



Habitat Friendly Solar Program

Workshop- Assessment and Forms

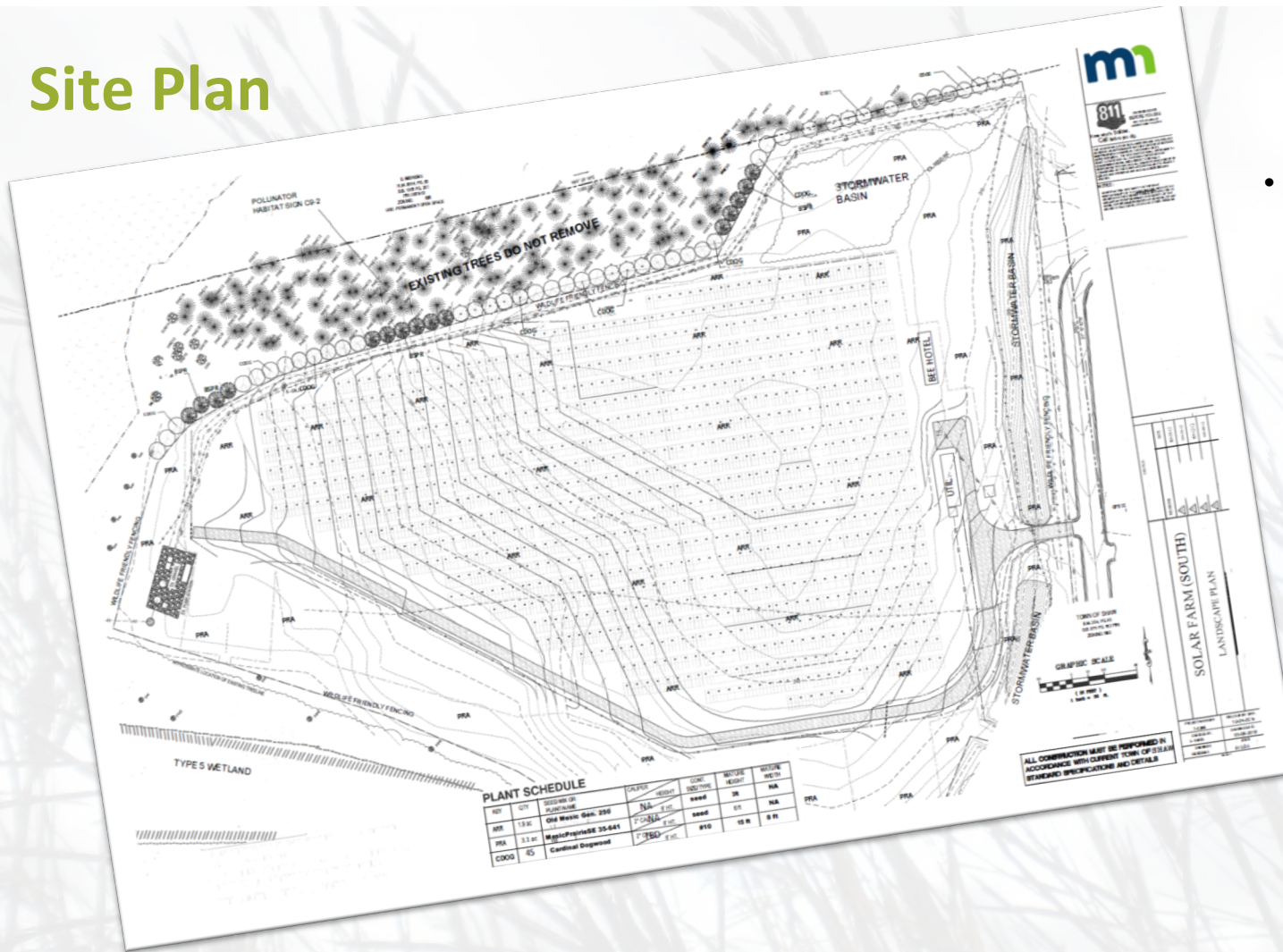
Paul Erdmann - Dan Shaw - BWSR



Agenda

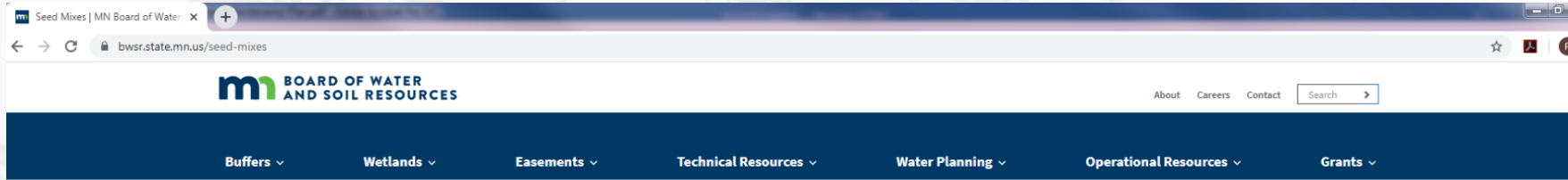
- 1) Overview
- 2) Go over process and forms
- 3) Discuss exercise
- 4) Groups of 3-4. Fill out forms
- 5) Group discussion

Site Plan



- What should be included
 - seed mixes
 - trees/shrubs
 - plant key
 - scale
 - quantities
 - vegetation to remain
 - other habitat features
 - sign locations
 - planner/designer

Seed Mixes



Seed Mixes



State agencies have created standard restoration and conservation seed mixes that can be used for projects (many native seed vendors can supply these mixes). Below are lists of current "State Seed Mixes" that have been in use since 2009.



Also listed are "Pilot Seed Mixes" that were developed to expand the use of native plant species for a variety of landscapes, and provide "model" mixes for projects that can be adapted for specific site conditions. These mixes are in a testing phase where we are looking for opportunities to work with partners to test their effectiveness on projects to guide future updates.

Note that cover crops are included in the mixes, so additional cover crops are not typically needed unless additional stabilization is necessary for projects (such as steep slopes).

Maps for Distribution of Mixes



Seed Mixes

Maps for Distribution of Mixes



Seed mix information

Search seed mixes Category Purpose
 Region

Minnesota Seed Mix Information Sheet Links

