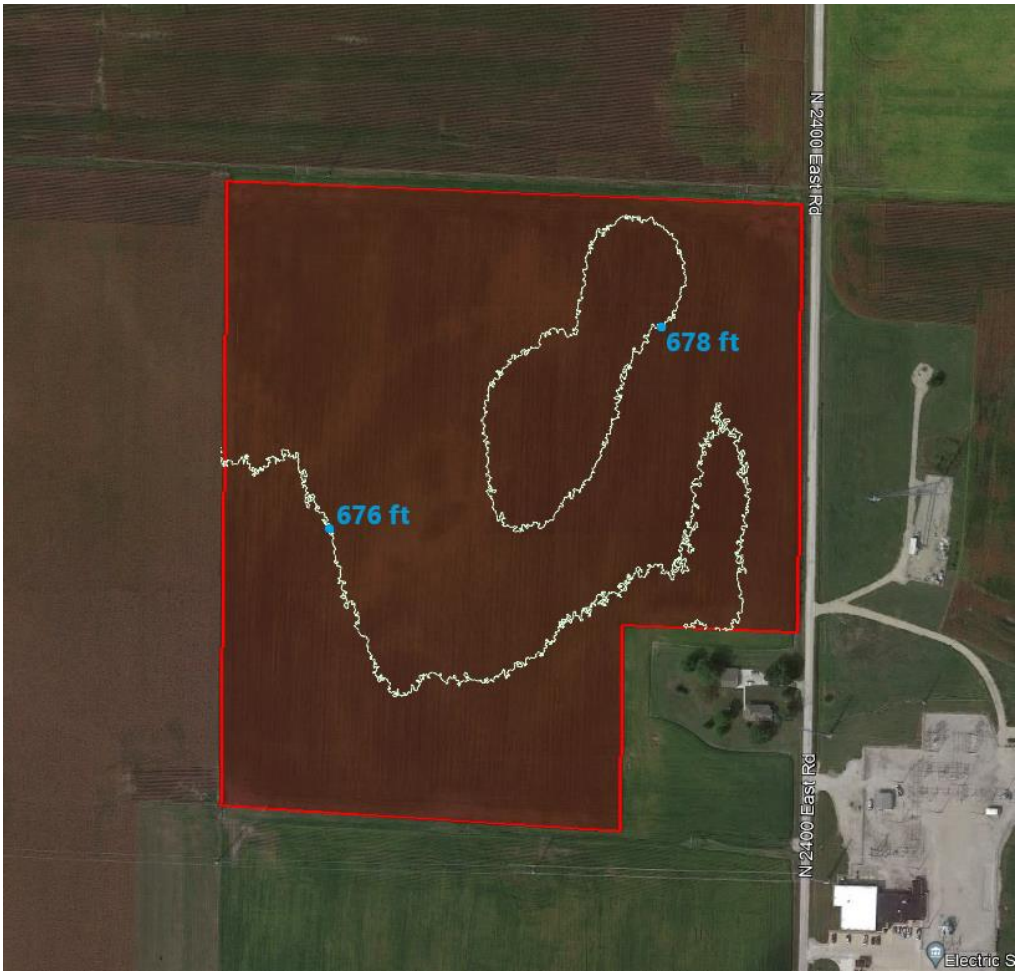
Vegetation Management Plan
North Pana Solar, LLC

GreenKey Development prepared this vegetation management plan for North Pana Solar, LLC in Pana Township, Christian County, Illinois. This plan was developed to meet the expectations of Christian County regarding vegetation management in and around the development of Commercial Solar Energy Facilities (CSEF). The plan is consistent with the goals of the Illinois Pollinator-Friendly Solar Site Act (525 ILCS 55/). This plan provides procedures to plant, establish, and maintain a vegetative ground cover for the life of the CSEF Project. The plan details adherence to the IDNR guidelines for vegetation management and short and long term property management practices that provide and maintain native and non-invasive naturalized perennial vegetation to protect the health and well-being of pollinators. It was developed according to the attached Pollinator Scorecard (as shown on **Exhibit A**). This project achieves a score of 90 on the scorecard, which exceeds the minimum score of 85 required to be recognized as a Pollinator Friendly Solar Site.

Contents

Project Description

1. Overview
    a. Project information: North Pana Solar, LLC is being developed by GreenKey Development, LLC.
    b. Location: This project is located along N 2400 East Rd north of Pana, IL. The GPS coordinates are 89.0836853°W 39.4110979°N. The project will encompass a portion of Christian County parcel identification number 11-25-09-400-004-00.
    c. Size: This project is 4.99 MW alternating current and is located on approximately 35 acres of land.
    d. Land use types on and adjacent to the site: The parcels surrounding this project are predominantly used for agricultural and industrial purposes. To the south, west, and north, the parcels are all used for farming purposes, including annual grain crop production. The land across the street to the east is used for a large electric utility substation and buildings, as well as tall communication towers/antennas. The subject property is bordered by high voltage electric transmission lines on the south side of the property and the north side of the property. There is one single family residence to the east of the project.
    e. Soil type according to USDA-NRCS Soil Survey: The soils in this site include Herrick silt loam, Virden silty clay loam, and Harrison silt loam. See **Exhibit B** for more information.
    f. Topography: The topography on the project area ranges from a maximum elevation of 678 feet to a minimum elevation of 676 feet. A map of the project site that shows contour lines with 2-foot intervals is provided in the image below.



g. Hydrology: There are no wetlands or floodplains on the Property according to the USFWS National Wetland Inventory and the Federal Emergency Management Agency FIRMette.

2. Map: See the detailed Zoning Site Plan submitted with this conditional use permit application for more information on the project site.
3. Site Assessment: The natural resource review provided by EcoCAT (Ecological Compliance Assessment Tool) for the proposed facility was received from the Illinois Department of Natural Resources (IDNR) on February 27, 2023. As stated in the letter, the Illinois Natural Heritage Database showed the protected Franklin's Ground Squirrel may be in the vicinity of the project location. An IDNR staff member further evaluated this potential, and provided a follow-up letter dated March 3, 2023, that stated the "Department has evaluated this information and concluded that adverse effects are unlikely. Therefore, consultation…is terminated." As a result, no further action is necessary. The existing vegetation is an annual grain crop rotation of corn and soybeans. It is anticipated that any existing crops will be harvested before construction of the project. The vegetation will be replaced with native species, as detailed in this report. This project will likely improve water quality in the area, as native prairie species have deeper roots than annual grain crops, which increases infiltration of rainwater into the soil. The deep roots of native prairie species increase the soil's capacity to hold water and significantly decrease runoff from a field as compared to annual grain crop rotations.

4. Vegetation Establishment Goals and Objectives: This site will establish native, pollinator-friendly vegetation in order to maximize community benefits. These benefits include but are not limited to reduced stormwater runoff, flooding, and erosion at the ground-mounted solar energy system, improved soil health, and increased foraging habitat for game birds, songbirds, and pollinators.

