



Fall Crew, pictured left to right: Jacob Churulo, Riley Berner, Olivia Freiberg, Zach Skubizewski

PLANTING #139

2024 Planting History

HOLLAND
SAVANNA

Prepared by Jacob
Churulo

Table of Contents

<i>Introduction</i>	2
<i>Site Conditions</i>	2
<i>Soil Types</i>	2
Map A	2
Table 1	3
<i>Topography</i>	3
<i>Site History</i>	3
<i>Site Preparations</i>	3
<i>Seed Mixes</i>	4
Table 2	5
Table 2A	5
Table 3	6
Map C	7
<i>Seed Planting</i>	7
<i>Lessons Learned</i>	8
<i>Seed Species List</i>	9
Table 4	17
<i>Maps and Photos</i>	17

Introduction

In December of 2024, the Nachusa crew completed their annual planting of 12 acres in the Holland savanna unit. After a busy year of seed collection, the planting was completed in three days. In total, the crew collected just under 1,000 lbs. of seed, of which 600 lbs. went into the planting. The primary plant communities consisted of dry mesic prairie mixed in with woodland seed to aim for the biodiversity that oak savannas are known for.

Summer Crew: Clara Barton, Riley Berner, Jacob Churulo, Olivia Freiberg, Katie Jo Jackson, Zach Skubizewski

Fall Crew: Riley Berner, Jacob Churulo, Olivia Freiberg, Zach Skubizewski

Site Conditions

General location: Neighboring to the west of Holland House, South of Flagg Rd. and West of Lowden Rd., within the north bison unit.

GPS coordinates: 41.903909, -89.347203

Acreage: 12 acres

County: Ogle

Soil Types



Map A: Map of different soil types in planting 139 area of interest (AOI). Green border represents planting boundary, orange borders represent different soil types. See Table 1 for key of soil types.

Map Unit Symbol	Map Unit Soil Type	Acres in AOI	% of AOI
361D2	Kidder loam, 6 to 12 percent slopes, eroded	2.6	21.4
509C2	Whalan loam, 5 to 10% slopes, eroded	5.9	49.0
509D2	Whalan loam, 10 to 18% slopes, eroded	1.3	11.1
509E2	Whalan loam, 18 to 25% slopes, eroded	0.2	1.9
761B	Eleva fine sandy loam, 2 to 7% slopes	1.0	8.5
761D	Eleva fine sandy loam, 7 to 15% slopes	1.0	8.1
Totals in AOI		12.0	100

Table 1: Key for Map A, showing different soil types present in planting 139 AOI.

Topography

The site has some rolling hill topography throughout but remains fairly flat, especially in the western portion of the unit. The slopes are moderate and were easily traversable with both a tractor and our trucks pulling the seeders. There were three small slash piles we had to maneuver as a result of the brush mowing that occurred during site preparation. Also, being in the bison unit, there were several wallows starting to form throughout the whole unit.

Site History

The Holland Savanna unit was purchased in 2005 as part of a larger land tract purchase. Kirk Hollowell and other volunteers dedicated considerable time over the years clearing brush, basal barking, and picking native seed for this area. However, the site has not been formally planted or overseeded. The vegetation has primarily consisted of low-quality, pervasive species such as smooth brome, ragweed, and reed canary grass. Holland Savanna is included in the north bison unit but has seen minimal grazing impacts. After the site was brush mowed in the summer of 2024 to prepare for the planting, the bison quickly returned for several rounds of grazing. They made sure to leave us many gifts all over the ground to fertilize our new seed soon to be planted.

Site Preparations

Because the site was full of low-quality and undesirable species, it received many rounds of preparation. It was first sprayed in October of 2023 with glyphosate to knockback weedy and invasive plants. In early April 2024, the site was sprayed with Garlon 3A using the JD9 tractor sprayer, mostly targeting poison hemlock. A second round of glyphosate was applied in late May for the same purpose of pushing back against the overall undesirable vegetation and to make room for the future seed to germinate. Shortly after this, in June, about an acre and a half of reed canary was treated with the grass-specific herbicide clethodim.

