

## **Appendix I**

### **Conceptual Visual Mitigation Planting Plan**

# Conceptual Mitigation Planting Plan



**Northern Bobwhite Solar**

Marion County, Kentucky

Sheet 1 of 12



## **Mitigation Planting Plan Design Methodology**

The Northern Bobwhite Solar Facility will include the installation of a variety of visual screening treatments at different areas throughout the Facility Site. A Conceptual Visual Mitigation Planting Plan was developed as part of the Facility's State Siting Certificate to Construct a Merchant Electric Generating Facility Application, with the goal of minimizing and mitigating the Facility's visual effects. This Conceptual Visual Mitigation Planting Plan consists of a master plant list and detailed planting modules designed for specific circumstances. While the planting modules were not designed to completely screen views of the proposed Facility, the introduction of native tree and shrub mixes, interspersed with pollinator habitat along the roadsides adjacent to the Facility is intended to soften the visual effect of the Facility. The natural forms and colors of the planted vegetation will partially screen and divert viewer attention from the modern materials and inorganic forms of the photovoltaic panel arrays.

The conceptual planting plan design was developed using the following approach:

- **Review local zoning guidelines.**
- **Document existing visual character and vegetation within the Facility site and surrounding area.**
- **Maintain existing vegetation/hedgerows where feasible.**
- **Install native, noninvasive species that provide ecological benefits.**
- **Soften the appearance of the perimeters of the PV arrays/perimeter fences so that they blend into the existing landscape.**
- **Take design and material cues from the surrounding landscape.**

## **Selection of Plant Materials**

When designing a conceptual mitigation planting plan, it is important to propose a site-specific selection of plant materials that can provide the appropriate level of vegetative screening, match the vegetation and visual character of the existing landscape, provide ecological benefits including wildlife habitat, and prioritize the use of native vegetation species. Environmental Design & Research, D.P.C. (EDR) staff with expertise in landscape architecture and visual impact assessment conducted a review of botanical and soil properties information available for the Facility Site and adjacent areas, and provided guidance regarding the production of the master plant list to be included in the conceptual mitigation planting plan.

The site consists of a mosaic of landscape types, primarily open fields with active agriculture or early successional (i.e. old field) communities, mixed forest or hedgerows dominated by deciduous species, and formal or intentional landscapes around residential properties. The conceptual planting modules developed for the Facility intentionally mimic the character of the existing roadside vegetation, hedgerows and forest stands in an effort to visually integrate of the Facility into the surrounding landscape.

Plant species to be included in the conceptual master plant list (see below), were chosen based on county-level records of native plants as available through the USDA PLANTS Database (USDA, NRCS 2020), Ecoregions of Kentucky descriptions provided by the US EPA, and the Flora of the Southeastern United States: Kentucky (Weakley, 2020). In addition, soil classification and properties data available through the USDA NRCS WebSoilSurvey application was used to ensure that species proposed would be broadly appropriate for the site soils. The Exotic Invasive Plants of Kentucky list (KY Exotic Plant Pest Council, 2013) and right-of-way vegetation guidance lists available from the Kentucky Transportation Cabinet were consulted to ensure that no

invasive species were proposed.

Other resources used in creating the master plant list include the Kentucky Pollinator Handbook (USDA, NRCS 2016), and Kentucky Pollinator Protection Plan (KY Department of Agriculture 2019), which include recommended native vegetation that can provide ecological benefits at solar facilities.



Examples of landscape character found around the Facility Site, photographed by Terracon during wetland delineation work.