Site Preparation

1. Vegetation control
    a. As of the date of this plan, there is no existing vegetation on the property where the solar facility will be located. In 2023, the crop was corn.
    b. Any existing nonnative vegetation will be removed prior to native seed planting. This will be achieved through selective application (i.e., spot application rather than routine broadcast spraying) of chemical herbicides. Herbicide will be applied in strict compliance with all warning labels and applicable codes, standards, and best management practices.
    c. The herbicide glyphosate (brand name RoundUp) will be used to treat weeds prior to seed broadcast and as necessary to prevent the establishment of weeds throughout the life of the project. To increase the effectiveness of the herbicide, ammonium sulfate will be added to the water prior to the addition of the herbicide at a rate of 8.5 to 17 pounds per 100 gallons of water. Glyphosate will be applied at the standard application rate of 0.75 pounds acid equivalent (a.e.) per acre. A formulation of glyphosate will be used that already contains surfactants at the appropriate rates.[1]
2. Seed bed preparation: The site will be bare ground when seeds are planted to promote the best germination rates. Any eroded gullies or washes will be worked and smoothed.
3. Erosion control: For areas with erosion potential, a cover crop such as oats or ReGreen will be sown.

[1] Source: Wessel, J. (n.d.). *Glyphosate Use for Optimum Field Performance*. Pioneer. https://www.pioneer.com/us/agronomy/glyphosate_use_optimum_field_performance.html

Vegetation Establishment

1. Seed mix species list for all species[2]: Seed mixes are likely to be based upon the following when available. The exact makeup of the mixes may be updated as approved by a vegetation consultant. Any seed mix changes will not result in a score below 85 on the pollinator scorecard.
    a. In Between and Under Panels

Common Name	**Scientific Name**	**Type**	**Seeds per ft^2**
Side-Oats Grama	*Bouteloua curtipendula*	Grass/Sedge	1.74
Sand Lovegrass	Eragrostis trichodes	Grass/Sedge	2.49
Prairie Junegrass	Koeleria macrantha	Grass/Sedge	0.67
Little Bluestem	*Schizachyrium scoparium*	Grass/Sedge	3.51
Composite Dropseed	Sporobolus compositus	Grass/Sedge	1.65
Canadian Milkvetch	Astragalus canadensis	Forb/Flower	0.11
Partridge Pea	*Chamaecrista fasciculata*	Forb/Flower	0.17
White Prairie Clover	*Dalea candida*	Forb/Flower	0.07
Purple Prairie Clover	*Dalea purpurea*	Forb/Flower	0.19
Illinois Bundleflower	*Desmanthus illinoensis*	Forb/Flower	0.14
Showy Ticktrefoil	*Desmodium canadense*	Forb/Flower	0.20
Common Milkweed	*Asclepias syriaca*	Forb/Flower	0.30
Butterfly Milkweed	*Asclepias tuberosa*	Forb/Flower	0.02
Lanceleaf Tickseed Coreopsis	*Coreopsis lanceolata*	Forb/Flower	1.47
Eastern Purple Coneflower	*Echinacea purpurea*	Forb/Flower	0.24
Dense Blazing Star	*Liatris spicata*	Forb/Flower	0.40
Wild Bergamot	*Monarda fistulosa*	Forb/Flower	0.83
Stiff Goldenrod	*Oligoneuron rigidum*	Forb/Flower	0.15
Foxglove Beardtongue	*Penstemon digitalis*	Forb/Flower	0.24
Tall Cinquefoil	*Potentilla arguta*	Forb/Flower	0.84
Narrowleaf Mountainmint	*Pycnanthemum tenuifolium*	Forb/Flower	1.39
Virginia Mountainmint	*Pycnanthemum virginianum*	Forb/Flower	0.08
Pinnate Prairie Coneflower	*Ratibida pinnata*	Forb/Flower	0.14
Black-Eyed Susan	*Rudbeckia hirta*	Forb/Flower	2.17
Browneyed Susan	*Rudbeckia triloba*	Forb/Flower	0.13
Gray Goldenrod	*Solidago nemoralis*	Forb/Flower	0.33
Smooth Blue Aster	*Symphyotrichum laeve*	Forb/Flower	0.037
Calico Aster	*Symphyotrichum lateriflorum*	Forb/Flower	0.46
New England Aster	*Symphyotrichum novae-angliae*	Forb/Flower	0.48
Bluejacket Spiderwort	*Tradescantia ohiensis*	Forb/Flower	0.003
Hoary Verbena	*Verbena stricta*	Forb/Flower	0.12
Culver's Root	*Veronicastrum virginicum*	Forb/Flower	0.28
Golden Zizia	*Zizia aurea*	Forb/Flower	0.09
Leadplant	*Amorpha canescens*	Sub-Shrub/Legume	0.09

[2] Seed mixes prepared by Illinois Pheasants/Quail Forever. See **Exhibit C** and **Exhibit D** for more details.

b. Perimeter and Buffer

Common Name	**Scientific Name**	**Type**	**Seeds per ft^2**
Big Bluestem	Andropogon gerardii	Grass/Sedge	1.64
Side-Oats Grama	*Bouteloua curtipendula*	Grass/Sedge	0.87
Sand Lovegrass	Eragrostis trichodes	Grass/Sedge	1.42
Switchgrass	Panicum virgatum	Grass/Sedge	2.75
Little Bluestem	Schizachyrium scoparium	Grass/Sedge	2.34
Indiangrass	Sorghastrum nutans	Grass/Sedge	0.98
Canadian Milkvetch	Astragalus canadensis	Forb/Flower	0.11
Partridge Pea	*Chamaecrista fasciculata*	Forb/Flower	0.17
White Prairie Clover	*Dalea candida*	Forb/Flower	0.07
Purple Prairie Clover	*Dalea purpurea*	Forb/Flower	0.19
Illinois Bundleflower	*Desmanthus illinoensis*	Forb/Flower	0.14
Showy Ticktrefoil	*Desmodium canadense*	Forb/Flower	0.20
Common Milkweed	*Asclepias syriaca*	Forb/Flower	0.03
Butterfly Milkweed	*Asclepias tuberosa*	Forb/Flower	0.02
Lanceleaf Tickseed Coreopsis	*Coreopsis lanceolata*	Forb/Flower	1.47
Eastern Purple Coneflower	*Echinacea purpurea*	Forb/Flower	0.24
Dense Blazing Star	*Liatris spicata*	Forb/Flower	0.40
Wild Bergamot	*Monarda fistulosa*	Forb/Flower	0.83
Stiff Goldenrod	*Oligoneuron rigidum*	Forb/Flower	0.15
Foxglove Beardtongue	*Penstemon digitalis*	Forb/Flower	0.24
Tall Cinquefoil	*Potentilla arguta*	Forb/Flower	0.84
Narrowleaf Mountainmint	*Pycnanthemum tenuifolium*	Forb/Flower	1.39
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Pinnate Prairie Coneflower	*Ratibida pinnata*	Forb/Flower	0.14
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Browneyed Susan	*Rudbeckia triloba*	Forb/Flower	0.13
Gray Goldenrod	*Solidago nemoralis*	Forb/Flower	0.33
Smooth Blue Aster	*Symphyotrichum laeve*	Forb/Flower	0.04
Calico Aster	*Symphyotrichum lateriflorum*	Forb/Flower	0.46
New England Aster	*Symphyotrichum novae-angliae*	Forb/Flower	0.05
Bluejacket Spiderwort	*Tradescantia ohiensis*	Forb/Flower	0.003
Hoary Verbena	*Verbena stricta*	Forb/Flower	0.12
Culver's Root	*Veronicastrum virginicum*	Forb/Flower	0.28
Golden Zizia	*Zizia aurea*	Forb/Flower	0.09
Leadplant	*Amorpha canescens*	Sub-Shrub/Legume	0.09

2. Rates of pure live seed (PLS) for each species: All seeds in this mix are 100% Pure Live Seed (PLS).
3. Seeds per square foot of each species: see 1.a. and 1.b. above.
4. Map showing the different seed mix locations: See **Exhibit E**.
5. Method used to sow seed: The ground will be worked fine and then a mechanical broadcaster will be used to spread the seeds throughout the site. A roller will be used to press the seeds into the soil until the ground is firm but not hard. Another method may be used to sow the seed if approved by a vegetation consultant prior to planting.

