. Forested state. Forest border to border but there's this one professor there at Austin P who's kind of a grasslands nut. He saw that roadsides can't have trees in them, due to safety concerns. Why not-- let's make those prairies, you know. So he invited me out to talk and I suppose there was maybe seven or eight states from the south east in attendance. Georgia, lots of neighboring state. North Carolina, so many others. You know, those were the kinds of questions that I got from all that group. And it's tougher, you know, when we are such a large organization. We are predominately a grass state anyway, it's not a big jump to say we should be using those grasses in the roadside. If it's a predominately forested area and you are just trying to grow something where you don't want trees it's a tougher sale first of all and you really don't have the umpf, good luck with the transcriber on that one. You just don't have the wear-with-all to control the market or drive the market like we were able to. So you know, they are probably going to struggle or they are going to have to work regionally with maybe two or three other states to get to a point where they can kind of control their destiny like that.

I: Equipment has changed a lot over the years.

P: That it has. I think Well, it has and it hasn't. I mean, the seed drill. The Navy grass seed drill, we've pretty much used that since day one. You know, John Truax up there

has learned as we have developed this program and so seeding equipment that was originally developed maybe for pastures is not a good fit in a roadside just because of the changes in terrain. You can't have the big equipment. It needs to be lighter weight so you are not burrowing down into the ditches and getting stuck. We've gone-- we've added no till. When we first did it, we didn't have that no till option out there. So now we use no till equipment on the front of those drills. We've learned that contractors are usually under the gun. They bit more work than they can get done often and so they'll be out there working in winter conditions and we would like to seed. And so when they are doing that then that seed drill buries that seed too deep. So to kind of hedge that, we've learned that if you unhook every other hose under those seed drills so that half the seed is broadcast on top and half of it is drilled, you kind of hedge your bet against those guys that do it in less than ideal conditions. You just have better results and so yeah. From that perspective, the drill today does not look like the drill twenty years ago.

I: Talk a little bit more about the no till use there.

P: Well, the idea is if you do full-tillage to prepare a seed bed you are exposing all of that weed seed that has amassed there over the years and there is a ton of it-- to growing conditions and now it can get day light and now it can get moisture it doesn't have competition from any other vegetation. So a lot of those, particularly annual weeds, but perennial as well are the first things to shoot out of the ground. So we've learned then that if you want to get things established maybe the thing is not to till it up but to just mow it short. Mow it down as the regrowth occurs, spray it with a non-selective herbicide like Round-up but the idea is to not expose all that soil and expose all that weed seed to give it a chance to germinate. So this no-till attachment that goes on these drills is like a little disc and it just cuts a slit in front of where that seed drops out of those seed boxes and a packer wheel follows up and presses it into the soil, so what we are after is good seed to soil contact, which is key. If the seed does not come in contact with the soil, it will not grow. And you need to have that get thatch from the previous vegetation is almost like mulch. You know, the weed seed is not exposed. It can't germinate or if it is going to germinate it's going to be greatly diminished in the quantities and the area covers and those kinds of things but and so very successful. We've had a lot of success using that practice. We recommend it to everybody else as well. Really the only place I would say that doesn't work is if you are in a highly compacted new construction area. You really need to de-compact the soil, you need to rip it up, what we would typically do is seed it to a temporary mix like oats, maybe a rye grass or something like that. Let that grow for a year, then mow it off, then do the no till seeding right over the top of that and so again you've got that dead vegetation there to act as a mulch and a weed barrier for the new growth.

I: It's kind of like working with cover crops, then.

P: A little bit.

I: Similar in how they work a little bit more with brassicas for tillage. Biological tillage instead of the other and so--

Transcribed by Ashley Kinkade, kinkadea1@gmail.com

P: Right.

I: Again, it takes some time to make it all happen, but..

P: The issue of cover crops is an interesting one. You try to include things in your seed mix that germinate quickly and then you also want to include the species that are longer term, longer lasting species. It's-- it's not an exact science and you are going to win some and you are going to lose some but that is something that we've kind of experimented with over the years. We've included oats, maybe in our seed mixes to act as a cover crop or something that will come up very quickly and give us some protection when it comes to soil and erosion. Then we thought, well why can't we use some of that quicker germinating natives. Those rye grasses, black-eyed susans, partridge pea. All species that comes up pretty readily. Germinate relatively quickly and can provide some color and some cover until the others can get established then.

