

Kurtz 4.19.16

I: Today is April 19th, 2016. Interview with Carl Kurtz. Interviewer is Jean Eells. Looks like all the sound is picking up as it should. Lay that a little closer and we will get started. So what is your first memory of becoming aware of prairie and how you got involved in some of that early prairie excitement?

P: It came about because of my relationship to Roger Landers. I didn't really know anything about it and I don't remember just when it began. I started looking at areas around the state with him. They were primarily state preserves and it opened your eyes to the possibility of what prairie was. We still have part of an old railroad right of way that runs through our farm. That's where there was a bit of remnant and I found a lot of wild strawberries. This was interesting as I think my father knew about them too. I also discovered there were a lot of flowers that also grew there. That was an eye opener. My father didn't know the flowers, but he did know about the strawberries. There's a picture in the Iowa Natural Heritage foundation's original book. My neighbor tells me they were one of her favorite things which she grew up with.

I: And that many wild strawberries was a lot...

P: It was a lot.

I: Because they are so small and have so much flavor it makes my mouth water just thinking about them.

P: It's the little things you do that you may not think much about at the time, which later have a profound meaning.

I: And then to have the reason to go down there and then notice the flowers 'cause blooming at the time the strawberries are out you are probably at the peak of the phlox and other early flowers

P: There was phlox and spiderworts. Then later there was actually a couple of pretty odd things there which one can't hardly find anywhere. One was meadow phlox, which grows in wet areas. It's not very easy to find except in some of the state preserves. There was also some hoary puccoon.

I: Yeah, so how did you come to know Landers as a student or...

P: I had him as a teacher but quite frankly there was little memory of that. He wasn't a very dramatic teacher, but a great person. I can't remember how we got started with this business of traveling around the state but he was fun to be with. He had a contract with the National Park Service to look at places like Pipestone, Effigy Mounds, and Homestead, Nebraska, which is a small park service area. One thing I remember was his statement from that experience. I did not go there. He said they took him out to a spot at the site, which he would have sworn it was a virgin prairie. They had photographs of it being farmed. It turned out they had put prairie hay on it. That was one of the early ways that people were trying to restore prairie. They got out, harvested the hay and then scattered the hay. The hay contained the seed.

I: Interesting.

P: Because I'm a farmer that told me: why take the trouble to make hay just harvest the seed with a combine.

I: So you traveled around with him a fair amount and got to see things and learned a great deal about plants and plant communities-- when did you start doing presentation programs, talking to groups about prairie or was it mostly individuals for a long time?

P: Well, I used to do talks for all kinds of groups about natural history every week. I also started doing presentations at Iowa Prairie conferences about our efforts to reconstruct prairie. I also did a short talk about prairie areas at a National Prairie conference at Iowa State and Roger Landers was the presiding chairman of it. It was sometime in the mid-70s. I don't remember many details about the conference but it was a really good experience. At subsequent conferences Robert Betts from Northeastern Illinois University. He talked about planting prairie the Fermi lab near Chicago. You know that's that circle in Chicago. It's a proton accelerator.

I: Oh, okay.

P: Anyway it was a mile around and so he planted the interior and came up with the concept of a matrix of species, about thirty species that comprised eighty to ninety percent of the biomass. "Okay, you got to plant the big stuff first and you get mostly grasses, then you throw in this

other stuff". What he was not doing was all was mowing. If I made any contribution to this whole business I said, "why do you want to let the weeds take over?" It gets back to my farm experience. You don't plant your corn crop and then walk off and leave it. That doesn't make sense. So I started mowing and then eventually my pitch on this was, you can plant everything at once but just keep it mowed so everything has a chance to get started.

I: Sure.

P: So not everybody does that. Jon Judson is mowing it the first three years! He says it really helps.

I: So...

P: Bett's work was probably in the mid-late seventies. I've still got the papers as I thought that was really important. He had the big part of biomass. He called it a matrix. if you got that matrix going, essentially you have a pretty functioning system, however, it isn't two hundred and fifty species, but works pretty well.

