

IRVINE PRAIRIE

Winter Meeting | February 28, 2024

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Tallgrass Prairie
CENTER

University of Northern Iowa.

Planned Work

2024



2024 Irvine Prairie Restoration and Management Work Plan

Restoration and management work in 2024 will consist primarily of new planting and prescribed burning. Some plug transplanting will occur. Tasks to support 2024 operations follow:

SPRING (April 1 - June 30)

Prescribed Burning

Approximately 30 acres of Irvine Prairie planted in 2021-2022 will be burned as part of the long-term management of the site. Work is dependent on favorable weather.

Operator: JM, TPC staff and volunteers

Equipment: 2 pump engines, 4 backpack sprayers, 2 flappers

Location: Throughout East half of South Tract

Timing: March-April

Supplemental Plug Planting

Specific planting locations are currently unknown, but will likely be in the uplands of the 2022 fall seeding area of Irvine Prairie. These will be the first non-shrub transplants in the North Tract. Species to be transplanted into suitable areas include species that are difficult/prohibitively expensive to procure in adequate quantities for direct seeding, or have not been found to establish in past seedings at Irvine Prairie. We will attempt to grow 120 seedlings each of these species: porcupine grass, palespike lobelia, rough false foxglove (with Bicknell's sedge as a host), groovestem Indian plantain, prairie goldenrod, purple lovegrass, Parlin's pussytoes, prairie groundsel, agueweed (stiff gentian), prairie blue-eyed grass, Sullivant's milkweed, and Carolina rose. Three of these species are from local sources: rose seed was collected from the ditch along 55th Street west of Irvine Prairie, and Parlin's pussytoes and prairie groundsel were sourced from Black Hawk County. Several of the target species are considered difficult to grow, and we may not be successful in producing transplantable plugs of all listed species. A UNI student is carrying out trials of techniques for germinating porcupine grass so that we can more reliably produce seedlings of this species. If we have extra plugs of suitable species being grown for the TPC Plant Materials Program, we may add them to the list.

Operator: LFW, TPC staff and volunteers

Equipment: Volunteer labor, hand tools

Location: 2022 seeding area

Timing: late April-early June

Invasive Grass Mowing

Problem perennial grass areas found in old waterways should be mowed to promote uniform growth in preparation for a spring herbicide application.

Operator: JM

Equipment: Any mower set to 4 in. cutting height

Location: Past waterways

Timing: pre-green-up (Mar-Apr)

Invasive Grass Herbicide Application

After invasive perennial grass areas have had time to regrow, they should be sprayed with appropriate herbicides at label recommended rates. Spot spraying will minimize off-target effects in established vegetation.

Operator: JM

Equipment: Backpack sprayer

Location: Past waterways/headlands

Timing: April-May

Establishment Mowing #1 (Fall 2023 Areas)

All early plantings benefit from mowing relatively early in the season to encourage light penetration to the soil surface. This mowing will cover ~25 acres. Depending on the equipment available, rotary disc mowers or other hay mowers are ideal for avoiding vegetation matting, which can impede light penetration to soil surface.

Operator: BP

Equipment: Hay mower ideal, brush hog OK, mower at ~6 in

Location: 2023 Fall Seeded Area

Timing: late June

Invasives Mowing #1 (sweetclover)

Several large, dense patches of sweetclover will need to be mowed. Cut stems close to the ground after leaves on the lower stems have died (before flowering occurs) through the early flowering period.

Operator: JM

Equipment: Allis-Chalmers small tractor with flail mower

Location: Mostly central and western areas of south tract

Timing: variable

Local Ecotype Seed Collection

Potential target species for local ecotype seed collection include Illinois tick trefoil, false boneset, heavy sedge, smooth blue aster, Scribner's panic grass, porcupine grass, and partridge pea. We will continue collecting information about Benton County remnant populations using GIS apps to facilitate returning to the populations for seed harvest. We will communicate with the Benton County Roadside Manager regarding seed collecting plans from roadsides. Seed will be cleaned and stored at the TPC until sufficient quantities are on hand for inclusion in Irvine Prairie seeding mixes, or collections may be used for establishment of seed increase plots to produce enough seed for use in plantings. Small collections or species that establish poorly from seed (e.g., Scribner's panic grass, porcupine grass) may be used to produce greenhouse-grown plugs for direct transplantation at Irvine Prairie in future years.