I: Nice mix of things-- and it gets 'em going.

P: Mhm.

I: Talk a little bit more about some of the design along the roadways. I think probably people that travel our interstates are-- you know. See it because you've got a long distance to watch and you can-- you know see several miles of stuff and maybe start to ask questions and start to see on interstates but uhm, how has that changed where you are putting in shrubs, trees or not, or that mix. How are you balancing that?

P: Okay. Well, you know. You have to ask yourself, what's the purpose of the landscaping. So number one, we want to control erosion. That's where the native grasses and wildflowers come in. Two, we want to do what we can to control blowing and drifting snow and so quite often through the state, you'll see two rows of shrubs planted out near the fence. Near the edge of the right of way, or it might even be trees if there's enough space in there, but the idea is that we want to try and capture that snow before it gets to the roadway. The Iowa design for living snow fence is two rows of shrubs, the rows are five feet apart and the shrubs are four feet apart within the row and my predecessors back in the 60's worked with Iowa State University and did some wind tunnel research out there using a jet engine to provide the wind on, you know, what's the optimum configuration for snow fence and what they found was that this configuration with the shrubs gives you about fifty percent porosity. If you go buy wood slat snow fence or you go buy a plastic snow fence, you are probably in that forty to fifty percent porosity range as well, so there you can use live plant materials rather than structural materials and you can catch the most snow in the least amount of space. The more open or porous the snow fence is the longer downwind those drifts are, and shallower. The more dense or less porous that the snow fence is, you end up with shorter, deeper drifts. So the configuration that we use gives you a kind of a rule of thumb that-- that snow drift down downwind from those two rows of shrubs, will probably extend ten to twelve times the height of those plants. So if you are planting eight foot plants, you know, you need to be at least eighty to a hundred feet away from the edge

of the shoulder or you are going to cause more drifting problems than you are solving. So, you know, we can pretty accurately predict how the snow will react based on how we are landscaping out there. And another component is you know, driver fatigue, highway hypnosis, whatever you want to call it, but if you ever have driven in portions of Kansas or Nebraska where there is just that sameness for mile after mile, there's no vertical relief. There's no change in color, or very little, you know, those kinds of things. Drivers become less safe because they are mesmerized. They quit really focusing on driving. They just kind of get into this trance. So one of the things we think we can do to help combat that is make-- mix up by adding trees, maybe it's evergreens, maybe it's trees with spring blooms, maybe it's fall colors, maybe it's berries or apples or you know, crab-apples or hawthorn berries in the summer. We can use the native grasses and wildflowers species. Sometimes we will have a smaller grass species to allow more of the flowers to be seen and make it a showier thing. The idea is to just change it up as you are driving down the road. Anything you can do to add vertically to change texture, to change color, helps. I don't know how you can measure that but it helps with that highway hypnosis. With that driver, I can't dig this really. So those are the main things we focus on. We also had a program that started about the same time as the this integrated roadside vegetation stuff back in 1990 where we were asked by the governor to get together with the department of natural resources and try and think of ways to maybe better use-- or better utilize highways rights of way to help with Iowa's ecology and so we got together with the DNR and we talked about two or three different options and we ended up with this-- let's just do a tree planting program. There are places out there that are white enough, particularly on the interstates, freeways, expressways where the right of way is white enough to accommodate you know, rows of trees and so, that really was going strong until just a couple years ago. We kind of just ran out of space to put those kinds of plantings out there. The DNR then would do the design, they would let the contract, they would do the inspection of the work and the DOT would pay the bill and so the DNR, particularly Roger Jacob was a forester there at the State Forest Nursery and he would be the one that managed those contracts, did the design work. It would put rows of plant materials, it'd be trees, shrubs, mixture of evergreen and deciduous, tall, short, all to help with the highway hypnosis stuff. All to help with controlling run-off. All with help with purifying the air, for example. So you know, just trying to add some more ecological benefits to that highway corridor.

I: All right.

P: Kind of along that line I guess I could add.

