

Storm Lake Dredge Site Vegetation Establishment Plan

City of Storm Lake
May 2025

Submitted by:

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I. PROJECT INFORMATION

PROJECT NAME: Storm Lake Dredge Site Vegetation Establishment
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SPONSER INFORMATION:	AGENT INFORMATION:
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Phone Number: 712-732-8000	Phone Number: 507-380-4578
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PROJECT LOCATION (Exhibit A)

County: Buena Vista County	Size of Easement: 166.27 acres	Major Watershed: Oak Creek		
Latitude: 42.627637	Longitude: -95.162846	Section No.: 12	Township No.: 90	Range No.: 37

II. OBJECTIVES, NEED AND FEASIBILITY

A. Objectives and Needs

The City of Storm Lake refers to the area where the dredge site lies as the Gateway to the City. The Gateway area is the main access to the city off U.S. Highway 71, bringing in visitors along East Lakeshore Drive into the heart of the Storm Lake community and attractions.

The city would like to conduct vegetative maintenance to eradicate invasive species, focusing on the development of a native plant community. During that time, the city would develop walking and biking trails to provide additional outdoor recreational opportunities for both residents and visitors.

The objective of this restoration project is to restore this parcel into a native natural plant community. This project is not proposing to restore this site to its original plant community but rather restore the plant community that will thrive in a more traditional wetter environment due to the spoil material. The City of Storm Lake has five objectives for the Dredge Spoil Restoration Project:

- Treat and remove woody volunteers and remove invasive species that are currently found within the site.
- Regrade the site for effective site hydrology flow.
- Restore native vegetation to the site.
- Create additional wildlife habitat for both mammals, birds and insects.
- Construct trails throughout the restored site.

This project will also restore important ecological habitat for migrating birds, as this is part of an important continental flyway. The Mississippi Flyway comprises a large swath through the central United States centered over the Mississippi River, hosting a wide range of migratory birds between Central and South America to Canada. The flyway is home to more than 50% of Northern American migratory waterfowl and over 300 species of birds. Large areas of this flyway have been drained for agricultural purposes, losing millions of acres of wetland that served these species. Maintaining wetlands along this flyway provides important nesting and feeding grounds for migratory birds.

B. Technical Feasibility

The restoration will be dependent on the success of managing the existing species on the site. This project is not looking to restore the site to its historic pre-settlement plant community but rather a vegetation community that will succeed in a wetter system. The lake dredge material naturally will hold more water due to the soil texture. While historically this area was an upland prairie, the restoration will be mimicking more of a prairie pothole wetland.

While the lake dredge material is quite hydric, the volunteers that have grown in the last five to eight years have proven that this growing material will allow other plants to be grown in it. With a year of vegetative maintenance including mowing, herbicide treatments and slow speed mows, followed by seeding, maintenance and monitoring, this site can be successfully managed to produce an attractive area for residents and visitors to the Storm Lake.

C. Ecological Suitability

The goal of the project is to create a native plant community as part of a larger recreational opportunity for the community and visitors. The vegetation will be focused on existing plant communities, wetlands and uplands. This will allow for the need to make major changes to the site through filling and draining.

1. Upland Areas

The goal of the upland restoration is to create a tall-grass prairie by eradicating invasive and noxious weeds in unwooded areas. The wooded areas will stay intact.

2. Forested Wetland

The forested wetland consists of a thick stand of native saplings. The goal here is to encourage the growth of native trees by selectively harvesting smaller saplings.

3. Emergent Wetland

The emergent wetland is dominated by *Phragmites americanus* (American common reed). The goal will be to bring the species under control and develop a more diverse plant community.

III. HISTORICAL CONDITIONS AND JURISDICTIONAL STATUS

The Iowa DNR bought the rights to store dredge spoil from Storm Lake in the early 2000's on the site being considered for vegetation establishment. The dredging operation began by 2004, ending before 2020. In the early years of the spoil site, decanted water was pumped back to Storm Lake. In 2013, the decanting pond to the south was excavated and an outlet to the dredge site was established around 2016.

Dredging activities ended prior to 2020 and the land was handed over to the City of Storm Lake and the Lake Improvement Commission. Since then, the site has stood fallow developing into a combination of forested wetlands, emergent wetlands and upland areas.

Prior to the development of the dredge storage site, the land was in agricultural production. Small non-jurisdictional seasonally flooded wetlands were present at this time. These wetlands were highly degraded through agricultural activities. The site has developed into a large wetland basin but has no direct hydrological connection to any Waters of the United States (WOTUS). Therefore, the site is not under the jurisdiction of the Clean Water Act (CWA). Any improvements or physical changes to the site will not require permitting through the Rock Island District of the Army Corps of Engineers.

IV. EXISTING CONDITIONS

A. General Conditions

The site being considered for vegetive restoration, lies on the east side of Storm Lake, known as the gateway to the city (Exhibit A). It consists of Storm Lake dredge material being stored over the approximately 188-acre site. The southern portion, approximately 75-acres, consists of 36-acres of open water. The ponded area appears to be the result of decanting the dredged spoil in the northern half of the site. The spoil portion is surrounded by an embankment with an outlet pipe draining into the ponded portion of the site to the south. Currently, the outlet is damaged and not working as designed.

The northern area is the portion being considered for vegetive restoration. The area consists of upland, emergent wetlands and a forested wetland (Exhibit B).

There are two accesses to the site. One from the west, where a small access road off of 120th Avenue leads to the site. The other is from the north off of East Lakeshore Drive. The site consists of seven properties owned by the City of Storm Lake and the Lake Improvement Commission.

B. Upland Area

The smallest plant community on the site are the upland areas. There are three upland areas, one in the northwest portion of the site, a small pocket to the south and another in the northeast portion of the site. These open area is dominated by common volunteer species such as goldenrods, saw tooth sunflower, common milkweed and trees. Along with these volunteer species, invasive species such as thistles, stinging nettle and ragweed have

established. The wooded areas are dominated by native tree species in good health.