Operator: LFW, JM

Equipment: GIS software, TPC seed lab and greenhouse equipment

Location: TBD

Timing: May - October

Summer (July 1-September 1)

Vegetation Outcomes Monitoring

In order to assess the success of the planting areas, formal monitoring needs to be undertaken. Information derived from monitoring will be used to identify areas for reseeding next year, and plan for future management prescriptions.

Operator: JM

Equipment: GPS, sampling frame, datasheets

Location: All Irvine Prairie

Timing: July

Establishment Mowing #2 (Fall 2023 Areas)

A second mowing should occur when weed or cover crop reaches approximately 2ft in height. Plan to mow at the end of July. This mowing will cover ~25 acres. Depending on the equipment available, disc or sickle mowers are ideal for encouraging light penetration to soil surface.

Operator: BP

Equipment: Hay mower ideal, bush hog OK, mower at 4-6in

Location: 2023 Fall Seeded Area

Timing: late July

Establishment Mowing #3 (Fall 2022 Areas)

A third mowing may not be necessary, but should occur when weed or cover crop once again reaches approximately 2ft in height. Plan for a final mow mid-late August. This mowing will cover ~25 acres planted fall 2022. Depending on the equipment available, disc or sickle mowers are ideal for encouraging light penetration to soil surface.

Operator: BP

Equipment: Hay mower ideal, bush hog OK, mower at 4-6in

Location: 2022 Fall Seeded Area,

Timing: late August

Fall (September 1 - December 1)

Seeding Establishment Monitoring

In order to assess the success of the planting areas, formal monitoring needs to be undertaken. Information derived from monitoring will be used to identify areas for reseeding next year, and plan for future management prescriptions.

Operator: JM

Equipment: GPS, sampling frame, datasheets

Location: All Irvine Prairie

Timing: September

Invasive Grass Spot Herbicide Application

Mow invasive grasses, and after invasive perennial grass areas have had time to regrow, they should be sprayed with appropriate herbicides at label recommended rates. Spot spraying will minimize off-target effects. Task may not be necessary depending on results of previous control efforts.

Operator: JM

Equipment: Backpack sprayer

Location: Past waterways

Timing: October

Fall Seeding

Approximately 35 acres of Irvine Prairie will be broadcast in the fall by TPC staff using a pendulum broadcast spreader. Three seed mixes will be planted in the central area of Irvine Prairie (new addition). Establishment results from vertical tillage trials will determine whether vertical tillage prior to seeding will be required..