I: Yeah, keep going.

P: It's really not an issue here in Iowa, yet but nationally, carbon loading is an issue. Particularly in cities or highly organized areas and so highway administration has asked some states, a year or two ago, to look at a pilot program to use roadside vegetation as carbon sinks or carbon sequestration zones to ease the problem with the air pollution in those cities. So like I said, we are not really into that in Iowa, yet. There are three places

in the state that are close to being non-attainment areas but they are not there yet, but you know, it could be that roadsides will play a part in air quality at some point.

I: That would be an interesting discussion on the vegetation, wouldn't it?

P: Yes.

I: It would kind of. Very interesting. Okay.

P: Then another thing that has been looked into is use of rights of way to produce biomass for energy. I think University of Northern Iowa worked with their local utility there in Cedar Falls and did some harvested of roadside native grasses and wildflower mixes. I think they experimented with different-- different kinds of mixes and different species composition but they would harvest it, send it off to get it pelletized, was sent back to the Cedar Falls facility and used for fuel. I think they found out that the roadsides is not-- can't produce the amount that they need. I mean, it's just a drop in a bucket but you know, every drop might count at some point so that's kind of been something that's been explored here in the last few years.

I: All kind of comes together I suppose or it might be some states where that might be more possible, all though we can grow vegetation like crazy. Volume.

P: We got the best soil in the country.

I: And moisture to go with it. Speaking of moisture on our recent hirings and flooding, is that generally a part of the equation or is it primarily erosion control?

P: It's primarily erosion control.

I: That's fair.

P: A lot of times where we see wash-outs following flooding, it's where, yeah. The existing vegetation was-- didn't have enough of a root system. There might be a sand seam in the soil or there might be a weak spot there. We just don't see those washouts in those big erosive areas where we have natives established. You know those massive root systems just bind that soil together and it's just about impossible for even the force of water to cut through that. I probably just gave myself the kiss of death there. Jinxed it.

I: We can erase the tape. Yeah, that makes sense. Is there anything else that I have not thought of, we went the directions that I needed to go to fill in the pieces. We spent a fair amount of time when we first met just visiting about the program overall but...

P: Well, you know, we talked a little bit about how farmers harvest on the rights of way, but it's not limited to just farmers. We have a variety of people that want to come out and harvest aronia berries down on highway 210. We had a medicine man that needed certain herbs for his rituals, that wanted to do some harvesting on the rights of way.

Transcribed by Ashley Kinkade, kinkadea1@gmail.com

What we constantly struggle with is--- it's probably okay to harvest if they are not doing damage to that existing vegetation but then the quarrel becomes, well what if they are selling it? What if they are taking this stuff off public land and selling it? How does that all come together? We struggle with that all the time. Typically we tell people you can't do that. If we find people doing it, well tell them to stop but we've never really prosecuted anybody but the more natives that we put out there the more that becomes an issue because people want that stuff in their home garden now. Particularly with the pollinator and monarch butterfly issues, the people-- we find people out there harvesting illegally on a pretty regular basis.

I: That makes sense. I can see where that can be an issue I guess I can say, not that makes sense but I can see where that can be an issue. Well, I'd like to go back because I know it's going to bother me tonight if I don't ask you now. I don't want to have to ask later, I'm going to jump back to when you and Ole Skaar, who were able to just kind of...

P: Make the jump?

I: Make the jump! Yeah. So both of you were actually in administrative positions where you could kind of...

P: Ole was actually the one that kind of--- put the plans together and so he would develop the seed mixes. He was the one that would put-- write the specifications that kind of stuff. I just kind of paved the way, administratively, that we could spend the money that way. Those kind of things. Really that's nothing that-- you know, we just kind of did it. We didn't really brag about it. We didn't really seek approval from top management. We just did it. Nobody really questioned us. So I guess you could kind of say we got away with it. You know, even if somebody questioned us, we had good logic behind doing that and I remember one time I had a division director ask me to come talk to the Iowa DOT commission about how we do natives. Why we do re-vegetation, some of those kinds of things. He says, "I want you to give it because when you talk it makes it sound like it makes sense." Where you know if an engineer was up there trying to give it or somebody else they just don't have that confidence, can't speak. Technically about the benefits of it like that but I always kind of took that as a complement that it was like-- I can sell that but nobody else can or other people couldn't. Yeah.