C. Forested Wetland

A dense forested wetland lies in the middle of the site. The forested wetland has soils that are saturated to the surface. This area is dominated by woody species such as aspen and willow species. The sapling stands are thick, mainly dominated by native species.

D. Emergent Wetland

The two emergent wetlands lie on either side of the forested wetland. These wetlands have some areas of shallow standing water, but hydrology is dominated by saturated soils. The vegetation is dominated by phragmites, a common volunteer species.

E. Soils

The soil consists of dredged material from Storm Lake. This is a fine silty soil with low organic content. Soils testing revealed that soils contain high amounts of phosphorus and potassium.

V. VEGETATION ESTABLISHMENT

The goal of this project is to restore the dredge site to a native habitat allowing for recreational activities. The native plant communities will be established using proven vegetative management techniques until a native plant community has been established. These techniques include herbicide treatments, mowing, interseeding and slow speed mows. Prescribed burns are the most effective way to control thatch layers and woody vegetation in native plant communities. Thatch can inhibit native plant growth and, if not controlled, woody species will shade out native species. In some areas, due to nearby structures or municipal ordinances. In these cases, the site can be mowed using a flail type mower at low speeds. This technique will also reduce thatch and allow for natives to emerge.

The vegetation will be closely monitored to ensure that a native plant community flourishes and invasive and weedy species are controlled. Once the native plant community is established, spot mowing and herbicide treatments as well as slow speed mows should continue in order to sustain the native plant community.

In order to establish a native plant community, it is recommended that a full growing season of eradication efforts take place prior to a fall seeding of native seed mixes. Fall seeding of native seeds has shown to be more successful because the winter months allow for the scarification of seeds. Each plant community will require different techniques and timing to be successful.

A. Upland Area

The upland areas have a mix of trees, weedy species, invasive species and some native species. The goal here is to eradicate the invasive species and control weedy species through the establishment of a native plant community in the open areas, leaving the wooded areas intact. The majority of invasive species can be hand pulled, such as sweet clover, bull thistle and common mullein. Hand pulling can take place during summer months prior to the plants blooming or going to seed. These species can also be sprayed with a glyphosate-based herbicide before they go to bloom. Other species such as smooth brome will need to be sprayed in early spring with a glyphosate-based herbicide. Other species that have a rhizomounous root system will need to be sprayed in the fall to allow the herbicide to have a direct path to the roots as the plant expires for the season.

During the first growing season, periodic mowing of the entire site will help keep the weedy species and invasive species under control, allowing natives to flourish. At the end of the season, upland areas should be mowed at slow speeds using a flail type mower and drill seeded with the recommended upland seed mix found in the Appendix, following the seeding plan on Exhibit C. Table 1 gives a general schedule for the upland establishment.

TABLE 1: UPLAND VEGETATION ESTABLISHMENT SCHEDULE (2025)

Time Frame	Establishment Activity
Early Summer (June)	-Apply glyphosate-based herbicide to invasive spring grasses. -Mow entire site two weeks after herbicide treatment. -Hand pull or spray with glyphosate-based herbicide all tap rooted and shallow rooted invasive species such as bull thistle, sweet clover and common mullein. -Apply glyphosate-based herbicide thistles prior to flowering.
Mid-summer (August)	-Apply glyphosate-based herbicide thistles prior to flowering. -Two weeks later, mow all upland areas.
Fall (Early October)	-Apply glyphosate-based herbicide to rhizomatous invasive species. -Two weeks later, mow entire upland areas.
Fall (Late October)	-Conduct slow speed mow. -Drill seed upland areas with recommended seed mix or similar. Fertilizer and mulch should not be used.

B. Forested Wetland

The forested wetland is dominated by a thick stand of woody saplings. These saplings are native species, meeting the goals of this project. The goal within this area is to thin the stand to allow the larger and healthy saplings to flourish. This can be done by selectively harvesting smaller saplings.

TABLE 2: FORESTED WETLAND VEGETATION ESTABLISHMENT SCHEDULE (2025-2026)

Time Frame	Establishment Activity
Winter Months	-Selectively mow saplings below 2-inches DBH once ground has frozen. Remove all harvested material from the site.

C. Emergent Wetland

The emergent wetland consists of a monoculture of common reed (*Phragmites Americanus*). Although common reed is not considered to be invasive, it is considered to be a noxious weed that can outcompete native species. There are several ways to thin out the stand, mechanical to herbicide treatments. It is recommended that a slow speed mow be conducted once the ground freezes to remove any thatch. In the spring when the stems of the plant reach 5-foot tall, the monoculture should be sprayed with a Imazapyr based herbicide. With the size of this monoculture, an aerial application is suggested at a rate of 4-6 pints per acre. The monoculture should continue to be monitored, and more applications may be necessary when the plants reaches 5-feet in height.

Remove thatch once the plants die back after the last treatment, which should be in the fall. Broadcast seed entire area in accordance with the seeding plan found on Exhibit C.

TABLE 3: EMERGENT WETLAND VEGETATION ESTABLISHMENT SCHEDULE (2025-2026)	
Time Frame	Establishment Activity
Winter (November)	-Once ground freezes, conduct slow speed mow of emergent wetland area.
Spring (May/June)	-When leaves reach 5-feet, spray the entire area with an imazapyr based herbicide.
Summer (August/September)	- When leaves reach 5-feet, spray the entire area with an imazapyr based herbicide.
Winter (November)	-Once ground freezes, conduct slow speed mow of emergent wetland area.
Winter (December)	-Broadcast seed over first snow fall, between 1-inch and 6-inches. Do not use fertilizer or mulch.

VI. VEGETATION MAINTENANCE

With the site being seeded in the fall to allow for seed stratification over the winter, the following growing season will be focused on allowing the natives to flourish. This will be completed by conducting spot mows and spot herbicide treatments. The basic premise is to discourage invasive species and weedy species from outcompeting the native species by keeping those species knocked down.

