

**IRVINE PRAIRIE  
WORK ASSESSMENT  
2018**



# IRVINE PRAIRIE SCIENCE UPDATE

## Year 1 (2018)

Justin Meissen

### Introduction

One of the primary components of the Irvine Prairie mission is the restoration and maintenance of an ecologically diverse tallgrass prairie. We began this work in 2018, seeding ~ 9 ac on the hilltop nearest the farm in May. In order to ensure that our efforts at restoring a diverse prairie are effective, we must reliably monitor our progress through detailed vegetation sampling. Monitoring also allows us to anticipate potential problems in the future, and helps us tweak our management practices in order to get the best results we can get out of the seeds and plants we've planted. This document serves as a "check-up" to see how the restoration is doing, and how well we are meeting our goals. In this update we 1) review how we conducted our monitoring (Methods), 2) show what the monitoring tells us (Results), and 3) discuss steps we should take based on our results (Management Implications).

### Methods

Our approach to monitoring is to use randomized, permanent plots to answer our questions about the performance and ecology of Irvine Prairie. We established the first set of monitoring points in 2018. Each permanent plot consists of two steel pipes recessed into the ground at the corners of a ~ 10 ft<sup>2</sup> square area, with approximately 2 in of exposed pipe. A custom constructed sampling frame with downward facing pipefittings can be placed on the permanently established pipes to form a repeatable sampling area. These permanent steel "corner posts" are designed to withstand both fire and mowing (> 4 in), and similar permanent marker designs have been used successfully under comparable circumstances (Meissen et al. 2017).

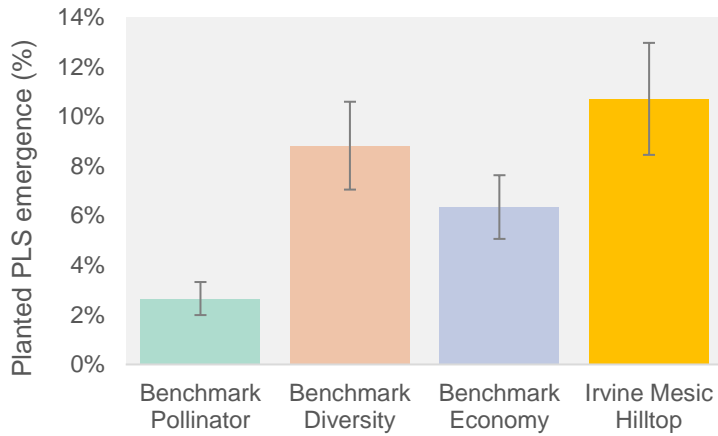
We measured species identity, vegetation density and canopy cover metrics at each sampling location. To measure canopy cover, we identified all species present and estimated the area covering the ~10 ft<sup>2</sup> quadrat by each species (including bare ground) using Daubenmire cover classes. We then used the class midpoints to estimate canopy cover by species and



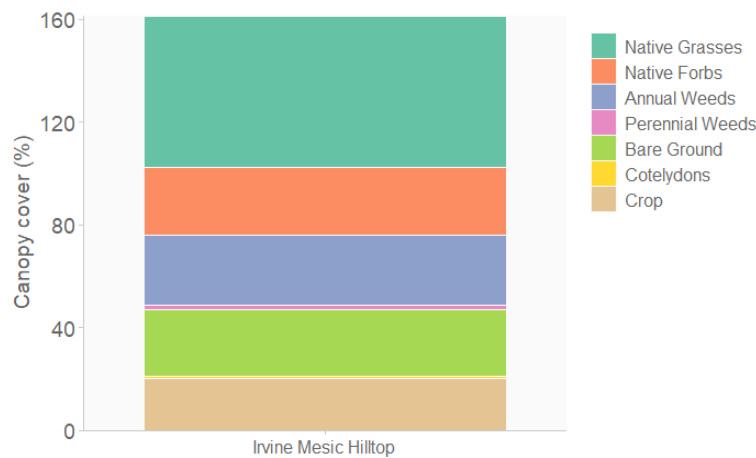
**Figure 1.** Typical view of the planting area, 8/1/18. Oat cover crop fully established.



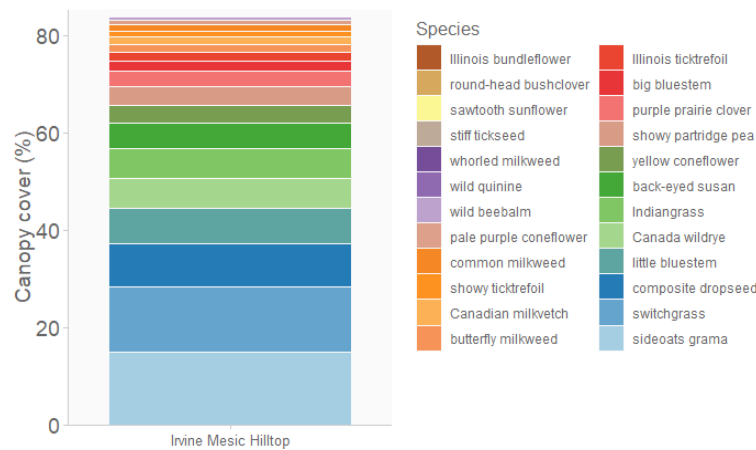
**Figure 2.** Typical vegetation detail. Note high nurse crop cover. Several small native seedlings can be seen.



**Figure 3.** Seedling emergence after one growing season (% planted seeds emerged) compared to benchmark seed mixes.



**Figure 4.** Canopy cover of functional groups sampled in ten ~10 ft<sup>2</sup> quadrats. Cover may exceed 100% due to use of cover classes.



**Figure 5.** Canopy cover of top 20 species sampled in ten 1m<sup>2</sup> quadrats. Cover may exceed 100% due to use of cover classes.

combined species data to estimate canopy cover by functional group. We used this data (species presence in ~10ft<sup>2</sup>) to estimate species richness. We measured density data using a smaller ~1ft<sup>2</sup> quadrat nested in the southwest corner of the larger ~10 ft<sup>2</sup> quadrat. Here we measured each plant and number of stems for all species present in the quadrat.

We catalogued all species present in the 2018 planting using a meandering walk. During the walk, we recorded all planted species encountered, and estimated their overall abundance using a qualitative scale: Very Rare, Rare, Uncommon, Infrequent, Frequent, Common, Very Common.

## Results

Overall, restoration outcomes met or exceeded expectations in 2018. It appears seeding was executed without significant issues, and both native species and cover crops established well (Fig. 1, Fig. 2). Weed issues were nearly non-existent across most of the site, with the exception of crabgrass matting in the areas nearest the parking area. This mat prevented all native establishment. The area that used to be a waterway in the northwest had issues in establishment, apparently due to water moving seeds off-site.

Establishment of the planted seed mix was very good in 2018 (Fig. 3). Compared to other benchmark seed mixes, this seed mix performed about as well or better than the Nashua Diversity Mix. Establishment rates exceeded 10%, which is rare in prairie restoration.