In late July, the entire site was mowed using the Cat skid-steer to clear away thick vegetation. Mowing also cleared invasive woody species and cleaned up downed limbs and woody debris, which made the site passable by our trucks with the seeders. The results from brush mowing were night and day, and it finally allowed us to walk around the site and get the big picture of how we wanted to go about the planting.

Finally, in September, a third round of glyphosate was applied to tackle resprouts and any invasive plants still alive.



Map B: Map of areas that were boom sprayed with glyphosate during site preparation. From top to bottom, the polygons outlined in blue represent areas that were sprayed in October 2023, May 2024, and September 2024, respectively.

Seed Mixes

The two crews together, summer and fall, picked 835 lbs. of seed from 241 different species, plus 126 lbs. of combine mix, totaling 961 lbs. Seed was classified as combine mix if it was collected with the seed stripper (which we used for little bluestem) or if multiple related species were indistinguishable and collected together. An example of this was the crew collecting *Symphotrichum laeve* and *S. oolentangiense* (smooth blue and sky blue aster, respectively) together, as it was not worthwhile to try to ID them separately.

We created 5 mixes with all of the seed we collected, and this year we had several species in a mix titled “Other.” These species were not mixed together; we separated them from our step-in mix to indicate that they did not go into the planting. Instead, they were individually hand

seeded in other areas of the preserve that matched their preferred conditions. These were rarer seeds or seeds with more specific preferences that would not have performed well in a mix or in our planting site. In the case of New Jersey Tea, we added all but 1 pound to the dry mesic mix, and we left a pound out to hand seed in another area in the hopes of seeing more of it on the preserve in the future.

Mix	Species Diversity	Total Weight (Lbs.)
Dry	29	31
Dry Mesic	88	492
Mesic	43	224
Wet	54	131
Woodland	43	60
Step In	1	3.16
Other*	12	2.36

Table 2: Summary of seed mixes made in 2024 and total weights. (*) “Other” represents a collection of various species that were planted in other parts of the preserve. See **Table 2A**.

Common Name	Scientific Name	Weight (Lbs.)	General Location
Asclepias amplexicaulis	Sand Milkweed	0.006	Bushclover Rise
Aquilegia canadensis	Red Columbine	0.001	Big Woods
Ceanothus americanus	New Jersey Tea	1.0	Big Woods
Gentiana purberulenta	Prairie Gentian	0.055	Bushclover Rise
Geranium maculatum	Wild geranium	0.995	West Heinkel
Geum triflorum	Prairie Smoke	0.002	Bushclover Rise
Opuntia cespitosa	Eastern Prickly Pear	0.07	Bushclover Rise; Doug’s Knob’ Big Woods
Phemeranthes rugospermum	Sand Fameflower	0.001	Bushclover Rise
Pulsatilla patens	Prairie Pasque Flower	0.009	Bushclover Rise
Salix humilis	Prairie Willow	0.092	Bushclover Rise
Silene regia	Royal Catchfly	0.003	Big Woods
Spiraea alba	Meadowsweet	0.025	Big Woods Sedge Meadow

Table 2A: Summary of “Other” mix. These were rarer species or species with too specific of condition requirements to make them appropriate for the large mixes. The crew hand seeded these in appropriate areas around the preserve. See Field Maps Seed Planting layer for specific locations.

Mix	Acres in Planting	Total Weight (lbs.)	Lbs./acre
Dry	0.3*	8	26.667
Dry Mesic	11.2	492	43.93
Mesic	0.5	41	82.0

Woodland	1.8*	61	33.889
Hazelnut	0.6*	3	5.0
Total	11.5	604	NA

Table 3: Summary of seed mixes used in planting 139. (*) These mixes were planted over the base planting of Dry Mesic and Mesic. Acreage represents size of polygon on **Map C** but does not add to total planting acreage. Total planting acreage represents coverage of Dry Mesic and Mesic mixes.