A. Upland Area

The upland area has an existing plant community which is mixed with native species and invasives/noxious species. The goal is to establish a native plant community over a five-year period. During this five-year period, the focus will be spot mowing and spot spraying, with a slow speed mow after the third growing season.

TABLE 4: UPLAND AREA MAINTENANCE SCHEDULE (2026-2031)	
FIRST FIVE GROWING SEASONS	
Spring (May)	-Spot mow invasive and noxious species. -Two weeks after mowing, spray mowed area with glyphosate-based herbicide.
Summer (July)	-Spot mow invasive and noxious species. -Two weeks after mowing, spray mowed area with glyphosate-based herbicide.
Fall (October)	-Spot mow invasive and noxious species. -Two weeks after mowing, spray mowed area with glyphosate-based herbicide.
AFTER THE THIRD GROWING SEASON (2032+)	
Winter (November)	-Conduct slow speed mow when ground freezes. This will keep the thatch layer under control, allowing native species to flourish.

B. Forested Wetland

The forested wetland is dominated by a thick stand of native saplings. As a native sapling community has developed, the goal will be to thin the stand to promote the growth of healthy specimens.

TABLE 5: FORESTED WETLAND MAINTENACE SCHEDULE

FIRST FIVE GROWING SEASONS (2027-2032)

Winter Months	-Selectively harvest saplings below 2-inches DBH. Remove all harvested material from the site.
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C. Emergent Wetland

The goal in the emergent area is to bring the common reed under control. In order to do this, herbicide treatments using an imazapyr based herbicide will have to be more direct. This can be done using a backpack sprayer for larger populations and wicking the leaves for individual specimens. It is important not to allow for any overspray that will negatively affect native species.

TABLE 6: EMERGENT WETLAND MAINTENACE SCHEDULE (2027-2032)

FIRST FIVE GROWING SEASONS

Spring (May)	-Spot spray or wick common reed when the plants reach five feet.
Summer (July)	-Spot spray or wick common reed when the plants reach five feet.
Fall (October)	-Spot spray or wick common reed when the plants reach five feet.
AFTER THE THIRD GROWING SEASON	
Winter (November)	-Conduct slow speed mow when ground freezes. This will keep the thatch layer under control, allowing native species to flourish.

VII. VEGETATION MONITORING

Monitoring will be completed to ensure the success of the site. Through periodic site visits and plant community surveys, the monitoring period will closely analyze the success of the site. The collected data will be used to guide vegetative maintenance efforts.

Monitoring will be conducted by an experienced biologist familiar with native plant community establishment. Monitoring will occur for a period of five growing seasons after seeding is complete, with the goal that a native plant community dominates the site.

Native plant species surveys will be conducted along five predetermined transects, extending through tall grass prairie, forested wetland and emergent wetlands (Exhibit D). Herbaceous sampling plots will have a five-foot radius, while plots located within the forested wetland will have a 15-foot radius. These plots have been predetermined using soils and topographic survey data. At each sampling plot, plants species will be identified, and the percent cover of each species will be determined. This information will be compiled to give an accurate representation of species diversity throughout the restoration. These surveys will occur once a year.

In order to understand the extents of invasive, non-native species throughout the site and help manage those species, an invasive and weedy species will be identified once during the early part of the growing season using a meander survey and located using a GPS unit. This information will be shared with the sponsor to maintain invasive species control and tracked in the monitoring reports.

TABLE 7: GENERAL MONITORING SCHEDULE (2026-2032)	
DATE	ACTIVITY
May	- Conduct invasive species survey.
June	- Conduct invasive species survey
July	- Conduct native plant species survey. - Conduct plant community boundary survey, beginning in third year.

VIII. LONG-TERM MAINTENANCE

In order to maintain a native plant community, annual site inspections will be conducted after the monitoring period has concluded. If these inspections find deficiencies, appropriate measures will be taken to correct the deficiencies. It is foreseen that these corrective actions could include invasive species control through herbicide treatments, spot mowing, and slow speed mows.

The following long-term management schedule is flexible and can be modified if conditions warrant. Conditions that may cause a more intense maintenance schedule may include an outbreak of an invasive species due to native species dying off as a result of drought or flooding. Reseeding any infected areas may be warranted. Issues that may arise will be handled on a case-by-case basis. Each incident may require different techniques to remedy and new management techniques may develop over the years.

TABLE 6: LONG TERM MANAGEMENT (2032+)	
DATE	ACTIVITY
June	- Conduct a meander vegetation survey, locating invasive species. - Spot spray invasive species.
Late October	- Identify any areas of invasive and undesired plant species. - Spot spray invasive species.
Every 3 Years	- Conduct a slow speed mow of entire area.

IX. ADAPTIVE MANAGEMENT

An adaptive management plan will be implemented to ensure the success of the site. Unforeseen changes to site conditions are possible as a result of both natural and human influences. The plan will involve assessing the site conditions, determining the proper solution to any issues and implementing those procedures. It is difficult to foresee specific issues that may arise, but these issues may include:

- Invasive species control – If flooding and or drought causes native species to die and an outbreak of invasive species occurs that exceed the performance standard, corrective actions will be taken. This may include, but is not limited to, herbicide treatments, mowing and interseeding.
- Native Species – If native vegetation has not been established, the deficient areas will be interseeded.
- Reed canary grass reproduces prolifically through high seed volumes and rhizomes. A treatment regime of mowing the species in the spring to prevent seed production, as well as rhizome herbicide treatments in the fall will be necessary if the species emerges.
- Canada thistle can develop in bare areas that have been affected by flooding or herbicide overspray, forming large colonies. Where identified, the colonies will be mowed in the spring and an herbicide treatment will be conducted in the fall.