**Table 1.** Species and abundance found in 2018 planting area.

<i>Common Name</i>	<i>Scientific Name</i>	<i>Abundance</i>
big bluestem	<i>Andropogon verardii</i>	Common
sideoats grama	<i>Bouteloua curtipendula</i>	Common
Canada wildrye	<i>Elymus canadensis</i>	Common
switchgrass	<i>Panicum virgatum</i>	Very Common
little bluestem	<i>Schizachyrium scobarium</i>	Common
Indiangrass	<i>Sorghastrum nutans</i>	Common
composite dropseed	<i>Sporobolus compositus</i>	Common
sedge	<i>Carex sp.</i>	Very Rare
leadplant	<i>Amorpha canescens</i>	Very Rare
Canadian milkvetch	<i>Astragalus canadensis</i>	Common
white wild indigo	<i>Baptisia alba</i>	Very Rare
showy partridge pea	<i>Chamaecrista fasciculata</i>	Common
purple prairie clover	<i>Dalea purpurea</i>	Common
Illinois bundleflower	<i>Desmanthus illinoensis</i>	Frequent
showy ticktrefoil	<i>Desmodium canadense</i>	Common
Illinois ticktrefoil	<i>Desmodium illinoense</i>	Common
round-head bushclover	<i>Lespedeza capitata</i>	Rare
thimbleweed	<i>Anemone cylindrica</i>	Very Rare
prairie sage	<i>Artemisia ludoviciana</i>	Very Rare
common milkweed	<i>Asclepias syriaca</i>	Common
butterfly milkweed	<i>Asclepias tuberosa</i>	Common
whorled milkweed	<i>Asclepias verticillata</i>	Uncommon
false boneset	<i>Brickellia eupatorioides</i>	Uncommon
New Jersey tea	<i>Ceanothus americanus</i>	Very Rare
stiff tickseed	<i>Coreopsis palmata</i>	Very Rare
pale purple coneflower	<i>Echinacea pallida</i>	Common
tall boneset	<i>Eupatorium altissimum</i>	Rare
sawtooth sunflower	<i>Helianthus grosseserratus</i>	Frequent
smooth oxeye	<i>Helopsis helianthoides</i>	Common
wild beebalm	<i>Monarda fistulosa</i>	Frequent
wild quinine	<i>Parthenium integrifolium</i>	Frequent
yellow coneflower	<i>Ratibida pinnata</i>	Common
back-eyed susan	<i>Rudbeckia hirta</i>	Common
sweet coneflower	<i>Rudbeckia subtomentosa</i>	Rare
rosinweed	<i>Silphium integrifolium</i>	Very Rare
compass plant	<i>Silphium laciniatum</i>	Very Rare
smooth blue aster	<i>Symphotrichum laeve</i>	Very Rare
New England aster	<i>Symphotrichum novae-</i>	Rare
prairie ironweed	<i>Vernonia fasciculata</i>	Uncommon

Vegetation structure was quite varied throughout the 2018 planting (Fig.4). We found a relatively even mix of native forbs, annual weeds, bare ground and cover crops on site, and a fairly high abundance of native grass. We were encouraged to find little to no perennial weed cover throughout the sample site.

We found over 40 species throughout the planting site (Table 1). This is encouraging given the generally late timing of planting- many forbs are likely to emerge next year as dormancy is broken over the cold months. We expect the list of species present on site to grow substantially in 2019.

Species abundance was highly variable, but we found most at low abundance (1-5% cover) (Fig. 5). Some grass species like composite dropseed, switchgrass, and sideoats grama were particularly common, with cover ranging from 10-20%.

## Management Implications

In general, the outcomes from our formal vegetation assessment were good. To continue achieving ecological goals on schedule, we suggest similar implementation and management should continue.

There are two areas that will likely require re-seeding next year: Area 1 with crabgrass matting and Area 2 that experienced some seed washout (Fig. 6). Further monitoring in these areas in 2019 will confirm the necessity of reseeding. If no further native plant establishment occurs by September 2019, re-seeding will commence that fall or the following spring.

The high abundance of switchgrass should be reassessed next year to

inform whether warm season grass control measures should be considered for this planting in the future. Unlike many switchgrass cultivars, the Iowa ecotype switchgrass we planted is not typically overly competitive. However, the abundance of switchgrass that established is much higher than expected given the moderate seeding rate. The potential for competitive exclusion of conservative species in this planting due to switchgrass abundance exists, but ultimately is probably low.

Switchgrass seeding densities should be reduced in other Irvine Prairie plantings. We may see different establishment patterns in 2019 due to the differences in site preparation (bean stubble vs disked corn) that may render switchgrass overabundance a non-issue, but we prefer to avoid that risk by lowering the seeding rate.

## References

Meissen, J. C., S. M. Galatowitsch, and M. W. Cornett. 2017. Meeting seed demand for landscape-scale restoration sustainably: the influence of seed harvest intensity and site management. *Ecoscience* 24:145–155.



**Figure 6.** Emergent management areas. Area with yellow hatching show locations with poor initial establishment. Follow up monitoring and likely reseeding should occur in these areas in fall 2019.

**IRVINE PRAIRIE  
PLANNED WORK  
2019**





## 2019 Irvine Prairie Restoration and Management Work Plan

Work in 2019 will consist primarily of new planting: spring seeding, summer mowing, and potential fall re-seeding in problem areas. Some plug transplanting will occur at small scales to supplement seedings. Tasks to support 2019 restoration and management operations follow:

### Spring (April 1-June 30)

#### Primary Seeding

*Approximately 17 acres of Irvine Prairie will be drilled in early spring by TPC staff using an 8ft Truax native seed drill. Three seed mixes will be planted across the western section of Irvine Prairie (see Map 4). Seeding will be conducted as early as feasible to promote dormancy breaking in seeded forbs.*

Operator: JM/AK  
Equipment: Truax Drill (8ft)  
Location: Throughout 2019 Work Area (see Map 4)  
Timing: mid-late April

#### Supplemental Broadcast Seeding

*Part of the land to be restored in 2019 will employ an alternative seed supply model, using bulk harvested seed rather than commercially purchased and cleaned seed. The bulk nature of the seed may preclude effective planting using a native seed drill, so we plan on using broadcast seeding equipment to plant this mix. Mix TBA.*

Operator: JM/AK  
Equipment: Truax Seed Slinger ATV Attachment  
Location: Designated "Bulk Diversity Mix (Mesic)" area (see Map 4)  
Timing: mid-late April

#### Supplemental Plug Planting

*Some prairie species establish poorly from seed, and areas that facilitate soil movement pose a risk to all seeds. Using potted, already established plant materials is important in overcoming these barriers to restoration. Several areas that have already encountered low seedling establishment or areas that may encounter particularly wet conditions will be targeted for plug planting.*

Operator: LFW  
Equipment: Volunteer labor, hand tools  
Location: Y1 planting in old waterway, "Wet Prairie" area (see Map 4)  
Timing: mid-late April

#### Portable Restroom Placement

*In order to promote community engagement and for the sake of being a good host, visitors will have access to a portable restroom.*

Operator: Cooley Sanitation, L.L.C.  
Equipment: Portable Restroom  
Location: TBD  
Timing: early April

## **Invasive Grass Scouting**

*Prior to seeding any areas that currently or recently supported populations of invasive perennial grasses (e.g. Bromus inermis, Phalaris arundinacea, Poa pratensis), those populations must be effectively controlled. The site will be scouted early season to identify problem areas. In order to guarantee effective grass identification, it is important to keep waterways and grassways unmowed up until this survey.*

Operator: JM  
Equipment: GPS  
Location: Throughout all Irvine Prairie  
Timing: mid June

## **Establishment Mowing #1 (All Planting Areas)**

*All early plantings benefit from mowing relatively early in the season to encourage light penetration to the soil surface. This mowing will cover the entire ~30 acres, including 2018 and 2019 plantings. 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: TBA  
Equipment: Hay mower ideal, brush hog OK, mower at 6-12in  
Location: Throughout 2018 and 2019 Work Area (see Map 1 & 2)  
Timing: late June

## **Summer (July 1-September 1)**

### **Establishment Mowing #2 (2019 Planting 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 the 19 acres, planted spring 2019. Depending on the equipment available, disc or sickle mowers are ideal for encouraging light penetration to soil surface.*

Operator: TBA  
Equipment: Hay mower ideal, bush hog OK, mower at 4-6in  
Location: Throughout 2019 Work Area (see Map 1 & 2)  
Timing: late July

### **Establishment Mowing #3 (2019 Planting 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 the 19 acres, planted spring 2019. Depending on the equipment available, disc or sickle mowers are ideal for encouraging light penetration to soil surface.*