I: Sure. Sure. So having people in place administratively who can make something move, I guess, make something move internally, you know on some level is really pretty important.

P: Maybe not to get things started but at some point top management is going to have to support you. Either through budget or through politics, if there is political backlash or politicians are questioning the use, you need their support so if this was-- if some other state was reading this, that's what you gotta do. You gotta go educate and convert or convince those top policy makers that this is the way to go. You know, the other thing is, we do it because it helps us. It serves so many purposes that we need served and other states may not be able to say that as much. You know, the states that

are predominately woodland. You get out in the mountain states for example, not a lot of soil in a lot of those roadsides. It's rock. Exposed rock and stuff and so it's tougher settle out there that you know, they don't have the erosive issues like we do with our great soils here in Iowa. So...

I: Yeah, yeah. Well, I think I'm going to stop it.

Masteller 3 2016

I: Session 3. Mark Masteller. October 10th, 2016. Interviewer Jean Eells.

P: Yeah, just to kind of add or build on something that we talked about earlier, you know, you need support from your top management, your politicians, you need seed suppliers, but there's also the contracting industry that we didn't talk about and you know, when we were first proposing this, none of them had ever pulled a native seed drill before. All of them had been in full seed bed preparation on their seeding. Nobody had ever done no-till work before. So there was a learning curve for the contracting industry as much as there was for us as practitioners because now we were requiring them to buy new equipment or different equipment which required a capital out-lay on them and they were a little resistant at first but once they saw that we were going to be doing lots of acres, I think that went away fairly quickly, but then even today, we'll go out there and we'll find a contractor using a seed drill and then we'll ask them, when was the last time that was calibrated, they just give you this blank look like, what do you mean by calibrated? So it's a constant battle with the contracting industry because you know, on small contract, these are small contractors, these are not multi-million dollar firms that are doing this. So they operate on low overhead. They have cheap labor, they have big turnover in labor and so it's almost a constant educational battle with those contractors that-- this is how you need to do it. This is the equipment that you need to use, this is how you should be using that equipment. We only want to do it during these dates, not during these dates. That's a big component of our job really is working with those contractors to make sure that they know how we want it to be done and how it should be done and how it will be successful. Really, with the advent of storm water permits, you know the storm water rules went into effect in the early 90's as well and it requires a storm water permit on every project that disturbs one acre or more. You have to get this construction permit from the department of natural resources. So the only way you can end that permit at the end of construction is-- you have to have permanent perennial vegetation established on seventy percent of your site. What I hear from other states is-- that hasn't really been an issue for us so far, what I hear from other states is that they think it takes three years for natives to get established and so they won't use natives just because they want to get out from under those permit requirements of weekly inspections and radiation and everything that goes with it. I totally get and understand that. So that's why on our seed mixes, we include a lot of that faster germinating stuff in there because it helps us adhere or comply with those permit requirements. And-- that's another one of the questions that I get from other states as well-- but if that stuff takes three years, you know, you keep those permits open that long? Then I think another thing we didn't really talk about was management of the graze so much. I think early on, the prairie enthusiasts, the native plant enthusiasts all thought, well if you are growing prairie you have to burn. You know, we did some experimentation with burning. It's not a small task, it's very intensive labor-wise. It's very time consuming over a short period of time in the spring or in the fall when you want to do it and so between those reasons and also between liability reasons with smoke blowing across the road, we do not burn our native species. When I get comments or questions or concerns from the native plant experts, I kind of tell them-- my take on it is

we're not reconstructing prairie out here. We are using prairie to landscape the roadside-- prairie species. We are just going to be doing spot spraying, we are going to be doing spot mowing where we can to control weeds, to control invasive, to control brush and burning is not in the cards for us until we can somehow show that the risk and cost is worth it. So what we see is, over time, we probably do see diminishing forbs and the grasses kind of take over a little bit or tend to dominate a little bit, but if it gives us a stable roadside, it serves all of the purposes we continue to have it serve, we are fine with that. You know, that's probably one of the other things that pops up in discussions all the time is why we don't burn to manage those roadsides, so.