6. Seed sowing dates: Seeds will be planted either in the fall or spring. If they are planted in the fall, they will be planted late enough to prevent germination, usually after the first killing frost. If they are planted in the spring, they will be planted in late spring after the danger of frost has passed.
7. Erosion control (during vegetation establishment): A cover crop of oats, ReGreen, or a similar crop will be sown to control erosion during vegetation establishment. Living vegetation significantly decreases runoff and erosion by slowing water running across the surface of the soil and encouraging infiltration of rainwater into the soil.
8. Cover crop species and rate: If necessary, a cover crop such as oats or ReGreen will be seeded along with the pollinator mix to prevent establishment of undesirable species. The cover crop will be seeded at a rate of at least 10 seeds per square foot.

Monitoring and Maintenance

1. Methods to ensure vegetation establishment:
    a. Short-term maintenance: Seeds will be watered regularly for the first 6-8 weeks to promote proper establishment and germination of the seeds. During the first year, the site may be mown at a height of 10" or greater 1-3 times during the growing season if undesirable weeds are overtopping the newly established seedlings. Spot spraying will be used to control noxious weeds. If the percentage of native plants drops below 25%, the site will be seeded with the original seed mix at a rate of 20 seeds per square foot.
    b. Long-term maintenance: After the first year, Annual mowing will be properly timed and kept to a minimum to avoid disturbance of wildlife and native vegetation but frequent enough to prevent the establishment of weeds, trees, and shrubs that may be introduced by seed over time. Annual mowing will occur once a year, after October 15th and before April 15th, when most native plants have already flowered and gone to seed, and native birds have not begun nesting. Spot-spraying will be used to prevent establishment of noxious weeds and other undesirable species.
2. Erosion Control: Once native plants are established, no further action will be needed to prevent erosion. Living vegetation significantly decreases runoff and erosion by slowing water running across the surface of the soil and encouraging infiltration of rainwater into the soil. Native prairie species have much deeper roots than annual grain crops such as corn and soybeans, so the site will have significantly improved drainage as compared to the same site producing corn. If the density of plants within the site drops to such a degree that erosion may be an issue, the site will be reseeded with the original seed mix at a rate of 20 seeds per square foot.
3. Monitoring schedule: Throughout the growing season, the site will be monitored on a monthly basis for the first year.
4. Management schedule: The management practices will be determined based on the results of monitoring. All care will be taken to minimize the amount of mowing and herbicides used on the site. If monitoring shows the percentage of native plants

dropping below 25%, the site will be reseeded with the original seed mix at a rate of 20 seeds per square foot.

5. Herbicide: The herbicide glyphosate (brand name RoundUp) will be used as necessary to prevent the establishment of weeds throughout the life of the project. To increase the effectiveness of the herbicide, ammonium sulfate will be added to the water prior to the addition of the herbicide at a rate of 8.5 to 17 pounds per 100 gallons of water. Glyphosate will be applied at the standard application rate of 0.75 pounds acid equivalent (a.e.) per acre. A formulation of glyphosate will be used that already contains surfactants at the appropriate rates.[3]
6. Pesticide drift: The site will be listed on fieldwatch.com to prevent insecticide drift. No insecticide will be used on-site or on seeds prior to planting (excluding around buildings or electrical boxes).

Exhibits

Exhibits A through E are on the following pages.

[3] Source: Wessel, J. (n.d.). *Glyphosate Use for Optimum Field Performance*. Pioneer. https://www.pioneer.com/us/agronomy/glyphosate_use_optimum_field_performance.html

Exhibit A: Pollinator Scorecard

[*Exhibit A Begins on Following Page*]

Illinois Solar Site Pollinator Habitat Planning Form

Use this form as a draft before completing the *Illinois Planned Pollinator Habitat on Solar Sites Scorecard* online

In Between and Under Solar Panels

1. PLANNED PLANT DIVERSITY IN ROWS & UNDER SOLAR ARRAY (choose up to 2)
   - ☐ 4-6 species +5 pts
   - ☒ 7 or More species +8 pts
   - ☐ All Native Species (minimum 4 species) +10 pts

Perimeter and Buffer Area

2. VEGETATIVE BUFFER PLANNED ADJACENT TO THE SOLAR SITE (choose all that apply)
   - ☐ Buffer planned outside of array fencing +5 pts
   - ☐ Buffer is 30-49ft wide measured from array fencing +5 pts
   - ☐ Buffer is at least 50ft wide measured from array fencing +10 pts
   - ☐ Buffer has Native shrubs/trees that provide food for wildlife +5 pts

3. SEEDS USED FOR NATIVE PERIMETER & BUFFER AREAS (choose all that apply)
   - ☒ Mixes are seeded using at least 20 seeds per square foot of Pure Live Seed or 40 Seeds per square foot on slopes > 5% +10 pts
   - ☐ All seeds are from a source within 150 miles of site +5 pts
   - ☐ At least 2% milkweed cover is planned to be established from seeds/plants +5 pts

4. PLANNED # OF NATIVE SPECIES IN SITE PERIMETER & BUFFER AREA (species with more than 1% cover)(choose 1)
   - ☐ 5-10 species +2 pts
   - ☐ 10-15 species +5 pts
   - ☐ 16-20 species +10 pts
   - ☒ >20 species +15 pts

Exclude invasive and non-native plant species from total

5. PLANNED PERCENT OF PERIMETER & BUFFER AREA DOMINATED BY NATIVE PLANT SPECIES (choose 1)
   - ☐ 26- 50 % +2 pts
   - ☐ 51-75 % +10 pts
   - ☐ More than 75% +15 pts

Whole Site

6. PLANNED PERCENT OF SITE VEGETATION COVER TO BE DOMINATED BY DESIRABLE WILDFLOWERS (choose 1)
   - ☐ 26- 50 % +2 pts
   - ☐ 51-75 % +10 pts
   - ☐ More than 75% +15 pts

7. PLANNED SEASONS WITH AT LEAST THREE BLOOMING NATIVE SPECIES PRESENT (choose all that apply)
   - ☒ Spring (April-May) +5 pts
   - ☒ Summer (June-August) +5 pts
   - ☒ Fall (September-October) +5 pts

8. HABITAT SITE PREPARATION PRIOR TO IMPLEMENTATION (choose all that apply)
   - ☒ Soil preparation done to promote germination and reduce erosion as appropriate for the site. +10 pts
   - ☒ Measures taken to control weeds prior to seeding +10 pts
   - ☐ None -10 pts

9. AVAILABLE HABITAT COMPONENTS WITHIN 0.25 MILES (choose all that apply)
   - ☐ Native bunch grass for bee nesting +2 pts
   - ☒ Native trees/shrubs for bee nesting +2 pts
   - ☒ Clean, perennial water sources +2 pts
   - ☐ Created habitat nesting features +2 pts