Operator: TBA  
Equipment: Hay mower ideal, bush hog OK, mower at 4-6in  
Location: Throughout 2019 Work Area (see Map 1 & 2)  
Timing: mid-late August

## **Invasive Grass Mowing (Year 1 of 2)**

*Once problem perennial grass areas are identified and assessed, they should be mowed in preparation for a fall (first frost) herbicide application. The scale of this work will vary depending on the size and number of patches.*

Operator: TBA  
Equipment: TBA (based on size)  
Location: TBD based on scouting  
Timing: mid-late August (pair with other mowing activity)

**Seeding Establishment and 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: Throughout 2018 and 2019 Work Area (see Map 3)

Timing: ~September 1

**Invasive Grass Herbicide Application (Year 1 of 3)**

*After invasive perennial grass areas have had time to regrow, they should be sprayed with Roundup at label recommended rates soon after first frost. This application may need to be continued for two more years.*

Operator: TBA

Equipment: TBA (based on size)

Location: TBD based on scouting

Timing: ~October 15



**MAPS AND  
SUPPLEMENTAL  
MATERIAL**





**Map 1. Restoration Timeline**

≡ Irvine Prairie Operations

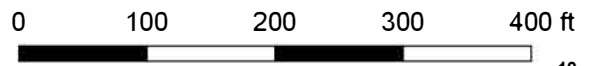




Irvine Farm



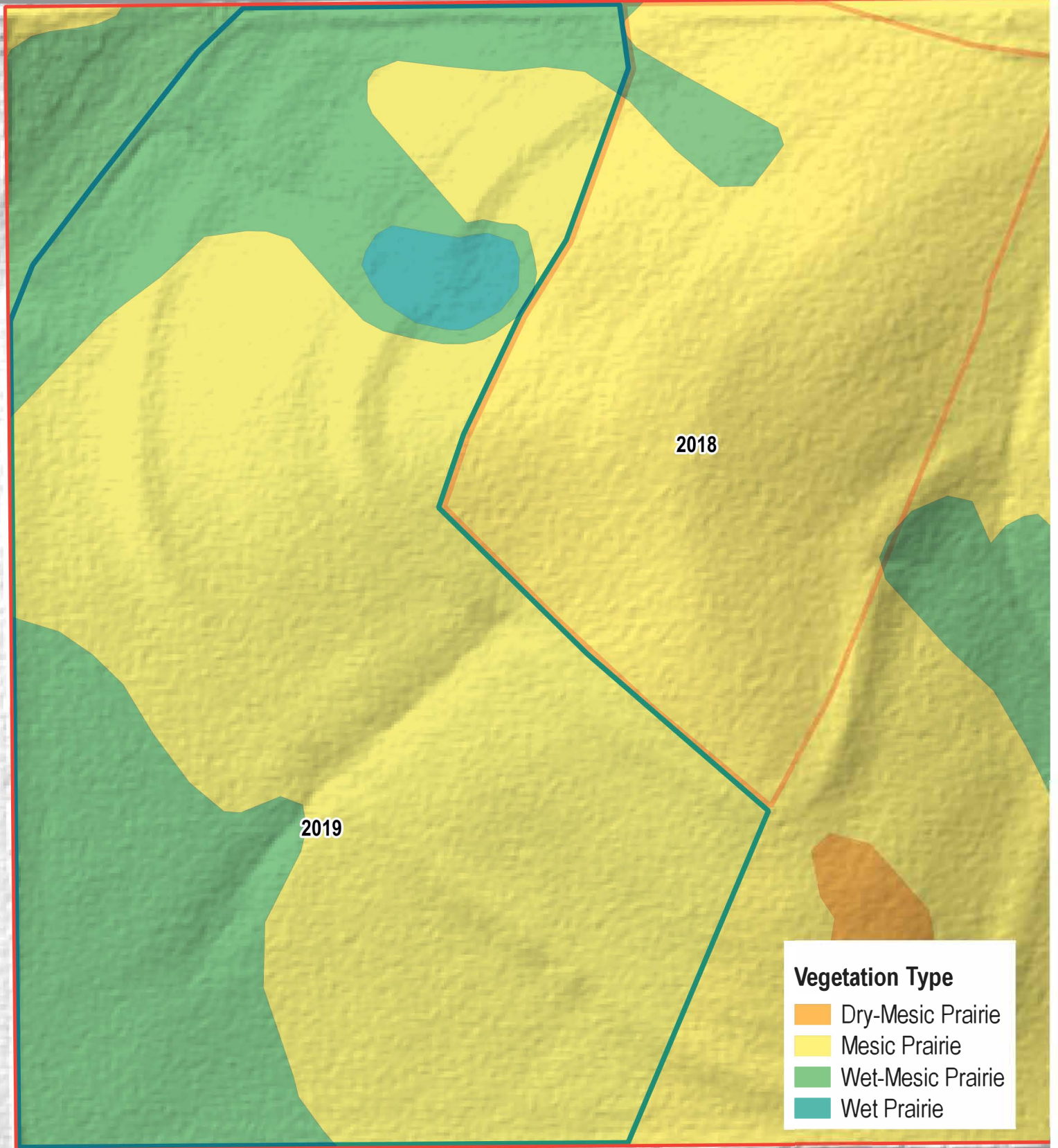
**Map 2. Restoration Area Aerial View**  
Irvine Prairie Operations 2019