- ❖ **Dry**
 Dry mix was hand seeded on the top of a hill after noticing particularly sandy soil where bison began forming wallows. We chose a small barrel that had only 8 pounds in it in case any dry species wanted to take hold here. We used all of that seed on this hilltop which brought us to around 27 Lbs./ acre, acceptable since this wasn't a dedicated dry section of the planting.
- ❖ **Dry Mesic**
 Pretty much the entirety of the planting was dry mesic conditions. For this reason, and because of a smaller seed harvest this year, we biased a lot of species to be into this mix. We used all of our dry mesic mix in this planting, which allowed us to seed at a rate of about 44 Lbs./acre.
- ❖ **Mesic**
 We seeded Mesic mix in a small pocket on the East end of the unit boundary where the steepest slopes occurred. This area also had Reed Canary grass pushing in which indicated soil that held onto moisture a bit longer than the rest of the planting. We planted this first to get it out of the way before starting the bulk of the unit with dry mesic. It should be noted that we did not plant all 41 Lbs. of mesic mix here, so the poundage in Table 3 is not entirely accurate. We drove around until we were satisfied with the coverage, and the rest of it was mixed with dry mesic seed when we started the border afterwards.
- ❖ **Woodland**
 We seeded woodland mix with the pendulum after the entire planting was seeded with dry mesic and mesic. We did this because there were two areas with good shade coverage and enough dappled sunlight that we felt woodland species would be able germinate and perform well. We also hypothesized that going over our dry mesic mix with woodland mix would create more of that savanna community with a mosaic of prairie and woodland species found around the large Bur oaks with broad canopies.
- ❖ **Step In: Hazelnuts**
 Hazelnut was our only step in species for this planting. This followed a 2022 planting of hazelnut in two similar areas within this unit, which did not result in any shrubs (definitely not after the unit was brush mowed). We chose two areas in the planting near Bur oaks but with mostly full sun as Hazelnut tends to prefer the edges and openings in woodlands. We hand planted between 350-400 hazelnuts between the two areas marked on Map C, and we left the remaining couple handfuls in Bennet Woods for the chipmunks to do some work (see Restoration Photo Points on Field Maps for location of this pile).



Map C: Color coded map of different planting areas' boundaries within planting 139 site. Legend describes where different mixes were planted. Seed planted via drop seeder covered the entire unit, step-in and pendulum polygons are overlain to represent how that seed was planted on top of drop seeder seed.

Seed Planting

The planting took three days to complete between December 2-4 of 2024. The weather was moderately cold (30-40 degrees F), and wind was modest but picked up on day 3. There was a very light dusting of snow on day 1 that melted quickly as it warmed up in the afternoon; other than that, there was no precipitation. Before planting, we identified several hazards that were impassable to the trucks such as three small slash piles and several large open-grown Bur oaks with branches that extended too low to drive a truck or tractor underneath. These trees were hand-seeded around with woodland mix on day 2. Ironically, one of the truck tires were popped during the scouting mission by a large branch sticking up near one of the slash piles.

Day 1 started with the half-acre mesic area of the planting. We loaded a 41 lb. barrel of mesic seed into one drop seeder and filled the rest with dry mesic because the soil was still dry enough to accommodate many species in the dry mesic mix. We also biased the dry mesic mix to include the most seed due to a lower collection this year, so there were plenty of species in that mix that could have been completely appropriate in a mesic mix as well. Being only a half-acre, we didn't bother to drive in transects here. Instead, we used the Field Maps' location stream feature to make sure our random driving didn't leave any gaps.

After the mesic was planted, we refilled the drop seeder and filled the second with dry mesic mix and started driving the border of the planting. We drove the trucks with drop seeders in the same fashion as has been followed for the majority of the previous plantings. The trucks were staggered, with the behind truck making sure to create an overlap in the coverage of the drop seeders to avoid creating any large gaps where invasive species could take hold. The drop

seeder openings were set to around 50-70% open to control the rate of seed being used. We drove this way in three concentric passes around the entire planting, creating a thick border of seed. With the border established, we switched to driving in transects—first east-west transects and then followed up by north-south transects to ensure even coverage. Day 1 ended with us completing our first round of transects over the entire planting.

On Day 2, we completed our north-south transects and finished our base layer of dry mesic seed over whole unit. Next, we used a tractor with a pendulum seeder implement to overlay woodland seed in the areas with higher shade coverage (see **Map C**). While Zach was driving the tractor, the rest of the crew hand seeded some dry mix on the top of a hill where we noticed sandy soil.

