

Native Plant Identification Walking Tour with Jeff Nekola

Watch out for Wild Parsnip (*Pastinaca sativa*) as we're walking along here, because with your sweat and the sun it will give you chemical blister. That blister may last at least six months and the scar may last for over a year and a half. Fortunately, Kent mowed a huge path through the middle of this patch of wild parsnip, otherwise we couldn't have gotten through. A lot of cases thought to be poison ivy are actually wild parsnip. It's far more common and much worse than poison ivy. So if you see this plant in a ditch or a field, stay out of that ditch or field until fall. As far as I know, anyone who walks through a patch of wild parsnip will suffer as a result.

Let's talk a bit about the geology of this area, since that affects the plants and animals, too. This area is all underlain by limestone that is approximately 400 million years old. It's a time period when the Appalachian Mountains were just beginning to rise, and Africa was slamming into the North American continent to the east. The ocean shore got brought up close enough to the surface that coral reefs formed, and there was abundant life. If you look in the rocks and creeks and road cuts here, you will find lots of interesting fossils. So that sets the background for this area.

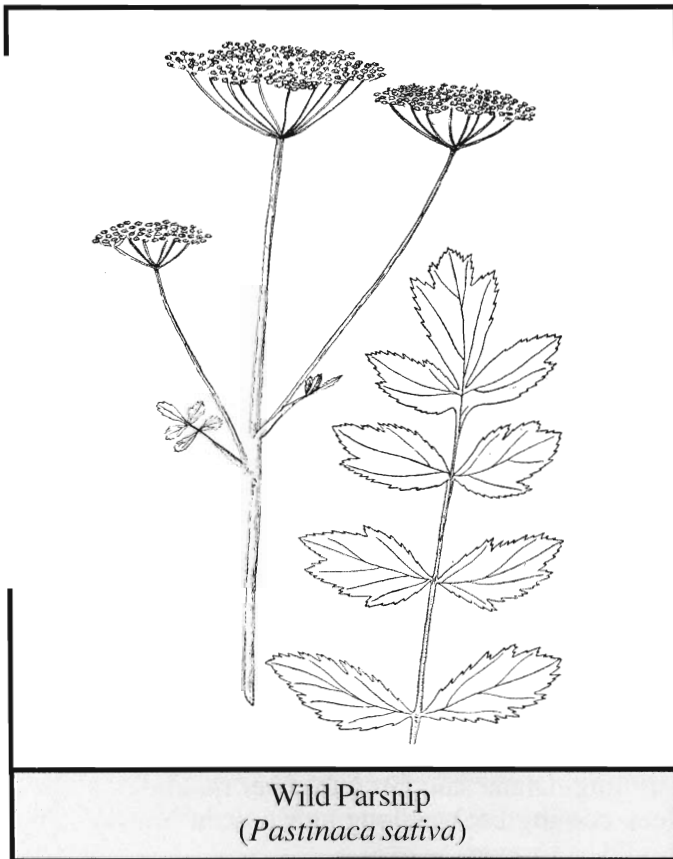
What's more important is the last two and a half

million years, when this area underwent the ice age period. Every 250,000 years, we get another ice age, and it's because of the wobbles in the earth's orbit. There are times when the earth is farther away from the sun and the tilt is greater, so there's a bigger Arctic Circle and the earth is moving a bit more slowly. So we have a large Arctic Circle a long way away from the sun and a really long winter, and that builds up ice sheets. Those happened most recently in this area about 15,000 years ago. The ice was up north and didn't get here, but it was so cold in this area that permafrost got into the ground and broke up the rock. So when the ice age ended, it left the hills in this area.

In just the last 10 years we've learned that the ice age didn't end slowly. It ended in a 15-year period. When they took a look at the makeup of the atmosphere in the ice cores taken from the Greenland ice sheet and the Arctic ice sheet, they found that it took just 10 years for this to go from being tundra to a climate just like today's. Ten years! Think about how rapid that change was.

When the climate warmed that quickly, all that ice melted out of the ground and, because the rock was all loose and unstable, all of a sudden there was a huge rush of water coming down here, and it carved out these hillsides. People talk about northeastern Iowa being the place the glaciers forgot, but it isn't; this is our newest landscape, formed by the rapid melting of permafrost at the end of the last ice age. So these hillsides we're walking through aren't ancient hillsides that go back millions and millions of years ago – they were formed within the last 15,000 years.

There's a crevice back over here with a huge spring that feeds this pond. That crevice is a part of an old ice wedge, where the permafrost got into the limestone. Every winter a little more ice got in that wedge, and as it froze it got bigger and kept wedging out like a crowbar – a little bit more and a little bit more – until now there's a wedge probably three feet wide. It's a water conduit, and that's where the spring comes from. That ledge you see leads right up to the top of the hill. Whenever it rains, it seeps into a series of sinkholes through these cracks in the rocks where there used to be permafrost, and it comes out at the bottom and makes this pond. Almost all the groundwater we have in northeastern Iowa is not coming from thousands of miles away, purified by passage through lots of rock – it's just coming from the top of the hill, falling down the sinkholes, and coming out right here. That's why people around here are really concerned about what their neighbors are doing with their sinkholes, because that is going



to influence what they're drinking from their wells. Groundwater quality is a big concern around here.