### **Northern Bobwhite Solar**

Marion County, Kentucky

### **Conceptual Mitigation Planting Plan**

Sheet 3 of 12

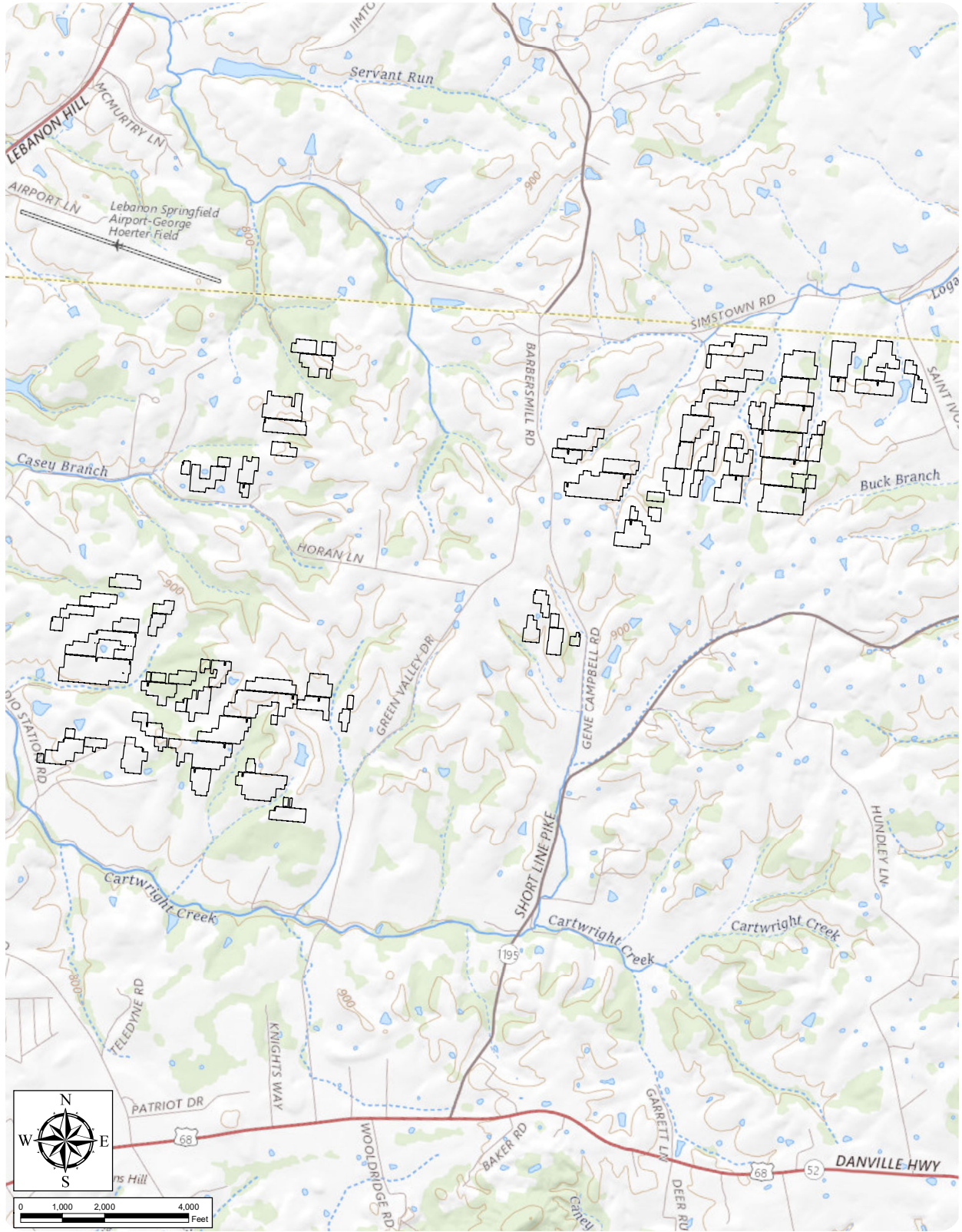




## MASTER PLANT LIST

<u>TREES</u>	<u>COMMON NAME</u>	<u>SIZE</u>	<u>GROWTH RATE</u>	<u>MATURE SIZE</u>
<i>Acer rubrum</i>	Red Maple	2" Cal.	Fast	40'-60' H x 35'-45' W
<i>Acer saccharum</i>	Sugar Maple	2" Cal.	Medium	60'-75' H x 40'-50' W
<i>Aesculus glabra</i>	Ohio Buckeye	2" Cal.	Medium	20'-40' H x 20'-40' W
<i>Amelanchier arborea</i>	Downy Serviceberry	1.5" Cal.	Medium	15'-25' H x 15'-25' W
<i>Carpinus caroliniana</i>	American Hornbeam	1.5" Cal.	Slow	20'-40' H x 20'-30' W
<i>Cercis canadensis</i>	Eastern Redbud	5' Ht.	Medium	20'-30' H x 25'-35' W
<i>Cladrastis kentukea</i>	American Yellowwood	1.5" Cal.	Medium	30'-50' H x 40'-55' W
<i>Juniperus virginiana</i>	Eastern Red Cedar	5' Ht.	Medium	40'-50' H x 8'-20' W
<i>Liquidambar styraciflua</i>	American Sweet Gum	2" Cal.	Medium	60'-75' H x 40'-75' W
<i>Nyssa sylvatica</i>	Sour Gum	2" Cal.	Medium	30'-50' H x 20'-30' W
<i>Ostrya virginiana</i>	American Hophornbeam	1.5" Cal.	Slow	25'-40' H x 20'-30' W
<i>Oxydendrum arboreum</i>	Sourwood Tree	1.5" Cal.	Medium	25'-30' H x 20'-25' W
<i>Pinus strobus</i>	White Pine	8' Ht.	Fast	50'-80' H x 20'-40' W
<i>Pinus virginiana</i>	Virginia Pine	8' Ht.	Slow	15'-40' H x 10'-30' W
<i>Quercus alba</i>	White Oak	2" Cal.	Medium	50'-80' H x 50'-80' W
<i>Quercus coccinea</i>	Scarlet Oak	2" Cal.	Medium	40'-75' H x 40'-75' W
<i>Quercus rubra</i>	Red Oak	2" Cal.	Medium	60'-75' H x 60'-75' W
<i>Quercus velutina</i>	Black Oak	2" Cal.	Slow	50'-60' H x 50'-60' W
<i>Sassafras albidum</i>	Sassafras	5' Ht.	Medium	20'-30' H x 25'-40' W
<i>Tilia americana</i>	American Linden	2" Cal.	Medium	60'-80' H x 30'-60' W
<u>SHRUBS</u>	<u>COMMON NAME</u>	<u>SIZE</u>	<u>GROWTH RATE</u>	<u>MATURE SIZE</u>
<i>Aronia melanocarpa</i>	Black Chokeberry	4' Ht.	Medium	3'-6' H x 3'-6' W
<i>Calycanthus floridus</i>	Sweetshrub	3' Ht.	Medium	6'-10' H x 6'-10' W
<i>Cornus racemosa</i>	Gray Dogwood	3' Ht.	Medium	10'-15' H x 10'-15' W
<i>Cornus sericea</i>	Red Twig Dogwood	3' Ht.	Fast	7'-10' H x 7'-10' W
<i>Corylus americana</i>	American Hazelnut	3' Ht.	Medium	6'-10' H x 6'-10' W
<i>Hamamelis virginiana</i>	Common Witch Hazel	5' Ht.	Medium	15'-20' H x 15'-20' W
<i>Rhus typhina</i>	Staghorn Sumac	5' Ht.	Fast	15'-25' H x 20'-30' W
<i>Rosa carolina</i>	Carolina Rose	2' Ht.	Fast	3'-6' H x 3'-6' W

# Facility Site Context Map



## Northern Bobwhite Solar

Marion County, Kentucky

## Conceptual Mitigation Planting Plan

Sheet 5 of 12



