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Prairie view

Iowa county decides to thin vegetation

Pottawattamie County, Iowa, is located within the deep loess deposits in southwest Iowa along the Missouri River.

The county has varying landscape, from the semiarid loess bluffs on the western edge to some exposed glacial deposits and more level terrain to the east. The area receives about 30 in. of rain annually. The soils are fertile and the land succumbs to volunteer trees and brush if not routinely cultivated or mowed.

Pottawattamie County received Railroad Highway from the state as a transfer of jurisdiction in 2004. The highway came with a very wide right-of-way created by an abandoned road alignment that exists between the later alignment and the Burlington Northern Santa Fe Railroad. The project area is approximately 21 acres, varying from 50 to 140 ft in width as measured from the toe of the roadway embankment.

The previous alignment was abandoned prior to 1950 and had become overgrown with volunteer cottonwoods, elms, mulberry, elderberry and sumac. The trees and brush had encroached onto the shoulder of the roadway. It was a dangerous situation; the trees created obstacles for errant vehicles, but also provided cover for deer. Deer vs. vehicle collisions are very common in the county; however, with the dense cover next to the road this area was especially dangerous. Additionally the trees had the potential to fall onto the road during wind and ice events.

Removing the trees would help mitigate many of the existing hazards, but the county had concerns that the tree removal would create a negative public response. We also knew that removing the trees without a future maintenance plan would allow the volunteer trees and brush to re-establish. Just trimming or removing the trees and brush would be a short-term solution, and we intended to provide something more sustainable.

A living roadway

It quickly became apparent that a native prairie restoration would provide the benefits we desired and mitigate the physical and political hazards that existed. The prairie would be visually interesting due to a variety of grasses and flowers. While the flowers provide immediate cover and visual interest, the native grasses would become established and outcompete the volunteer trees and brush with the help of spot spraying, mowing and prescribed burns. As the prairie becomes more established the need for spot spraying and mowing should lessen.

Pottawattamie County has an integrated roadside vegetation management (IRVM) plan and utilizes the IRVM Technical Manual for work performed on the county right-of-way. The manual can be found at www.uni.edu/irvm/techmanual/IRVM-Technical-Manual.pdf for technical help in establishment of roadside plantings. Having an IRVM plan allows the county to participate in the Iowa Living Roadway Trust Fund (LRTF) program.

We had worked with the LRTF program in the past to procure native plant seed and equipment to maintain existing native plantings. From 1995 to date the Iowa LRTF program has provided the county with approximately $170,000 in seed and native planting equipment grants. They provide an excellent service to the state, and we were excited to ask them to be our partner. We applied for and were awarded a multiyear LRTF grant to remove the trees and re-establish the area as a native prairie. The county was awarded $19,750 in 2008, 2009 and 2010 to provide an accumulated total of $59,250 for tree removal and to accomplish the plantings.

To reduce costs and discourage farming we left the stumps in the ground and mulched the debris. The trees were mulched in place by Ben Bowman using a track-mounted Fecon Brush Grinder. A local logging company took the large cottonwood trees; these trees were beyond the capability of the mulching machine and were going to be an extra project expense. The stumps were treated with Pathfinder II to eliminate regrowth, and we continue to spot mow and treat weeds and brush as they appear in the prairie.

The county contributed approximately $24,000 toward the project. The grant was not sufficient to cover all of the tree removal needed. The county applied Pathfinder II, Roundup and Garlon herbicides to control weeds and regrowth. Additional seed was applied as well as the cover crop. Other efforts included brush removal, flagging traffic, removing large logs, treated stumps, and planting the seed.

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Table 1: Glasses	lb/acre	Seeds/sq ft
Big bluestem *(Andropogon gerardii)*	1.5	5.50
Sideoats grama (Bouteloua curtipendula)	2.5	5.50
Canada wildrye *(Elymus canadensis)*	2.0	3.80
Switchgrass *(Panicum virgatum)*	0.5	2.60
Little bluestem *(Schizachyrium scoparium)*	2.5	13.80
Indiangrass *(Sorghastrum nutans)*	1.5	6.60
Rough dropseed *(Sporobolus asper)*	1.0	11.00
Total	**11.50**	**48.80**

Table 2: Wet Species	oz./acre	Seeds/sq ft
Swamp milkweed *(Asclepias incarnata)*	2.8	0.31
Blue joint *(Calamagrostis canadensis)*	1.2	7.71
Brown fox sedge (Carex vulpinoidea)	3.2	7.35
Sneezeweed *(Helenium autumnale)*	0.6	1.79
Great blue lobelia (Lobelia siphilitica)	0.4	4.59
Mountain mint (Pycnanthemum virginianum)	0.4	2.02
Dark green bulrush (Scirpus atrovirens)	3.2	33.79
Blue vervain (Verbena hastata)	0.4	0.85
Total	**12.20**	**58.41**

The prairie has received prescribed burns to encourage the native species and discourage volunteer trees and brush. Burning will become routine maintenance; spot spraying and mowing are becoming less necessary as the native grasses become more established.