X. LIST OF APPENICES

Appendix A:

Exhibit A: Location Map

Exhibit B: Existing Conditions

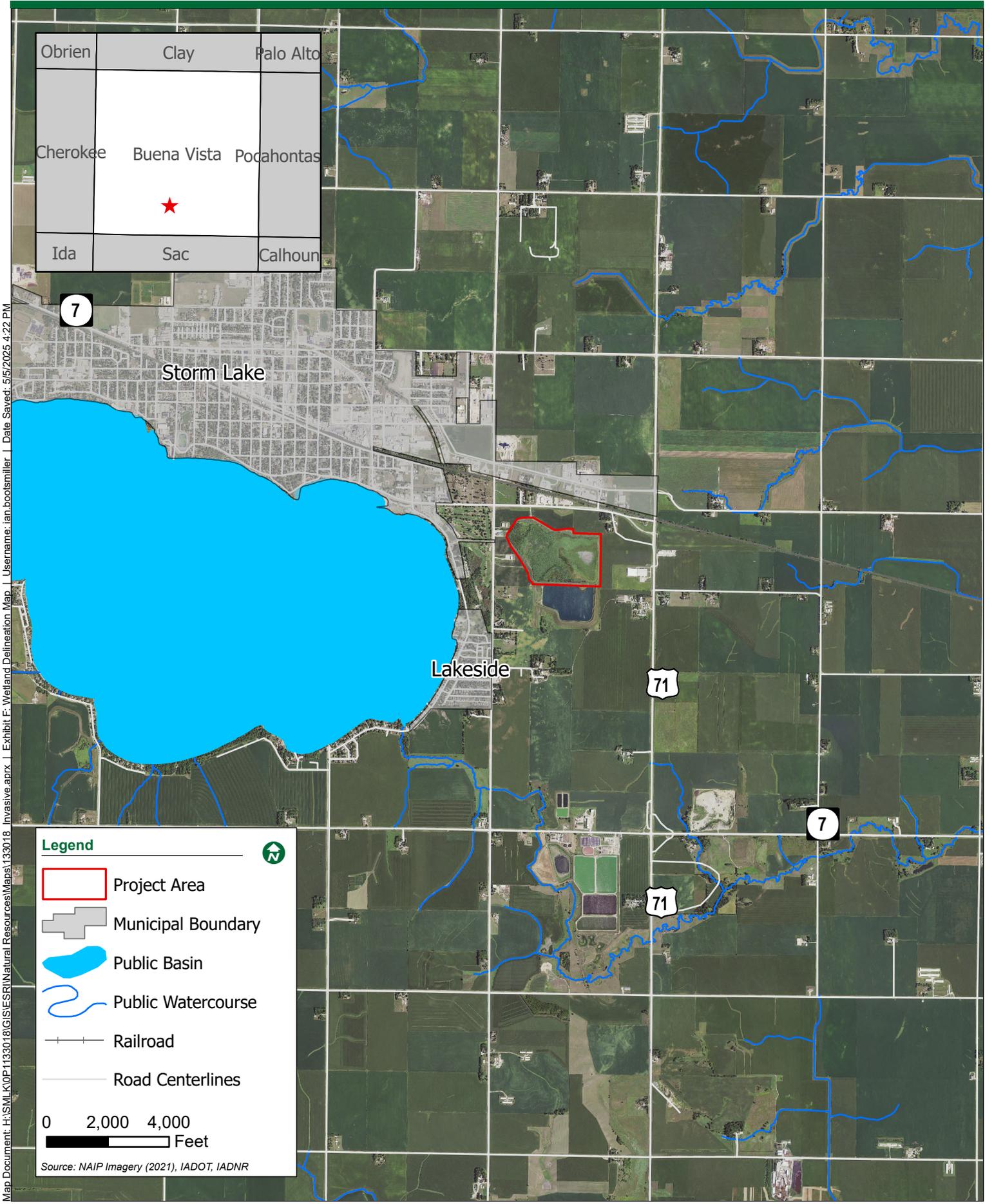
Exhibit C: Seeding Plan

Exhibit D: Monitoring Plan

Appendix B:

Seed Mixes

Appendix A: Exhibits



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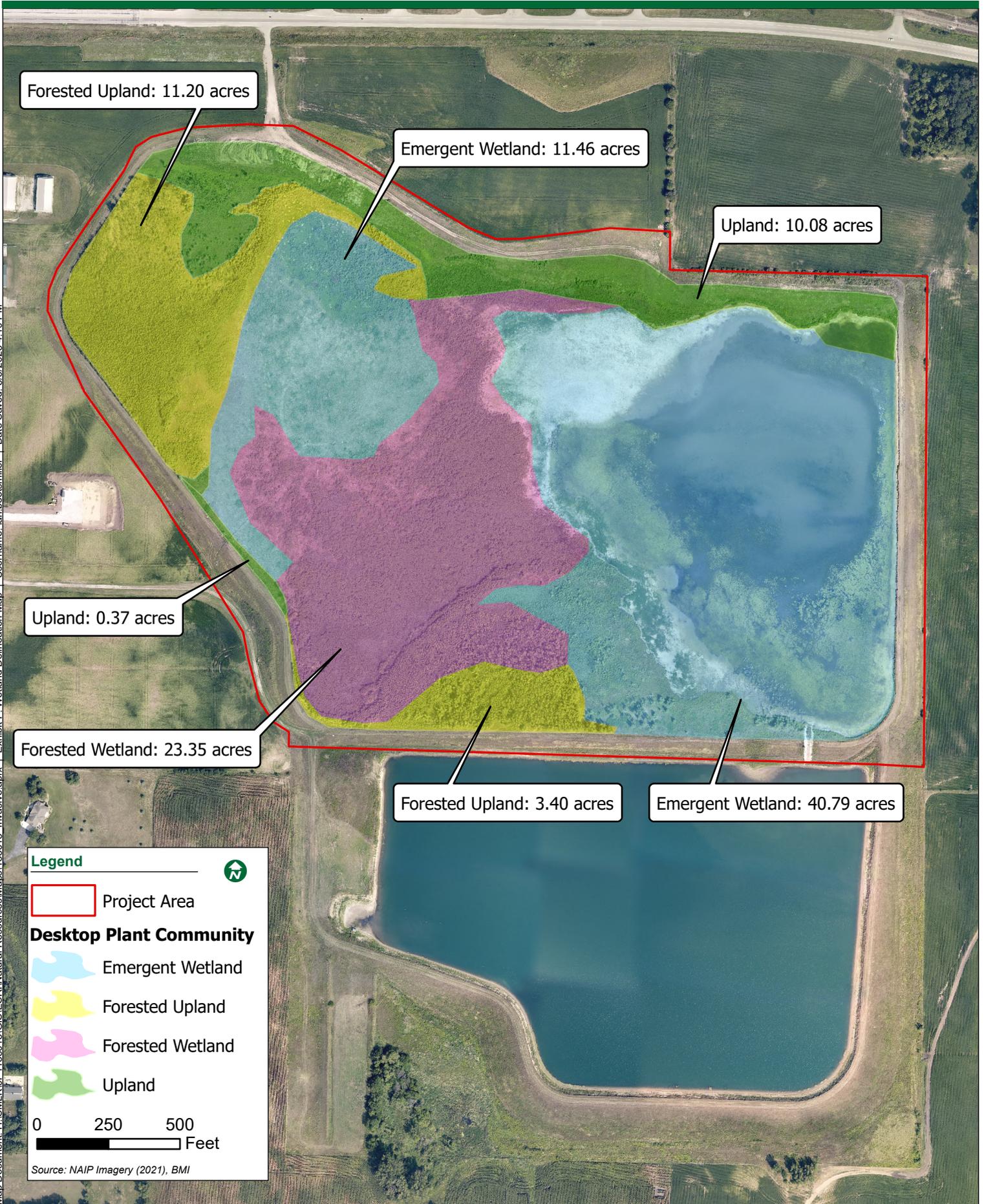
Legend