10. SITE PLANNING AND MANAGEMENT(choose all that apply)
    - ☒ Detailed establishment and management plan developed +10 pts
    - ☒ Signage legible at forty or more feet stating “pollinator friendly solar habitat” +3 pts

11. INSECTICIDE RISK (choose all that apply)
    - ☐ Planned on-site use of insecticide or pre-planting seed/plant treatment (excluding buildings/electrical boxes, etc.) -40 pts
    - ☒ Communication/registration with local chemical applicators or on www.fieldwatch.com to prevent drift +5 pts

Total Points: 90

Meets Preliminary Pollinator Standards - 85
Provides Exceptional Habitat - 110 and higher

Owner: North Pana Solar, LLC
Vegetation Consultant: Quail and Pheasants Forever
Project Location: Pana, IL
Project Size: 35 **acres**
Final Seeding Date: TBD

This form is designed (with the help of the Solar Site Pollinator Guidelines found on IDNR’s website) to guide owners or managers of solar sites to meet the requirements to be able to claim a site is pollinator friendly according to the “Pollinator Friendly Solar Site Act (525 ILCS 55)”. This form is for company records only and does not grant the title of a Pollinator Friendly Solar Site until the “Illinois Planned Pollinator Habitat on Solar Sites Scorecard” is completed with a score of 85 or higher on IDNR’s website. This preliminary recognition is good for 3yrs, after which the “Established Pollinator Habitat on Solar Sites Scorecard” will need to be completed every 5 years to maintain recognition as a Pollinator Friendly Solar Site.

12/3/2019

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Exhibit B: USDA-NRCS Soils Survey

[*Exhibit B Begins on Following Page*]

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Christian County, Illinois

March 7, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Map Scale: 1:2,970 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 40 80 160 240

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Christian County, Illinois
Survey Area Data: Version 17, Aug 28, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 1, 2020—Oct 1, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (North Pana Solar, LLC)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
46A	Herrick silt loam, 0 to 2 percent slopes	25.8	73.0%
50A	Virden silty clay loam, 0 to 2 percent slopes	3.4	9.6%
127B	Harrison silt loam, 2 to 5 percent slopes	6.2	17.4%
Totals for Area of Interest		**35.4**	**100.0%**

Map Unit Descriptions (North Pana Solar, LLC)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate

pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Christian County, Illinois

46A—Herrick silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tbs2
Elevation: 330 to 820 feet
Mean annual precipitation: 38 to 46 inches
Mean annual air temperature: 52 to 58 degrees F
Frost-free period: 180 to 195 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Herrick and similar soils: 92 percent
Minor components: 8 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Herrick

Setting

Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess over silty pedisediment

Typical profile

Ap - 0 to 13 inches: silt loam
Btg - 13 to 39 inches: silty clay loam
Bt - 39 to 60 inches: silty clay loam
2C - 60 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0
Available water supply, 0 to 60 inches: High (about 10.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R114XB902IN - Wet Upland Prairie
Hydric soil rating: No

Minor Components

Virden

Percent of map unit: 4 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: R114XB902IN - Wet Upland Prairie
Hydric soil rating: Yes

Piasa

Percent of map unit: 3 percent
Landform: Depressions, ground moraines
Landform position (two-dimensional): Toeslope, summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R114XB901IN - Sodium Affected Uplands
Hydric soil rating: Yes

Cowden

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R113XY903IL - Wet Upland Prairie
Hydric soil rating: Yes

50A—Virden silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tw8q
Elevation: 430 to 790 feet
Mean annual precipitation: 36 to 41 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 180 to 190 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Virden and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Virden

Setting

Landform: Ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loess

Typical profile

Ap - 0 to 16 inches: silty clay loam
Btg - 16 to 49 inches: silty clay loam
Cg - 49 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C/D
Ecological site: R108XB009IL - Ponded Loess Sedge Meadow
Hydric soil rating: Yes

Minor Components

Ipava

Percent of map unit: 4 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R108XB008IL - Wet Loess Upland Prairie
Hydric soil rating: No

Herrick

Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R114XB902IN - Wet Upland Prairie
Hydric soil rating: No

Piasa

Percent of map unit: 2 percent
Landform: Ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Interfluve, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R113XY903IL - Wet Upland Prairie
Hydric soil rating: Yes

Timewell

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R115XC002IL - Loess Upland Prairie
Hydric soil rating: No

127B—Harrison silt loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: 316ws
Elevation: 340 to 1,200 feet
Mean annual precipitation: 37 to 46 inches
Mean annual air temperature: 54 to 57 degrees F
Frost-free period: 190 to 225 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Harrison and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Harrison

Setting

Landform: Knolls, ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess over pedisediment over paleosol developed in till

Typical profile

Ap - 0 to 10 inches: silt loam
Bt1 - 10 to 45 inches: silty clay loam
2Bt2 - 45 to 65 inches: silty clay loam
3Btg - 65 to 79 inches: clay loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 20 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R108XB005IL - Loess Upland Prairie
Hydric soil rating: No

Minor Components

Virden

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R108XB009IL - Ponded Loess Sedge Meadow
Hydric soil rating: Yes

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Exhibit C: In Between and Under Panels Seed Mix

[*Exhibit C Begins on Following Page*]

Customize Options to Suit Site Conditions

Pick an Ecoregion

○ Xeric (dry) ◉ Mesic (medium) ○ Hydric (wet)

○ Prairie ○ Savanna ○ Wetland ○ Woodland

○ Long Term Program ○ Short Term Program

○ Monarch Preferred Species
○ Forage and Biomass (512) Planting

CHOOSE A RATE SPECIFICATION:

◉ lbs/acre PLS (check a mix) ○ Seeds/ft2 PLS (design a mix)

To override default cost, enter your cost in the applicable cell.

United States Department of Agriculture
Natural Resources Conservation Service

Criteria Revision Update 5/26/2020
Species Information Update 8/26/2021

CHOOSE YOUR GRASSES

Input quantity

	Common Name *Select Plants (Click)	Scientific Name Growth Form	Lbs / acre PLS	Seeds / ft2 PLS	Coefficient of Conservatism	Estimated Cost ($/lb)	# Seeds / ft² @ 1 lb. / ac	Pure Stand PLS Rate lbs / ac	% of Mix	Estimated Cost ($/ac)	Functional Group
			Equivalent rate below								
1	**Grama, Sideoats**	***Bouteloua curtipendula***	**0.40**		7	$9	4.4	8.0	8.6%	$4	Perennial Warm Season Grass
		Rhizomatous		**1.74**							
2	**Lovegrass, Sand**	***Eragrostis trichodes***	**0.070**		5	$75	35.6	1.0	12.3%	$5	Perennial Warm Season Grass
		Bunch		**2.49**							
3	**Junegrass, Prairie**	***Koeleria macrantha***	**0.020**		7	$75	33.6	1.0	3.3%	$2	Perennial Cool Season Grass
		Bunch		**0.67**							
4	**Bluestem, Little**	***Schizachyrium scoparium***	**0.60**		5	$12	5.9	6.0	17.4%	$7	Perennial Warm Season Grass
		Bunch		**3.51**							
5	**Dropseed, Composite**	***Sporobolus compositus***	**0.15**		3	$17	11.0	3.2	8.2%	$3	Perennial Warm Season Grass
		Bunch		**1.65**							
6										$0.00	
7										$0.00	
8										$0.00	
9										$0.00	
10										$0.00	
11										$0.00	
12										$0.00	
13										$0.00	
14										$0.00	
15										$0.00	
16										$0.00	
17										$0.00	
18										$0.00	
19										$0.00	
20										$0.00	
21										$0.00	
22										$0.00	
23										$0.00	
24										$0.00	
25										$0.00	