Notice the butterflies here, having breakfast. If we wait here long enough we'll probably see others; this Bee Balm is a favorite butterfly nectar plant. Yes, there's a monarch over there. I wanted you all to see this beautiful clump of Bee Balm, which is also called Wild Bergamot (*Monarda fistulosa*). It's native here in the Midwest and is a wonderful tea plant. Feel free to break a leaf off and crush it and smell it.

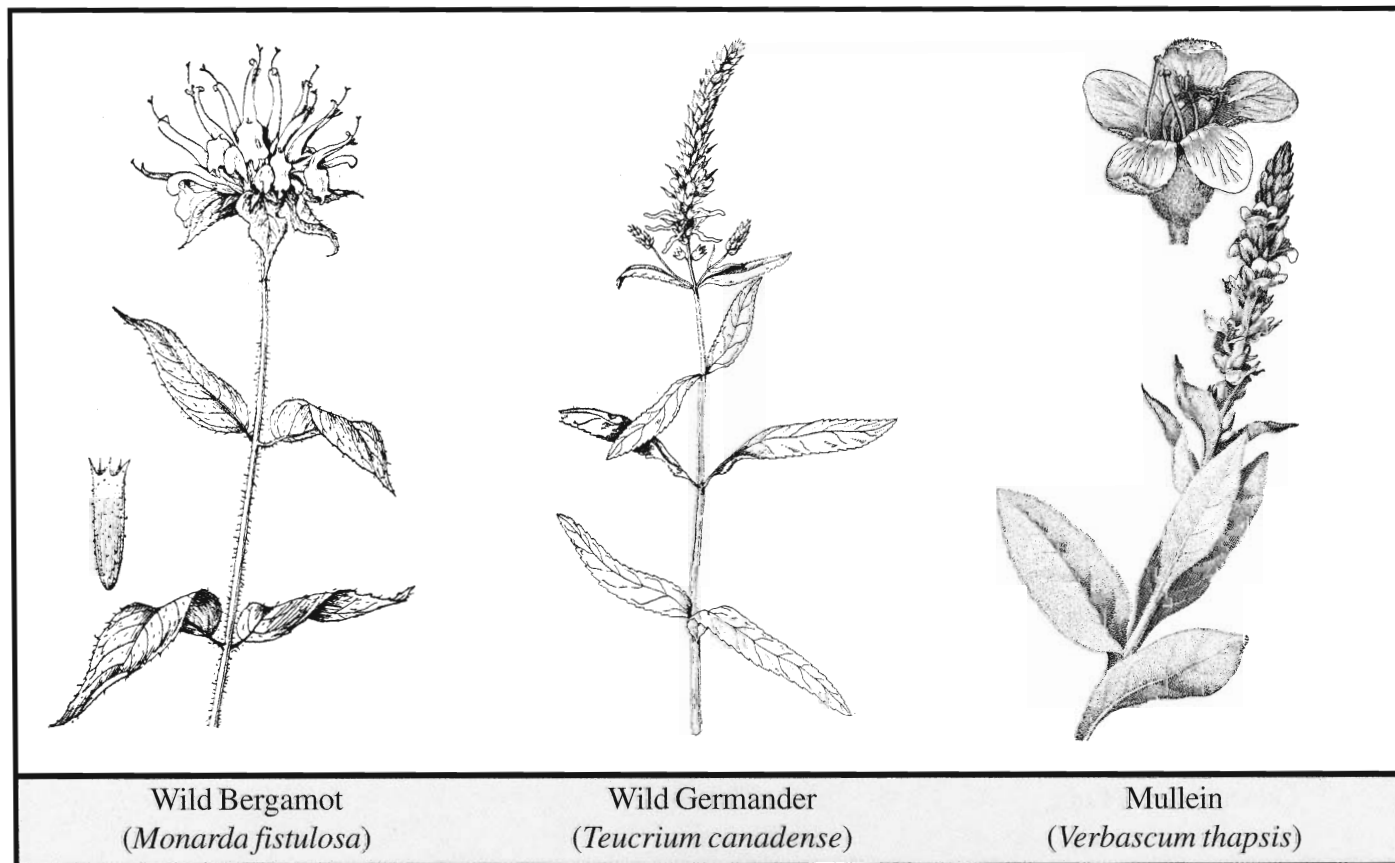
We're in a good position here to see what the valley looks like now. You can see that the bottom is all pastureland, all grass, with woods up on either side. It's important to remember that this stream flows almost due east-west, so the slopes on the right side (looking east) are north-facing and the slopes on the left side are south-facing. If you think of the way the sun moves during the course of the day, at high noon that north-facing slope is going to be shaded and this south-facing slope is going to get baked by the full sun. This means that the south-facing slopes are hotter and dryer in Iowa on average than the north-facing slopes.

One of the things I want us to notice today as we hike up the north side of the valley, where the south-facing slopes are, is how the trees and plants change in the native forests on the north side. I also wanted to point out this good grass we're walking through that makes up the majority of the Twin Valleys property. The total number

of plant species found on this farm is around 350-400, which is quite high. It's interesting to note that in this pasture approximately 95% of the plants are European. Almost every plant you see here except for the bee balm and some Wild Germander (*Teucrium canadense*) is a European plant – Mullein (*Verbascum thapsis*), Queen Anne's Lace or wild carrot (*Dacus carota*), Chicory (*Cichorium intybus*), and the pasture grasses Timothy (*Phleum pratense*) and Fescue (*Festuca glabra*). We're really walking through a piece of Europe. I've hiked through pastureland in the lower part of the Alps in Switzerland, and it's similar to what we're seeing right here.