- Project Area
- Municipal Boundary
- Public Basin
- Public Watercourse
- Railroad
- Road Centerlines

0 2,000 4,000
Feet

Source: NAIP Imagery (2021), IADOT, IADNR

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Legend

N

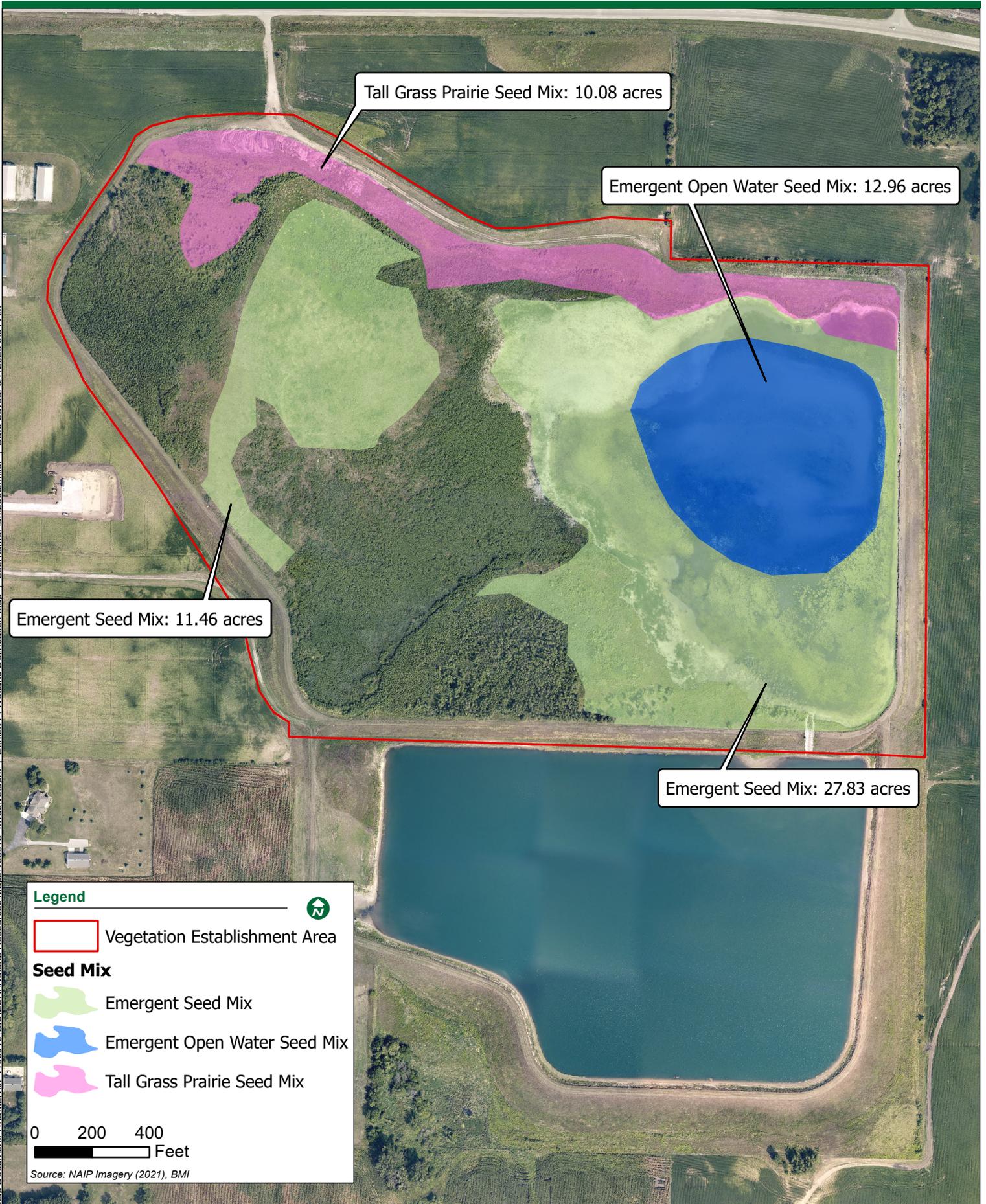
Project Area

Desktop Plant Community

- Emergent Wetland
- Forested Upland
- Forested Wetland
- Upland

0 250 500
Feet

Source: NAIP Imagery (2021), BMI



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Legend

Vegetation Establishment Area

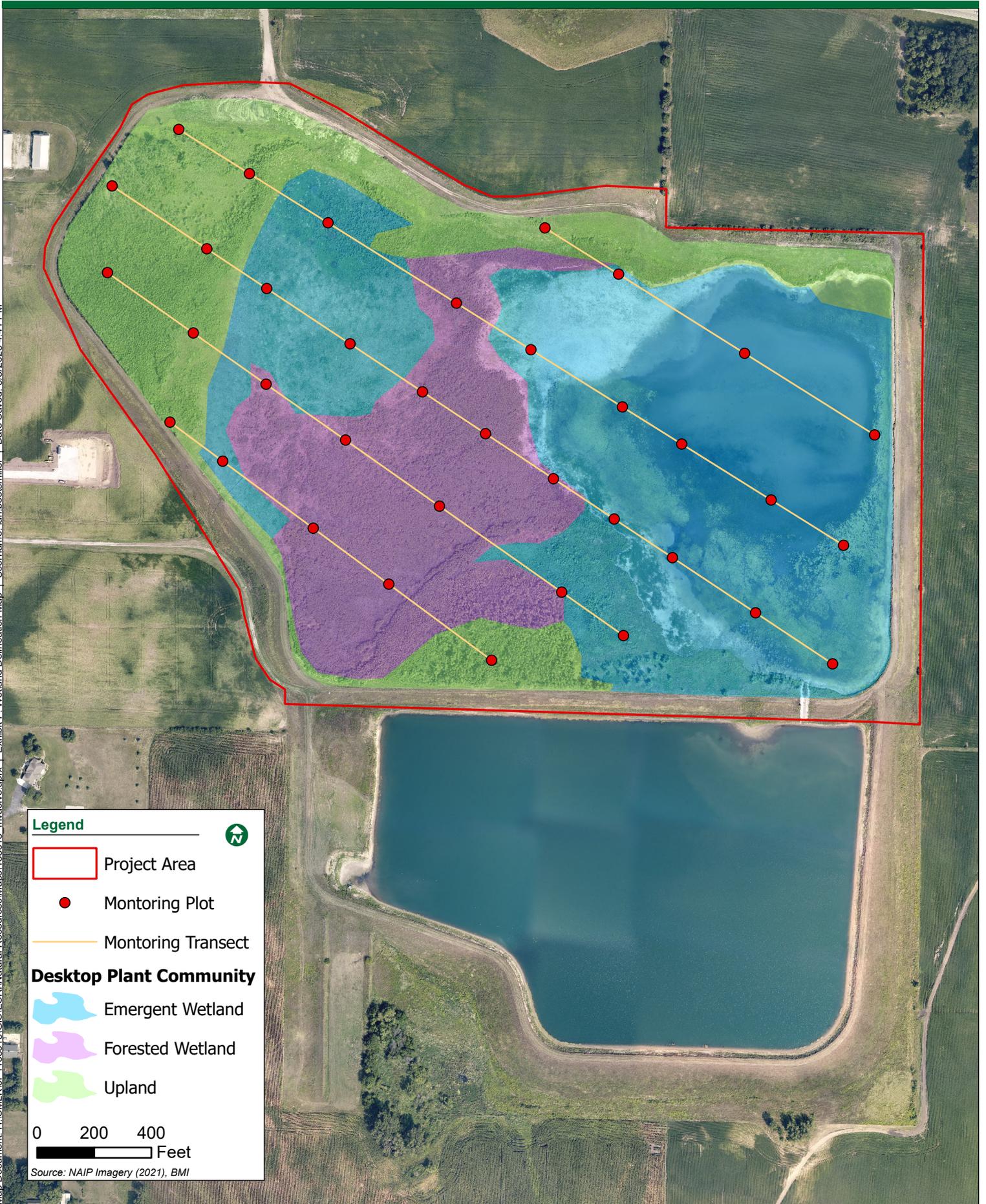
Seed Mix

- Emergent Seed Mix
- Emergent Open Water Seed Mix
- Tall Grass Prairie Seed Mix

0 200 400
Feet

Source: NAIP Imagery (2021), BMI

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Legend

- Project Area
- Monitoring Plot
- Monitoring Transect

Desktop Plant Community

- Emergent Wetland
- Forested Wetland
- Upland

0 200 400
Feet

Source: NAIP Imagery (2021), BMI

Appendix B: Seed Mixes

EMERGENT SEED MIX

EMERGENT SEED MIX					
Grasses	Scientific Name	Common Name	Seeds/Ft ²	PLS Lbs/Acre	PLS Lbs Total
1	<i>Calamagrostis canadensis</i>	Bluejoint	2.057	0.020	0.50
2	<i>Carex lupulina</i>	Hop Sedge	0.097	0.080	2.00
3	<i>Carex bebbii</i>	Bebb's Sedge	0.999	0.080	2.00
4	<i>Carex molesta</i>	Troublesome Sedge	0.367	0.040	1.00
5	<i>Carex vulpinoidea</i>	Fox Sedge	3.673	0.100	2.50
6	<i>Glyceria striata</i>	Fowl Mannagrass	2.938	0.050	1.25
7	<i>Leersia oryzoides</i>	Rice Cutgrass	0.375	0.030	0.75
8	<i>Carex annectens</i>	Yellowfruit Sedge	2.645	0.080	2.00
9	<i>Carex brevior</i>	Shortbeak Sedge	0.533	0.050	1.25
10	<i>Elymus canadensis</i>	Canada Wildrye	0.191	0.100	2.50
11	<i>Elymus virginicus</i>	Virginia Wildrye	0.771	0.500	12.50
12	<i>Carex lurida</i>	Shallow Sedge	0.661	0.150	3.75
13	<i>Juncus dudleyi</i>	Dudley's Rush	2.351	0.002	0.050
14	<i>Spartina pectinata</i>	Prairie Cordgrass	0.242	0.100	2.50