25										$0.00	
27										$0.00	
28										$0.00	
29										$0.00	
30										$0.00	

	Species Richness	lbs / acre PLS	seeds / ft^2 PLS	Average CC			
GRAMINOID TOTAL	5	1.24	10.07	5.4	ESTIMATED GRAMINOID COST ($/AC)	OST ($/AC)	$20

CHOOSE YOUR FORBS/LEGUMES

Input quantity

	Common Name *Select Plants (Click)	Scientific Name *Select Bloom Period below Scientific Name	Lbs / acre PLS	Seeds / ft2 PLS	Coefficient of Conservatism	Estimated Cost ($/lb)	# Seeds / ft^2 @ 1 lb. / ac	Pure Stand PLS Rate lbs / ac	% of Mix	Estimated Cost ($/ac)	Functional Group	Monarch Preferred
			Equivalent rate below									
1	Milkvetch, Canadian	*Astragalus canadensis*	0.020		7	$120	5.7	6.1	0.6%	$2	Perennial Forb, Legume	
	Input bloom period ->	Mid		0.11								
2	Partridge Pea	*Chamaecrista fasciculata*	0.15		1	$25	1.1	30.7	0.8%	$4	Annual Forb, Legume	
	Input bloom period ->	Mid		0.17								
3	Prairie Clover, White	*Dalea candida*	0.010		9	$90	7.0	5.0	0.3%	$0.90	Perennial Forb, Legume	X
	Input bloom period ->	Mid		0.070								
4	Prairie Clover, Purple	*Dalea purpurea*	0.030		8	$45	6.2	5.6	0.9%	$1	Perennial Forb, Legume	X
	Input bloom period ->	Late		0.19								
5	Bundleflower, Illinois	*Desmanthus illinoensis*	0.10		4	$45	1.4	25.1	0.7%	$5	Perennial Forb, Legume	
	Input bloom period ->	Mid		0.14								
6	Ticktrefoil, Showy	*Desmodium canadense*	0.10		5	$150	2.0	17.3	1.0%	$15	Perennial Forb, Legume	
	Input bloom period ->	Mid		0.20								
7	Milkweed, Common	*Asclepias syriaca*	0.020		0	$120	1.5	23.8	0.1%	$2	Perennial Forb	X
	Input bloom period ->	Mid		0.029								
8	Milkweed, Butterfly	*Asclepias tuberosa*	0.010		5	$300	1.6	22.2	0.1%	$3	Perennial Forb	X
	Input bloom period ->	Mid		0.016								
9	Coreopsis, Lanceleaf Tickseed	*Coreopsis lanceolata*	0.20		5	$1,280	7.3	4.8	7.3%	$256	Perennial Forb	X
	Input bloom period ->	Mid		1.47								
10	Coneflower, Eastern Purple	*Echinacea purpurea*	0.10		6	$45	2.4	14.4	1.2%	$5	Perennial Forb	X
	Input bloom period ->	Mid		0.24								
11	Blazing Star, Dense	*Liatris spicata*	0.010		7	$150	4.0	8.7	0.2%	$2	Perennial Forb	X
	Input bloom period ->	Mid		0.040								
12	Bergamot, Wild	*Monarda fistulosa*	0.030		4	$150	27.5	1.3	4.1%	$5	Perennial Forb	X
	Input bloom period ->	Late		0.83								
13	Goldenrod, Stiff	*Oligoneuron rigidum*	0.010		4	$225	15.1	2.3	0.7%	$2	Perennial Forb	X
	Input bloom period ->	Late		0.15								
14	Beardtongue, Foxglove	*Penstemon digitalis*	0.0050		4	$150	47.8	0.7	1.2%	$0.75	Perennial Forb	
	Input bloom period ->	Early		0.24								
15	Cinquefoil, Tall	*Potentilla arguta*	0.010		10	$120	84.5	0.4	4.2%	$1	Perennial Forb	
	Input bloom period ->	Mid		0.84								
16	Mountainmint, Narrowleaf	*Pycnanthemum tenuifolium*	0.010		4	$450	138.8	0.3	6.9%	$5	Perennial Forb	X
	Input bloom period ->	Late		1.39								
17	Mountainmint, Virginia (Common)	*Pycnanthemum virginianum*	0.0010		5	$450	80.8	0.4	0.4%	$0.45	Perennial Forb	X
	Input bloom period ->	Late		0.081								
18	Coneflower, Pinnate Prairie (Gray-heade	*Ratibida pinnata*	0.010		4	$60	14.3	2.4	0.7%	$0.60	Perennial Forb	
	Input bloom period ->	Mid		0.14								
19	Susan, Black-eyed	*Rudbeckia hirta*	0.063		2	$45	34.4	1.0	10.7%	$3	Biennial Forb	X
	Input bloom period ->	Mid		2.17								
20	Susan, Browneyed	*Rudbeckia triloba*	0.010		3	$90	12.9	2.7	0.6%	$0.90	Biennial Forb	X
	Input bloom period ->	Late		0.13								
21	Goldenrod, Gray (Field)	*Solidago nemoralis*	0.0030		3	$600	110.2	0.3	1.6%	$2	Perennial Forb	X
	Input bloom period ->	Late		0.33								
22	Aster, Smooth Blue	*Symphyotrichum laeve*	0.0020		8	$300	18.4	1.9	0.2%	$0.60	Perennial Forb	X
	Input bloom period ->	Late		0.037								

23	**Aster, Calico**	***Symphyotrichum lateriflorum***	**0.0050**		2	$600	91.8	0.4	2.3%	$3	Perennial Forb	X
	Input bloom period ->	Late		**0.46**								
24	**Aster, New England**	***Symphyotrichum novae-angliae***	**0.0020**		4	$300	24.2	1.4	0.2%	$0.60	Perennial Forb	X
	Input bloom period ->	Late		**0.048**								
25	**Spiderwort, Bluejacket (Ohio)**	***Tradescantia ohiensis***	**0.0010**		3	$300	2.9	11.9	0.0%	$0.30	Perennial Forb	
	Input bloom period ->	Early		**0.0029**								
26	**Verbena, Hoary**	***Verbena stricta***	**0.010**		2	$75	12.3	2.9	0.6%	$0.75	Perennial Forb	X
	Input bloom period ->	Late		**0.12**								
27	**Culver's Root**	***Veronicastrum virginicum***	**0.0010**		6	$1,200	275.5	0.1	1.4%	$1	Perennial Forb	X
	Input bloom period ->	Mid		**0.28**								
28	**Zizia, Golden (Alexander's)**	***Zizia aurea***	**0.020**		6	$120	4.4	7.9	0.4%	$2	Perennial Forb	
	Input bloom period ->	Early		**0.088**								
29										$0.00		
	Input bloom period ->											
30										$0.00		
	Input bloom period ->											
31										$0.00		
	Input bloom period ->											
32										$0.00		
	Input bloom period ->											
33										$0.00		
	Input bloom period ->											
34										$0.00		
	Input bloom period ->											
35										$0.00		
	Input bloom period ->											
36										$0.00		
	Input bloom period ->											
37										$0.00		
	Input bloom period ->											
38										$0.00		
	Input bloom period ->											
39										$0.00		
	Input bloom period ->											
40										$0.00		
	Input bloom period ->											