When the Europeans moved in here, they started changing the landscape. They cut all the trees out of this bottomland along the creek, they brought in their own forage plants and planted them here, and they did really well. So today, more than 120 years later, we have this European grassland community on this bottomland, and the White Park cattle are actually eating the types of grasses they would be eating in Europe. Yet up on the hillside, where it was too steep to cut and a cow normally wouldn't go, we see the native vegetation. Now we're going to go up this hill a bit, and we'll have our first major stop just around the corner.

So here we are, on the edge of one of these south-facing slopes. It's all rock, all the way on up to the top. I want you to notice what is growing here: Red Cedar trees (*Juniperus virginiana*), and another plant that



grows pretty much everywhere on this south pasture, called Prickly Ash (*Zanthoxylum americanum*). You'll find out why it's called that if you run into one. The more important thing about Prickly Ash is its smell. Crumple a leaf and tell me what you think it smells like. Citrus, isn't it? This is one of two plants in Iowa that are in the orange family. I'm going to pass these around – here are the little oranges that it makes. If you cut them with your fingernail and rub them, you'll again get that really strong citrus smell.

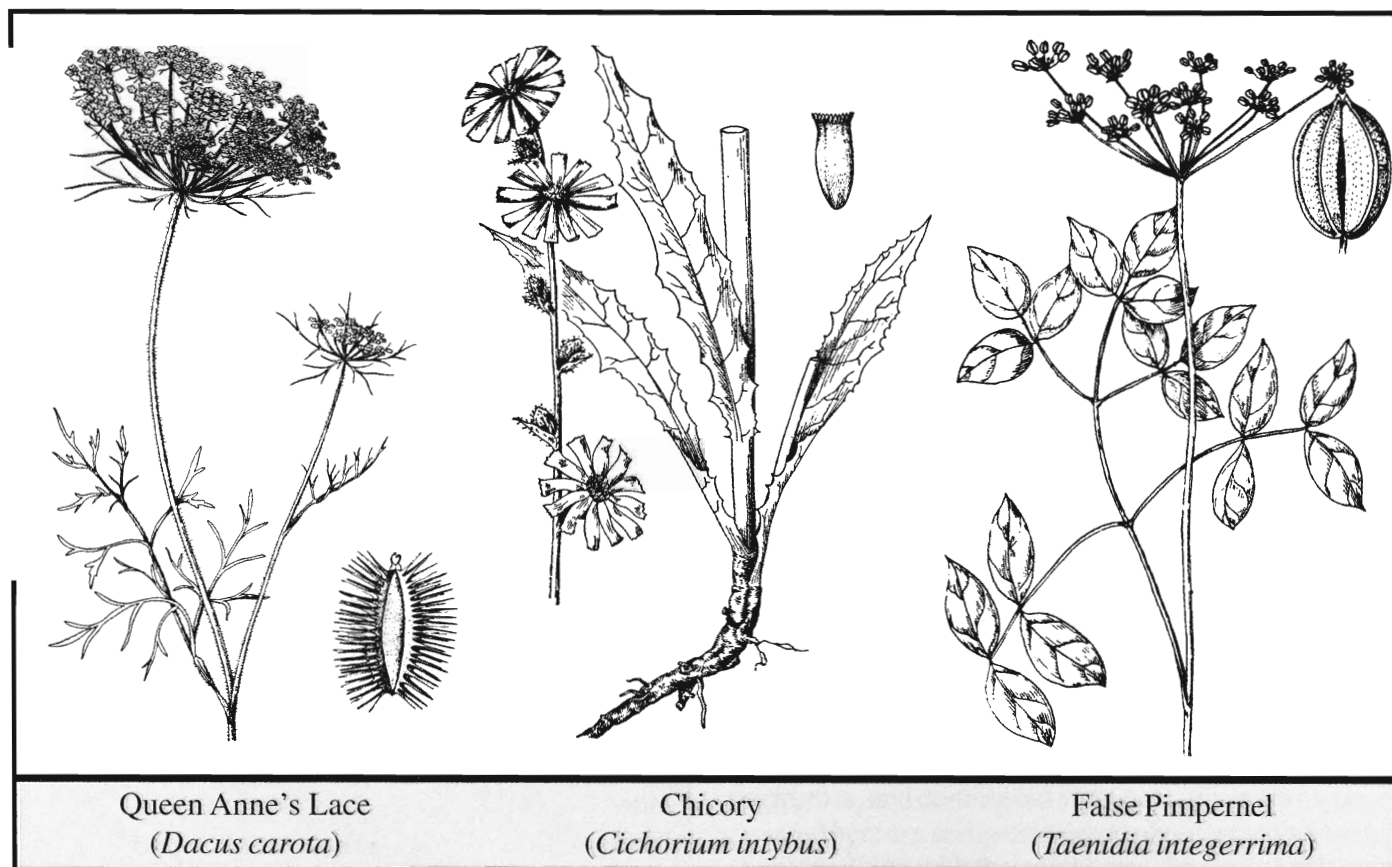
Prickly Ash is a very thorny plant. If you're a plant living in the pasture and cows show up and you have thorns like this, you aren't likely to be bothered. The cows aren't going to eat this; they're going to go for the grass and the soft stuff, not the thorny things. So over time, the thorny plants usually increase in a pastureland. So we find Prickly Ash and here, next to it are Gooseberries (*Ribes missouriense*) and Black Raspberries (*Rubus occidentalis*) over here.