## **Conceptual Planting Modules**

The Applicant developed three individual planting modules, each designed to apply to a specific circumstance within the Facility Site or accomplish a different set of goals. The three modules include:

1. Roadside Enhancement;
2. Open Field / Supplemental Hedgerow, and
3. Adjacent Visually Sensitive Resource / Residence.

Descriptions of these modules are provided below:

### **Module 1 | Roadside Enhancement**

Module 1 is emphasized along open fields where existing roadside screening is absent. It is designed to integrate the Facility Site into the landscape by mimicking the surrounding roadside vegetation, which includes active agricultural and successional fields, hedgerows, and woodlots. Consequently, Module 1 uses a selection of large to medium-sized shrubs, small to medium trees, evergreen material, and herbaceous perennials that will remain relatively low at mature height and provide a variety of color throughout the year. This module can be adapted to different roadside conditions, for example by adding evergreens in locations where they are more common in the existing landscape, or by emphasizing lower-growing species in locations where potential shading of the PV panels by larger tree species is a concern.

The Module 1 planting plan is designed to mimic the spacing and pattern of existing roadside and hedgerow vegetation as perceived by viewers who will experience the landscape from a moving vehicle while traveling along the adjacent roadway. Large spacing distances are thus proposed for the plant material both parallel to the roadway (i.e., lateral to the direction of travel) and perpendicular to the roadway (i.e., from the road toward the PV panel arrays). Plants will be grouped

into naturalistic clusters, with lateral spacing of approximately 30-50 feet between clusters combined with 25-40 feet of spacing in the perpendicular direction. While such spacing would be ineffective for completely screening views from a residence or other fixed vantage point, this design works well when viewed from a moving vehicle. To accomplish the goals of Module 1, planting areas are located outside the road right-of-way and placed approximately 15 feet from the perimeter fence surrounding the solar array.

The areas between clusters of trees and shrubs within planting Module 1 can be planted with a pollinator-friendly seed mix. A representative example seed mix is the Kentucky Department of Transportation Pollinator/Monarch Mix, as available from Roundstone Native Seed. This mix consists of a blend of 29 upland meadow species such as little bluestem (*Schizachyrium scoparium*), spiked blazing star (*Liatrix spicata*), lanceleaf coreopsis (*Coreopsis lanceolata*), purple coneflower (*Echinacea purpurea*), and others.