I: I'm so glad we talked about management because I know I wouldn't have thought about it later. DOT maintenance, secondary road maintenance folks and training.

P: Yeah, well, we've done a lot of training with them. We've set up our policies and our standards such that, typically the width-strip, one more width-strip on the shoulder would get mowed maybe three maybe four times a year. The narrower medians would get mowed three or four times a year like that. The idea is-- it's kind of a safety thing. Having six foot tall grasses right up next to the shoulder just makes people uneasy. What if a raccoon jumps out of there? What if a deer runs and jumps out of there-- and we should probably talk about wildlife as well. The-- having that mowed trimmed look serves a couple purposes. One it enhances safety, but two it makes it look like the roadside is being cared for. And that trickles all the way down to your backyard. If you just did your whole backyard in prairie, the neighbors would probably throw a fit. If you had selected prairie patches and you have edges around it or you have walking paths and it looks like it's part of a contrived, well thought through landscape, the objections go down. So that's been one of the things that we've learned over the years as well. You do need some level of maintenance. We often hear, "well you don't have to mow there anymore so you are saving money." That's not exactly true, even if you are using non-native species you don't have to mow. You don't have to mow. So that cost reduction is not really a true item for discussion. It's-- you are just going to-- you are spot mowing, you are spot spraying or your main control costs now and that mow along the edge thing. Then wildlife. That also popped into my head we were just talking. People say, or ask me, "aren't you drawing wildlife when you put habitat in the roadside. That seems like a dumb idea to put larger critters that-- closer to the roadway." My response to that is just what I've learned talking to like the DNR Deer Biologist, other wildlife biologist around it-- is that deer are crossing highways typically to go from water to a food source, to where they are going to overnight, to breeding grounds or wherever. That little strip growing next to the roadway is not determining where they walk and where they cross and where they don't cross and in actuality some of them say that if those deer feel safe because they are somewhat hidden in those roadside grasses they are less likely to bolt, and while nobody can really prove it, the potential is there that it actually reduces deer hits. Same thing is true with like skunks, raccoons, opossums, what-- any kind of critter that can be out in the roadside. The other theory that's floating around out there and I don't know that it's even been proven necessarily is that just like people are using the corridor to get from one place to the other, wildlife can use that corridor to get from a hilltop down to a creek for water and if they-- if they feel they are

in a safe corridor where they are somewhat hidden by a somewhat taller grasses and wildflowers and shrubs and trees and whatever, they'll stay there and they are less likely to bolt across. Now, states like out in the west-- Wyoming, Utah, Colorado. Those states, what they found is if you mow a lot, your right of way, that's what bring the deer in because that's new tender regrowth-- is just like a buffet for them, so if you mow a lot they don't feel safe, they are kind of on edge already but they really want that food and you know, that creates kind of an edgy condition for the wildlife and the potential for mixing with the traffic. So not mowing and allowing those natives to grow full height and fruition there may actually make things safer out there.

I: Makes sense. Bottom line, maintenance, vegetation, equipment, glad you circled back on contractors.

P: The other thing that we are just starting to kind of get into, we've always said that it helps with storm water infiltration because we looked at the original prairies, we saw that those were like sponges because of all the organic matter because of the massive root systems. It's really never been proven. Well now I'm serving on a state storm water technical committee and we are writing the Iowa Storm Water Manual. We are to a point we are thinking we might write a chapter on native vegetation as a storm water management tool. So we are starting to get into looking for research and even conducting some research on how those root systems of those native plants affect storm water. So you know, stems, the leaf masks, captures the small rain events-- the ground doesn't even get muddy underneath there. So you are capturing a lot of your first flush right there on the plants themselves but if it does get to the ground and it percolates and then it starts infiltrating, you know, what are we doing? Are we removing nitrogen? Are we removing phosphorous? Are we adding phosphorous? You know, we don't really have those answers and so that's kind of where I see the next field of study coming along. We just got a request from a researcher in Iowa City to look at that very thing in Buchanan County. They have some roadsides and they want to talk about how much watershed area flows into this road ditch from private land as well as from the highway itself and then of all that water, how much is making it to the stream. How much is then being infiltrated and what kind of chemicals are in that infiltrated-- you know, does it act as a filter? If it is acting as a filter, what's it filtering? Solids-- suspended solids probably-- might be an uptake of nitrogen, who knows what else could be in there that's kind of a relatively new field of study here in the last five to ten years. Here in Iowa, we are looking to try and make use of native vegetation-- a storm water practice--

I: Makes good sense. That's good to hear. A cool thing right from the get go I think. I think--

P: Those are what pops in my mind--

Masteller 4 2016

I: All right, session number 4. Mark Masteller October 10th, 2016. Interviewer Jean Eells.