Here you're seeing a native, rocky, south-facing slope. What is it dominated by? Lots of Elm (*Ulmus rubra*), and also Black Walnut (*Juglens nigra*) and Red Cedar. You'll notice that the trees aren't spaced very close together here, so there's a fairly open canopy. You also see that Dutch elm disease has killed some of the trees on the edge, and it may be affecting some of the smaller ones, but by and large this is pretty healthy.

What's really neat are the plants that are growing here.

There's an indicator plant I look for when I'm getting into a place where I start to see some really interesting, dry rocky woods plants. It's called False Pimpernel (the Latin name is *Taenidia integerrima*) and it's quite uncommon. It's not endangered, but it's only found in places where there's a lot of loose rock. It loves to grow in loose rock on south-facing slopes. So when I saw False Pimpernel here, I knew there could be some other interesting plants. Well, the ground is covered with a little plant with cross-shaped leaves, called Northern Bedstraw (*Galium boreale*). It normally grows out in prairies and also shows up on the tops of bluffs, and it's a good native plant. Well, that was even better.

Then I found a Wild Morning Glory (*Calystegia spithamea*). The last time it had been seen here in Winneshiek County was 1880. As far as I can tell, there are only six other places in Iowa where it's still known to grow. And it needs this habitat, this base of dry, loose limestone, a hotter and dryer-than-blazes place. You normally find this plant in the Ozarks. So on this south-facing rocky slope, which continues from here all the way back to where we first entered the Twin Valleys property, if you walked through the woods and skittered around on these limestone boulders you would find this same group of plants all the way along. It's kind of like having a piece of the Ozarks stranded here in northeastern Iowa. Because it's so hot and dry, the trees are stunted. I'm sure if we could



Queen Anne's Lace
(*Dacus carota*)

Chicory
(*Cichorium intybus*)

False Pimpernel
(*Taenidia integerrima*)

count the rings of some of these trees, they would be a lot older than they look, because they're not growing very fast. That little elm tree in front could easily be 50 years old if not more, just because it's growing under such harsh conditions in this area.

This is one of the major important natural habitats here. The White Park cattle don't have access to this area anymore, but even when this area was continually grazed I don't think the cattle could do any harm because they'd break their necks trying to go up in here. This rock has protected this area from grazing for the last 120 years and will continue to do so. This is an excellent example of a southern rocky forest with some really rare plants. I wish I could show you the morning glory, but I just don't see it right here.

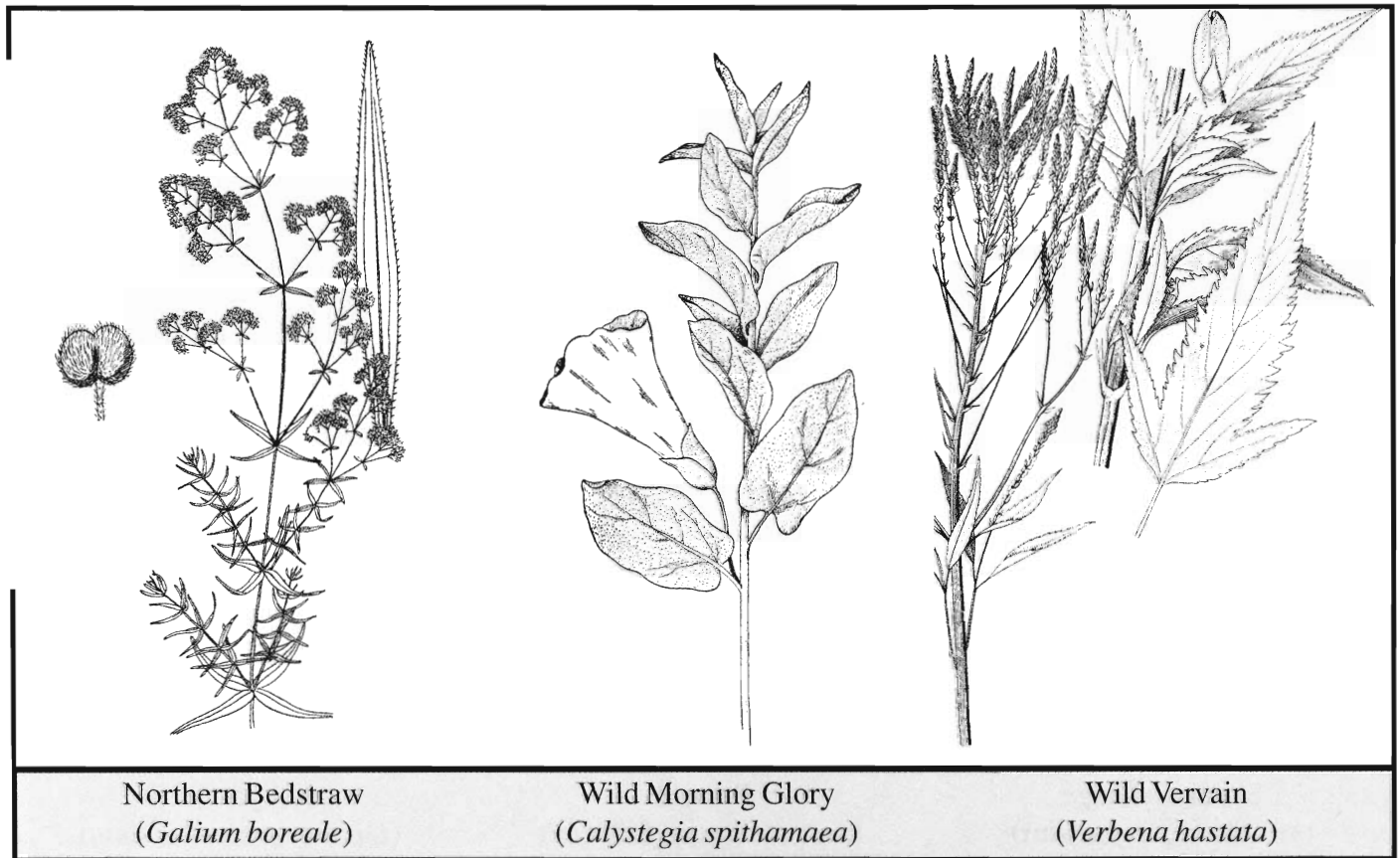
One other native plant I should point out that's left over from when this probably had a little bit of prairie in the uplands is Wild Vervain (*Verbena hastata*). Butterflies love it, so keep your eyes open for butterflies when you see some Wild Vervain.