### **Northern Bobwhite Solar**

Marion County, Kentucky



### **Conceptual Mitigation Planting Plan**




Sheet 6 of 12

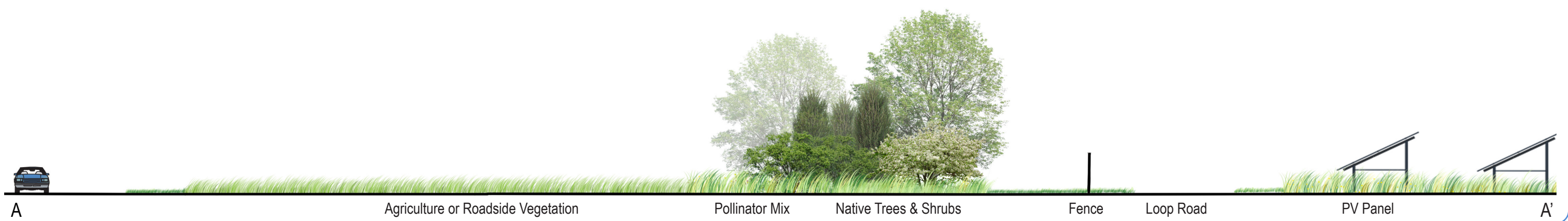
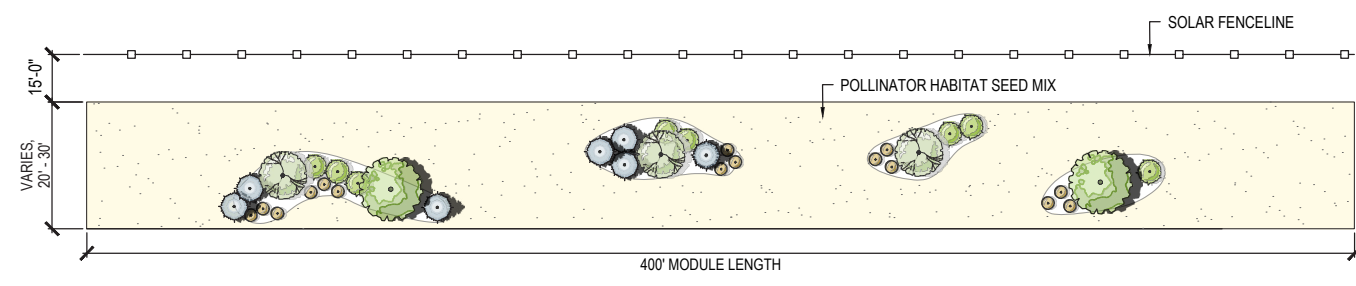
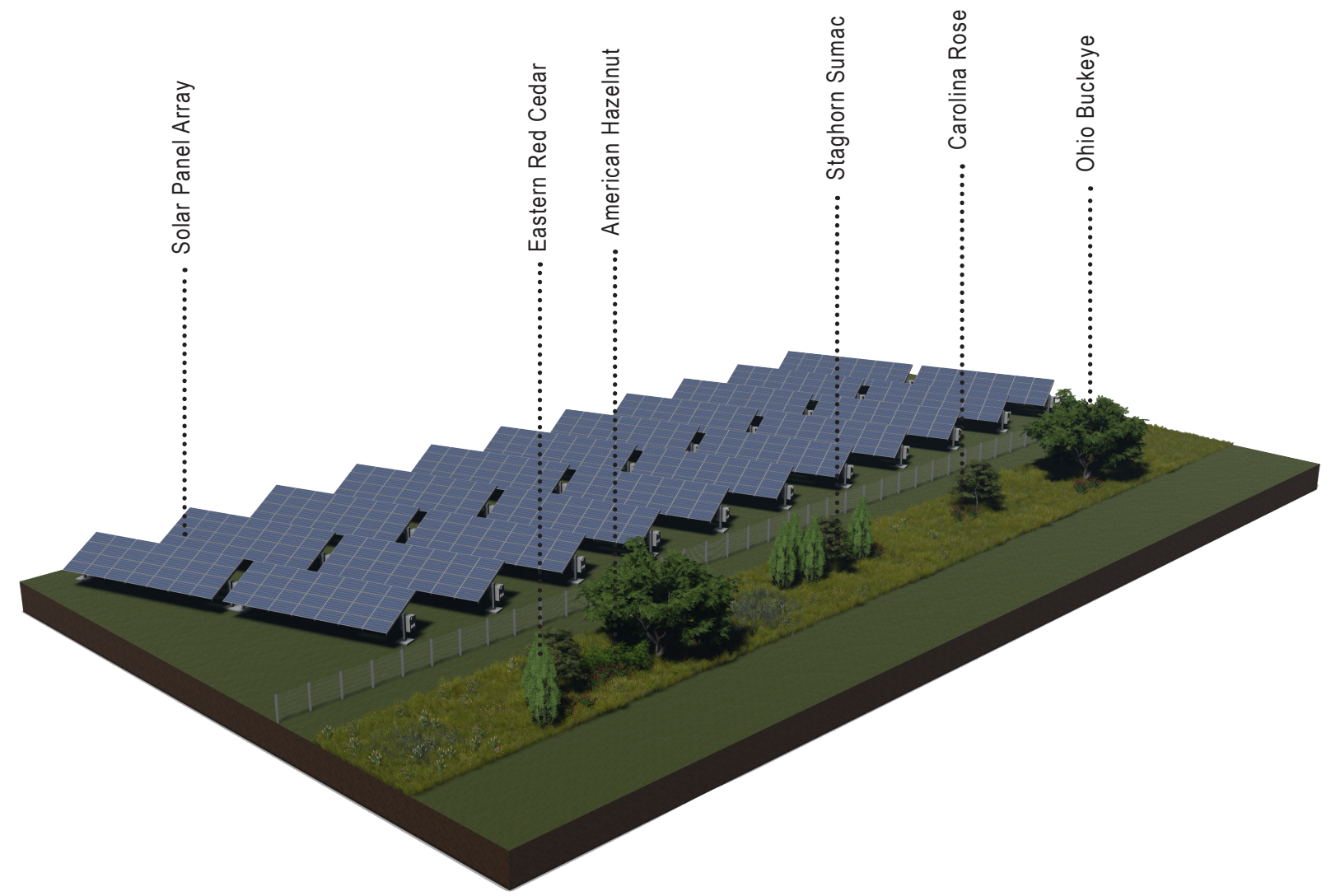