We waited to seed hazelnut on day 3 because of the warmer conditions. After trying on day 2, the ground was too frozen to get it done in a timely manner. With all 4 crew working together, we planted around 375 hazelnuts into the ground in about an hour. To plant the hazelnuts, one person was using a dibble bar to create the pockets in the ground and each of the other three crewmates had hazelnuts that we were planting 1-3 hazelnuts per hole. We aimed to make the holes around 4-6 inches deep and stepped in the dirt to cover the hole.

Lessons Learned

- Snow on the ground is a favorable condition. We had little visibility of real-time and instead relied solely on Field Maps location tracking.
- Walking around ahead of planting and cleaning up slash piles would have saved us time. There were too many times to count where we got out to throw large branches and debris into the slash piles. Doing this before hand would make the driving go more smoothly.
- Similarly, we could have benefitted from more prep of the woody debris. A good example is the popped tire. There were many large branches that the brush mower didn't fully eat up, and the three slash piles were small enough that they could have been condensed into one larger one to allow more area to be seeded.
- Seed collection could be more targeted to the planting in future years. We had no Dry mesic leftover and even still could have used a bit more—we only seeded around 45 lbs./acre. There didn't need to be as much collection of wet species and that time could've been spent beefing up the mixes that will be put into the planting. It's still good to have a lot of leftover mix for overseeding areas, but maybe if those priorities are laid out early in the year that could also help target seed collection efforts.
- The tractor was a great tool to fill in where the trucks couldn't get. Still limited around low-hanging, widespread oaks but it limited the amount of hand seeding needed around those trees.
- Take more photos!!!

Some lessons that may be learned from this in future years:

- How did the overlaying woodland on dry mesic mix turn out? Did it produce the savanna mosaic of prairie in open areas and woodland in shaded that we hoped for?
- Because this was seeded into a previously overgrown area, did the three rounds of glyphosate help knock back those weedy and invasive plants? Or did the planting struggle to establish compared to a new restoration planting?

- The planting site was too patchy to effectively burn before seed went into the ground. Could we wait until more plants take hold, burn, and then overseed again to increase biodiversity?

Seed Species List

SCIENTIFIC NAME	COMMON NAME	Total Lbs.	Dry	Dry Mesic	Mesic	Wet	Wood land	Step In	Other
Agalinis auriculata	Earleaf false foxglove	0.045			0.045				
Agalinis purpurea	Purple False Foxglove	0.263				0.263			
Agalinis tenuifolia	Slender False foxglove	1.224				1.224			
Agastache nepetoides	Yellow Giant Hyssop	4.95					4.950		
Agastache scrophulariaefolia	Purple Giant Hyssop	7.65					7.650		
Ageratina altissima	White Snakeroot	0.361					0.361		
Agrimonia gryposepala	Tall agrimony	0.069					0.069		
Agrimonia parviflora	Swamp Agrimony	0.318				0.318			
Alisma subcordatum	Water Plantain	0.097				0.097			
Allium cernuum	Nodding Wild Onion	0.395		0.395					
Amorpha canescens	Leadplant	10.95		10.95					
Anemone canadensis	Meadow Anemone	0.432				0.432			
Anemone cylindrica	Thimbleweed	0.599		0.599					
Anemone virginianum	Tall Thimbleweed	0.029					0.029		
Angelica atropurpurea	Great Angelica	4.95				4.95			
Antennaria neglecta	Field Cat's Foot	0.153		0.153					
Antennaria plantaginifolia	Pussy Toes (Everlasting)	3.06		3.06					
Apocynum androsaemifolium	Spreading Dogbane	1.3					1.300		
Aquilegia canadensis	Wild Columbine	0.001							0.001
Arisaema triphyllum	Jack In The Pulpit	0.025					0.025		
Aristida purpurea	3 Awn Grass	1.146		1.146					
Arnoglossum atriplicifolia	Pale Indian Plantain	1.036		1.036					
Arnoglossum plantaginea	Prairie Indian Plantain	1.25			1.25				