I: So you were part of conferences then and traveled around with Landers and then decided to, well you had your own right of way, railroad right of way remnant you could look at and when did you decide to start planting and experimenting with uh--

P: Well the first plot I did was a roadside. I went to our county engineer and could I can track the construction back to the early 1960 when I was in high school and helped build a road. Where they installed a culvert fill dirt was removed leaving roadside ditches of glacial till. It didn't have any vegetation on 12 or 13 years eight years after the construction plant the ditch to prairie and he said, "Oh heavens, I don't care." He was a really nice guy so I ordered the seed from Stock Seed Farm. It was mostly Little Blue Stem and side-oats grama. I hand collected prairie clover and some blazing stars seed from a roadside remnant. I also got a bag full of Rough Blazing-star (*Liatris aspera*) from Cedar Hills Sand Prairie the year that there were about a hundred thousand flowers. At the time it was the Mark Sand Prairie, not a State Preserve. I think Larry Eilers told me about an abandoned railroad right-of-way near Dyke that was about to be plowed up for farmland. It has some dense stands of

shooting star (*Dodecatheon media*). One area was so it was about 20 by 40 feet. Since they were going to plow it up I went up there and filled our pick-up with huge big clumps of shooting stars. I planted some in the roadside.

I: In your roadside.

P: Yes and I planted a few of them in another new three acre reconstruction east of our house.

I: With...

P: With again, a mixture of native grasses, as I didn't have hardly any forbs at that time.

I: I remember the point at which we were all pretty excited if we saw a field of switchgrass, you know what I mean...

P: Oh yeah.

I: It was because that was what we recognized. It felt like it was an achievement to get something growing. I remember those years of being pretty pumped about just seeing the grasses.

P: The three acre planting in 1976 had been a corn field and hog pasture. It was my first experience at keeping it mowed.

I: Uhm...

P: And also at that time period I was really starting to looking at old railroad right-of-ways, and roadsides along county roads for prairie remnants. One was on a dead-end road in southern Marshall County, and probably had never been sprayed.

I: So then you started hand collecting.

P: Little bits of stuff.

I: Bits here and there and adding to it.

P: The first seed combines from Doolittle was in 1980, It came up the third year after planting a sea of grey-headed coneflowers. I still have photos where it was planted. That was an epiphany you know what I mean. I had never seen anything like this before. Other prairie species followed in subsequent years.

I: I know it. To have all those things come up and yeah.

P: Flowers all over the place.

I: And how many acres was that?

P: Oh, maybe a quarter of an acre.

I: Quarter of an acre. Okay. And that was at your home place there?

P: It was just south of our house.

I: So you were star--

P: Well, the other thing we did started in '76. We had an association with the Marshall County Conservation Board for ten or more years. We rented our old pasture and planted it to native grasses. That was about thirty-eight acres and some was switchgrass, while so a lot of it was heavy with big bluestem and Indian grass. We sprayed out the pasture which we shouldn't have done, but we did. The tall prairie grasses grew and provided good habitat for wildlife, but what we learned from that experience was without the diversity you just have all kinds of other issues. Canada thistles were terrible at first. I think we lost a few native pasture plants that I still regret. One was a little patch of silverleaf scurf-pea. I later discovered it is somewhat resistant to Round-up, but it probably got shaded out by big bluestem.

I: So I'm interested in particular in who were some of the people that you were associating with that were in addition to Landers, who started

picking up on some of this and going around with you and looking and stuff or were you mostly on your own for a lot of it?

P: I would say I was on my own for a lot of it. One other experience I remember. We met John Madsen at Kalsow Prairie one year in late June or early July. The east side of Kalsow was covered with downy phlox and butterfly milkweed. John later wrote about that event in his book "Where the Sky Began". It makes you think, "Oh we got to do something." It was in '77 or '78.

I: So I missed Madsen just by a little bit, I really wasn't in the prairie scene enough at that time to of--

P: He could give really interesting talks. But in some ways he could be hard to be close to. At the time he was trying to finish up his book, "Where the Sky Began".

I: Did you have much to do with Paul Christensen then?

P: A little bit. In the mid- 90's we were still having field trips for The Nature Conservancy. He came and led one of the field trips. Afterward he said, "you've got Illinois tick-trefoil. I didn't even realize it was out there. He was a great person and really knew his plants.

I: Daryl said that he-- Paul was really the better botanist, and really good field botanist.

P: The other thing he did that I remember hearing about him. He would hand-collect seed and then he'd go out and just throw it in his roadside ditch, I just remember him telling about it. A lot of prairie plants were coming up and it was probably because he burned it occasionally. We used to go to the lakeside in the summer to various meetings and it was always fun to go out with him and Larry Eilers. Eilers was a great person as was his wife Charlotte. They were just the nicest people.

I: Who were some of the other folks you could like of? We'll just keep going back to people that you can think of that were kind of influential

until you got on the Preserves Board and then I'll mine that one. So anybody else in the very early years that you can think of...