# PLANT SCHEDULE: MODULE 1

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	GROWTH RATE	MATURE SIZE
	2	<i>Aesculus glabra</i>	Ohio Buckeye	2" Cal.	Medium	20'-40' H x 20'-40' W
	7	<i>Juniperus virginiana</i>	Eastern Red Cedar	5' Ht.	Medium	40'-50' H x 8'-20' W

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	GROWTH RATE	MATURE SIZE
	8	<i>Corylus americana</i>	American Hazelnut	3' Ht.	Medium	6'-10' H x 6'-10' W
	3	<i>Rhus typhina</i>	Staghorn Sumac	5' Ht.	Fast	15'-25' H x 20'-30' W
	15	<i>Rosa carolina</i>	Carolina Rose	2' Ht.	Fast	3'-6' H x 3'-6' W



## **Conceptual Planting Modules Continued**

### **Module 2 | Open Field / Supplemental Hedgerow**

Throughout the visual study area, narrow hedgerows commonly occur between agricultural fields or along roadsides. These hedgerows contribute to the overall character of the visual study area by reinforcing the mosaic pattern of open fields and trees, enclosing portions of the road system. Module 2 is designed to be used where existing hedgerows are present but do not provide the amount of screening desired at that location. The module is intended to be flexible, so that final choices of plant material can respond to the particular spacing and character of each existing hedgerow, as well as the potential for shading of PV panels. The selection and spacing of plant materials is generally similar to Module 1, but as it is primarily intended to be used in selected locations where plantings will be along the north side of the proposed PV arrays or filling gaps in an existing hedgerow that will remain, Module 2 uses a tighter spacing and may use larger plant material. This additional height of screening is proposed because shadows are not a concern in such locations, and the larger material will provide more substantial screening of the Facility.