Artemisia campestris caudata	Beach Wormwood	16.4	6.3	10.1	
Asclepias amplexicaulis	Sand Milkweed	0.006			0.006
Asclepias incarnata	Swamp Milkweed	0.019			0.019
Asclepias syriaca	Common Milkweed	0.348		0.348	
Asclepias tuberosa interior	Butterfly Weed	0.021		0.021	
Asclepias verticillata	Whorled Milkweed	0.286		0.286	
Asclepias viridiflora	Short Green Milkweed	0.006		0.006	
Astragalus canadensis	Canadian Milk Vetch	21.05		19.05	2
Aureolaria grandiflora var. pulchra	Yellow False Foxglove	6.4			6.400
Baptisia alba	White Wild Indigo	10.7		3	7.7
Besseyia bullii	Kittentails	0.223		0.223	
Bidens comosa	Swamp Tickseed	1.333			1.333
Boltonia asteroides	False Aster	6.75			6.75
Bouteloua curtipendula	Side-Oats Grama	0.867		0.867	
Bouteloua hirsuta	Hairy Grama	0.342	0.342		
Brickellia eupatoroides	False Boneset	3.2		3.2	
Calamagrostis canadensis	Blue Joint Grass	0.894		0.5	0.394
Caltha palustris	Marsh Marigold	0.017			0.017
Campanulastrum americana	American Bellflower	0.13			0.130
Carex hystericina	Porcupine sedge	0.832			0.832
Carex scoparia	Broom Oval Sedge	1.9			1.900
Carex trichocarpa	hairy-fruited lake sedge	0.1			0.100
Carex vulpinoides	Brown Fox Sedge	1.006			1.006
Castilleja sessiliflora	Downy Yellow Painted Cup	0.423	0.423		
Ceanothus americanus	New Jersey Tea	2.722		1.722	1
Cephalanthus occidentalis	Buttonbush	1.788			1.788
Chamecrista fasciculata	Partridge Pea	0.228		0.228	
Chelone glabra	Turtlehead	0.432			0.432
Cicuta maculata	Water Hemlock	0.11			0.11

Cirsium muticum	Swamp Thistle	0.017			0.017
Clematis virginiana	Virgin's Bower	0.026			0.026
Coreopsis lanceolata	Sand Coreopsis	3.85	1	2.85	
Coreopsis palmata	Prairie Coreopsis	4.65		2	2.65
Coreopsis tripteris	Tall Coreopsis	7.75			7.75
Corylus americana	American Hazelnut	3.162			3.162
Crocianthemum bicknellii	Rock Rose	1.489	0.789	0.7	
Cyperus lupulinus (filiculmus)	Slender Sand Sedge	0.074	0.074		
Dalea candidum	White Prairie Clover	2.33		2.33	
Dalea purpureum	Purple Prairie Clover	6.309		6.309	
Danthonia spicata	Poverty Oat Grass	0.317		0.317	
Dasistoma macrophylla	Mullein Foxglove	7.5			7.500
Desmodium sessilifolium	Sessile-leaved ticktrefoil	0.006	0.006		
Diarrhena obovata	Beak Grass	0.138			0.138
Dichanthelium latifolium	Broad-leaved Panic Grass	0.002			0.002
Dichanthelium leibergii	Prairie Panic Grass	0.04			0.040
Dichanthelium pseudopubescens	White-Haired Panic Grass	0.056		0.056	
Dichanthelium scribnerium	Scribner's Panic Grass	0.773		0.773	
Dodecatheon meadia	Shooting Star	5		5	
Doellingeria umbellata	Flat-topped Aster	1.24			1.24
Drymocalis arguta	Prairie Cinquefoil	19.05		17.05	2
Echinacea pallida	Pale Purple Coneflower	96.05		75	21.05
Elymus canadensis	Prairie Wild Rye	30.55		30.55	
Elymus villosus	Silky Wild Rye	0.352			0.352
Epilobium coloratum	Cinnamon Willow Herb	0.44			0.44
Erigeron annuus	Annual Fleabane	0.4		0.4	
Eryngium yuccifolium	Rattlesnake Master	28.75		23.75	5
Eupatorium altissimum	Tall Boneset	1.61			1.610