15	<i>Carex tribuloides</i>	Blunt Broom Sedge	2.204	0.05	1.25
SUBTOTAL GRASSES			20.104	1.432	35.800
Forbs/Legum	Scientific Name	Common Name	Seeds/Ft ²	PLS Lbs/Acre	PLS Lbs Total
1	<i>Anemone canadensis</i>	Canadian Anemone	0.235	0.030	0.011
2	<i>Verbena hastata</i>	Blue Vervain	1.025	0.030	0.011
3	<i>Pedicularis lanceolata</i>	Swamp Lousewort	0.485	0.015	0.0056
4	<i>Gentiana andrewsii</i>	Bottle Gentian, Closed Gent	1.543	0.020	0.0075
5	<i>Glycyrrhiza lepidota</i>	Wild Licorice	0.029	0.000	0.00
6	<i>Pycnanthemum virginianum</i>	Common Mountain Mint	2.424	0.000	0.00
7	<i>Physostegia virginiana</i>	False Dragonhead	0.202	0.000	0.00
8	<i>Hypericum ascyron</i>	Giant St. Johnswort	0.698	0.010	0.0037
9	<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	1.286	0.010	0.0037
10	<i>Lobelia siphilitica</i>	Great Lobelia	1.837	0.000	0.00
11	<i>Vernonia fasciculata</i>	Ironweed	0.264	0.002	0.00075
31	<i>Mimulus ringens</i>	Monkey Flower	1.690	0.050	0.019
12	<i>Symphotrichum novae-angliae</i>	New England Aster	1.212	0.150	0.056
13	<i>Liatris pycnostachya</i>	Prairie Blazing Star	0.606	0.000	0.00
14	<i>Eupatorium perfoliatum</i>	Boneset	0.588	0.012	0.0045
15	<i>Asclepias sullivantii</i>	Prairie Milkweed	0.020	0.008	0.0030
16	<i>Silphium perfoliatum</i>	Cup Plant	0.004	0.000	0.00
17	<i>Iris shrevei</i>	Blue Flag	0.073	0.050	0.019
18	<i>Symphotrichum laeve</i>	Smooth Blue Aster	1.010	0.050	1.25
19	<i>Helenium autumnale</i>	Sneezeweed	0.955	0.020	0.50
20	<i>Oligoneuron riddellii</i>	Riddell's Goldenrod	0.342	0.010	0.25
21	<i>Asclepias incarnata</i>	Swamp Milkweed	0.264	0.150	3.75
22	<i>Lythrum alatum</i>	Winged Loosestrife	1.102	0.001	0.025
23	<i>Veronicastrum virginicum</i>	Culver's Root	1.469	0.005	0.13
24	<i>Rudbeckia subtomentosa</i>	Fragrant Coneflower	0.474	0.030	0.75
25	<i>Doellingeria umbellata</i>	Flat-Topped Aster, White Aster	0.738	0.030	0.75