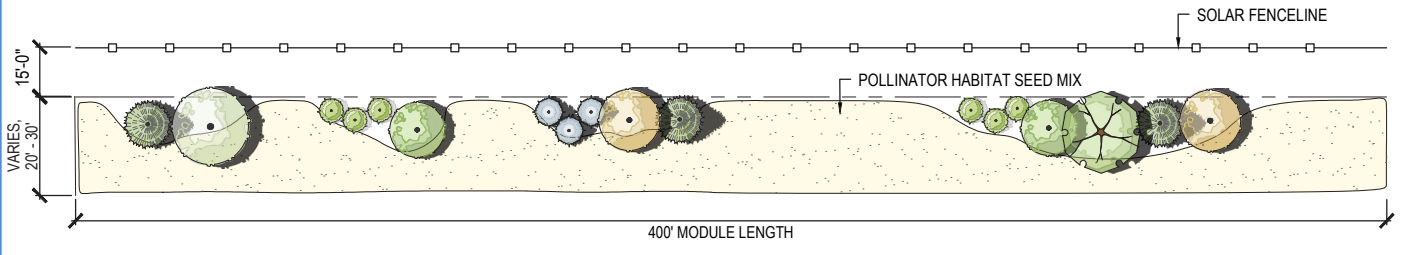
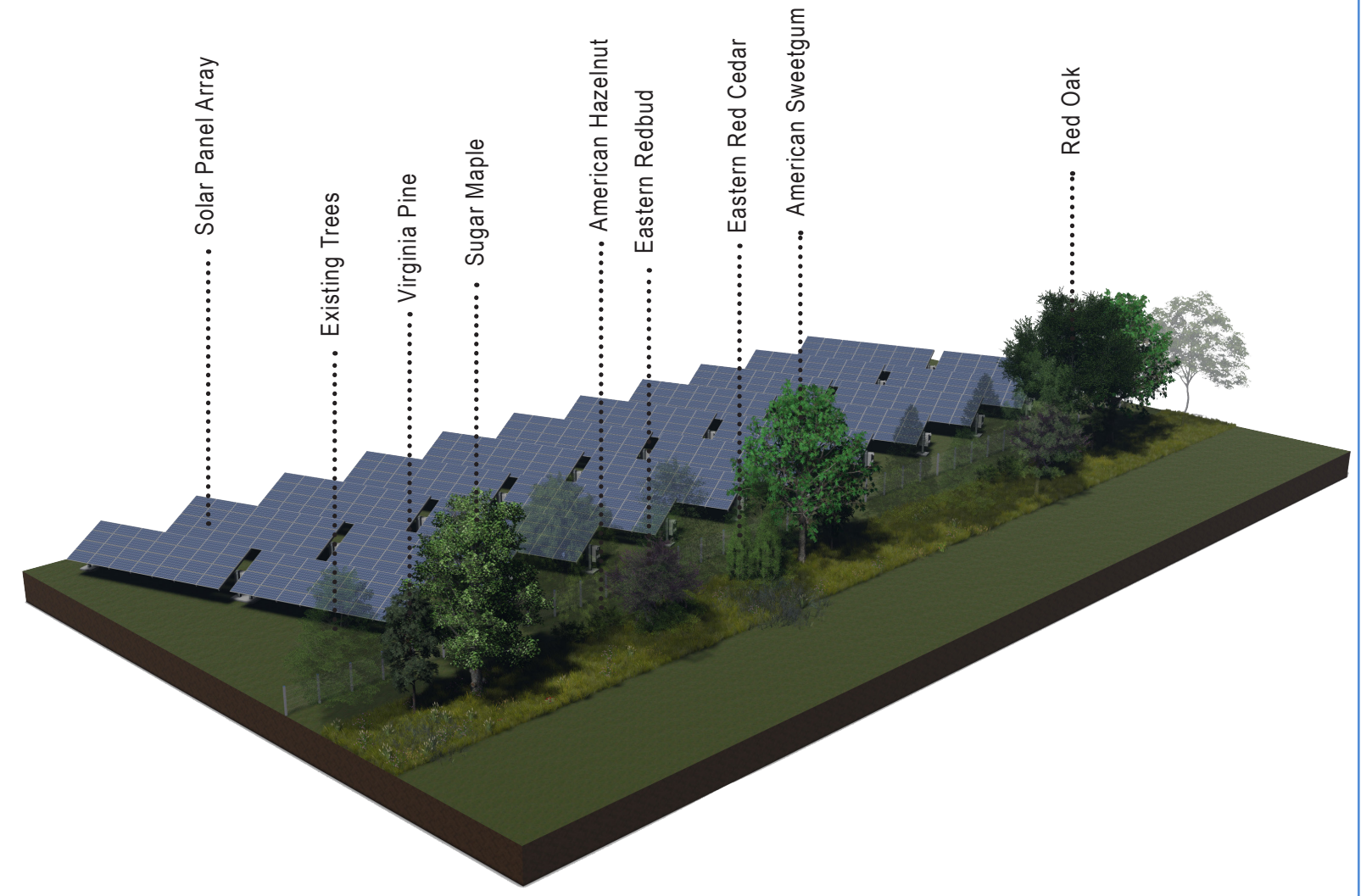
Module 2 can be adapted to fill breaks in hedgerows with plantings that mimic the specific material and scale of the surrounding hedgerow vegetation, allowing the proposed planting plan to blend into the existing hedgerow and create more continuous visual screening along the perimeter of the Facility Site.