Eupatorium perfoliatum	Boneset	2.59		1.49	1.1
Euphorbia corollata	Flowering Spurge	0.23	0.23		
Euthamia graminifolia	Smooth Grass-leaved Goldenrod	3.05		3.05	
Euthamia gymnospermoides	Viscid Grass-leaved Goldenrod	13.55	13.55		
Eutrochium maculatum	Spotted Joe Pye Weed	8.4			8.4
Eutrochium purpureum	Purple Joe-Pye Weed	12.9			12.90
Festuca subverticillata	Nodding Fescue	0.012			0.012
Filipendula rubra	Queen-of-the-Prairie	0.042			0.042
Galium boreale	Northern Bedstraw	0.043			0.043
Gaura biennis (longiflora)	Common Gaura	0.025	0.025		
Gentiana alba	Cream Gentian	24.65	14.4	10.25	
Gentiana purberulenta	Prairie Gentian	0.055			0.055
Gentianopsis crinita	Fringed Gentian	0.032			0.032
Geranium maculatum	Wild Geranium	0.995			0.995
Geum triflorum	Prairie Smoke	0.002			0.002
Hasteola suaveolens	Sweet-scented Indian Plantain	5.8			5.8
Helenium autumnale	Sneezeweed	6.2		3.2	3
Helianthus divaricatus	Woodland Sunflower	3.3			3.300
Helianthus grosseserratus	Sawtooth Sunflower	0.8		0.8	
Helianthus hirsutus	Hispid sunflower	0.614	0.614		
Helianthus occidentalis	Western Sunflower; Naked S.	3.65	3.65		
Helianthus pauciflorus	Prairie Sunflower	0.142	0.142		
Heliopsis helianthoides	False Sunflower; "Ox-eye"	2.037	2.037		
Hesperostipa spartea	Porcupine Grass	1.2	1.2		
Heterotheca camporum	Plains Golden Aster	0.215	0.215		

Heuchera richardsonii	Prairie Alum root	0.505	0.505		
Hibiscus laevis	Halberd-Leaved Rose Mallow	3.75			3.75
Hieracium longipilum	Long-Bearded Hawkweed	0.04	0.04		
Hieracium scabrum	Rough Hawkweed	0.01			0.010
Houstonia longifolia	Long-Leaved Bluets	0.011	0.011		
Hypericum ascyron	Great St. Johnswort	0.162			0.162
Hypoxis hirsuta	Yellow Star Grass	0.001	0.001		
Hystrix patula	Bottlebrush Grass	0.539			0.539
Impatiens capensis	Spotted Touch-Me-Not	0.005			0.005
Ionactis linariifolia	Stiff Aster (Flax-Leaved)	0.7	0.7		
Iris virginica shrevei	Blue Flag	0.256			0.256
Koeleria macrantha	Prairie June Grass	14.45	13.45		1
Krigia virginica	Dwarf Dandelion	0.014	0.014		
Lechea tenuifolia	Slender-Leaved Pinweed	0.439	0.439		
Lechea villosa (mucronata)	Hairy Pinweed	0.554	0.554		
Lespedeza capitata	Round-headed Bush Clover	59.35	40	19.35	
Lespedeza virginica	Slender Bush Clover	0.144	0.144		
Liatris aspera	Rough Blazing-star	3.2	1	2.2	
Liatris pycnostachya	Gayfeather; Prairie Blazing Star	3.5		3.5	
Lilium michiganense	Turk's Cap lily	0.01			0.01
Linum sulcatum	Grooved Yellow Flax	0.55	0.55		
Lithospermum incisum	fringed puccoon	0.079	0.079		
Lobelia cardinalis	Cardinal Flower	0.05			0.05
Lobelia inflata	Indian Tobacco	0.002			0.002
Lobelia siphilitica	Great Lobelia	0.372			0.372
Lobelia spicata	Pale-spike Lobelia	0.008		0.008	
Ludwigia alternifolia	Seed Box	0.637			0.637
Lupinus perennis	Wild Lupine	5.4	1	4.4	
Lycopus uniflorus	Northern Bugleweed	0.152			0.152
Lysimachia quadriflora	Narrow-Leaved Loosestrife	0.478			0.478