	Species Richness	**lbs / acre PLS**	**seeds / ft^2 PLS**	**Average CC**		
FORBS/LEGUMES TOTAL	28	0.94	10.02	4.7	ESTIMATED FORB COST ($/AC)	$324

CHOOSE YOUR VINE OR Sub-Shrub PLANT SPECIES

	Common Name	**Scientific Name** Flowering Period	**Lbs / acre PLS**	**Seeds / ft2 PLS**	Coefficient of Conservatism	Estimated Cost ($/lb)	# Seeds / ft^2 @ 1 oz. / ac	Pure Stand PLS Rate lbs / ac	% of Mix	Estimated Cost ($/ac)	Functional Group	Monarch Preferred
			Equivalent rate below									
1	**Leadplant**	***Amorpha canescens***	**0.015**		8	$225.00	6	6	0.0%	$3	Sub-Shrub, Legume	X
	Input bloom period ->	Mid		**0.094**								
2										$0.00		
	Input bloom period ->											
3										$0.00		
	Input bloom period ->											
4										$0.00		
	Input bloom period ->											
5										$0.00		
	Input bloom period ->											

	Species Richness	**Lbs / acre PLS**	**seeds / ft^2 PLS**	**Average CC**		
VINE & WOODY PLANT TOTAL	1	0.02	0.09	8.0	**ESTIMATED VINE & WOODY COST ($/AC)**	**$3**

	lbs / acre PLS	seeds / ft^2 PLS	Average CC	Species Richness	Floristic Quality Index		ESTIMATED GRAND TOTAL COST ($/AC)
GRAND TOTAL	2.20	20.2	4.9	34	28.5	$347	

Illinois NRCS 420 Wildlife Habitat Planting Implementation Requirements Full Seeding			
Requirement	**Criteria**	**Mix**	**Criteria Met**
Requirements for sites on < 5% slope			
Grass Seeds/ft^2, Minimum	10.0	10.1	Meets Criteria
Forb & Sub-shrub Seeds/ft^2, Minimum	5.0	10.1	Meets Criteria
Total Seeds/ft^2, Minimum	20.0	20.2	Meets Criteria
Requirements for sites on >=5% slope			
Grass Seeds/ft^2, Minimum	20.0	10.1	Does Not Meet Criteria
Forb & Sub-shrub Seeds/ft^2, Minimum	5.0	10.1	Meets Criteria
Total Seeds/ft^2, Minimum	30.0	20.2	Does Not Meet Criteria
Wildlife Special Purposes Escape and Nesting Cover Requirements			
Wildlife monoculture native grass (PLS/ft^2)	30.0	10.1	Does Not Meet Criteria

Illinois NRCS 420 Wildlife Habitat Planting Diverse Grass and Forb Stand (>15 desirable Species) Interseeding ½ Rate			
Requirement	**Criteria**	**Mix**	**Criteria Met**
Grass and Forb Interseeding on < 5% slope			
Grass Seeds/ft^2, Minimum	5.0	10.1	Meets Criteria
Forb & Shrub Seeds/ft^2, Minimum	2.5	10.1	Meets Criteria
Total Seeds/ft^2, minimum	10.0	20.2	Meets Criteria
Forb Only Interseeding on < 5% slope			
Forb & Sub-shrub Seeds/ft^2, Minimum	2.5	10.1	Meets Criteria
Grass and Forb Interseeding on >= 5% slope			
Grass Seeds/ft2, Minimum	10	10.1	Meets Criteria
Forb & Sub-shrub Seeds/ft^2, Minimum	2.5	10.1	Meets Criteria
Total Seeds/ft^2, Minimum	15	20.2	Meets Criteria
Forb Only Interseeding on >= 5% slope			
Forb & Sub-shrub Seeds/ft^2, Minimum	2.5	10.1	Meets Criteria

Criteria Revision Update 5/26/2020 Species Information Update 8/26/2021

Exhibit D: Perimeter and Buffer Seed Mix

[*Exhibit D Begins on Following Page*]

Customize Options to Suit Site Conditions

Pick an Ecoregion

○ Xeric (dry) ◉ Mesic (medium) ○ Hydric (wet)

○ Prairie ○ Savanna ○ Wetland ○ Woodland

○ Long Term Program ○ Short Term Program

○ Monarch Preferred Species
○ Forage and Biomass (512) Planting

CHOOSE A RATE SPECIFICATION:

◉ lbs/acre PLS (check a mix) ○ Seeds/ft2 PLS (design a mix)

To override default cost, enter your cost in the applicable cell.

United States Department of Agriculture
Natural Resources Conservation Service

Criteria Revision Update 5/26/2020
Species Information Update 8/26/2021

CHOOSE YOUR GRASSES

Input quantity

	Common Name *Select Plants (Click)	Scientific Name Growth Form	Lbs / acre PLS	Seeds / ft2 PLS	Coefficient of Conservatism	Estimated Cost ($/lb)	# Seeds / ft² @ 1 lb. / ac	Pure Stand PLS Rate lbs / ac	% of Mix	Estimated Cost ($/ac)	Functional Group
			Equivalent rate below								
1	**Bluestem, Big**	***Andropogon gerardii***	**0.55**		5	$7	3.0	11.7	8.2%	$4	Perennial Warm Season Grass
		Bunch		**1.64**							
2	**Grama, Sideoats**	***Bouteloua curtipendula***	**0.20**		7	$9	4.4	8.0	4.3%	$2	Perennial Warm Season Grass
		Rhizomatous		**0.87**							
3	**Lovegrass, Sand**	***Eragrostis trichodes***	**0.040**		5	$75	35.6	1.0	7.1%	$3	Perennial Warm Season Grass
		Bunch		**1.42**							
4	**Switchgrass**	***Panicum virgatum***	**0.30**		4	$8	9.2	4.0	13.7%	$2	Perennial Warm Season Grass
		Rhizomatous		**2.75**							
5	**Bluestem, Little**	***Schizachyrium scoparium***	**0.40**		5	$12	5.9	6.0	11.6%	$5	Perennial Warm Season Grass
		Bunch		**2.34**							
6	**Indiangrass**	***Sorghastrum nutans***	**0.25**		4	$6	3.9	9.0	4.8%	$2	Perennial Warm Season Grass
		Bunch		**0.98**							
7										$0.00	
8										$0.00	
9										$0.00	
10										$0.00	
11										$0.00	
12										$0.00	
13										$0.00	
14										$0.00	
15										$0.00	
16										$0.00	
17										$0.00	
18										$0.00	
19										$0.00	
20										$0.00	
21										$0.00	
22										$0.00	
23										$0.00	
24										$0.00	
25										$0.00	

25										$0.00	
27										$0.00	
28										$0.00	
29										$0.00	
30										$0.00	

	Species Richness	lbs / acre PLS	seeds / ft^2 PLS	Average CC			
GRAMINOID TOTAL	6	1.74	10.01	5.0	ESTIMATED GRAMINOID COST ($/AC)	OST ($/AC)	$17