In addition to the proposed trees and shrubs, Module 2 can include the use of pollinator-friendly herbaceous seed mix similarly to Module 1. In this case the seed would be primarily used in the portion of the planting area closer to the roadway.



# PLANT SCHEDULE: MODULE 2

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	GROWTH RATE	MATURE SIZE
	1	<i>Acer saccharum</i>	Sugar Maple	2" Cal.	Medium	60'-75' H x 40'-50' W
	2	<i>Cercis canadensis</i>	Eastern Redbud	5' Ht.	Medium	20'-30' H x 25'-35' W
	3	<i>Juniperus virginiana</i>	Eastern Red Cedar	5' Ht.	Medium	40'-50' H x 8'-20' W
	2	<i>Liquidambar styraciflua</i>	American Sweet Gum	2" Cal.	Medium	60'-75' H x 40'-75' W
	3	<i>Pinus virginiana</i>	Virginia Pine	8' Ht.	Slow	15'-40' H x 10'-30' W
	1	<i>Quercus rubra</i>	Red Oak	2" Cal.	Medium	60'-75' H x 60'-75' W
SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	GROWTH RATE	MATURE SIZE
	6	<i>Corylus americana</i>	American Hazelnut	3' Ht.	Medium	6'-10' H x 6'-10' W



## **Conceptual Planting Modules Continued**




### **Module 3 | Adjacent Resource / Residence**

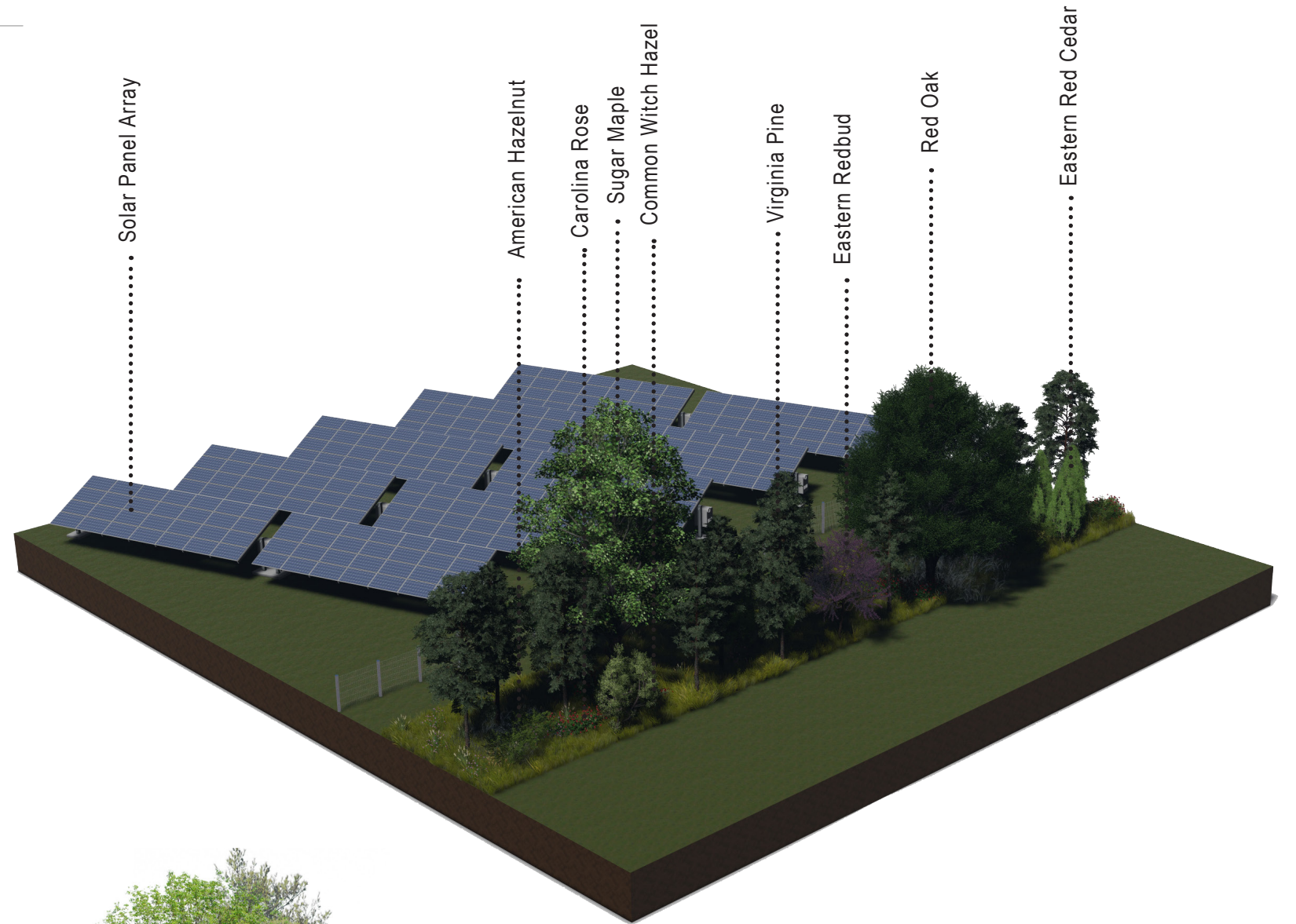
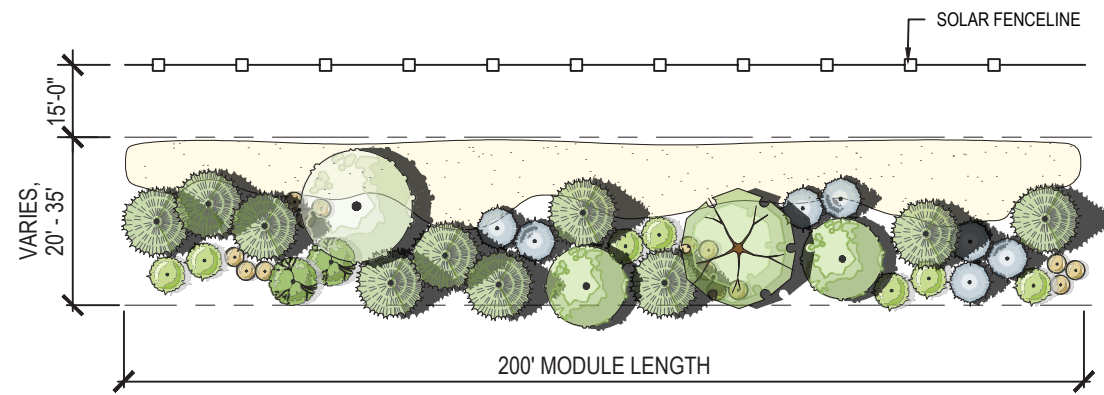
Module 3 consists of a thicker planting that will result in more complete screening of view toward the Facility Site from adjacent homes or Visually Sensitive Resources. Plant species used are similar to Module 2, but a greater emphasis is placed on evergreen species that will provide denser year-round screening. Module 3 seeks to provide this screening effect while