Lythrum alatum	Winged Loosestrife	0.206			0.206
Mertensia virginica	Virginia Bluebells	0.177			0.177
Minuartia michauxii	Stiff Sandwort	0.004	0.004		
Monarda fistulosa	Wild Bergamot	0.831		0.4	0.431
Monarda punctata villicualis	Horse Mint	1		1	
Napaea dioica	Glade Mallow	0.059			0.059
Nuttallanthus canadensis	Blue toadflax	0.003	0.003		
Oligoneuron riddellii	Riddell's goldenrod	0.131			0.131
Oligoneuron rigidum	Stiff Goldenrod	4.95		4	0.95
Onoclea sensibilis	Sensitive Fern	1.76			1.76
Onosmodium molle	Marbleseed	1.264			1.264
Opuntia cespitosa	Prickly Pear Cactus	0.07			0.07
Oxalis violacea	Violet Wood-sorrel	0.009	0.009		
Packera plattensis	Prairie Ragwort	0.476		0.476	
Panicum capillare	Old Witch Grass	0.807	0.807		
Parnassia glauca	Grass of Parnassus	0.004			0.004
Parthenium integrifolium	Wild Quinine (Feverfew)	43		30	13
Pedicularis canadensis	Wood Betony	3.1		2.1	1
Pedicularis lanceolata	Swamp Betony	0.903			0.903
Penstemon digitalis	Foxglove Beardtongue	32.5		12.5	20
Penstemon grandiflorus	Large Flowered Beardtongue	0.034		0.034	
Penstemon hirsutus	Hairy Beard tongue	1.033	1.033		
Persicaria virginiana	Jumpseed	0.061			0.061
Pheperanthes rugospermum	Sand Fameflower	0.001			0.001
Phyrma leptostachya	Lopseed	0.018			0.018
Physostegia virginiana arenaria	Prairie Obedient Plant	0.03			0.03
Platanthera leucophaea	Eastern Prairie Fringed Orchid	0.001			0.001
Polemonium reptans	Jacob's Ladder	0.09			0.090
Polygala polygama obtusata	Purple Milkwort	0.003		0.003	
Polygala sanguinea	Field Milkwort	0.025			0.025
Polygonatum biflorum	Smooth Solomon's seal	0.099			0.099
Polygonum tenue	Slender Knotweed	0.018	0.018		

Polytaenia nuttallii	Prairie Parsley	0.47	0.47	
Pseudognaphalium obtusifolium	Sweet Everlasting	0.028	0.028	
Pulsatilla patens	Pasque Flower	0.009		0.009
Pycnanthemum tenuifolium	Narrow-leaved Mountain Mint	9.45	9.45	
Pycnanthemum virginianum	Mountain mint	5.75		5.75
Rhexia virginica	Meadow Beauty	0.227		0.227
Rosa carolina	Pasture Rose	1.44	1.44	
Rudbeckia hirta	Black-eyed Susan	4.1	3.1	1
Rudbeckia laciniata	Wild Golden Glow	0.069		0.069
Rudbeckia subtomentosa	Sweet Black-eyed Susan	16.05		16.05
Ruellia humilis	Wild Petunia	0.036	0.036	
Rumex orbiculatus	Great Water dock	16.9		16.9
Salix humilis	Prairie Willow	0.092		0.092
Schoenoplectus tabernaemontani	Softstem bullrush	0.192		0.192
Scrophularia lanceolata	Early figwort	4.483		4.483
Scrophularia marilandica	Late Figwort	0.434		0.434
Scutellaria ovata versicolor	Heart-leaved Skullcap	0.103		0.103
Scutellaria parvula leonardi	Small Skullcap	0.021	0.021	
Senna hebecarpa	Wild Senna	0.479		0.479
Silene antirrhina	Sleepy Catchfly	0.05	0.05	
Silene regia	Royal catchfly	0.003		0.003
Silene stellata	Starry Champion	0.104		0.104
Silphium integrifolium	Rosinweed	29.1	15	14.1
Silphium laciniatum	Compass plant	18.85	15	3.85
Silphium perfoliatum	Cup-plant	5		5
Silphium terebinthaceum	Prairie Dock	10.8	8.8	2
Sisyrinchium albidum	Common Blue-eyed grass	0.07	0.07	
Smilacina racemosa	Feathery False Solomon's Seal	0.095		0.095
Solidago juncea	Early goldenrod	0.764	0.764	
Solidago missouriensis	Missouri Goldenrod	0.973	0.973	