26	<i>Eupatoriadelphus maculatus</i>	Spotted Trumpetweed	1.047	0.030	0.75
27	<i>Ludwigia alternifolia</i>	Seedbox	0.478	0.001	0.025
SUBTOTAL FORBS			22.099	0.714	8.320
TOTAL			42.203	2.506	62.650

OPEN WATER SEED MIX

			PLS	PLS Lbs
Grasses	Scientific Name	Common Name	Lbs/Acre	Total
1	<i>Beckmannia syzigachne</i>	American Sloughgrass	0.060	3.98
2	<i>Glyceria grandis</i>	American Mannagrass	0.040	2.65
3	<i>Calamagrostis canadensis</i>	Bluejoint	0.020	1.33
4	<i>Glyceria striata</i>	Fowl Mannagrass	0.020	1.33
5	<i>Leersia oryzoides</i>	Rice Cutgrass	0.020	1.33
6	<i>Carex hystericina</i>	Bottlebrush Sedge	0.100	6.63
7	<i>Carex lupulina</i>	Hop Sedge	0.200	13.25
8	<i>Carex vulpinoidea</i>	Fox Sedge	0.050	3.31
9	<i>Schoenoplectus acutus</i>	Hardstem Bulrush	0.150	9.94
10	<i>Schoenoplectus tabernaemontani</i>	Softstem Bulrush	0.150	9.94
11	<i>Scirpus atrovirens</i>	Green Bulrush	0.015	0.99
12	<i>Carex comosa</i>	Longhair Sedge	0.100	6.63
SUBTOTAL GRASSES			0.925	61.281
			PLS	PLS Lbs
Forbs/Legum	Scientific Name	Common Name	Lbs/Acre	Total
1	<i>Acorus calamus</i>	Sweetflag	0.200	13.25
2	<i>Alisma subcordatum</i>	Water Plantain	0.250	16.56
3	<i>Sagittaria latifolia</i>	Common Arrowhead	0.150	9.94
4	<i>Lythrum alatum</i>	Winged Loosestrife	0.003	0.20
5	<i>Doellingeria umbellata</i>	Flat-Topped Aster, White A:	0.050	3.31
6	<i>Bidens cernua</i>	Nodding Beggartick	0.030	1.99
7	<i>Boltonia asteroides</i>	White Doll's Daisy	0.040	2.65
8	<i>Eupatoriadelphus maculatus</i>	Spotted Trumpetweed	0.050	3.31
9	<i>Eupatorium perfoliatum</i>	Boneset	0.030	1.99
10	<i>Mimulus ringens</i>	Monkey Flower	0.003	0.20
11	<i>Helenium autumnale</i>	Sneezeweed	0.060	3.98
12	<i>Iris shrevei</i>	Blue Flag	0.100	6.63
13	<i>Verbena hastata</i>	Blue Vervain	0.080	5.30
14	<i>Asclepias incarnata</i>	Swamp Milkweed	0.140	9.28
15	<i>Lobelia siphilitica</i>	Great Lobelia	0.010	0.66
SUBTOTAL FORBS			1.196	79.235
TOTAL			2.120	140.520