still blending into the existing landscape as much as possible. The plant arrangements are therefore intended to be naturalistic, and species chosen are in keeping with the local vegetation. A pollinator-friendly seed mix can again be used to increase the habitat value of the proposed plantings. As with Modules 1 and 2, Module 3 is a flexible concept, so that final species chosen for a given location can respond to the unique character and needs of that location.



# PLANT SCHEDULE: MODULE 3

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	GROWTH RATE	MATURE SIZE
	1	<i>Acer saccharum</i>	Sugar Maple	2" Cal.	Medium	60'-75' H x 40'-50' W
	2	<i>Cercis canadensis</i>	Eastern Redbud	5' Ht.	Medium	20'-30' H x 25'-35' W
	7	<i>Juniperus virginiana</i>	Eastern Red Cedar	5' Ht.	Medium	40'-50' H x 8'-20' W
	10	<i>Pinus virginiana</i>	Virginia Pine	8' Ht.	Slow	15'-40' H x 10'-30' W
	1	<i>Quercus rubra</i>	Red Oak	2" Cal.	Medium	60'-75' H x 60'-75' W

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE	GROWTH RATE	MATURE SIZE
	7	<i>Corylus americana</i>	American Hazelnut	3' Ht.	Medium	6'-10' H x 6'-10' W
	2	<i>Hamamelis virginiana</i>	Common Witch Hazel	5' Ht.	Medium	15'-20' H x 15'-20' W
	14	<i>Rosa carolina</i>	Carolina Rose	2' Ht.	Fast	3'-6' H x 3'-6' W



## **REFERENCES**

Kentucky Department of Agriculture. 2019. *Kentucky Pollinator Protection Plan*.

Kentucky Exotic Pest Plant Council. 2013. *Exotic Invasive Plants of Kentucky List (Third Edition)*.

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