Solidago nemoralis	Gray Goldenrod; Oldfield	2.65	2.65		
Solidago patula	Swamp Goldenrod	2.95		2.95	
Solidago speciosa	Showy Goldenrod	8.95	8.95		
Solidago ulmifolia	Elm-leaved Goldenrod	1.4		1.400	
Spartina pectinata	Prairie Cord Grass	0.182		0.182	
Spiraea alba	Meadowsweet	0.025			0.025
Stachys pilosa	Prairie woundwort	0.409		0.409	
Symphotrichum ericoides	Heath Aster	1.1	1.1		
Symphotrichum novae-angliae	New England Aster	1.95		1.95	
Symphotrichum oblongifolius	Aromatic Aster	0.403	0.403		
Symphotrichum pilosum	Hairy Aster	3.65		3.65	
Symphotrichum puniceum	Swamp Aster	0.134		0.134	
Symphotrichum sericeum	Silky Aster	1.07	1.07		
Tephrosia virginiana	Goat's Rue	2.34	1	1.34	
Teucrium canadense	American Germander	0.098		0.098	
Thalictrum dasycarpum	Purple Meadow Rue	0.059		0.059	
Tradescantia ohiensis	Ohio Spiderwort	17.75	7.75	10	
Triodanis perfoliata	Venus' Looking Glass	0.081	0.081		
Triosteum perfoliatum	Horse Gentian	0.101	0.101		
Verbena hastata	Blue Vervain	2.55		1.55	1
Verbena stricta	Hoary Vervain	6.25	6.25		
Verbena urticifolia	Hairy White Vervain	0.157	0.157		
Verbesina alternifolia	Wingstem	1.4		1.400	
Vernonia fasciculata	Common Ironweed	10.35		10.35	
Veronicastrum virginicum	Culver's Root	10.6		9.5	1.1
Vicia americana	American vetch	0.001			0.001
Viola pedata lineariloba	Birdsfoot Violet	0.1	0.1		
Viola sagittata	Arrow-leaved violet	0.018	0.018		

<i>Zizia aptera</i>	Heart-leaved Meadow Parsnip	0.019	0.019						
<i>Zizia aurea</i>	Golden Alexander	13.35	8	5.35					
Total Seed Mix Weight		835.6	17.4	462.5	200.1	87.8	61.3	3.2	3.3

Table 4: List of all species hand collected, and their weight distribution in each seed mix. Weights are in pounds (lbs.). Total mix weights are rounded to the nearest tenth.

Maps and Photos



Photos A and B: The little bit of snow we had gave greater visibility of the seed on the ground. It's hard to see seed besides rose hips in the photo on the right.



Photo C: 2 trucks with drop seeders being filled before starting another round of transects. Trucks currently in the staggered formation mentioned above.



Photo D: Example of location stream showing our transects. Photo used is from 2023 planting because we forgot to screenshot our tracks from this year. Gives the same idea of how the dots show the trucks' lines and reveal any possible gaps.



Photo E: Fall crew standing with the pile of remaining hazelnuts in Stone Barn Savanna, Bennet Woods unit. We left them in a pile to encourage chipmunks to stockpile, figuring scattering them would lead to them more likely being eaten. We also left them on a downed log to increase the chances of them being found. There are around 100 hazelnuts in this pile.



Photo F: The flat tire on our silver Ram after scouting the unit for hazards (found them!). The crew lost 30 minutes putting on the spare tire and swapping trucks. Good reminder to always drive carefully. It will always save time to get out and move suspicious branches than to deal with this.