Table 3: Forbs	oz./acre	Seeds/sq ft
Lead plant *(Amorpha canascens)*	0.8	0.29
Butterfly milkweed *(Asclepias tuberosa)*	2.0	0.20
Canada milkvetch *(Astragalus canadensis)*	1.6	0.62
White wild indigo *(Baptisia lacteal)*	1.0	0.04
Partridge pea *(Chamaecrista fasciculata)*	32.0	2.00
Prairie coreopsis *(Coreopsis palmata)*	0.8	0.18
Purple prairie clover *(Dalea purpurea)*	3.2	1.10
Showy tick trefoil *(Desmodium canadense)*	0.8	0.10
Pale purple coneflower *(Echinacea pallida)*	4.4	0.53
Rattlesnake master *(Eryngium yuccifolium)*	2.0	0.34
Ox-eye sunflower *(Heliopsis helianthoides)*	4.8	0.69
Roundheaded bushclover *(Lespedeza capitata)*	2.0	0.37
Rough blazingstar *(Liatris aspera)*	0.8	0.29
Prairie blazingstar *(Liatris pycnostachya)*	4.8	1.21
Wild bergamot *(Monarda fistulosa)*	1.6	2.57
Stiff goldenrod *(Oligoneuron rigidum)*	0.8	0.75
Foxglove penstemon (Penstemon digitalis)	2.0	5.97
Large-flowered penstemon *(Penstemon grandiflorus)*	1.0	0.32
Yellow coneflower (Ratibida pinnata)	4.8	3.31
Black-eyed Susan (Rudbeckia hirta)	3.2	6.76
Sweet black-eyed Susan (Rudbeckia subtomentosa)	0.4	0.39
Wild petunia *(Ruellia humilis)*	1.6	0.19
Compass plant *(Silphium laciniatum)*	1.2	0.02
Smooth blue aster (Symphyotrichum leave)	0.4	0.51
New England aster (Symphyotrichum novae-angliae)	0.8	1.21
Ohio spiderwort *(Tradescantia ohiensis)*	2.4	0.44
Hoary vervain *(Verbena stricta)*	0.8	0.51
Ironweed *(Vernonia fasciculata)*	0.4	0.22
Culver's root *(Veronicastrum virginicum)*	0.4	7.35
Golden Alexanders *(Zizia aurea)*	1.6	0.40
Total	**84.40**	**38.88**

The county utilized the Iowa Diversity seed mixture and rates as detailed in Tables 1-3.

One disadvantage to our approach was the mulch provided a lot of unnecessary ground cover and has somewhat impeded our efforts. It is becoming less of an impediment due to natural decay and the prescribed burns that took place in 2010 and 2011. Although no weeds or trees are growing through the mulch, it does serve as a reminder that a volunteer timber once existed in the area.

During the project we made some discoveries that we incorporated: We discovered two walnut trees on the project and they remain as part of the prairie. We would have preserved oak, hackberry or ash if they had been discovered within the project. We also were encouraged by volunteer milkweed and prairie cord grass that seemed to indicate some prairie remnants still existed below the tree cover. It was helpful to show we were willing to preserve desirable trees that were growing in a safe location and motivational to know that some native prairie remnants were eager to emerge.

The prairie has received prescribed burns to encourage the native species and discourage volunteer trees and brush. The prescribed burns also help reduce the mulch ground cover. Burning will become routine maintenance for the area; the spot spraying and mowing are becoming less necessary as the native grasses become more established.

We believe the project reduces roadside hazards for errant vehicles; reduces animal vs. vehicle accidents due to better visibility; reduces shading of the roadway for snow and ice removal; mitigates tree debris on the roadway due to wind and ice damage; and provides some game bird nesting areas that are in short supply due to high grain prices. R&B

Rasmussen is the county engineer for Pottawattamie County, Iowa.

For more information about this topic, check out the Maintenance Channel at www.roadsbridges.com.