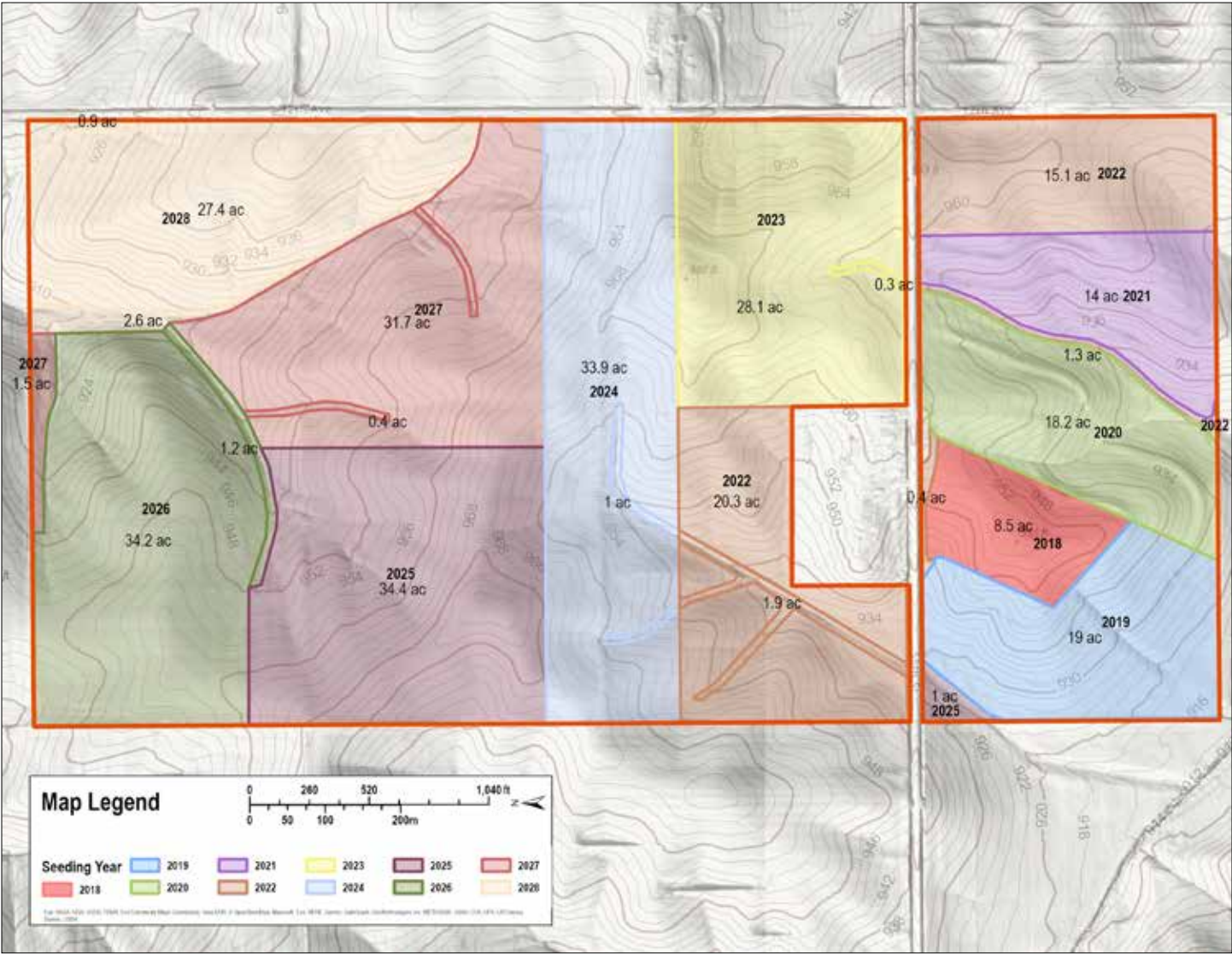
Operator: JM/AO

Equipment: Broadcast spreader