TALL GRASS PRAIRIE SEED MIX

Grasses	Scientific Name	Common Name	Seeds/Ft2	PLS	
				Lbs/Acre	Total
1	Sporobolus clandestinus	Rough Dropseed	1.102	0.100	10.250
2	Sorghastrum nutans	Indiangrass	2.204	0.500	51.250
3					
4	Carex molesta	Troublesome Sedge	0.184	0.020	2.050
5	Carex vulpinoidea	Fox Sedge	1.837	0.050	5.125
6	Schizachyrium scoparium	Little Bluestem	5.510	1.000	102.500
7					
8	Carex annectens	Yellowfruit Sedge	2.314	0.070	7.175
9	Carex brevior	Shortbeak Sedge	0.160	0.015	1.538
10	Elymus canadensis	Canada Wildrye	0.764	0.400	41.000
11	Elymus virginicus	Virginia Wildrye	1.543	1.000	102.500
12	Andropogon gerardii	Big Bluestem	4.040	1.100	112.750
13					
14	Panicum virgatum	Switchgrass	0.669	0.130	13.325
SUBTOTAL GRASSES			20.325	4.385	449.463

Forbs Legumes	Scientific Name	Common Name	Seeds/Ft2	PLS	
				Lbs/Acre	Total
1	Astragalus canadensis	Canadian Milkvetch	0.125	0.020	2.050
2	Anemone cylindrica	Candle Anemone	0.096	0.010	1.025
3	Tradescantia ohiensis	Common Spiderwort	0.441	0.150	15.375
4	Heuchera richardsonii	Alumroot	1.286	0.005	0.513
5	Anemone canadensis	Canadian Anemone	0.044	0.015	1.538
6	Glycyrrhiza lepidota	Wild Licorice	0.014	0.010	1.025
7	Pycnanthemum virginianum	Common Mountain Mint	1.616	0.020	2.050
8	Heliopsis helianthoides	Ox-eye	0.463	0.200	20.500
9	Silphium laciniatum	Compass Plant	0.048	0.200	20.500
10	Rudbeckia subtomentosa	Fragrant Coneflower	0.316	0.020	2.050
11	Dalea purpurea	Purple Prairie Clover	0.661	0.100	10.250
12	Verbena stricta	Hoary Vervain	0.206	0.020	2.050
13	Euthamia graminifolia	Grass-leaved Goldenrod	0.643	0.005	0.513
14	Desmodium illinoense	Illinois Ticktrefoil	0.158	0.100	10.250
15	Asclepias syriaca	Common Milkweed	0.016	0.010	1.025
16	Vernonia fasciculata	Ironweed	0.176	0.020	2.050
17	Asclepias tuberosa	Butterfly Milkweed	0.237	0.150	15.375
18	Symphyotrichum novae-angliae	New England Aster	0.485	0.020	2.050
19	Liatris pycnostachya	Prairie Blazing Star	0.808	0.200	20.500
20	Brickellia eupatorioides	False Boneset	0.118	0.010	1.025
21	Euphorbia corollata	Flowering Spurge	0.029	0.010	1.025
22	Penstemon digitalis	Foxglove Penstemon	0.478	0.010	1.025
23	Asclepias sullivantii	Prairie Milkweed	0.017	0.010	1.025
24	Silphium perfoliatum	Cup Plant	0.003	0.005	0.513
25	Lobelia spicata	Spiked Lobelia	0.331	0.001	0.103
26	Thalictrum dasycarpum	Purple Meadow-rue	0.162	0.040	4.100
27	Eryngium yuccifolium	Rattlesnake Master	0.275	0.100	10.250
28	Baptisia alba	White Wild Indigo	0.094	0.150	15.375
29	Rudbeckia hirta	Black-eyed Susan	0.507	0.015	1.538
30	Tradescantia bracteata	Longbract Spiderwort	0.073	0.020	2.050
31	Symphyotrichum laeve	Smooth Blue Aster	0.606	0.030	3.075
32	Oligoneuron riddellii	Riddell's Goldenrod	0.342	0.010	1.025
33	Asclepias incarnata	Swamp Milkweed	0.176	0.100	10.250
34	Echinacea pallida	Pale Coneflower	0.191	0.100	10.250
35	Veronicastrum virginicum	Culver's Root	1.469	0.005	0.513
36	Chamaecrista fasciculata	Partridge Pea	0.198	0.200	20.500
37	Zizia aurea	Golden Alexander's	0.808	0.200	20.500
38	Helianthus grosseserratus	Saw-tooth Sunflower	0.006	0.001	0.103
39	Potentilla arguta	Prairie Cinquefoil	0.845	0.010	1.025
40	Coreopsis palmata	Prairie Coreopsis	0.037	0.010	1.025
41	Phlox pilosa	Prairie Phlox	0.105	0.015	1.538
42	Helianthus rigidum	Prairie Sunflower	0.044	0.030	3.075
43	Lespedeza capitata	Round-headed Bush Clover	0.147	0.050	5.125
44	Desmodium canadense	Showy Ticktrefoil	0.061	0.030	3.075
45	Solidago speciosa	Showy Goldenrod	0.523	0.015	1.538
46	Achillea millefolium	Western Yarrow	0.327	0.005	0.513
47	Oligoneuron rigidum	Stiff Goldenrod	1.205	0.080	8.200
48	Symphyotrichum ericoides	White Heath Aster	0.367	0.005	0.513
49	Monarda fistulosa	Wild Bergamot	0.514	0.020	2.050
50	Ratibida pinnata	Gray-headed Coneflower	1.653	0.150	15.375
51	Artemisia ludoviciana	White Sagebrush	0.092	0.001	0.103
52	Hypericum ascyron	Giant St. Johnswort	0.349	0.005	0.513
SUBTOTAL FORBS			19.988	2.718	278.595

Woody	Scientific Name	Common Name	Seeds/Ft2	PLS	
				Lbs/Acre	Total
1	Amorpha fruticosa	False Indigo	0.014	0.010	1.025
2	Amorpha canescens	Lead Plant	0.176	0.030	3.075
SUBTOTAL WOODY			0.190	0.040	4.100

TOTAL **40.503** **7.143** **732.158**