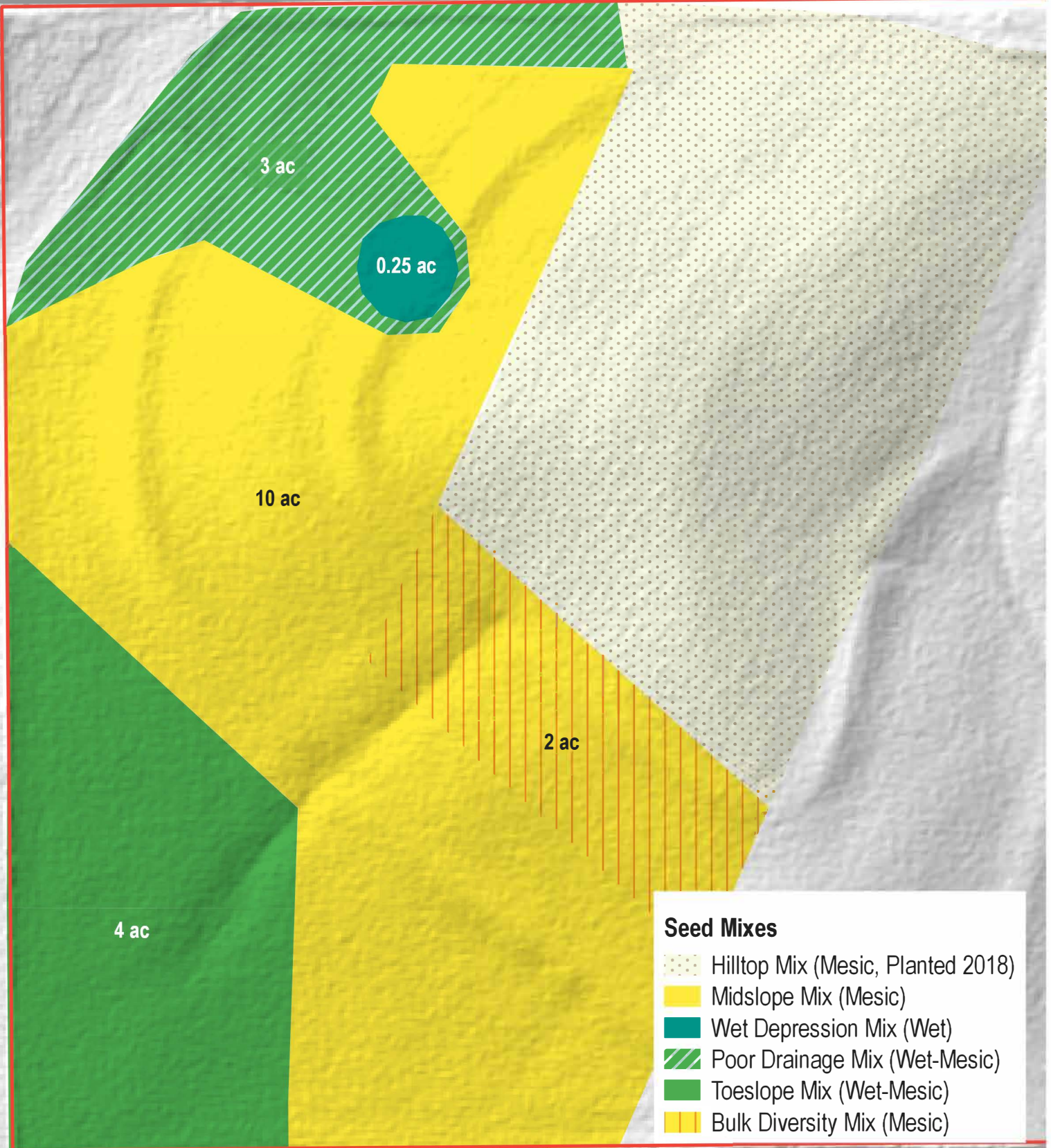


Irvine Farm



**Map 3. Target Native Vegetation Areas**  
Irvine Prairie Operations 2019





**Map 4. 2019 Seeding Areas**  
Irvine Prairie Operations 2019





Irvine Farm



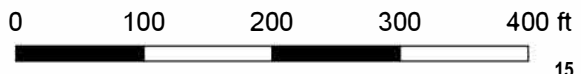
2018

2019

**Monitoring Locations**

- Permanent Sampling Points

**Map 5. 2019 Vegetation Monitoring Map**  
Irvine Prairie 2019 Operations



**SEEDING PLAN**  
*Mesic Midslope Mix*

Client: Cathy Irvine  
Area seeded: 10.000  
Date seeded: TBA April  
Job name: Irvine Prairie 2019

Common Name	Scientific Name	Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
<b>GRASSES</b>					
big bluestem	<i>Andropogon gerardii</i>	1.500	4%	0.408	4.08
sideoats grama	<i>Bouteloua curtipendula</i>	3.000	7%	0.944	9.44
Kalm's brome	<i>Bromus kalmii</i>	0.250	1%	0.085	0.85
Canada wildrye	<i>Elymus canadensis</i>	1.000	2%	0.439	4.39
switchgrass	<i>Panicum virgatum</i>	1.000	2%	0.170	1.70
little bluestem	<i>Schizachyrium scoparius</i>	3.000	7%	0.534	5.34
Indiangrass	<i>Sorghastrum nutans</i>	2.000	5%	0.473	4.73
tall dropseed	<i>Sporobolus compositus</i>	5.000	12%	0.454	4.54
prairie dropseed	<i>Sporobolus heterolepis</i>	0.100	0%	0.018	0.18
<b>SEDGES AND OTHER GRAMINOIDS</b>					
yellow fox sedge	<i>Carex annectens</i>	0.100	0%	0.003	0.03
Bicknell's sedge	<i>Carex bicknellii</i>	0.300	1%	0.048	0.48
shortbeak sedge	<i>Carex brevior</i>	0.500	1%	0.047	0.47
troublesome sedge	<i>Carex molesta</i>	0.250	1%	0.027	0.27
<b>Total grasses and sedges:</b>		<b>18.000</b>	<b>42%</b>	<b>3.651</b>	<b>36.51</b>
<b>LEGUMES</b>					
leadplant	<i>Amorpha canescens</i>	0.200	0%	0.030	0.30
Canada milkvetch	<i>Astragalus canadensis</i>	0.600	1%	0.096	0.96
white wild indigo	<i>Baptisia alba</i>	0.020	0%	0.032	0.32
partridge pea	<i>Chamaecrista fasciculata</i>	0.250	1%	0.252	2.52
white prairie clover	<i>Dalea candida</i>	0.500	1%	0.072	0.72
purple prairie clover	<i>Dalea purpurea</i>	1.000	2%	0.182	1.82
showy tick-trefoil	<i>Desmodium canadense</i>	0.150	0%	0.074	0.74
Illinois tick-trefoil	<i>Desmodium illinoense</i>	0.025	0%	0.016	0.16
round-headed bushclover	<i>Lespedeza capitata</i>	0.100	0%	0.034	0.34
<b>FORBS</b>					
Canada anemone	<i>Anemone canadensis</i>	0.050	0%	0.017	0.17
thimbleweed	<i>Anemone cylindrica</i>	0.100	0%	0.010	0.10
field pussytoes	<i>Antennaria neglecta</i>	0.200	0%	0.001	0.01
prairie sage	<i>Artemisia ludoviciana</i>	1.000	2%	0.011	0.11
swamp milkweed	<i>Asclepias incarnata</i>	0.100	0%	0.057	0.57
common milkweed	<i>Asclepias syriaca</i>	0.100	0%	0.068	0.68
butterfly milkweed	<i>Asclepias tuberosa</i>	0.030	0%	0.019	0.19
whorled milkweed	<i>Asclepias verticillata</i>	0.050	0%	0.012	0.12
New Jersey tea	<i>Ceanothus americanus</i>	0.100	0%	0.036	0.36
prairie coreopsis	<i>Coreopsis palmata</i>	0.050	0%	0.014	0.14
shootingstar	<i>Dodecatheon media</i>	0.030	0%	0.001	0.01
pale purple coneflower	<i>Echinacea pallida</i>	0.250	1%	0.128	1.28
rattlesnake master	<i>Eryngium yuccifolium</i>	0.250	1%	0.091	0.91
tall boneset	<i>Eupatorium altissimum</i>	0.250	1%	0.014	0.14
flowering spurge	<i>Euphorbia corollata</i>	0.100	0%	0.034	0.34
grass-leaved goldenrod	<i>Euthamia graminifolia</i>	1.000	2%	0.008	0.08
joe-pye weed	<i>Eutrochium maculatum</i>	0.200	0%	0.006	0.06
northern bedstraw	<i>Galium boreale</i>	0.100	0%	0.004	0.04
bottle gentian	<i>Gentiana andrewsii</i>	0.500	1%	0.005	0.05
bigtooth sunflower	<i>Helianthus grosseserratus</i>	0.080	0%	0.015	0.15
prairie sunflower	<i>Helianthus laetiflorus</i>	0.020	0%	0.014	0.14
ox-eye	<i>Heliopsis helianthoides</i>	0.500	1%	0.216	2.16
alumroot	<i>Heuchera richardsonii</i>	0.200	0%	0.001	0.01
rough blazingstar	<i>Liatis aspera</i>	0.100	0%	0.017	0.17
prairie blazingstar	<i>Liatis pycnostachya</i>	0.100	0%	0.025	0.25