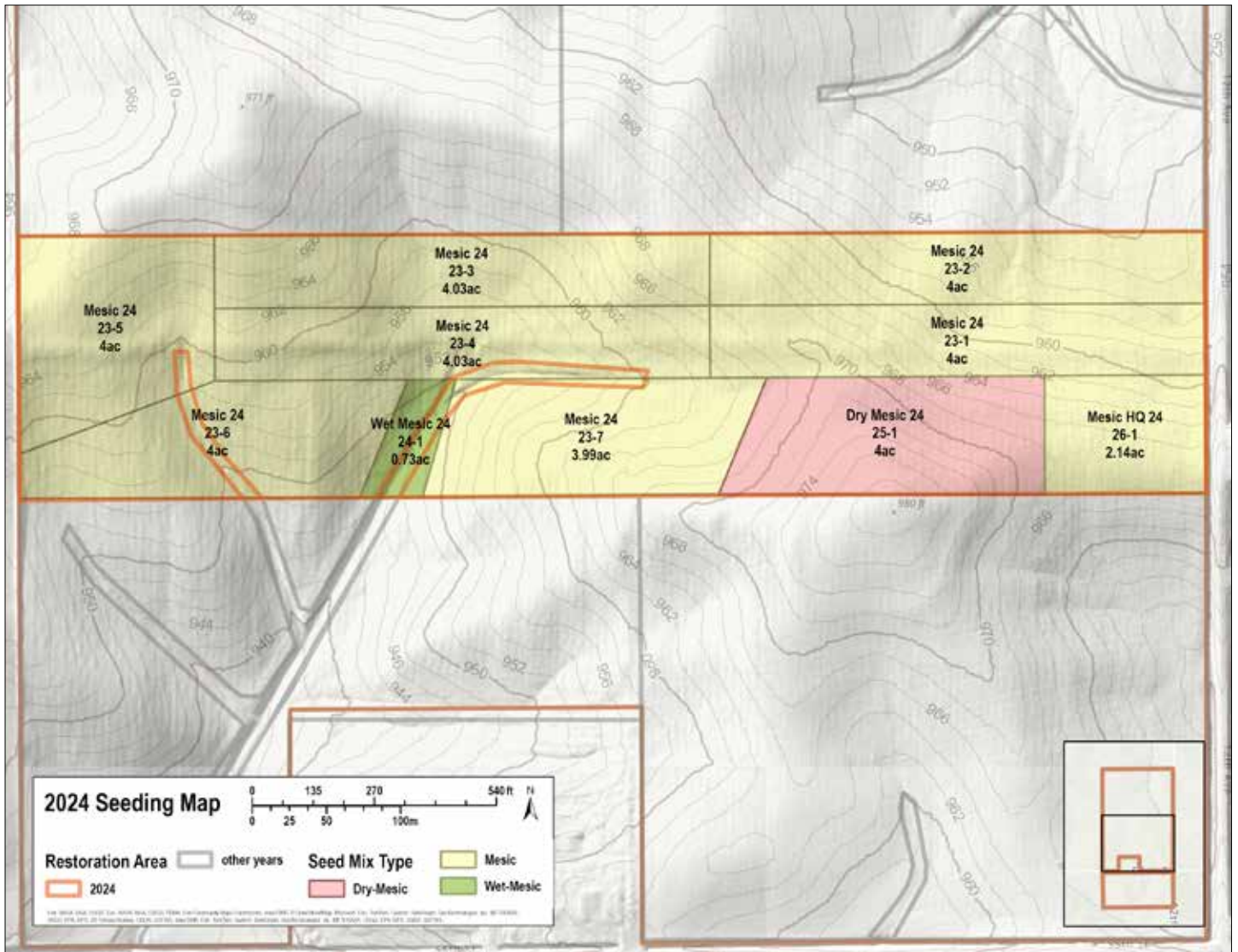
Location: Throughout 2024 Restoration Area