Title	Label	Seed mix category [▲]	Seed mix purpose	Seed mix region	Info Sheet Download Links
Mesic Prairie Southwest	35-541	Current State Seed Mix	Native Grassland	Southwest	Microsoft Word PDF
Wet Meadow South and West	34-271	Current State Seed Mix	Wetland	South & West	Microsoft Word PDF
Soil Building Cover Crop	21-113	Current State Seed Mix	Cover Crops	Statewide	Microsoft Word PDF
Riparian South and West	34-261	Current State Seed Mix	Wetland	South & West	Microsoft Word PDF
Dry Prairie Southeast	35-621	Current State Seed Mix	Native Grassland	Southeast	Microsoft Word PDF
Woodland Edge South and West	36-211	Current State Seed Mix	Woodland	South & West	Microsoft Word PDF
Dry Prairie General	35-221	Current State Seed Mix	Native Grassland	Statewide	Microsoft Word PDF
Riparian Northeast	34-361	Current State Seed Mix	Wetland	Northeast	Microsoft Word PDF
Mesic Prairie Southeast	35-641	Current State Seed Mix	Native Grassland	Southeast	Microsoft Word PDF
Woodland Edge Northwest	36-411	Current State Seed Mix	Woodland	Northwest	Microsoft Word PDF
Mesic Prairie General	35-241	Current State Seed Mix	Native Grassland	Statewide	Microsoft Word PDF

Seed Mixes

Low Growing Solar
Array Northeast+

Pilot Seed Mix

Pollinator

Northeast

[Microsoft Word](#) | [PDF](#)

Low Growing Solar
Array South & West

Pilot Seed Mix

Pollinator

South & West

[Microsoft Word](#) | [PDF](#)

Low Growing Solar
Array Moist Soils
South & West

Pilot Seed Mix

Pollinator

South & West

[Microsoft Word](#) | [PDF](#)