I wanted to point out this little row of either wild or maybe cultivated plum trees. You can tell the trees were planted there in two or three straight lines. They're in pretty bad shape and I don't know if I've ever seen them set fruit, but it's always kind of fun for me to see these little bits of where other people used to live and where they put things. Along this farm road, I think someone wanted to have a bite to eat on their way from

one pasture to the other and planted the plums along here.

We've reached the end of where we're going to be on mowed trails. Those of you who feel like you want to just walk back to the farm leisurely, you can do that. We're going to walk down this incline about an eighth of a mile to a patch of Skunk Cabbage (*Symplocarpus foetidus*) I want to show you up on the hillside. We will then cross down to where there's an old apple orchard, and then I want to walk that upper pasture because of the beautiful views. So we'll get a look at what some of the north-facing slopes look like as well.

Here's the skunk cabbage patch. Can you smell it? As you walk down this slope, you're going to enter an entirely new habitat. It's probably not too wet; the wettest part is over on that far side and we're going to avoid that. We'll just cut through this little seep. Jump up and down and feel what the ground is like here. It's kind of squishy and spongy, isn't it? You could reach in and pull up wet, mucky, peaty clay soil. This is a seep. I did my Ph.D. research on what are called fens, which are spring-fed peat bogs that are usually up on the side of a hill out in the prairie. This would have been surrounded by forest, so it never got the right plants and it never got the peat layer thick enough to be a true fen. So it's not a true fen, but there are a lot of really neat plants here in the south valley that are only found on these seeps. Unlike peat bogs, that form by just catching rainwater, these are bubbling up out of the ground.



Northern Bedstraw
(*Galium boreale*)

Wild Morning Glory
(*Calystegia spithamea*)

Wild Vervain
(*Verbena hastata*)

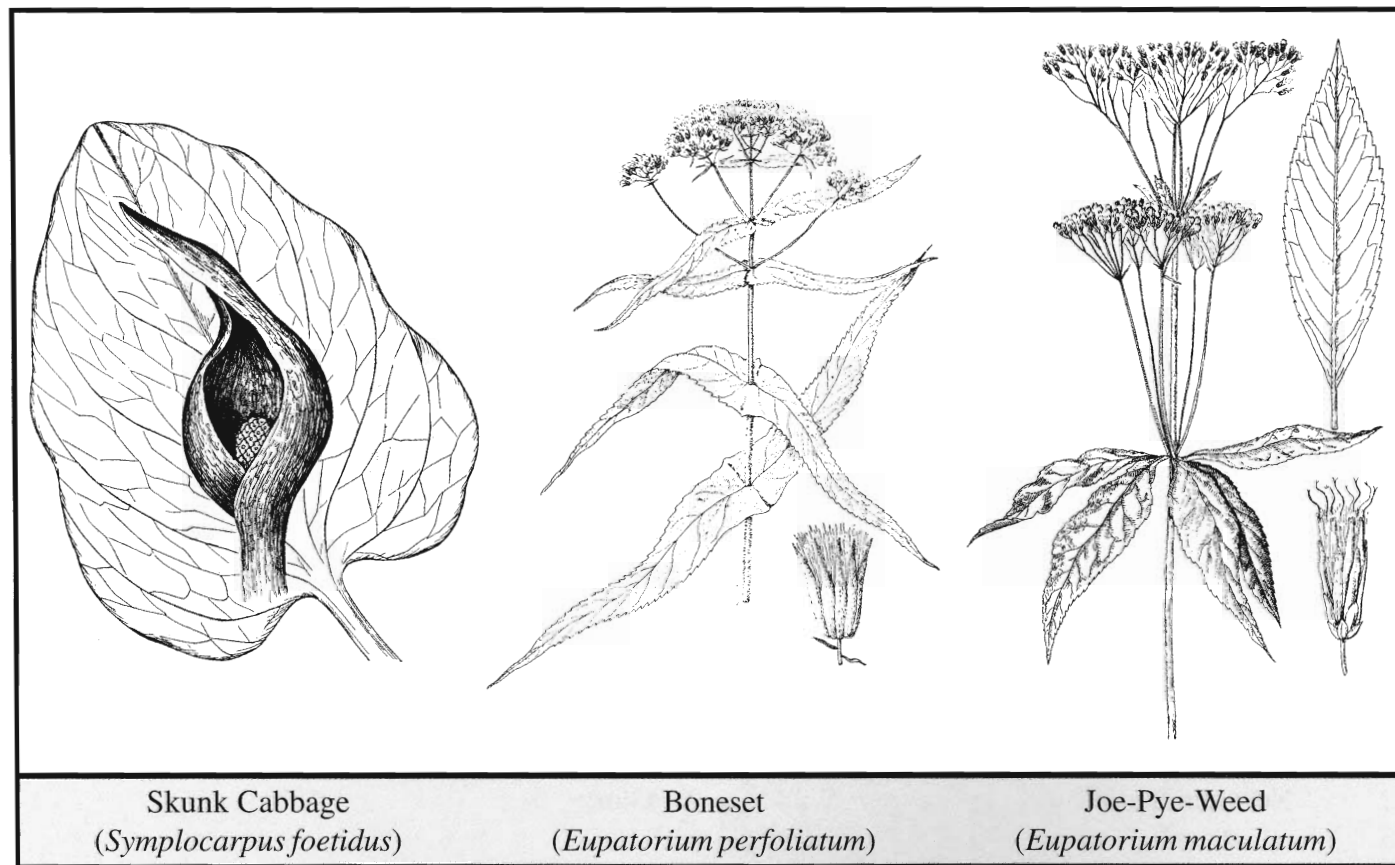
In Iowa, there were once 2,300 of these habitats, and we're down to about 150 now. And yet something like 35-40% of Iowa's endangered plants are found in these habitats. So this is a really important habitat to protect.