Common Name	Scientific Name	Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
great blue lobelia	<i>Lobelia siphilitica</i>	1.000	2%	0.005	0.05
wild bergamot	<i>Monarda fistulosa</i>	0.750	2%	0.029	0.29
biennial guara	<i>Oenothera gaura</i>	0.025	0%	0.025	0.25
stiff goldenrod	<i>Oligoneuron rigidum</i>	0.750	2%	0.050	0.50
prairie ragwort	<i>Packera plattensis</i>	0.010	0%	0.000	0.00
wild quinine	<i>Parthenium integrifolium</i>	0.200	0%	0.078	0.78
wood betony	<i>Pedicularis canadensis</i>	0.010	0%	0.001	0.01
foxglove beardtongue	<i>Penstemon digitalis</i>	2.000	5%	0.042	0.42
prairie phlox	<i>Phlox pilosa</i>	0.025	0%	0.004	0.04
prairie cinquefoil	<i>Potentilla arguta</i>	1.000	2%	0.012	0.12
hairy mt. mint	<i>Pycnanthemum pilosum</i>	1.000	2%	0.015	0.15
common mt. mint	<i>Pycnanthemum virginianum</i>	1.000	2%	0.012	0.12
yellow coneflower	<i>Ratibida pinnata</i>	1.000	2%	0.091	0.91
wild rose	<i>Rosa arkansana</i>	0.020	0%	0.022	0.22
black-eyed susan	<i>Rudbeckia hirta</i>	1.080	3%	0.032	0.32
sweet coneflower	<i>Rudbeckia subtomentosa</i>	1.000	2%	0.063	0.63
rosinweed	<i>Silphium integrifolium</i>	0.010	0%	0.023	0.23
compass plant	<i>Silphium laciniatum</i>	0.010	0%	0.041	0.41
showy goldenrod	<i>Solidago speciosa</i>	0.700	2%	0.020	0.20
heath aster	<i>Symphyotrichum ericoides</i>	0.500	1%	0.007	0.07
smooth blue aster	<i>Symphyotrichum laeve</i>	0.500	1%	0.025	0.25
New England aster	<i>Symphyotrichum novae-angliae</i>	0.200	0%	0.008	0.08
sky-blue aster	<i>Symphyotrichum oolentangiense</i>	0.500	1%	0.017	0.17
purple meadow rue	<i>Thalictrum dasycarpum</i>	0.100	0%	0.025	0.25
prairie spiderwort	<i>Tradescantia bracteata</i>	0.050	0%	0.014	0.14
ohio spiderwort	<i>Tradescantia ohioensis</i>	0.100	0%	0.034	0.34
blue vervain	<i>Verbena hastata</i>	0.100	0%	0.003	0.03
ironweed	<i>Vernonia fasciculata</i>	0.250	1%	0.028	0.28
culver's root	<i>Veronicastrum virginicum</i>	2.000	5%	0.007	0.07
golden alexanders	<i>Zizia aurea</i>	0.300	1%	0.074	0.74

**Total forbs: 24.495 58% 2.417 24.17**

COVER CROP	Summary	Total Species	Included	STD	PLS lb/ac	PLS lbs
			Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
	<b>Graminoid Total:</b>	<b>13</b>	<b>18.00</b>	<b>42%</b>	<b>3.65</b>	<b>36.51</b>
	<b>Forb Total:</b>	<b>64</b>	<b>24.50</b>	<b>58%</b>	<b>2.42</b>	<b>24.17</b>
	<b>Cover Crop Total:</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>0.00</b>	<b>0.00</b>
	<b>Overall Total:</b>	<b>77</b>	<b>42.50</b>	<b>100%</b>	<b>6.07</b>	<b>60.68</b>

**SEEDING PLAN**  
*Wet-Mesic Poor Drainage Mix*

Client: Cathy Irvine  
Area seeded: 3.000  
Date seeded: TBA April  
Job name: Irvine Prairie 2019

Common Name	Scientific Name	Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
<b>GRASSES</b>					
big bluestem	<i>Andropogon gerardii</i>	1.000	2%	0.272	0.82
sideoats grama	<i>Bouteloua curtipendula</i>	2.000	4%	0.629	1.89
Kalm's brome	<i>Bromus kalmii</i>	0.250	0%	0.085	0.26
bluejoint reedgrass	<i>Calamagrostis canadensis</i>	1.000	2%	0.011	0.03
Canada wildrye	<i>Elymus canadensis</i>	1.000	2%	0.439	1.32
Virginia wildrye	<i>Elymus virginicus</i>	0.250	0%	0.162	0.49
fowl mannagrass	<i>Glyceria striata</i>	2.000	4%	0.034	0.10
marsh muhly	<i>Muhlenbergia racemosa</i>	1.000	2%	0.034	0.10
switchgrass	<i>Panicum virgatum</i>	1.000	2%	0.170	0.51
little bluestem	<i>Schizachyrium scoparium</i>	2.000	4%	0.356	1.07
Indiangrass	<i>Sorghastrum nutans</i>	2.000	4%	0.473	1.42
prairie cordgrass	<i>Spartina pectinata</i>	0.250	0%	0.113	0.34
tall dropseed	<i>Sporobolus compositus</i>	2.000	4%	0.182	0.54
prairie dropseed	<i>Sporobolus heterolepis</i>	0.100	0%	0.018	0.05
<b>SEDGES AND OTHER GRAMINOIDS</b>					
yellow fox sedge	<i>Carex annectens</i>	1.000	2%	0.030	0.09
Bicknell's sedge	<i>Carex bicknellii</i>	0.500	1%	0.080	0.24
troublesome sedge	<i>Carex molesta</i>	1.000	2%	0.109	0.33
pointed broom sedge	<i>Carex scoparia</i>	1.000	2%	0.032	0.10
brown fox sedge	<i>Carex vulpinoidea</i>	2.000	4%	0.054	0.16
<b>Total grasses and sedges:</b>		<b>21.350</b>	<b>41%</b>	<b>3.285</b>	<b>9.85</b>
<b>LEGUMES</b>					
Canada milkvetch	<i>Astragalus canadensis</i>	1.000	2%	0.160	0.48
white wild indigo	<i>Baptisia alba</i>	0.020	0%	0.032	0.10
partridge pea	<i>Chamaecrista fasciculata</i>	0.300	1%	0.303	0.91
white prairie clover	<i>Dalea candida</i>	0.500	1%	0.072	0.21
purple prairie clover	<i>Dalea purpurea</i>	0.500	1%	0.091	0.27
showy tick-trefoil	<i>Desmodium canadense</i>	0.250	0%	0.124	0.37
wild licorice	<i>Glycyrrhiza lepidota</i>	0.100	0%	0.070	0.21
purple vetch	<i>Vicia americana</i>	0.100	0%	0.101	0.30
<b>FORBS</b>					
Canada anemone	<i>Anemone canadensis</i>	0.020	0%	0.007	0.02
thimbleweed	<i>Anemone cylindrica</i>	0.050	0%	0.005	0.02
prairie sage	<i>Artemisia ludoviciana</i>	1.000	2%	0.011	0.03
swamp milkweed	<i>Asclepias incarnata</i>	0.100	0%	0.057	0.17
common milkweed	<i>Asclepias syriaca</i>	0.100	0%	0.068	0.20
tall coreopsis	<i>Coreopsis tripteris</i>	0.100	0%	0.019	0.06
flat-topped aster	<i>Doellingeria umbellata</i>	0.100	0%	0.004	0.01
rattlesnake master	<i>Eryngium yuccifolium</i>	0.100	0%	0.036	0.11
boneset	<i>Eupatorium perfoliatum</i>	0.500	1%	0.009	0.03
grass-leaved goldenrod	<i>Euthamia graminifolia</i>	1.000	2%	0.008	0.02
joe-pye weed	<i>Eutrochium maculatum</i>	0.500	1%	0.014	0.04
northern bedstraw	<i>Galium boreale</i>	0.200	0%	0.008	0.02
bottle gentian	<i>Gentiana andrewsii</i>	2.000	4%	0.019	0.06
sneezeweed	<i>Helenium autumnale</i>	2.000	4%	0.042	0.13
bigtooth sunflower	<i>Helianthus grosseserratus</i>	0.100	0%	0.018	0.05
ox-eye	<i>Heliopsis helianthoides</i>	0.500	1%	0.216	0.65
meadow blazingstar	<i>Liatriis ligulistylis</i>	0.150	0%	0.041	0.12
prairie blazingstar	<i>Liatriis pycnostachya</i>	0.100	0%	0.025	0.07
cardinal flower	<i>Lobelia cardinalis</i>	0.100	0%	0.001	0.00
great blue lobelia	<i>Lobelia siphilitica</i>	2.000	4%	0.011	0.03