Seed Mixes



BWSR Pilot Seed Mixes



July 5, 2018

PILOT SEED MIXES:

These new "Pilot" seed mixes have been developed for a variety of restoration, conservation and stormwater uses. Goals were to meet the needs of common project types and to create direction for emerging topics such as biofuels, buffers, conservation grazing, and pollinators. All of the mixes were developed for specific functions and incorporate pollinator habitat to the extent possible. The mixes will remain as pilot mixes for a couple years until we understand how they are performing before we work to make them official state mixes. In many cases these mixes should be considered starting points for developing site specific mixes.

Note: Oats cover crop is included as a component of these seed mixes with the exception of some wetland mixes where cover species are not necessary. Winter wheat (at a similar rate to oats) may be selected in some cases where germination is needed later in the fall, followed by further green-up the following spring (oats will not come back the follow spring unless it re-establishes from seed).

Finalized Low Growing Solar Array Mix South & West

Function: Pollinator Intent: Low growing native vegetation establishment for under solar panels in south and west MN
 Planting Area: S & W
 Specialization:

	Scientific Name	Common Name	Seeds/ sq ft	Rate (lb/ac)	% Mix (by sqft)	% Mix (by wt)
Cover	Avena sativa	Oats* (See Cover crop note)	6	20.42		
	Total Guild:		6	20.42	12.85%	77.9%
Forb	Achillea millefolium	Common Yarrow	0.41	0.01		
	Allium stellatum	Prairie Wild Onion	0.51	0.12		
	Anemone canadensis	Canada Anemone	0.18	0.06		
	Anemone cylindrica	Long-headed Thimbleweed	0.6	0.06		
	Asclepias syriaca	Common Milkweed	0.46	0.30		
	Asclepias verticillata	Whorled Milkweed	0.32	0.08		
	Astragalus crassicaarpus	Ground Plum	0.36	0.19		
	Echinacea angustifolia	Narrow-leaved Purple Conefl	0.64	0.25		
	Euthamia graminifolia	Grass-leaved Goldenrod	0.8	0.01		
	Galium boreale	Northern Bedstraw	0.4	0.02		

Seed Mixes

Mesic Prairie Southeast

35-641

Common Name	Scientific Name	Rate (kg/ha)	Rate (lb/ac)	% of Mix (% by wt)	Seeds/ sq ft
big bluestem	<i>Andropogon gerardii</i>	1.01	0.90	7.49%	3.30
side-oats grama	<i>Bouteloua curtipendula</i>	1.54	1.37	11.38%	3.01
nodding wild rye	<i>Elymus canadensis</i>	1.18	1.05	8.77%	2.01
slender wheatgrass	<i>Elymus trachycaulus</i>	1.01	0.90	7.50%	2.28
switchgrass	<i>Panicum virgatum</i>	0.24	0.21	1.78%	1.10
little bluestem	<i>Schizachyrium scoparium</i>	1.42	1.27	10.59%	7.00
Indian grass	<i>Sorghastrum nutans</i>	2.24	2.00	16.68%	8.82
Total Grasses		8.63	7.70	64.19%	27.52
butterfly milkweed	<i>Asclepias tuberosa</i>	0.07	0.06	0.53%	0.10
whorled milkweed	<i>Asclepias verticillata</i>	0.01	0.01	0.10%	0.05
Canada milk vetch	<i>Astragalus canadensis</i>	0.18	0.16	1.33%	1.00
partridge pea	<i>Chamaecrista fasciculata</i>	0.67	0.60	5.00%	0.60
white prairie clover	<i>Dalea candida</i>	0.01	0.01	0.07%	0.06
purple prairie clover	<i>Dalea purpurea</i>	0.10	0.09	0.76%	0.50
Canada tick trefoil	<i>Desmodium canadense</i>	0.17	0.15	1.24%	0.30
ox-eye	<i>Heliopsis helianthoides</i>	0.06	0.05	0.43%	0.12
rough blazing star	<i>Liatris aspera</i>	0.03	0.03	0.21%	0.15
great blazing star	<i>Liatris pycnostachya</i>	0.03	0.03	0.29%	0.14
wild bergamot	<i>Monarda fistulosa</i>	0.01	0.01	0.06%	0.18
stiff goldenrod	<i>Oligoneuron rigidum</i>	0.02	0.02	0.17%	0.31
gray-headed coneflower	<i>Ratibida pinnata</i>	0.02	0.02	0.15%	0.20
black-eyed susan	<i>Rudbeckia hirta</i>	0.06	0.05	0.38%	1.54
heath aster	<i>Symphotrichum ericoides</i>	0.01	0.01	0.05%	0.40
smooth aster	<i>Symphotrichum laeve</i>	0.06	0.05	0.41%	1.00
bracted spiderwort	<i>Tradescantia bracteata</i>	0.04	0.04	0.34%	0.15
blue vervain	<i>Verbena hastata</i>	0.04	0.04	0.37%	1.50
hoary vervain	<i>Verbena stricta</i>	0.11	0.10	0.85%	1.05
golden alexanders	<i>Zizia aurea</i>	0.08	0.07	0.60%	0.29
Total Forbs		1.79	1.60	13.34%	9.64
Oats	<i>Avena sativa</i>	3.03	2.70	22.47%	1.20
Total Cover Crop		3.03	2.70	22.47%	1.20
Totals:		13.45	12.00	100.00%	38.36
Purpose:	Regional mesic prairie reconstruction for wetland mitigation, ecological restoration, or conservation program plantings.				
Planting Area:	Eastern Broadleaf Forest Province excluding Hardwood Hills subsection. Mn/DOT Districts Metro & 6.				