There are some really interesting plants living here on this near-fen, a lot of wetland plants and a lot of things you're not going to see otherwise. Look how far we are up above the creek – where is this water coming from? It's coming up out of the ground, and it goes back to that story of geology that I told you. There are fractures all over the hillsides. Water comes in, but we've come far enough downstream now that the creek has cut down into a different type of bedrock. The bedrock that we are standing on top of right now is not limestone; it's shale. Shale is like clay, and what happens is that the water comes down out of the limestone and hits the shale and it can't go down anymore – it's like a clogged sink drain. So it moves out horizontally and finds places to break through, and that water is now breaking through right here. Unlike that one big spring gushing out and making the pond, here it oozes out over a quarter of an acre of habitat. What wetland things are growing in this place that always has water coming up out of the ground? Well, first and foremost there is the skunk cabbage. We're nearing the end of July, so it's starting to die down, but it's surrounding us here. It clearly has one of the largest leaves of any plant here in the state of Iowa, huge leaves. It smells,

well, like skunk. And if you don't believe it, I'll pass this leaf around and you can smell it – it has a really strong smell. Skunk cabbage is very uncommon in Iowa, but it's found on these steep slopes on both sides of this valley, and also over in the north valley of the Twin Valleys property up along West Canoe Creek.

There are some other interesting plants here as well. Here is Boneset (*Eupatorium perfoliatum*) which has white flowers. And we have Joe-Pye-Weed (*Eupatorium maculatum*) coming in over here. Late in the summer this is going to be a solid mass of Joe-Pye-Weed. We have Touch-Me-Not (*Impatiens capiensis*) right here. When their seedpods are ripe, they're spring-loaded and if you touch them they spring open and throw their seeds all over the place. That's a Bulrush (*Scirpus validus*), and over there is an aster that's found only in fens and seeps. I call it the Fen Aster (*Aster puniceus*). And there are some grasses and sedges and other plants in here that are also characteristic of these kinds of habitats. Here's another really nice plant. It's been eaten on, but it has a little round leaf like this, and it's called Cowslip (*Caltha palustris*), which has yellow flowers that come up really early in the spring. So what you have here is a really good example of a woodland seep. The only thing to look out for is that there are some grasses here, which is Cutgrass (*Leersia oryzoides*) and it could rip your shorts. So I'm going to avoid the Cutgrass as much as I can.

Let's try to make it through here. I'll show you a



Skunk Cabbage
(*Symplocarpus foetidus*)

Boneset
(*Eupatorium perfoliatum*)

Joe-Pye-Weed
(*Eupatorium maculatum*)

little waterfall that's really special. We're going to want to get down below on the creek valley and look back up on top. There's timothy and bluegrass here. That water is coming down off the hillside and there are some little channels, and in the springtime you can actually see little waterfalls in those little gullies. We don't have time today to look for those, but it's really fun to have little waterfalls here on the property.