Common Name	Scientific Name	Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
palespike lobelia	<i>Lobelia spicata</i>	1.000	2%	0.003	0.01
prairie loosestrife	<i>Lysimachia quadriflora</i>	0.100	0%	0.003	0.01
winged loosestrife	<i>Lythrum alatum</i>	1.000	2%	0.001	0.00
wild bergamot	<i>Monarda fistulosa</i>	0.750	1%	0.029	0.09
Riddell's goldenrod	<i>Oligoneuron ridellii</i>	0.500	1%	0.015	0.04
stiff goldenrod	<i>Oligoneuron rigidum</i>	0.750	1%	0.050	0.15
marsh betony	<i>Pedicularis lanceolata</i>	0.500	1%	0.031	0.09
foxglove beardtongue	<i>Penstemon digitalis</i>	1.000	2%	0.021	0.06
prairie phlox	<i>Phlox pilosa</i>	0.020	0%	0.003	0.01
common mt. mint	<i>Pycnanthemum virginianum</i>	2.000	4%	0.025	0.07
yellow coneflower	<i>Ratibida pinnata</i>	1.000	2%	0.091	0.27
black-eyed susan	<i>Rudbeckia hirta</i>	0.750	1%	0.022	0.07
sweet coneflower	<i>Rudbeckia subtomentosa</i>	0.750	1%	0.047	0.14
mad-dog skullcap	<i>Scutellaria lateriflora</i>	0.100	0%	0.004	0.01
rosinweed	<i>Silphium integrifolium</i>	0.010	0%	0.023	0.07
heath aster	<i>Symphyotrichum ericoides</i>	0.500	1%	0.007	0.02
smooth blue aster	<i>Symphyotrichum laeve</i>	0.500	1%	0.025	0.07
New England aster	<i>Symphyotrichum novae-angliae</i>	0.750	1%	0.031	0.09
purple meadow rue	<i>Thalictrum dasycarpum</i>	0.200	0%	0.050	0.15
ohio spiderwort	<i>Tradescantia ohioensis</i>	0.100	0%	0.034	0.10
blue vervain	<i>Verbena hastata</i>	0.200	0%	0.006	0.02
ironweed	<i>Vernonia fasciculata</i>	0.500	1%	0.057	0.17
culver's root	<i>Veronicastrum virginicum</i>	4.000	8%	0.014	0.04
golden alexanders	<i>Zizia aurea</i>	0.400	1%	0.099	0.30

**Total forbs: 30.870 59% 2.259 6.78**

COVER CROP	Summary	Included		STD	PLS lb/ac	PLS lbs
		Total Species	Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
	<b>Graminoid Total:</b>	<b>19</b>	<b>21.35</b>	<b>41%</b>	<b>3.28</b>	<b>9.85</b>
	<b>Forb Total:</b>	<b>52</b>	<b>30.87</b>	<b>59%</b>	<b>2.26</b>	<b>6.78</b>
	<b>Cover Crop Total:</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>0.00</b>	<b>0.00</b>
	<b>Overall Total:</b>	<b>71</b>	<b>52.22</b>	<b>100%</b>	<b>5.54</b>	<b>16.63</b>

**SEEDING PLAN**  
*Wet-Mesic Toeslope Mix*

Client: Cathy Irvine  
Area seeded: 4.000  
Date seeded: TBA April  
Job name: Irvine Prairie 2019

Common Name	Scientific Name	Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
<b>GRASSES</b>					
big bluestem	<i>Andropogon gerardii</i>	1.000	2%	0.272	1.09
sideoats grama	<i>Bouteloua curtipendula</i>	3.000	6%	0.944	3.78
Kalm's brome	<i>Bromus kalmii</i>	0.250	0%	0.085	0.34
Canada wildrye	<i>Elymus canadensis</i>	1.000	2%	0.439	1.76
Virginia wildrye	<i>Elymus virginicus</i>	0.250	0%	0.162	0.65
fowl mannagrass	<i>Glyceria striata</i>	2.000	4%	0.034	0.14
marsh muhly	<i>Muhlenbergia racemosa</i>	1.000	2%	0.034	0.14
switchgrass	<i>Panicum virgatum</i>	1.000	2%	0.170	0.68
little bluestem	<i>Schizachyrium scoparium</i>	2.000	4%	0.356	1.42
Indiangrass	<i>Sorghastrum nutans</i>	2.000	4%	0.473	1.89
prairie cordgrass	<i>Spartina pectinata</i>	0.250	0%	0.113	0.45
tall dropseed	<i>Sporobolus compositus</i>	3.000	6%	0.272	1.09
prairie dropseed	<i>Sporobolus heterolepis</i>	0.100	0%	0.018	0.07
<b>SEDGES AND OTHER GRAMINOIDS</b>					
yellow fox sedge	<i>Carex annectens</i>	1.000	2%	0.030	0.12
Bicknell's sedge	<i>Carex bicknellii</i>	0.500	1%	0.080	0.32
shortbeak sedge	<i>Carex brevior</i>	0.500	1%	0.047	0.19
troublesome sedge	<i>Carex molesta</i>	0.500	1%	0.054	0.22
brown fox sedge	<i>Carex vulpinoidea</i>	2.000	4%	0.054	0.22
<b>Total grasses and sedges:</b>		<b>21.350</b>	<b>40%</b>	<b>3.640</b>	<b>14.56</b>
<b>LEGUMES</b>					
leadplant	<i>Amorpha canescens</i>	0.100	0%	0.015	0.06
Canada milkvetch	<i>Astragalus canadensis</i>	0.700	1%	0.112	0.45
white wild indigo	<i>Baptisia alba</i>	0.020	0%	0.032	0.13
partridge pea	<i>Chamaecrista fasciculata</i>	0.300	1%	0.303	1.21
white prairie clover	<i>Dalea candida</i>	0.500	1%	0.072	0.29
purple prairie clover	<i>Dalea purpurea</i>	1.000	2%	0.182	0.73
showy tick-trefoil	<i>Desmodium canadense</i>	0.250	0%	0.124	0.50
wild licorice	<i>Glycyrrhiza lepidota</i>	0.050	0%	0.035	0.14
purple vetch	<i>Vicia americana</i>	0.050	0%	0.050	0.20
<b>FORBS</b>					
Canada anemone	<i>Anemone canadensis</i>	0.020	0%	0.007	0.03
thimbleweed	<i>Anemone cylindrica</i>	0.050	0%	0.005	0.02
prairie Indian plantain	<i>Arnoglossum plantagineum</i>	0.025	0%	0.014	0.06
prairie sage	<i>Artemisia ludoviciana</i>	1.000	2%	0.011	0.04
swamp milkweed	<i>Asclepias incarnata</i>	0.100	0%	0.057	0.23
common milkweed	<i>Asclepias syriaca</i>	0.100	0%	0.068	0.27
butterfly milkweed	<i>Asclepias tuberosa</i>	0.010	0%	0.006	0.03
whorled milkweed	<i>Asclepias verticillata</i>	0.010	0%	0.002	0.01
New Jersey tea	<i>Ceanothus americanus</i>	0.050	0%	0.018	0.07
prairie coreopsis	<i>Coreopsis palmata</i>	0.050	0%	0.014	0.05
tall coreopsis	<i>Coreopsis tripteris</i>	0.100	0%	0.019	0.08
pale purple coneflower	<i>Echinacea pallida</i>	0.200	0%	0.103	0.41
rattlesnake master	<i>Eryngium yuccifolium</i>	0.200	0%	0.073	0.29
boneset	<i>Eupatorium perfoliatum</i>	0.200	0%	0.003	0.01
grass-leaved goldenrod	<i>Euthamia graminifolia</i>	1.500	3%	0.012	0.05
joe-pye weed	<i>Eutrochium maculatum</i>	0.250	0%	0.007	0.03
northern bedstraw	<i>Galium boreale</i>	0.200	0%	0.008	0.03
bottle gentian	<i>Gentiana andrewsii</i>	2.000	4%	0.019	0.08
sneezeweed	<i>Helenium autumnale</i>	2.000	4%	0.042	0.17
bigtooth sunflower	<i>Helianthus grosseserratus</i>	0.100	0%	0.018	0.07