P: Have you heard of Gene Kromray?

I: Yeah.

P: Gene was a real character.

I: Yeah. Got to know him at the Loess Hills Prairie Center is how I got to know him...

P: He had somebody develop a harvesting machine out of an old wind rower. The pictures he had of him going different places for harvest are hilarious. It's like he had all of his machines hooked together and he was going down the road. It looked like a disaster waiting to happen. I believe he's still living.. He was from down in the Ottumwa area,

I: He was very generous with his information and gave good presentations.

P: He was fun.

I: Yeah. Okay. I hadn't thought about him.

P: He often presented for those early conferences at UNI. He would do some sort of a talk, which, gave you ideas that were off the wall from anything you may have never thought about.

I: Yeah. Well, and he had kind of a farmer's-- orientation to the equipment and you know. So there are kind of three aspects of the information that I am after, one of course is just this overall you know, prairie history, and then any interactions that you might have had with the Living Roadway Trust Fund, any of that kind of stuff. I don't expect that to be a big part of your story because I never associate you with the huge part of that development and then your role on the preserves board

and with TNC in protecting remnants and who were some key players. So those are kind of the three areas so we may revisit the prairie history a little bit more but do you have any sense of who key players were that really made something happen for the roadside program? In case there's somebody that I haven't caught already.

P: Steve Holland asked me to do a winter presentation for the 6 road-maintenance divisions around the state. It was sponsored by the Federated Garden Clubs and was in 1989.

I: So it was you and Steve? Or mainly you?

P: Well, I think-- Steve Holland. I think he was part of the program all the way around but I did this presentation on prairie and its potential for roadsides-- . One little side note, where I planted the shooting stars there are now hundreds if not thousands of shooting stars in that road borrow. This is interesting otherwise that population would be completely gone.

I: Yeah, so there's a vigorousness to those that seem to be...

P: Well, if you get them in a place where's there's no competition...

I: No competition.

P: Which is what it's like in that ditch because it's still just glacial till, essentially hard-pan clay. There is no top-soil. Research on topsoil formation from Cornell University indicates it takes it only takes nine-hundred years to form an inch of topsoil.

I: That's right.

P. Recent on farm research indicates that farmers can gain one percent of additional organic material in about eight to ten years. With the best management you might get three or four percent in twenty years?

I: Kind of astounding, isn't it? Kind of astounding. So the garden clubs were one of the key, key groups really that got you-- got prairie spread really around the state. They are all kind of mentioned a little bit, too.

P: they were somewhat aware aware-- they just funded our trip around.

I: And so then you ended up on the preserves board. Do you kind of have a sense of what years that might have been?

P: I've been off for at least four years, possibly six and it was on for eight. So that would back it up to what? Maybe 2010. Probably from about 2002 to 2010.

I: Nature Conservancy then you were, I know Landers was instrumental in getting the-- he was one of several people that got the first chapter going-- Iowa Chapter going. Do you remember much about that process?

P: I remember going to the quarterly meetings with Landers. It was a small board group of six or seven individuals. John Brayton was a member. He was kind of our secretary and he was a fun guy who worked at the DOT part of the time. He sold me my first Allis Chalmers combine. I used it to harvest soybeans one year and later to harvest prairie. The meetings were more almost more social events than business. We TNC bought Behrens Ponds to protect the blue-spotted salamander it was sixty-three thousand dollars. We had no clue how we were going to pay for that.

I: How did they eventually pay for that?

P: I don't know. I don't remember. It wasn't too long after that we hired staff. Then the office staff started to appeal for money. People like Buzz Brenton and David Hurd who part of the Des Moines business community could ask for ten thousand dollars pretty easy. What I remember most about David was walking on Broken Kettle with he and his wife. There was a TNC meeting there and they had contributed a part of it called the Stevenson family preserve. The first time I was at the Bowl (Broken Kettle) with Landers and we didn't own any of it. One just looked out

there and said, "Wouldn't this be great." I never believed that we do any of that because we didn't have any money. When kids nowadays are discouraged, I tell them that story-- and now it is some eight or nine thousand acres , some of it owned, much of it under easements. It's amazing. Look at all the county conservation boards and all the good work they are doing. Forty years ago there wasn't hardly any of that.

I: No not really.

P: Marietta Sand Prairie was seventeen acres and now it's what two hundred and fifty something like that. That too is amazing.