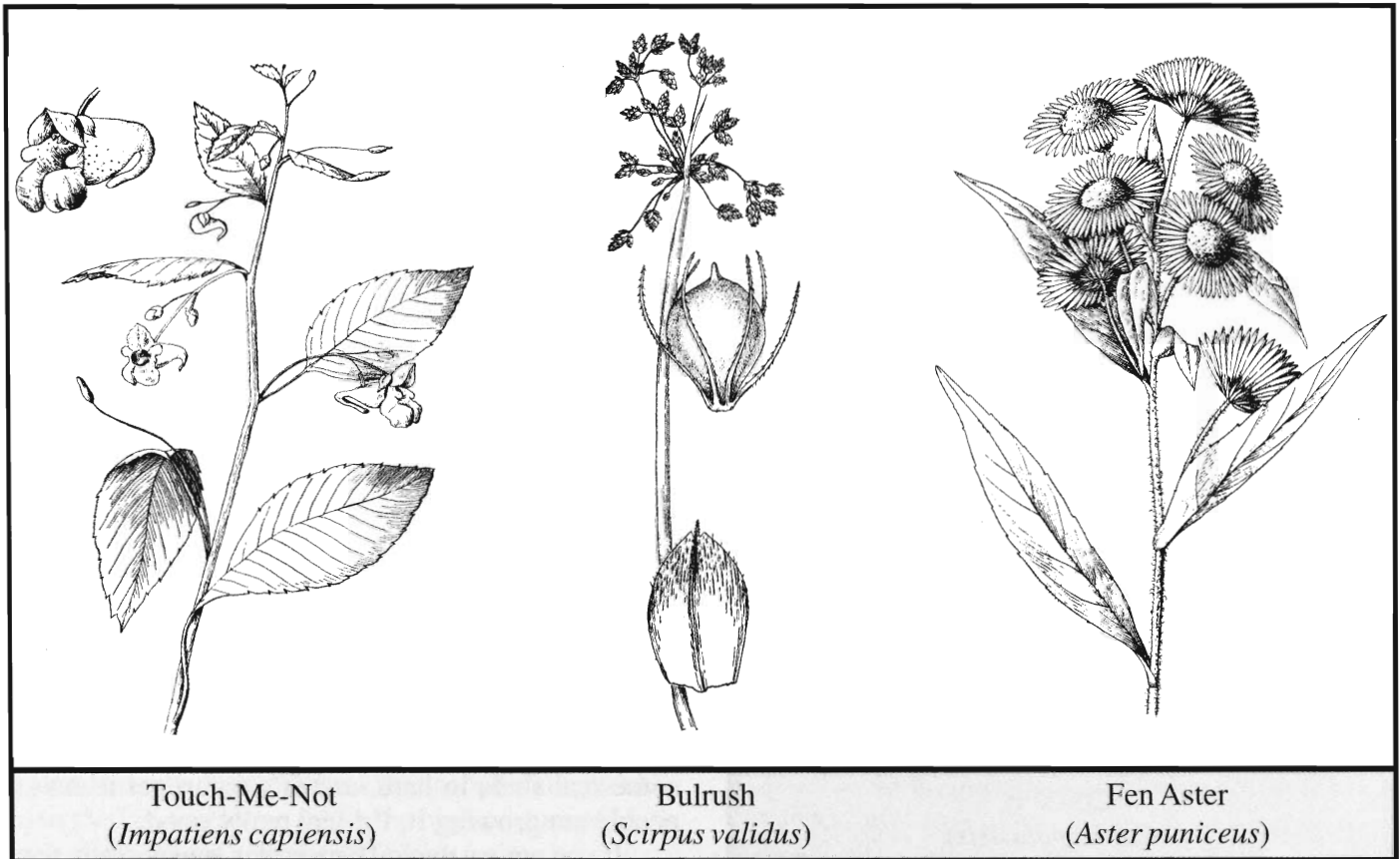
We're going to cross this gate over here and head over to the other side of the creek. Kent is working on obtaining funds to restore the woodland corridor along this creek. That's why they fenced it to keep the cows out. They're going to start planting trees in here and eventually hope to return this to a brook trout stream sometime in the future. When you look up either direction in this valley, notice that there are no telephone lines, no crop fields that you can easily see, no houses. This valley is one of the most amazing views I've ever seen anywhere, one of the few places where you can see Iowa without human beings.

This is the site of an old apple orchard. You can see how those old apple trees have been taken over by forest. We've crossed the creek, so we're now on the north-facing slope. What trees do we have around us? Right here mostly we have Maple trees (*Acer saccharum*), but we'll also see Basswood (*Tilia americana*) and Ash (*Fraxinus americanus*). We've just walked about the length of a football field, and we're seeing a

completely different set of trees. Let's take a look at this old apple orchard. You can see that the apple trees go all the way up here and continue for another football field length down this way. The aerial photographs that we have from the 1940s show this apple orchard being here. There was an old farmhouse up near the top of the ridge, but that's all we know. I'll let Dan Bussey tell the story about apples and apple conservation and why a place like this could be really important.

Dan Bussey: When you run into something like this, you always wonder whether these trees are random seedlings or were planted in rows. What you have to look for is the way man does things: in regular ordered patterns and rows. Random seedlings would just not have looked this way. You can see that this follows a rather predictable pattern – yes, there are gaps here and there, but when you start looking, you can tell that this is definitely the remnant of a planted orchard. Whether trees have been cut down and they've resprouted (because you see multiple trunks), these have long since been let go and they've resorted to sort of a wild form of tree with this particular upright shape. So it's really hard to tell now that they were once cultivated.