Common Name	Scientific Name	Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
ox-eye	<i>Heliopsis helianthoides</i>	0.500	1%	0.216	0.86
meadow blazingstar	<i>Liatris ligulistylis</i>	0.150	0%	0.041	0.16
prairie blazingstar	<i>Liatris pycnostachya</i>	0.200	0%	0.050	0.20
great blue lobelia	<i>Lobelia siphilitica</i>	2.000	4%	0.011	0.04
palespike lobelia	<i>Lobelia spicata</i>	1.000	2%	0.003	0.01
prairie loosestrife	<i>Lysimachia quadriflora</i>	0.200	0%	0.006	0.02
winged loosestrife	<i>Lythrum alatum</i>	2.000	4%	0.002	0.01
wild bergamot	<i>Monarda fistulosa</i>	0.750	1%	0.029	0.12
stiff goldenrod	<i>Oligoneuron rigidum</i>	0.750	1%	0.050	0.20
prairie ragwort	<i>Packera plattensis</i>	0.050	0%	0.002	0.01
wild quinine	<i>Parthenium integrifolium</i>	0.100	0%	0.039	0.16
marsh betony	<i>Pedicularis lanceolata</i>	0.500	1%	0.031	0.12
foxglove beardtongue	<i>Penstemon digitalis</i>	1.000	2%	0.021	0.08
prairie phlox	<i>Phlox pilosa</i>	0.020	0%	0.003	0.01
common mt. mint	<i>Pycnanthemum virginianum</i>	2.000	4%	0.025	0.10
yellow coneflower	<i>Ratibida pinnata</i>	1.000	2%	0.091	0.36
wild rose	<i>Rosa arkansana</i>	0.020	0%	0.022	0.09
black-eyed susan	<i>Rudbeckia hirta</i>	0.750	1%	0.022	0.09
sweet coneflower	<i>Rudbeckia subtomentosa</i>	0.750	1%	0.047	0.19
rosinweed	<i>Silphium integrifolium</i>	0.010	0%	0.023	0.09
compass plant	<i>Silphium laciniatum</i>	0.010	0%	0.041	0.17
heath aster	<i>Symphyotrichum ericoides</i>	0.500	1%	0.007	0.03
smooth blue aster	<i>Symphyotrichum laeve</i>	0.500	1%	0.025	0.10
New England aster	<i>Symphyotrichum novae-angliae</i>	0.750	1%	0.031	0.12
purple meadow rue	<i>Thalictrum dasycarpum</i>	0.100	0%	0.025	0.10
ohio spiderwort	<i>Tradescantia ohioensis</i>	0.100	0%	0.034	0.14
blue vervain	<i>Verbena hastata</i>	0.100	0%	0.003	0.01
ironweed	<i>Vernonia fasciculata</i>	0.250	0%	0.028	0.11
culver's root	<i>Veronicastrum virginicum</i>	4.000	8%	0.014	0.05
golden alexanders	<i>Zizia aurea</i>	0.300	1%	0.074	0.30

**Total forbs: 31.495 60% 2.445 9.78**

COVER CROP		Included	STD	PLS lb/ac	PLS lbs
Summary	Total Species	Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
<b>Graminoid Total:</b>	<b>18</b>	<b>21.35</b>	<b>40%</b>	<b>3.64</b>	<b>14.56</b>
<b>Forb Total:</b>	<b>59</b>	<b>31.50</b>	<b>60%</b>	<b>2.44</b>	<b>9.78</b>
<b>Cover Crop Total:</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>0.00</b>	<b>0.00</b>
<b>Overall Total:</b>	<b>77</b>	<b>52.85</b>	<b>100%</b>	<b>6.08</b>	<b>24.34</b>

**SEEDING PLAN**  
*Wet Depression Mix*

Client: Cathy Irvine  
Area seeded: 0.250  
Date seeded: TBA April  
Job name: Irvine Prairie 2019

Common Name	Scientific Name	Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
<b>GRASSES</b>					
bluejoint reedgrass	<i>Calamagrostis canadensis</i>	2.000	8%	0.022	0.01
fowl mannagrass	<i>Glyceria striata</i>	2.000	8%	0.034	0.01
rice cutgrass	<i>Leersia oryzoides</i>	1.000	4%	0.080	0.02
marsh muhly	<i>Muhlenbergia racemosa</i>	2.000	8%	0.068	0.02
prairie cordgrass	<i>Spartina pectinata</i>	0.500	2%	0.225	0.06
<b>SEDGES AND OTHER GRAMINOIDS</b>					
Bebb's sedge	<i>Carex bebbii</i>	1.000	4%	0.080	0.02
troublesome sedge	<i>Carex molesta</i>	1.000	4%	0.109	0.03
pointed broom sedge	<i>Carex scoparia</i>	1.000	4%	0.032	0.01
brown fox sedge	<i>Carex vulpinoidea</i>	2.000	8%	0.054	0.01
dark-green bulrush	<i>Scirpus atrovirens</i>	3.000	13%	0.018	0.00
wool grass	<i>Scirpus cyperinus</i>	5.000	21%	0.008	0.00
<b>Total grasses and sedges:</b>		<b>20.500</b>	<b>87%</b>	<b>0.731</b>	<b>0.18</b>
<b>LEGUMES</b>					
<b>FORBS</b>					
nodding bur marigold	<i>Bidens cernua</i>	0.100	0%	0.013	0.00
white turtlehead	<i>Chelone glabra</i>	1.000	4%	0.030	0.01
winged loosestrife	<i>Lythrum alatum</i>	2.000	8%	0.002	0.00
<b>Total forbs:</b>		<b>3.100</b>	<b>13%</b>	<b>0.044</b>	<b>0.01</b>
<b>COVER CROP</b>					
	Summary	Included Total Species	STD Seeds/ft <sup>2</sup>	PLS lb/ac % mix	PLS lbs PLS lbs
<b>Graminoid Total:</b>		<b>11</b>	<b>20.50</b>	<b>87%</b>	<b>0.73</b>
<b>Forb Total:</b>		<b>3</b>	<b>3.10</b>	<b>13%</b>	<b>0.04</b>
<b>Cover Crop Total:</b>		<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>0.00</b>
<b>Overall Total:</b>		<b>14</b>	<b>23.60</b>	<b>100%</b>	<b>0.78</b>



**SEEDING PLAN**  
*Mesic Hilltop Mix*

Client: Cathy Irvine  
Area seeded: 8.500  
Date seeded: 5/17/2018  
Job name: Irvine Prairie 2018