Timing: November

Maps and Supplemental Materials



Map 1 – Restoration timeline



Map 2 – 2024 Seed Mixes

Seed Mix	Year	Total seeds/ft ²	Total PLS lbs./ac
Dry Mesic 24	2024	62.70769513	8.808482573
Common Name	Scientific Name	Seeds/ft ²	PLS lbs./acre
big bluestem	<i>Andropogon gerardii</i>	1.32	0.36
sideoats grama	<i>Bouteloua curtipendula</i>	3.61	1.64
marsh muhly	<i>Muhlenbergia racemosa</i>	0.71	0.02
switchgrass	<i>Panicum virgatum</i>	0.31	0.06
little bluestem	<i>Schizachyrium scoparium</i>	5.60	1.02
Indian grass	<i>Sorghastrum nutans</i>	2.88	0.65
rough dropseed	<i>Sporobolus compositus</i>	6.69	0.61
prairie dropseed	<i>Sporobolus heterolepis</i>	0.17	0.03
purpletop	<i>Tridens flavus</i>	0.42	0.04
prairie brome	<i>Bromus kalmii</i>	0.83	0.28
yellowfruit sedge	<i>Carex annectens</i>	1.89	0.06
Bicknell's sedge	<i>Carex bicknellii</i>	0.34	0.05
shortbeak sedge	<i>Carex brevior</i>	1.10	0.10
heavy sedge	<i>Carex gravida</i>	0.07	0.02
few flowered panic grass	<i>Dichanthelium oligosanthes</i>	0.06	0.02
Canada wild rye	<i>Elymus canadensis</i>	1.45	0.76
partridge pea	<i>Chamaecrista fasciculata</i>	0.35	0.35
Canadian milkvetch	<i>Astragalus canadensis</i>	0.85	0.14
cream wild indigo	<i>Baptisia leucophaea</i>	0.02	0.03
white prairie clover	<i>Dalea candida</i>	1.79	0.26
purple prairie clover	<i>Dalea purpurea</i>	1.75	0.26
Illinois tick trefoil	<i>Desmodium illinoense</i>	0.09	0.06
field pussytoes	<i>Antennaria neglecta</i>	0.79	0.01
prairie alumroot	<i>Heuchera richardsonii</i>	4.03	0.02
large flowered beardtongue	<i>Penstemon grandiflorus</i>	0.77	0.15
prairie phlox	<i>Phlox pilosa</i>	0.09	0.01
prairie rose	<i>Rosa arkansana</i>	0.07	0.07
prairie blue eyed grass	<i>Sisyrinchium campestre</i>	0.11	0.01
prairie spiderwort	<i>Tradescantia bracteata</i>	0.07	0.02
prairie violet	<i>Viola pedatifida</i>	0.15	0.01
heart leaved meadow parsnip	<i>Zizia aptera</i>	0.29	0.07
thimbleweed	<i>Anemone cylindrica</i>	0.15	0.02
tall green milkweed	<i>Asclepias hirtella</i>	0.04	0.03
common milkweed	<i>Asclepias syriaca</i>	0.09	0.06
butterfly milkweed	<i>Asclepias tuberosa</i>	0.06	0.04
whorled milkweed	<i>Asclepias verticillata</i>	0.04	0.01

false boneset	<i>Brickellia eupatorioides</i>	0.46	0.04
New Jersey tea	<i>Ceanothus americanus</i>	0.08	0.03
prairie coreopsis	<i>Coreopsis palmata</i>	0.09	0.03
prairie cinquefoil	<i>Drymocallis arguta</i>	2.96	0.04
pale purple coneflower	<i>Echinacea pallida</i>	0.48	0.25
rattlesnake master	<i>Eryngium yuccifolium</i>	0.23	0.08
flowering spurge	<i>Euphorbia corollata</i>	0.08	0.03
false sunflower	<i>Heliopsis helianthoides</i>	0.53	0.23
spotted st. johns wort	<i>Hypericum punctatum</i>	2.76	0.01
pale spiked lobelia	<i>Lobelia spicata</i>	1.14	0.00
wild bergamot	<i>Monarda fistulosa</i>	1.67	0.07
spotted beebalm	<i>Monarda punctata</i>	0.38	0.01
wild quinine	<i>Parthenium integrifolium</i>	0.11	0.04
hairy mountain mint	<i>Pycnanthemum pilosum</i>	0.53	0.01
yellow coneflower	<i>Ratibida pinnata</i>	1.12	0.10
black eyed Susan	<i>Rudbeckia hirta</i>	1.91	0.06
wild petunia	<i>Ruellia humilis</i>	0.10	0.05
compass plant	<i>Silphium laciniatum</i>	0.02	0.07
upland white aster	<i>Solidago ptarmicoides</i>	0.32	0.01
hoary vervain	<i>Verbena stricta</i>	0.43	0.04
tall boneset	<i>Eupatorium altissimum</i>	0.28	0.02
stiff sunflower	<i>Helianthus pauciflorus</i>	0.05	0.02
rough blazing star	<i>Liatris aspera</i>	0.33	0.06
gray goldenrod	<i>Solidago nemoralis</i>	3.36	0.03
stiff goldenrod	<i>Solidago rigida</i>	0.26	0.02
showy goldenrod	<i>Solidago speciosa</i>	0.77	0.02
heath aster	<i>Symphotrichum ericoides</i>	0.55	0.01
smooth blue aster	<i>Symphotrichum laeve</i>	0.60	0.03
aromatic aster	<i>Symphotrichum oblongifolium</i>	0.29	0.02
sky blue aster	<i>Symphotrichum oolentangiense</i>	1.78	0.06