Forms



Solar Site Pollinator Habitat Assessment Form for Project Planning

For solar companies and local governments to meet Habitat Friendly standards
Draft 2-6-20

1. PLANNED % OF SITE DOMINATED BY NATIVE SPECIES COVER (wildflowers, grasses, sedges, shrubs, trees)

- 26-50% +5 points
 51-75% +10 points
 76-100% +15 points

Total points

2. PERCENT OF PROPOSED SITE VEGETATION COVER TO BE DOMINATED BY WILDFLOWERS (not grasses and sedges)

- 20-45 % +5 points
 46-60 % +10 points
 61+ % +15 points

Total points

Note: Projects may have "array" mixes and diverse border mixes; forb dominance should be averaged across the entire site. The dominance should be calculated from total numbers of forb seeds vs. grass seeds based on seeds per square foot from all seed mixes to be planted).

3. PLANNED COVER DIVERSITY (# of species in seed mixes; numbers from upland and wetland mixes can be combined)

- 10-19 species +5 points
 20-25 species +10 points
 26 or more species +15 points

Total points

4. PLANNED SEASONS WITH AT LEAST 3 BLOOMING SPECIES PRESENT (check/add all that apply)

- Spring (April-May) +5 points
 Summer (June-August) +5 points
 Fall (September-October) +5 points

Total points

See BWSR [Pollinator Toolbox](#) about bloom seasons

5. AVAILABLE HABITAT COMPONENTS WITHIN .25 MILES (check/add all that apply)

- Native bunch grasses for nesting +3 points
 Native flowering shrubs +4 points
 Clean, perennial water sources +3 points
 Created nesting feature/s +4 points
 (bee blocks, etc.) Total points

6. SITE PLANNING AND MANAGEMENT

- Detailed establishment and management plan (see notes) developed with funding/contract to implement +15 points
 Signage legible at forty or more feet stating pollinator friendly solar habitat (at least 1 every 20ac) +5 points

Total points

7. SEED MIXES

- Mixes are composed of at least 40 seeds per square foot +5 points
 All seed genetic origin within 175 miles of site (see notes) +8 points
 At least 2% milkweed cover to be established from seed/plants +10 points

Total points

8. INSECTICIDE RISK

- Planned on-site insecticide use or pre-planting seed/plant treatment (excluding buildings/electrical boxes, etc.) -40 points
 Communication with local chemical applicators/neighbors about need to prevent drift from adjacent areas (see notes). +10 points

Total points

Grand Total


Provides Exceptional Habitat >85
 Meets Pollinator Standards 70-84

Project Name: _____
 Vegetation Consultant: _____
 Project County: _____
 Project Size: _____
 Projected Seeding Date: _____

See notes related to the question on the back side of this form.