I: When you think about going from almost no recognition of prairie to as much recognition as we have it is kind of an amazing kind of thing and you kind of look around and say how did this all happen and that's partly why I'm kind of teasing out some of these things who were people that

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I: Session two. April 19, 2016, Interview with Carl Kurtz continues.

P: So anyway, I mean that too has been such an eye-opener because...

I: Yeah, Andersen Lake by Jewel and the private club and you bought in a share in 198-

P: Probably 87 or so.

P: Brian Holt has been a member since then then we started to see that we just needed habitat instead of farmland. I did the first planting with Rick Hager, an intern and who eventually went to Neil Smith NWR. He had graduated, worked for us through the summer and until November. We planted the first area with a fertilizer spreader. Today it is pretty well buffered all the way around and have purchased more land to enlarge the watershed. We hope to buy more land and have a buffer one quarter mile wide on all sides. It's really exciting to see the club is doing something that makes such a difference. We are trying to get it back the original look of the marsh. There is much data on that site going back to 1900 with Louis Pammel with other people like Milton Weller and Paul Errington. They all did research there and we have most of those papers. That's really neat you know? I believe that at one time it had four hundred native species. I suspect there's may to be three hundred there now. It's incredible.

I: Yes. If you think about what a transformation it went through.

P: And now they are doing some of the same things at Big Wall Lake in Wright County. Jim Dinsmore donated the land he donated money to purchase more land which is encouraging.

P: To me this is encouraging and the product of getting lots of people excited and interested and opening their eyes to diversity and how important it is. It's a critical issue. It's not just in the prairie, but also in agriculture.

P: If you don't have diversity, you don't have stability.

I: Makes a big big difference. Let's circle back to Buzz Brenton a little bit more-- David Hurd and any other key players that you recognize were influential at key points or early in that early history.

P: I remember them because they had many connections to the business community. they helped bring in others and businesses such as Pioneer with Don Duvick.

I: Off the nature conservancy board? yeah.

P: I was on the board for perhaps twenty some years. It was fun and nice to meet people but also nice to be off the board and onto other things.

I: Yeah. Yeah. So funding remnants and finding and protecting, can you talk a little bit more about any of those that you can think of that were-- kind of walk me through like Broken Kettle, there's-- there's one example are there any others that you can think of where really found-- where there was habitat that prairie was part of that all of a sudden

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somebody goes, "Wow there was a remnant there we didn't know that before" and set about protecting?

P: The Mark Sand Prairie in Blackhawk County was purchased and became Cedar Hills Sand Prairie. Eventually they added another unit to the north of the original purchase. I was able to photograph as dramatic display of rough blazing stars in 1974 which may have helped with the purchase of the site. It points out how important photography can be to get people excited for protection of a site.

I: Yes. Yes.

P: And then the other site that I knew more about was a disjunct part of the Marietta Sand Prairie. there was a cornfield north of the preserve and some pasture land north of it. The pasture was marginal and the cropland often failed unless it rained every week throughout the summer. There was a sand blowout in the corn field , but the pasture had lots of wet areas and a fen which contained a host of fairly rare species. species. One was Adder's tongue fern, *Ophioglossum* sp. which was quite unusual.

I: How did you come to be-- to know about that one, did that come from--

P: Roger Landers discovered that site see. He said he was driving down the road one day, noticed the unusual vegetation and walked across the fence. The owner came along and they became acquainted. I eventually got to know the owner pretty well. He lightly grazed his cows on the prairie which turned out to be a benefit. A number of species were lost when the grazing stopped. The area needs serious management help. Starting with grazing it would be better.

P: It's Marshall County Conservation site.

I: I was thinking they have that. So Landers happened on to it and...

P: Landers might have gotten there because of soil surveys or simply driving back roads. I have visited the site dozens of times since it's really close to home. I went there to take photographs and was really excited to see big patches of liatris or other native prairie plants. There were 3 species of ferns and quaking aspens in the wet areas. It pointed out how diverse prairies could be. They often have many different zones of vegetation, wet and dry and swampy.

I: Want to make sure I'm still picking up here, I think it's picking up. Yes. And so that's a really excellent example of one and I know that TNC has gone through an evolution in how they identify and where they priorities and the landscape areas and some of those things but in the early years it was kind of find it and protect it, or...

P: Originally most of the properties were donated. Since they are small they are very time-consuming to deal with and now in 2016 they would like to pass them on to other agencies such as county conservation boards. They are looking at landscaped-sized areas which hold endangered species, protect water quality and for example have prairie chickens . Broken Kettle in NW Iowa, the Kellerton site in southern Iowa and the South Cedar River in SE Iowa. Most of the algific slopes have been given to the Fish and Wildlife service.