Seed Mix	Year	Total seeds/ft ²	Total PLS lbs./ac
Mesic 24	2024	53.27693474	8.345016256
Common Name	Scientific Name	Seeds/ft ²	PLS lbs./acre
big bluestem	<i>Andropogon gerardii</i>	1.32	0.36
sideoats grama	<i>Bouteloua curtipendula</i>	3.61	1.64
marsh muhly	<i>Muhlenbergia racemosa</i>	0.71	0.02
switchgrass	<i>Panicum virgatum</i>	0.77	0.15
little bluestem	<i>Schizachyrium scoparium</i>	5.60	1.02
Indian grass	<i>Sorghastrum nutans</i>	2.88	0.65
rough dropseed	<i>Sporobolus compositus</i>	6.69	0.61
prairie dropseed	<i>Sporobolus heterolepis</i>	0.17	0.03
prairie brome	<i>Bromus kalmii</i>	0.24	0.08
yellowfruit sedge	<i>Carex annectens</i>	0.76	0.02
Bicknell's sedge	<i>Carex bicknellii</i>	0.17	0.03
shortbeak sedge	<i>Carex brevior</i>	0.44	0.04
heavy sedge	<i>Carex gravida</i>	0.07	0.02
troublesome sedge	<i>Carex molesta</i>	0.20	0.02
Canada wild rye	<i>Elymus canadensis</i>	0.72	0.38
Virginia wild rye	<i>Elymus virginicus</i>	0.65	0.42
partridge pea	<i>Chamaecrista fasciculata</i>	0.35	0.35
biennial gaura	<i>Oenothera gaura</i>	0.01	0.01
Canadian milkvetch	<i>Astragalus canadensis</i>	0.85	0.14
white wild indigo	<i>Baptisia lactea</i>	0.04	0.06
cream wild indigo	<i>Baptisia leucophaea</i>	0.01	0.02
white prairie clover	<i>Dalea candida</i>	1.79	0.26
purple prairie clover	<i>Dalea purpurea</i>	1.75	0.26
showy tick trefoil	<i>Desmodium canadense</i>	0.10	0.05
Illinois tick trefoil	<i>Desmodium illinoense</i>	0.09	0.06
field pussytoes	<i>Antennaria neglecta</i>	0.39	0.00
prairie alumroot	<i>Heuchera richardsonii</i>	1.01	0.00
wood betony	<i>Pedicularis canadensis</i>	0.12	0.01
foxglove beardtongue	<i>Penstemon digitalis</i>	2.25	0.05
prairie phlox	<i>Phlox pilosa</i>	0.09	0.01
prairie rose	<i>Rosa arkansana</i>	0.03	0.04
prairie blue eyed grass	<i>Sisyrinchium campestre</i>	0.05	0.00
prairie spiderwort	<i>Tradescantia bracteata</i>	0.07	0.02
Ohio spiderwort	<i>Tradescantia ohiensis</i>	0.12	0.04
heart leaved meadow parsnip	<i>Zizia aptera</i>	0.14	0.03
golden Alexanders	<i>Zizia aurea</i>	0.28	0.07
thimbleweed	<i>Anemone cylindrica</i>	0.10	0.01