- Who fills out the form?
- When
- Expertise needed
- Instructions/notes
- Discuss each category

Forms



Solar Site Pollinator Habitat Assessment Form for Established Plantings (after yr.3)

For solar companies and local governments to meet Habitat Friendly standards
Draft 2-9-20

1. % OF SITE DOMINATED BY NATIVE SPECIES COVER (wildflowers, grasses, sedges, shrubs, trees)

<input type="checkbox"/> 1-25%	+5 points
<input type="checkbox"/> 26-50%	+15 points
<input type="checkbox"/> 51-75%	+20 points
<input type="checkbox"/> 76-100%	+25 points

Total points

2. PERCENT OF SITE DOMINATED BY WILDFLOWERS (not grasses and sedges)

<input type="checkbox"/> 1-10 %	+10 points
<input type="checkbox"/> 11-20 %	+15 points
<input type="checkbox"/> 21-30 %	+20 points
<input type="checkbox"/> 31-40 %	+25 points
<input type="checkbox"/> 41+	+30 points

Total points

3. COVER DIVERSITY (# of plant species with >1% cover)

<input type="checkbox"/> 1-9 species	+5 points
<input type="checkbox"/> 10-19 species	+15 points
<input type="checkbox"/> 20-25 species	+20 points
<input type="checkbox"/> 26 or more species	+25 points

Total points

Exclude invasives/noxious weeds from species totals.

4. SEASONS WITH AT LEAST 3 BLOOMING SPECIES PRESENT (check/add all that apply)

<input type="checkbox"/> Spring (April-May)	+5 points
<input type="checkbox"/> Summer (June-August)	+5 points
<input type="checkbox"/> Fall (September-October)	+5 points

Total points

See BWSR [Pollinator Toolbox](#) for Information about bloom season

5. AVAILABLE HABITAT COMPONENTS WITHIN .25 MILES (check/add all that apply)

<input type="checkbox"/> Native bunch grasses for nesting	+3 points
<input type="checkbox"/> Native flowering shrubs	+4 points
<input type="checkbox"/> Clean, perennial water sources	+3 points
<input type="checkbox"/> Created nesting feature/s (bee blocks, etc.)	+4 points

Total points

6. AVAILABLE HABITAT COMPONENTS ON-SITE (check/add all that apply)

<input type="checkbox"/> At least 2% milkweed cover	+5 points
<input type="checkbox"/> Detailed management plan developed(see notes) with funding/contract to implement	+15 points
<input type="checkbox"/> Signage legible at forty or more feet stating pollinator friendly solar habitat (at least 1 every 20ac.)	+5 points
<input type="checkbox"/> Constructed and maintained nesting habitat feature/s (bee blocks, etc.)	+5 points

Total points

7. INSECTICIDE RISK

<input type="checkbox"/> Planned on-site insecticide use. (excluding buildings/electrical boxes, etc.)	-25 points
<input type="checkbox"/> Communication with local chemical applicators/neighbors about need to prevent drift from adjacent areas.	+10 points

Total points

Grand Total

Provides Exceptional Habitat	>85
Meets Pollinator Standards	70-84

Project Name: _____
Vegetation Consultant: _____
Project County: _____
Project Size: _____

See notes related to the question on the back side of this form.

Pg. 1

- Who fills out the form?
- When
- Other inspections
- Expertise needed
- Instructions/notes
- Discuss each category

Guidance

Prairie Establishment & Maintenance Technical Guidance for Solar Projects

Minnesota Department of Natural Resources

Revised July 2019



- What's Included
 - Suggested guidance
 - Site preparation
 - Seed mix design
 - Planting
 - Management

Guidance- Sample Specifications

Sample Specifications for the Establishment of Native Vegetation as Part of Habitat Friendly Solar Projects

5-9-19

Developed by the Minnesota Board of Water and Soil Resources and the Minnesota Department of Natural Resources

Note: these specifications are suggestions for projects and should be adapted to meet specific site conditions and project goals.