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I: Talk more about county conservation boards and-- in general and your involvement in prairie and how you might have interacted with them.

P: I think it could have been very different depending on the board and who their director was, in some cases they were very forthright and out-looking and thinking about protecting all the remnants and then in other cases that wasn't happening. I mean, Marshall County, we worked at the Marietta site for years but it was not a priority for the director.

I: County Conservation Boards as a whole are certainly torn in different directions catering to different user groups. It can be challenging to protect and managing of those sites. Each one has special needs.

P: Maybe the people have more of an interest in botany and endangered species to some degree. I thought Hamilton County was doing very well and I knew Brian Fankhauser really well and he was really wonderful.

I: So qualified. So very talented in that way.

P: We worked with him a lot. We really liked Brian. Brian Holt was really good at looking at the whole picture. He been great to work with that Anderson Lake.

I: It's great, it's a good thing. That's a good deal.

P: And he's working on his own site. He's managing the Woodland where he is.

I: Yeah, and that's fun to see how that's working out. Are there other key people that you would want to talk about with the seed business and more about prairie seed 'cause you've really got the seed history knowledge, you know, like you say we started with Stock Seed from out of state and there wasn't much available and then some of the other people. Gene Kromray certainly was an early bird but--

P: What we saw from the early plantings was plants established from western seed sources seed eventually it disappeared since it was too wet here. We had a small planting dominated by switchgrass, it eventually died out. It was replaced by big bluestem and it also died out after a number of years. So over time plantings tend to diversify, but it's a pretty slow process. What I'm telling people to do now is seed in the fall and burn in the spring. That's the opposite of what we ever did before. We see seedlings come up every year after fire. It's just unbelievable.

I: Good stuff. Get it in the ground and it grows.

P: The seeds are all on the surface. n We would have never done that before because you would have thought they would all get burned up.

I: Cool. yeah. So I know you have gone through a lot of work with you seed business and being able to sell mixed seed, has its own challenges as opposed to single species and then mix them later and then how you worked with that. Can you talk through a little bit of that whole process? You started with some Doolittle seed and you worked with...

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P: Well, okay. So the beginning of this was that I was farming from '77 to 19'88 and I figured out that if I kept doing this I was going to go broke. We didn't have that much land so that's when we first planted this a little plot thinking that if we got it going we could use that seed and plant more areas. In 1990 we talked to Dorrel Doolittle about harvesting the privately owned section of Doolittle prairie. With the seed we harvested we over seeded our first little plot. The fourth growing season we harvested it and sold it to my neighbor. That was an opening for seed sales. The next year we harvested the Doolittle prairie again and planted another area. We continued this process for more than 20 years planting more areas or overseeding areas to try and get higher diversity in previous plantings. We have tested seed nearly every year. We always try to do our own analysis and as it helps you see what has happened. Some years one species does really well and the next year it doesn't. Last year I couldn't find a single filled switchgrass seed. The seed testing lab showed that in our mix because again. Testing labs look at seed for diversity, but they don't check and see if the seed is filled. The results in 2015 was forty-nine percent seed in our mix. I only found only thirty-four percent because of the seed that had not filled. Filled seed has a kernel inside its husk and is hard.

I: Are hard.

P: I take a tweezers under a dissecting scope and check every seed in the sample. We also have lab test results for NRCS, and a germination test for the top 15-20 species.

I: Because you know the other is definitely not viable.

P: It makes sense and has helped us because buyers get results. If they have lots of flowers they tell their neighbors, which drums up business.

I: And there have been some years that it's been harder to sell seed than others? Just volumes of it?

P: We seen that when the prices of grain went way up, people were plowing up everything. When we started out more than ten years ago the Fish and Wildlife Service still had funding for management and restoration. They were purchasing hundreds of pounds each year. That really helped us to buy a remnant pasture. It was really degraded from serious overgrazing.

I: Yeah.

P: But what we learned most from that was if you overseed the degraded remnants, the species that are missing start to come back in. that is what we need to be doing at Ames High Prairie. That would help you solve its problems. It's short on species and diversity makes a difference." That's what we learned from overseeding remnants. It's

exciting to go and look at the changes in species diversity and the absence of weedy vegetation.

I: Not yet.