P: Yeah, as we are wrapping this up, I had one more thought about an item that becomes-- has become an issue in a handful of highway projects around and that's when we build a new roadway next to an established prairie or a remnant and the issue of contaminating-- potentially contaminating that area. So our approach, we usually, if we are going by those areas we initiate a discussion with the owners or operators or managers of that land and we say, "Now, we've got a couple options here." One is, we just won't seed natives next to your area. So there's not any cross contamination. If that's not an issue for you, we would use natives all the way through but if it's truly something that they are trying to protect we have on multiple areas come to an agreement where we would harvest seed from that remnant and use it in the area adjacent to that remnant on the highway construction site. We are doing that now on highway 100 in Cedar Rapids. We've done it when they built the Neil Smith area down there on 163. We pur-- we went to them. You know, we didn't harvest from their lands because they were still new and hadn't really got a lot of prairie established there but what we did do is where they bought seed from is where we bought seed from so that the same thing that was going into the roadside is what was going in on their side of the fence. So yeah. In the case of Linn county and Iowa 100 in Cedar Rapids, we hired the local road-room and the local roadside manager and we were working with County Conservation board who manages the Rock Island preserve there to harvest off that preserve, store that seed, hopefully they've been doing that for a couple of years-- we are getting ready to seed here in another year and then use that seed out on the highway 100 project. It kind of buffers them any potential contamination of species there.

I: Yeah. Yeah. Good.

P: I guess when you are talking about protected, there are threatened and endangered species that are growing on highway rights of ways as well. It's kind of a tough thing to try and educate your maintenance guys on what they can and can't do there and still keep that secret or try and protect the identity and location of those areas. I don't think we've had-- I can only think of one time where we thought we had an incident and then it turned out that it wasn't such a big deal-- just a couple plants got wiped out of-- pretty large population there. I think we dodged a bullet on that one but I guess it just goes to show that, you know, you need to be aware of that-- that can be an issue on the roadside just as it can on private property so.

I: Yeah. Interesting. Interesting twist. Yeah, all kinds of things. Not only plants but also probably amphibians and some of those kinds of--

P: Yeah.

I: Yeah. Makes a lot of sense. Just going to let it run a little bit. A little bit of blank space won't hurt anything, just if anything else pops into mind.

P: No-- across the state, everybody is pretty aware that use of native species for buffer strips is a common practice and a best management practice and we've-- when we get a 404 permit from the depart-- the US Army Corps of Engineers and we have to do that for every project that impacts wetlands and then along with that comes a 401 water quality certification from the Department of Natural Resources. They actually require us to seed natives and do buffers along streams and so you know, we've been doing it all along because it was a good idea and it made sense for a lot of reasons for us and now they are telling us we have to do that we can't-- we can't go back on that idea so.

I: That's interesting how that's changed, hum. The permitting and stuff is so complicated and stuff. It's a real moving target.

P: There are over a hundred different laws that govern how we can or can't locate and build highway. Most of them are environmental. Probably eighty of them are. And you know, trying to navigate through all that is a nightmare. I was at a meeting once with a guy from the Alaska department of transportation and they had a bridge somewhere in the interior of Alaska that they were trying to build and they said that between the trout or salmon-- whichever it was, Eagles, bears, migratory birds, all these different species are all at this site. That if they follow every rule and regulation to the letter they would have two and a half weeks to build that bridge in a year. Of course--

I: Oh my. It's Alaska, they hardly have any time anyway. Wow.

P: You know, it just shows ya how many rules and regs are out there so.

I: Complex. Very complex. Very interesting.