CHOOSE YOUR FORBS/LEGUMES

Input quantity

	Common Name *Select Plants (Click)	Scientific Name *Select Bloom Period below Scientific Name	Lbs / acre PLS	Seeds / ft2 PLS	Coefficient of Conservatism	Estimated Cost ($/lb)	# Seeds / ft^2 @ 1 lb. / ac	Pure Stand PLS Rate lbs / ac	% of Mix	Estimated Cost ($/ac)	Functional Group	Monarch Preferred
			Equivalent rate below									
1	Milkvetch, Canadian	*Astragalus canadensis*	0.020		7	$120	5.7	6.1	0.6%	$2	Perennial Forb, Legume	
	Input bloom period ->	Mid		0.11								
2	Partridge Pea	*Chamaecrista fasciculata*	0.15		1	$25	1.1	30.7	0.8%	$4	Annual Forb, Legume	
	Input bloom period ->	Mid		0.17								
3	Prairie Clover, White	*Dalea candida*	0.010		9	$90	7.0	5.0	0.3%	$0.90	Perennial Forb, Legume	X
	Input bloom period ->	Mid		0.070								
4	Prairie Clover, Purple	*Dalea purpurea*	0.030		8	$45	6.2	5.6	0.9%	$1	Perennial Forb, Legume	X
	Input bloom period ->	Late		0.19								
5	Bundleflower, Illinois	*Desmanthus illinoensis*	0.10		4	$45	1.4	25.1	0.7%	$5	Perennial Forb, Legume	
	Input bloom period ->	Mid		0.14								
6	Ticktrefoil, Showy	*Desmodium canadense*	0.10		5	$150	2.0	17.3	1.0%	$15	Perennial Forb, Legume	
	Input bloom period ->	Mid		0.20								
7	Milkweed, Common	*Asclepias syriaca*	0.020		0	$120	1.5	23.8	0.1%	$2	Perennial Forb	X
	Input bloom period ->	Mid		0.029								
8	Milkweed, Butterfly	*Asclepias tuberosa*	0.010		5	$300	1.6	22.2	0.1%	$3	Perennial Forb	X
	Input bloom period ->	Mid		0.016								
9	Coreopsis, Lanceleaf Tickseed	*Coreopsis lanceolata*	0.20		5	$1,280	7.3	4.8	7.3%	$256	Perennial Forb	X
	Input bloom period ->	Mid		1.47								
10	Coneflower, Eastern Purple	*Echinacea purpurea*	0.10		6	$45	2.4	14.4	1.2%	$5	Perennial Forb	X
	Input bloom period ->	Mid		0.24								
11	Blazing Star, Dense	*Liatris spicata*	0.010		7	$150	4.0	8.7	0.2%	$2	Perennial Forb	X
	Input bloom period ->	Mid		0.040								
12	Bergamot, Wild	*Monarda fistulosa*	0.030		4	$150	27.5	1.3	4.1%	$5	Perennial Forb	X
	Input bloom period ->	Late		0.83								
13	Goldenrod, Stiff	*Oligoneuron rigidum*	0.010		4	$225	15.1	2.3	0.7%	$2	Perennial Forb	X
	Input bloom period ->	Late		0.15								
14	Beardtongue, Foxglove	*Penstemon digitalis*	0.0050		4	$150	47.8	0.7	1.2%	$0.75	Perennial Forb	
	Input bloom period ->	Early		0.24								
15	Cinquefoil, Tall	*Potentilla arguta*	0.010		10	$120	84.5	0.4	4.2%	$1	Perennial Forb	
	Input bloom period ->	Mid		0.84								
16	Mountainmint, Narrowleaf	*Pycnanthemum tenuifolium*	0.010		4	$450	138.8	0.3	6.9%	$5	Perennial Forb	X
	Input bloom period ->	Late		1.39								
17	Mountainmint, Virginia (Common)	*Pycnanthemum virginianum*	0.0010		5	$450	80.8	0.4	0.4%	$0.45	Perennial Forb	X
	Input bloom period ->	Late		0.081								
18	Coneflower, Pinnate Prairie (Gray-heade	*Ratibida pinnata*	0.010		4	$60	14.3	2.4	0.7%	$0.60	Perennial Forb	
	Input bloom period ->	Mid		0.14								
19	Susan, Black-eyed	*Rudbeckia hirta*	0.063		2	$45	34.4	1.0	10.8%	$3	Biennial Forb	X
	Input bloom period ->	Mid		2.17								
20	Susan, Browneyed	*Rudbeckia triloba*	0.010		3	$90	12.9	2.7	0.6%	$0.90	Biennial Forb	X
	Input bloom period ->	Late		0.13								
21	Goldenrod, Gray (Field)	*Solidago nemoralis*	0.0030		3	$600	110.2	0.3	1.6%	$2	Perennial Forb	X
	Input bloom period ->	Late		0.33								
22	Aster, Smooth Blue	*Symphyotrichum laeve*	0.0020		8	$300	18.4	1.9	0.2%	$0.60	Perennial Forb	X
	Input bloom period ->	Late		0.037								

23	**Aster, Calico**	***Symphyotrichum lateriflorum***	**0.0050**		2	$600	91.8	0.4	2.3%	$3	Perennial Forb	X
	Input bloom period ->	Late		**0.46**								
24	**Aster, New England**	***Symphyotrichum novae-angliae***	**0.0020**		4	$300	24.2	1.4	0.2%	$0.60	Perennial Forb	X
	Input bloom period ->	Late		**0.048**								
25	**Spiderwort, Bluejacket (Ohio)**	***Tradescantia ohiensis***	**0.0010**		3	$300	2.9	11.9	0.0%	$0.30	Perennial Forb	
	Input bloom period ->	Early		**0.0029**								
26	**Verbena, Hoary**	***Verbena stricta***	**0.010**		2	$75	12.3	2.9	0.6%	$0.75	Perennial Forb	X
	Input bloom period ->	Late		**0.12**								
27	**Culver's Root**	***Veronicastrum virginicum***	**0.0010**		6	$1,200	275.5	0.1	1.4%	$1	Perennial Forb	X
	Input bloom period ->	Mid		**0.28**								
28	**Zizia, Golden (Alexander's)**	***Zizia aurea***	**0.020**		6	$120	4.4	7.9	0.4%	$2	Perennial Forb	
	Input bloom period ->	Early		**0.088**								
29										$0.00		
	Input bloom period ->											
30										$0.00		
	Input bloom period ->											
31										$0.00		
	Input bloom period ->											
32										$0.00		
	Input bloom period ->											
33										$0.00		
	Input bloom period ->											
34										$0.00		
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35										$0.00		
	Input bloom period ->											
36										$0.00		
	Input bloom period ->											
37										$0.00		
	Input bloom period ->											
38										$0.00		
	Input bloom period ->											
39										$0.00		
	Input bloom period ->											
40										$0.00		
	Input bloom period ->											

	Species Richness	**lbs / acre PLS**	**seeds / ft^2 PLS**	**Average CC**		
FORBS/LEGUMES TOTAL	28	0.94	10.02	4.7	ESTIMATED FORB COST ($/AC)	$324