P: You must talk to Andy Swanson. His site south of McCallsburg is incredible. You will never see anything like this anywhere. It has more flowers than any place I've ever been. It does have species like prairie dock and on a sandy knob on the back and so he's has some species from Western Iowa. He's also trying to plant wild rice in some wetlands.

I: Yeah. That-- what's growing and how it's growing and what happens.

P: He's so excited, that's what's so neat about it. He was telling me about ground plum, a legume. It's got a lavender flower but it puts out this little edible... ground plums.

P: To me this is where politics get involved. At places like Neil Smith NWR where you are going to plant a prairie and need lots of seed you should hire a farmer with a background in horticulture. One year Andy Swanson had fourteen hundred pounds of pale purple cone flowers and all native. Not only that he had thirty species in plots where he lived and he did most of it by himself. He planted it by hand. Years ago he had a patch of butterfly milkweed. He called me up and he said, "I think you can see them from a satellite." There were all in flowers. "I planted them on my hands and knees." He said. It was incredible.

I: Plugs, starts, seeds...

P: He'd start them in cone containers.

I: Yeah, somebody can get people excited about growing stuff in a big way.

P: He helped us. We used to buy local remnant grown seed from him. Oxeye Sunflowers, purple cone flowers, and black-eyed Susan's and add them to our mix. It was so exciting to see his rows of flowers although monocultures are difficult to deal with.

I: That transfer of ideas and excitement and knowledge. That's been a theme in pretty much everybody's interview has been that transfer of that excitement.

P: He gave us a pound of butterfly milkweed one year which I planted them on the northeast facing slope we donated to the Iowa Natural Heritage Foundation. One year there were probably a hundred butterfly milkweeds on that slope. It took seven eight

years before they flowered. Some day we hope that slope will be covered with butterfly milkweed and pale purple coneflowers.

I: That'd be fun.

P: yeah.

I: Fun to get to see that. Let's pop back into the photography a bit more than and talk about how you worked with that and I like your statement about it, you know, probably as a way of helping people get excited but.

P: I started doing slide presentations that showed the process of seeding, mowing and other aspects of planting and management. In one of the programs I mowed enough black eyed Susan's by the hundreds in an early stage planting. People thought it was terrible, but it was done to control weedy vegetation. You don't want to count on the seed that you are growing to get your prairie started, you'll want to count on the seed that you have planted to get your prairie started and keep the weedy growth under control. That was the lesson I was trying to get through to them. You want to put down enough seed and nurture what you have planted. The presentations I did were kind of a step by step process of how you get there. Roger Maddox looked at an area we had planted years before and said he thought it was a remnant. It is so important to get people excited.

I: Yeah.

P: People with yard plantings said kids really liked it. Soon the neighbors were also onboard with the idea. Butterflies tend to be a real magnet for kids.

I: All righty. Are there people or any areas that we missed that you can think of that--

P: I think we are failing in the management of big areas, especially state preserves, We should be looking at other management strategies like haying you know to control woodies and to control sweet clover. I have seen photos of Kalsow prairie and the only thing you could see was sweet clover across over the whole site. We need to get the local community, nearby landowners, or neighboring farmers involved in the management of our state prairies. We have to or we are going to lose them. Give it to them for hay. We have seen that work really well.

I: Yeah, 'cause it can sure take over a site in a hurry.

P: Most of the prairie preserves survived because they were used for hay in the first place.

P: Things like Marietta they don't really fall into that nature. They need long-term management, perhaps moderate grazing, however this is complicated because of the fencing and monitoring. Finding somebody to do it judiciously and not over graze it to the point where you are starting to do damage. The next generation must begin to manage areas sustainably.

I: Well and it's interesting to think how-- where we've come from on that, you know and you think about early burns and how we burn and what we burn and what we wore when we burned and what we checked out before we burned and what we didn't check out so there's been quite an evolution in that as well.

P: There is lots of controversy with the business of burning and that will continue.

I: Yet that was the big tool, that was the big thing to

P: Burn frequency depends on a person's goals for the site and its issues. When Brian Wisley brings his class over every year, he says the areas we have burned for twenty straight years are the most diverse areas he's ever seen.

I: Interesting.

P: It is because there's so much species diversity in every square meter. North and south of Iowa latitude-wise this may not be true or where it gets dryer to the west. You can't hardly burn too much if you want to get diversity.

I: Yeah. Interesting. Uhm, well, I think we've been around that horn on quite a few of the things and yours fits in nicely with what I've got from some of the others so I'll go ahead and stop.