common milkweed	<i>Asclepias syriaca</i>	0.09	0.06
butterfly milkweed	<i>Asclepias tuberosa</i>	0.06	0.04
whorled milkweed	<i>Asclepias verticillata</i>	0.04	0.01
false boneset	<i>Brickellia eupatorioides</i>	0.23	0.02
New Jersey tea	<i>Ceanothus americanus</i>	0.06	0.02
prairie coreopsis	<i>Coreopsis palmata</i>	0.09	0.03
prairie cinquefoil	<i>Drymocallis arguta</i>	2.96	0.04
pale purple coneflower	<i>Echinacea pallida</i>	0.19	0.10
rattlesnake master	<i>Eryngium yuccifolium</i>	0.11	0.04
flowering spurge	<i>Euphorbia corollata</i>	0.06	0.02
northern bedstraw	<i>Galium boreale</i>	0.17	0.01
false sunflower	<i>Heliopsis helianthoides</i>	0.53	0.23
prairie blazing star	<i>Liatris pycnostachya</i>	0.14	0.03
wild bergamot	<i>Monarda fistulosa</i>	1.67	0.07
wild quinine	<i>Parthenium integrifolium</i>	0.11	0.04
hairy mountain mint	<i>Pycnanthemum pilosum</i>	0.53	0.01
yellow coneflower	<i>Ratibida pinnata</i>	1.12	0.10
black eyed Susan	<i>Rudbeckia hirta</i>	1.91	0.06
sweet black eyed Susan	<i>Rudbeckia subtomentosa</i>	0.27	0.02
wild petunia	<i>Ruellia humilis</i>	0.07	0.04
rosinweed	<i>Silphium integrifolium</i>	0.02	0.05
compass plant	<i>Silphium laciniatum</i>	0.01	0.04
hoary vervain	<i>Verbena stricta</i>	0.43	0.04
Culver's root	<i>Veronicastrum virginicum</i>	1.08	0.00
white sage	<i>Artemisia ludoviciana</i>	0.62	0.01
tall boneset	<i>Eupatorium altissimum</i>	0.28	0.02
grass leaved goldenrod	<i>Euthamia graminifolia</i>	0.72	0.01
cream gentian	<i>Gentiana alba</i>	0.47	0.01
sawtooth sunflower	<i>Helianthus grosseserratus</i>	0.08	0.01
stiff sunflower	<i>Helianthus pauciflorus</i>	0.05	0.02
rough blazing star	<i>Liatris aspera</i>	0.12	0.02
gray goldenrod	<i>Solidago nemoralis</i>	0.67	0.01
stiff goldenrod	<i>Solidago rigida</i>	0.52	0.03
showy goldenrod	<i>Solidago speciosa</i>	0.77	0.02
heath aster	<i>Symphotrichum ericoides</i>	0.55	0.01
smooth blue aster	<i>Symphotrichum laeve</i>	0.60	0.03
New England aster	<i>Symphotrichum novae-angliae</i>	0.33	0.01
sky blue aster	<i>Symphotrichum oolentangiense</i>	0.71	0.02
ironweed	<i>Vernonia fasciculata</i>	0.20	0.02

Seed Mix	Year	Total seeds/ft ²	Total PLS lbs./ac
Wet Mesic 24	2024	103.4233313	7.675399447

Common Name	Scientific Name	Seeds/ft ²	PLS lbs./acre
big bluestem	<i>Andropogon gerardii</i>	2.64	0.72
sideoats grama	<i>Bouteloua curtipendula</i>	2.06	0.94
marsh muhly	<i>Muhlenbergia racemosa</i>	1.07	0.04
switchgrass	<i>Panicum virgatum</i>	1.55	0.30
little bluestem	<i>Schizachyrium scoparium</i>	3.20	0.58
Indian grass	<i>Sorghastrum nutans</i>	1.44	0.33
prairie cordgrass	<i>Spartina pectinata</i>	0.22	0.09
rough dropseed	<i>Sporobolus compositus</i>	2.23	0.20
yellowfruit sedge	<i>Carex annectens</i>	1.89	0.06
shortbeak sedge	<i>Carex brevior</i>	1.10	0.10
crested sedge	<i>Carex cristatella</i>	0.31	0.01
troublesome sedge	<i>Carex molesta</i>	0.41	0.04
fox sedge	<i>Carex vulpinoidea</i>	7.94	0.22
Virginia wild rye	<i>Elymus virginicus</i>	1.30	0.85
fowl manna grass	<i>Glyceria striata</i>	4.97	0.08
Dudley's rush	<i>Juncus dudleyi</i>	10.44	0.01
dark green bulrush	<i>Scirpus atrovirens</i>	4.12	0.02
prairie wedge grass	<i>Sphenopholis obtusata</i>	2.89	0.04
slenderleaf false foxglove	<i>Agalinis tenuifolia</i>	2.15	0.01
partridge pea	<i>Chamaecrista fasciculata</i>	0.35	0.35
Canadian milkvetch	<i>Astragalus canadensis</i>	1.44	0.23
white prairie clover	<i>Dalea candida</i>	0.90	0.13
purple prairie clover	<i>Dalea purpurea</i>	0.87	0.13
showy tick trefoil	<i>Desmodium canadense</i>	0.10	0.05
wild licorice	<i>Glycyrrhiza lepidota</i>	0.17	0.12
Maryland senna	<i>Senna marilandica</i>	0.06	0.09
Canada anemone	<i>Anemone canadensis</i>	0.06	0.02
foxglove beardtongue	<i>Penstemon digitalis</i>	2.25	0.05
prairie phlox	<i>Phlox pilosa</i>	0.04	0.01
prairie blue eyed grass	<i>Sisyrinchium campestre</i>	0.05	0.00
purple meadow rue	<i>Thalictrum dasycarpum</i>	0.14	0.03
Ohio spiderwort	<i>Tradescantia ohioensis</i>	0.18	0.06
golden Alexanders	<i>Zizia aurea</i>	0.28	0.07