This is a collection of germplasm that may be very unique, because these trees have obviously been here for a long time and would represent varieties that were grown a long time ago that may be long out of cultivation. So there may be some rare things here that we don't know



Touch-Me-Not
(*Impatiens capiensis*)

Bulrush
(*Scirpus validus*)

Fen Aster
(*Aster puniceus*)

about. The challenge for horticulturists like myself is how to identify them. There are endless possibilities. Thousands of varieties have come and gone in this country, and especially in Iowa many thousands of varieties have been planted, tried, and abandoned. You have to think about what the purpose of this orchard was – did it just feed a homestead like what was once up the hill, for the person’s own use, or were there enough extra apples for possible stock feeding for himself or to sell, or to make apple butter or cider to sell? An orchard this large leads me to believe that it was for commercial potential.

Most farmsteads would not plant one or two or three varieties; they’d plant lots of different varieties that each had a different usage. There would be apples that matured early, apples that would store well, apples that were good for specific purposes. It wasn’t like now where we have basically one variety that’s supposed to do everything. There was a lot more variability at that time. There are some old varieties that are as hard as nails when you first pick them; but if you put them in your root cellar, about May when there’s not much left in your root cellar, these apples finally come into their own.

That’s the fun of finding something like this, because it’s a window to a generation long ago that we’d like to keep open. We hope to be able to identify these apple varieties sometime. There might be some really interesting things here. The problem is, when you come across something like this, what do you do with it?



Obviously the trees seem to survive pretty well without any care at all, and some of the apples might actually be fairly acceptable. There are certainly a lot of problems with insect pests that would cause difficulties if you were trying to grow nice apples next to an orchard like this, so most people would just cut all this down and get rid of it. Orchards were usually planted around larger cities, and it’s a pity that all those old orchards got cut down, just a tremendous loss of apples that have come and gone in this country. Fortunately, there are still lots of them left, and I’ll get into that in my apple workshop and discussion tomorrow.

Question: Did people do their own grafting or did they buy seedlings?

Dan: At the time this orchard would have been planted, it could have been either. They could have done their own grafting, because that was very common at that time. People did that for themselves; they were much more self-sufficient than we are now. It was hard to go to a nursery, but there were traveling nursery people. And mail-order nurseries have been around back east since the mid-1800s, so it wasn’t hard to have apple trees shipped by train to whatever the local outlet was. It’s a tough call to say what these were. More than likely, the age of these trees would make me believe that they were probably purchased and then planted, rather than grafted. That’s just a guess.

Jeff: The other part of the apple story that really intrigues me is that the biodiversity is here, but what’s been lost? The loss is the knowledge of what apples these are. So it’s the human part that’s been lost. The tree is still here, but if you can’t put a name on it, it’ll be “Heritage Farm 001” or something. Yet, if you look through *The Apples of New York* or other books, you might find one of these varieties and it might be thought to be extinct. The problem is that the old farmer who lived at the top of the hill has been dead for 30 years. The one person who knew what these were is gone. So for protecting the fruit crops, finding the people who know and who have not passed on yet actually is as important as finding the orchard, so human beings become a much more important part of the process. And it’s the human knowledge and keeping the oral tradition alive that becomes essential. That to me is the really neat part of fruit orcharding, that it’s not just biology – you have to be a Studs Terkel, too. You have to go out there and find these people, so they can tell their stories about the fruits.

So this is the old orchard. I find this a magical place, to see a really old orchard and what it looks like. I’m really hopeful that someday maybe we’ll actually get some of these apples back out. I’ll bet there’s some real finds in here, and if we can get it out so people are growing it, I’d feel really good.

If you notice, the soil here is clay, and not only that,



Dan Bussey (left) and Jeff Nekola (center, in overalls) in One of the Abandoned Orchards in the South Valley of Twin Valleys (Photo courtesy of Bruce Kennett Studio)

there are seeps coming up. If we went straight ahead here, we'd be in more skunk cabbage. It's well watered, and because there are seeps in here, it will hardly ever dry out completely. So I think this is probably a prime orchard site. It would be nice if we could find records of somebody shipping apples from this farm to somewhere, but, again, this is where historians come into play. And that's why seed saving is more than biology and genetics and gardening – it's also historians, the Studs Terkels, and that's just as important. We always need to collect the cultural history with the varieties as well as the genetics, because if you have one but not the other, it's not the full package. Particularly with apples, you have to have the culture, otherwise it's just a number. It would be far better to know who and why and where and how.

The reason I wanted up to hike up to here is that this is one of my favorite views, really spectacular. It gets us up above the White Park cattle and the pasture, and it's just a gorgeous, gorgeous place. I think of Ireland and the high pastures that people talk about in Irish stories, and to me this is the high pasture of Heritage Farm, and it's a magical place for me.

Jeff Nekola and Dan Bussey are both Advisors for the Seed Savers Exchange. Jeff is an Associate Professor in the Department of Natural and Applied Sciences at the University of Wisconsin at Green Bay. He is an ecological researcher investigating the biodiversity of native plants, land snails and butterflies. About two years ago, Jeff completed a comprehensive plant survey for SSE's new Twin Valleys property.

Dan Bussey maintains an orchard containing about 400 heritage apple varieties, and is a commercial cider maker who is maturing traditional cider blends. Dan, a highly accomplished grafter, is largely responsible each year for the grafting needed to maintain the Historic Orchard at Heritage Farm. After more than a decade of research and writing, he has finished a complete history of apples in North America that describes nearly 8,000 named varieties.