CONTRACTOR QUALIFICATIONS

1. Seeding contractors must have at least three years of experience installing native seed and installing or maintaining prairie restoration projects or other similar types of projects.

PROPOSED CHANGES TO PROJECT SPECIFICATIONS

1. Once project specifications are approved by the local government unit (LGU) that is reviewing it for compliance with the Habitat Friendly Solar Standards they are considered final. Any changes to the project specifications after this point, need approval by the LGU responsible for compliance with the Habitat Friendly Solar Standards

SEED SPECIFICATIONS

1. Substitution of species in the specified seed mixes/species lists must be approved by the local government organization staff that are reviewing the project for compliance with the Habitat Friendly Solar Standards.
2. All seed that is supplied for projects must be labeled according to the requirements of the Minnesota Seed Law, section 21.82, including limits on noxious weed seed.
3. The origin of seed is required to be listed on the seed tag for all species in a mix to provide verification of original (generation 0) seed source. The smallest known geographic area (township, county, ecotype region, etc.) shall be listed.
 - o Information pertaining to purity, germination, and hard (dormant) seed of individual components in a mix is required on seed tags.
 - o When submitting seed bids, seed vendors must list any *Amaranth* seeds that were found in official seed tests. If *Amaranth* species are found in the test results, the Minnesota Department of Agriculture (MDA) requires that the vendor pay for genetic testing to determine if the *Amaranth* seeds present are *Palmer amaranth*.
4. Seed must be cleaned to an extent sufficient to allow its passage through appropriate seeding

- Specifications covering all key aspects of site planning, installation and management

BWSR's Website: bwsr.state.mn.us/bwsr-habitat-friendly-solar-program

BWSR Habitat Friendly Solar Program

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 - Lawns to Legumes Program
 - Pollinator Toolbox
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- Guidance Documents, Tools & Resources
- Conservation Practice Standards

Steps for Meeting and Maintaining Standard Requirements

What is Habitat Friendly Solar? This program promotes the planting and management of wildlife habitat with an emphasis on pollinator benefits on solar projects. This effort was initiated to comply with Minnesota legislative requirements stating that "an owner of a solar site implementing solar site management practices may claim that the site provides benefits to gamebirds, songbirds and pollinators only if the site adheres to guidance set forth by the pollinator plan provided by the Board of Water and Soil Resources" ([Minn. Stats. 216B.1642](#)). Local governments and other landowners, as well as solar developers, can work toward meeting the standards. Some municipalities are also requiring that ground mounted solar projects are meeting Habitat Friendly standards to help ensure that projects are providing multiple landscape benefits and are maintained into the future.

The following information summarizes the steps to meeting and maintaining the standard requirements.

Steps to meet standards

- 1) For design guidance refer to [Prairie Establishment & Maintenance Technical Guidance for Solar Projects \(pdf\)](#) and BWSR's [Sample Habitat Friendly Solar Planting Plan Specifications \(pdf\)](#) and work with experts in the field of habitat restoration.
- 2) Fill out the [Project Planning Assessment Form \(pdf\)](#). See additional information about these forms on the "[Assessing and Prioritizing Project Sites](#)" page of BWSR's Pollinator Toolbox.
- 3) Submit the Project Planning Assessment Forms with images of the proposed site and a copy of the planting plan for the project and any supplemental long term management plans and communication to protect the site from pesticide drift (see details in the assessment form) to local government staff who have approval responsibilities for the project or to dan.shaw@state.mn.us, if local staff are not involved. Local staff who are approving projects with then coordinate with BWSR.
- 4) If projects meet the requirements listed above they will be added to a list of projects meeting requirements posted on the Board of Water and Soil Resources website and will be able to promote the array as a MN Board of Water and Soil Resources "Habitat Friendly Solar" project.

Diverse buffer around solar arrays