prairie Indian plantain	<i>Arnoglossum plantagineum</i>	0.09	0.05
swamp milkweed	<i>Asclepias incarnata</i>	0.19	0.11
common milkweed	<i>Asclepias syriaca</i>	0.09	0.06
tall coreopsis	<i>Coreopsis tripteris</i>	0.15	0.03
rattlesnake master	<i>Eryngium yuccifolium</i>	0.23	0.08
northern bedstraw	<i>Galium boreale</i>	0.10	0.00
false sunflower	<i>Heliopsis helianthoides</i>	0.53	0.23
prairie blazing star	<i>Liatris pycnostachya</i>	0.55	0.14
winged loosestrife	<i>Lythrum alatum</i>	10.12	0.01
wild mint	<i>Mentha arvensis</i>	0.67	0.01
wild bergamot	<i>Monarda fistulosa</i>	1.67	0.07
wild quinine	<i>Parthenium integrifolium</i>	0.11	0.04
obedient plant	<i>Physostegia virginiana</i>	0.19	0.02
Virginia mountain mint	<i>Pycnanthemum virginianum</i>	4.06	0.05
yellow coneflower	<i>Ratibida pinnata</i>	1.12	0.10
black eyed Susan	<i>Rudbeckia hirta</i>	1.91	0.06
sweet black eyed Susan	<i>Rudbeckia subtomentosa</i>	1.33	0.08
rosinweed	<i>Silphium integrifolium</i>	0.03	0.08
American germander	<i>Teucrium canadense</i>	0.18	0.03
blue vervain	<i>Verbena hastata</i>	1.92	0.06
Culver's root	<i>Veronicastrum virginicum</i>	5.38	0.02
flat topped aster	<i>Doellingeria umbellata</i>	0.33	0.01
tall boneset	<i>Eupatorium altissimum</i>	0.28	0.02
boneset	<i>Eupatorium perfoliatum</i>	0.50	0.01
grass leaved goldenrod	<i>Euthamia graminifolia</i>	1.45	0.01
cream gentian	<i>Gentiana alba</i>	0.47	0.01
bottle gentian	<i>Gentiana andrewsii</i>	2.60	0.03
sneezeweed	<i>Helenium autumnale</i>	2.25	0.05
sawtooth sunflower	<i>Helianthus grosseserratus</i>	0.08	0.01
great blue lobelia	<i>Lobelia siphilitica</i>	1.72	0.01
white rattlesnakeroot	<i>Prenanthes alba</i>	0.12	0.02
stiff goldenrod	<i>Solidago rigida</i>	0.52	0.03
heath aster	<i>Symphyotrichum ericoides</i>	0.55	0.01
smooth blue aster	<i>Symphyotrichum laeve</i>	0.89	0.04
panicled aster	<i>Symphyotrichum lanceolatum</i>	0.27	0.02
New England aster	<i>Symphyotrichum novae-angliae</i>	0.65	0.03
ironweed	<i>Vernonia fasciculata</i>	0.40	0.05