Common Name	Scientific Name	Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
<b>GRASSES</b>					
big bluestem	<i>Andropogon gerardii</i>	1.500	4%	0.408	3.47
sideoats grama	<i>Bouteloua curtipendula</i>	3.000	7%	0.944	8.03
Kalm's brome	<i>Bromus kalmii</i>	0.250	1%	0.085	0.72
Canada wildrye	<i>Elymus canadensis</i>	1.000	2%	0.439	3.73
switchgrass	<i>Panicum virgatum</i>	2.000	5%	0.340	2.89
little bluestem	<i>Schizachyrium scoparius</i>	3.000	7%	0.534	4.54
Indiangrass	<i>Sorghastrum nutans</i>	2.000	5%	0.473	4.02
tall dropseed	<i>Sporobolus compositus</i>	5.000	12%	0.454	3.86
prairie dropseed	<i>Sporobolus heterolepis</i>	0.500	1%	0.091	0.77
<b>SEDGES AND OTHER GRAMINOIDS</b>					
yellow fox sedge	<i>Carex annectens</i>	0.100	0%	0.003	0.03
Bicknell's sedge	<i>Carex bicknellii</i>	0.200	0%	0.032	0.27
shortbeak sedge	<i>Carex brevior</i>	0.500	1%	0.047	0.40
heavy sedge	<i>Carex gravida</i>	0.020	0%	0.005	0.04
troublesome sedge	<i>Carex molesta</i>	0.100	0%	0.011	0.09
<b>Total grasses and sedges:</b>		<b>19.170</b>	<b>46%</b>	<b>3.866</b>	<b>32.86</b>
<b>LEGUMES</b>					
leadplant	<i>Amorpha canescens</i>	0.186	0%	0.028	0.24
Canada milkvetch	<i>Astragalus canadensis</i>	1.000	2%	0.160	1.36
white wild indigo	<i>Baptisia alba</i>	0.050	0%	0.080	0.68
partridge pea	<i>Chamaecrista fasciculata</i>	0.250	1%	0.252	2.14
purple prairie clover	<i>Dalea purpurea</i>	1.000	2%	0.182	1.54
Illinois bundleflower	<i>Desmanthus illinoensis</i>	0.025	0%	0.016	0.14
showy tick-trefoil	<i>Desmodium canadense</i>	0.150	0%	0.074	0.63
Illinois tick-trefoil	<i>Desmodium illinoense</i>	0.100	0%	0.063	0.54
round-headed bushclover	<i>Lespedeza capitata</i>	0.100	0%	0.034	0.29
<b>FORBS</b>					
wild garlic	<i>Allium canadense</i>	0.100	0%	0.036	0.30
thimbleweed	<i>Anemone cylindrica</i>	0.100	0%	0.010	0.09
prairie sage	<i>Artemisia ludoviciana</i>	1.000	2%	0.011	0.09
swamp milkweed	<i>Asclepias incarnata</i>	0.100	0%	0.057	0.48
common milkweed	<i>Asclepias syriaca</i>	0.250	1%	0.170	1.45
butterfly milkweed	<i>Asclepias tuberosa</i>	0.250	1%	0.158	1.35
whorled milkweed	<i>Asclepias verticillata</i>	0.100	0%	0.025	0.21
false boneset	<i>Brickellia eupatoriodes</i>	0.086	0%	0.007	0.06
New Jersey tea	<i>Ceanothus americanus</i>	0.100	0%	0.036	0.30
prairie coreopsis	<i>Coreopsis palmata</i>	0.100	0%	0.027	0.23
shootingstar	<i>Dodecatheon media</i>	0.100	0%	0.005	0.04
pale purple coneflower	<i>Echinacea pallida</i>	0.250	1%	0.128	1.09
rattlesnake master	<i>Eryngium yuccifolium</i>	0.330	1%	0.120	1.02
tall boneset	<i>Eupatorium altissimum</i>	0.250	1%	0.014	0.12
flowering spurge	<i>Euphorbia corollata</i>	0.100	0%	0.034	0.29
grass-leaved goldenrod	<i>Euthamia graminifolia</i>	1.000	2%	0.008	0.07
northern bedstraw	<i>Galium boreale</i>	0.100	0%	0.004	0.03
bottle gentian	<i>Gentiana andrewsii</i>	0.500	1%	0.005	0.04
bigtooth sunflower	<i>Helianthus grosseserratus</i>	0.150	0%	0.027	0.23
prairie sunflower	<i>Helianthus laetiflorus</i>	0.020	0%	0.014	0.12
ox-eye	<i>Heliopsis helianthoides</i>	0.500	1%	0.216	1.84
alumroot	<i>Heuchera richardsonii</i>	0.020	0%	0.000	0.00
spotted St. John's wort	<i>Hypericum punctatum</i>	0.150	0%	0.001	0.01
rough blazingstar	<i>Liatis aspera</i>	0.100	0%	0.017	0.14

Common Name	Scientific Name	Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
prairie blazingstar	<i>Liatis pycnostachya</i>	0.102	0%	0.025	0.21
great blue lobelia	<i>Lobelia siphilitica</i>	1.000	2%	0.005	0.05
wild bergamot	<i>Monarda fistulosa</i>	0.750	2%	0.029	0.25
stiff goldenrod	<i>Oligoneuron rigidum</i>	0.750	2%	0.050	0.42
wild quinine	<i>Parthenium integrifolium</i>	0.250	1%	0.097	0.83
foxglove beardtongue	<i>Penstemon digitalis</i>	1.000	2%	0.021	0.18
prairie phlox	<i>Phlox pilosa</i>	0.025	0%	0.004	0.03
prairie cinquefoil	<i>Potentilla arguta</i>	1.000	2%	0.012	0.10
hairy mt. mint	<i>Pycnanthemum pilosum</i>	1.000	2%	0.015	0.13
common mt. mint	<i>Pycnanthemum virginianum</i>	1.000	2%	0.012	0.11
yellow coneflower	<i>Ratibida pinnata</i>	1.000	2%	0.091	0.77
black-eyed susan	<i>Rudbeckia hirta</i>	1.080	3%	0.032	0.27
sweet coneflower	<i>Rudbeckia subtomentosa</i>	1.000	2%	0.063	0.54
rosinweed	<i>Silphium integrifolium</i>	0.050	0%	0.113	0.96
compass plant	<i>Silphium laciniatum</i>	0.017	0%	0.070	0.60
old field goldenrod	<i>Solidago nemoralis</i>	0.100	0%	0.001	0.01
showy goldenrod	<i>Solidago speciosa</i>	1.000	2%	0.029	0.24
heath aster	<i>Symphyotrichum ericoides</i>	0.230	1%	0.003	0.03
smooth blue aster	<i>Symphyotrichum laeve</i>	0.500	1%	0.025	0.21
New England aster	<i>Symphyotrichum novae-angliae</i>	0.300	1%	0.012	0.11
sky-blue aster	<i>Symphyotrichum oolentangiense</i>	0.100	0%	0.003	0.03
purple meadow rue	<i>Thalictrum dasycarpum</i>	0.200	0%	0.050	0.42
prairie spiderwort	<i>Tradescantia bracteata</i>	0.108	0%	0.029	0.25
ohio spiderwort	<i>Tradescantia ohioensis</i>	0.200	0%	0.068	0.58
hoary vervain	<i>Verbena stricta</i>	0.100	0%	0.010	0.08
ironweed	<i>Vernonia fasciculata</i>	0.500	1%	0.057	0.48
prairie violet	<i>Viola pedatifida</i>	0.250	1%	0.024	0.21
golden alexanders	<i>Zizia aurea</i>	0.232	1%	0.057	0.49

**Total forbs: 22.461 54% 3.027 25.73**

COVER CROP		Included	STD	PLS lb/ac	PLS lbs	
Oats (<10% slope)	<i>Avena sativa</i>	1.000	16.00	16.00	136.00	
Summary		Total Species	Seeds/ft <sup>2</sup>	% mix	PLS lb/ac	PLS lbs
<b>Graminoid Total:</b>		<b>14</b>	<b>19.17</b>	<b>46%</b>	<b>3.87</b>	<b>32.86</b>
<b>Forb Total:</b>		<b>61</b>	<b>22.46</b>	<b>54%</b>	<b>3.03</b>	<b>25.73</b>
<b>Cover Crop Total:</b>		<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>16.00</b>	<b>136.00</b>
<b>Overall Total:</b>		<b>75</b>	<b>41.63</b>	<b>100%</b>	<b>22.89</b>	<b>194.60</b>