CHOOSE YOUR VINE OR Sub-Shrub PLANT SPECIES

	Common Name	**Scientific Name** Flowering Period	**Lbs / acre PLS**	**Seeds / ft2 PLS**	Coefficient of Conservatism	Estimated Cost ($/lb)	# Seeds / ft^2 @ 1 oz. / ac	Pure Stand PLS Rate lbs / ac	% of Mix	Estimated Cost ($/ac)	Functional Group	Monarch Preferred
			Equivalent rate below									
1	**Leadplant**	***Amorpha canescens***	**0.015**		8	$225.00	6	6	0.0%	$3	Sub-Shrub, Legume	X
	Input bloom period ->	Mid		**0.094**								
2										$0.00		
	Input bloom period ->											
3										$0.00		
	Input bloom period ->											
4										$0.00		
	Input bloom period ->											
5										$0.00		
	Input bloom period ->											

	Species Richness	**Lbs / acre PLS**	**seeds / ft^2 PLS**	**Average CC**		
VINE & WOODY PLANT TOTAL	1	0.02	0.09	8.0	**ESTIMATED VINE & WOODY COST ($/AC)**	**$3**

	lbs / acre PLS	seeds / ft^2 PLS	Average CC	Species Richness	Floristic Quality Index		ESTIMATED GRAND TOTAL COST ($/AC)
GRAND TOTAL	2.70	20.1	4.8	35	28.6	$345	

Illinois NRCS 420 Wildlife Habitat Planting Implementation Requirements Full Seeding			
Requirement	**Criteria**	**Mix**	**Criteria Met**
Requirements for sites on < 5% slope			
Grass Seeds/ft^2, Minimum	10.0	10.0	Meets Criteria
Forb & Sub-shrub Seeds/ft^2, Minimum	5.0	10.1	Meets Criteria
Total Seeds/ft^2, Minimum	20.0	20.1	Meets Criteria
Requirements for sites on >=5% slope			
Grass Seeds/ft^2, Minimum	20.0	10.0	Does Not Meet Criteria
Forb & Sub-shrub Seeds/ft^2, Minimum	5.0	10.1	Meets Criteria
Total Seeds/ft^2, Minimum	30.0	20.1	Does Not Meet Criteria
Wildlife Special Purposes Escape and Nesting Cover Requirements			
Wildlife monoculture native grass (PLS/ft^2)	30.0	10.0	Does Not Meet Criteria

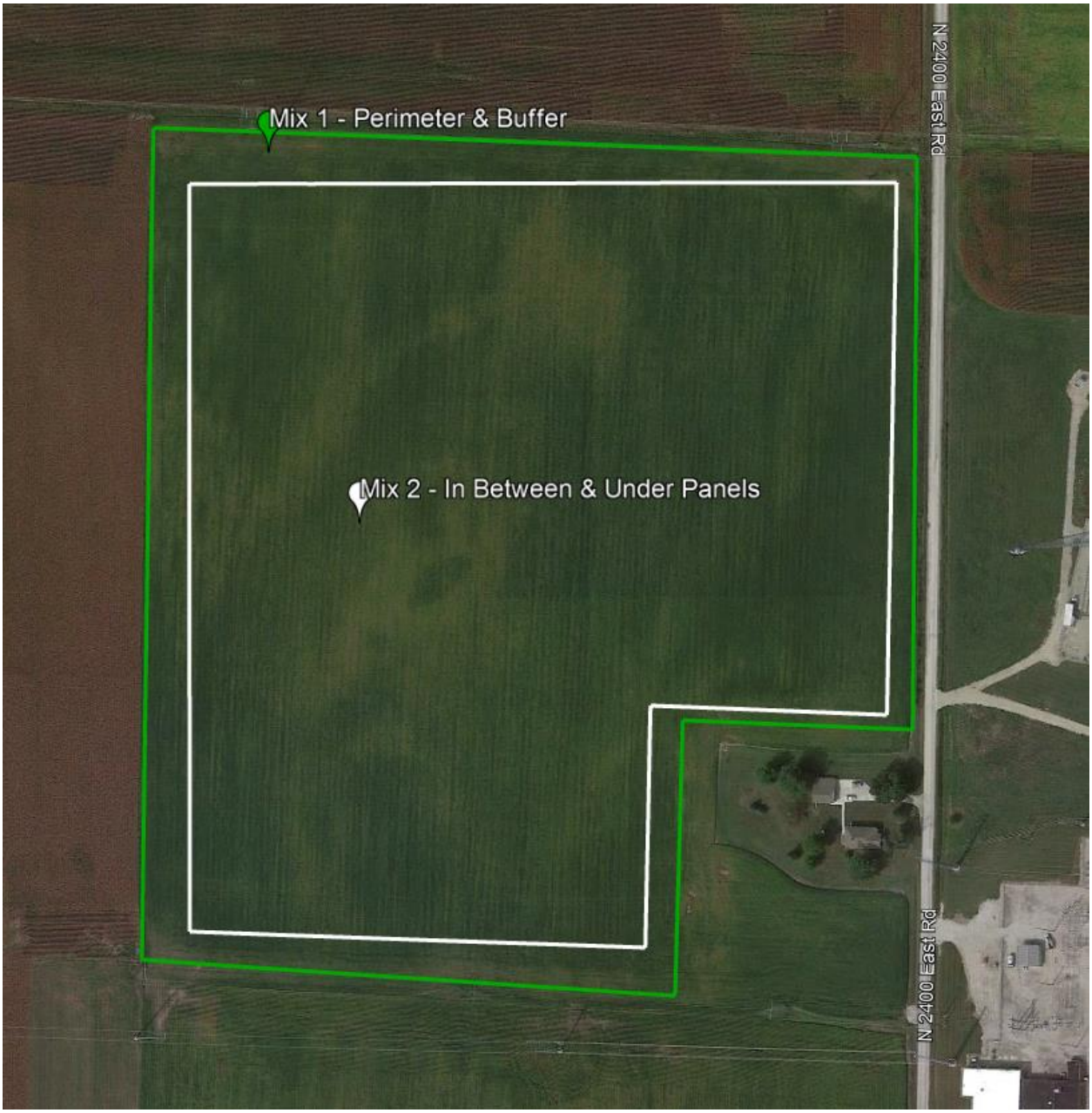
Illinois NRCS 420 Wildlife Habitat Planting Diverse Grass and Forb Stand (>15 desirable Species) Interseeding ½ Rate			
Requirement	**Criteria**	**Mix**	**Criteria Met**
Grass and Forb Interseeding on < 5% slope			
Grass Seeds/ft^2, Minimum	5.0	10.0	Meets Criteria
Forb & Shrub Seeds/ft^2, Minimum	2.5	10.1	Meets Criteria
Total Seeds/ft^2, minimum	10.0	20.1	Meets Criteria
Forb Only Interseeding on < 5% slope			
Forb & Sub-shrub Seeds/ft^2, Minimum	2.5	10.1	Meets Criteria
Grass and Forb Interseeding on >= 5% slope			
Grass Seeds/ft2, Minimum	10	10.0	Meets Criteria
Forb & Sub-shrub Seeds/ft^2, Minimum	2.5	10.1	Meets Criteria
Total Seeds/ft^2, Minimum	15	20.1	Meets Criteria
Forb Only Interseeding on >= 5% slope			
Forb & Sub-shrub Seeds/ft^2, Minimum	2.5	10.1	Meets Criteria

Criteria Revision Update 5/26/2020 Species Information Update 8/26/2021

Exhibit E: Map Showing Seed Mix Locations

[*Exhibit E Begins on Following Page*]

Exhibit E: Map Showing Seed Mix Locations



Mix 1 will be used outside of the solar array, but inside the fence (approximately 7 acres).

Mix 2 will be used under and in between the solar panels (approximately 27 acres).