

TECHNICAL GUIDANCE FOR THE DEVELOPMENT OF WILDLIFE & POLLINATOR HABITAT AT SOLAR FARMS

South Carolina Solar Habitat Act — July 2023



TABLE OF CONTENTS

Introduction	1
Choosing a Solar Site	3
Design Considerations	4
Streams and Wetlands	4
Stormwater	5
Farmlands.....	5
Infrastructure – Lines, Lighting & Fences.....	5
Wildlife Corridors.....	6
Wildlife Movement and Security Fencing.....	6
Species Concerns	7
State-listed Species Permit Procedures.....	8
Federally-listed Species Permit Procedures	9
Establishment and Management of Solar Habitat.....	13
Soil.....	13
Pollinator Seed Mixes	13
Preparation & Planting	15
Maintenance	16
Long-Term Management	17
Landowner Guidance: Reclamation of Solar Sites	19
Solar Habitat Certification & Training Program.....	20
APPENDIX A Solar Native Plant Species All Zones	24
APPENDIX B SC Native Plant Vendor List.....	30
APPENDIX C Solar Habitat Application.....	34
APPENDIX D Vegetation Management Template	39
APPENDIX E South Carolina Pollinator Habitat Scorecard for Solar Sites	41

Introduction

The South Carolina Department of Natural Resources (SCDNR) is supportive of renewable energy and innovative ways to continue to support natural resources. In June 2014, Act 236 (SC Code of Laws Title 58 Chapter 39) was signed into law. This legislation required the development of renewable energy facilities as a part of South Carolina's electrical utilities peak demand. This led to South Carolina's solar industry boom. Additionally, in 2019, Act 62 (SC Code of Laws Title 58 Chapter 27 and 41) legislation passed encouraging utilities to develop voluntary renewable energy programs and neighborhood community solar programs. In 2017, according to the Smart Electric Power Alliance, South Carolina was fourth in the country in new solar capacity per state, following behind California, Texas and North Carolina.

While SCDNR is supportive of renewable energy, the increase in solar generation means a new land use on South Carolina's landscape competing with the needs of natural resources. Solar farms can adversely affect valuable natural resources if they are not properly planned and constructed. However, solar developers have an opportunity to provide increased benefits to our natural resources by siting and developing their solar sites wisely and managing them to create habitat suitable for a wide variety of wildlife.

Pollinator habitat consists of flowering, herbaceous native plants and grasses that provide food and cover for pollinators such as bees, butterflies, moths, birds and more. Many of these species that use open prairies and grasslands are in decline in the Eastern United States due, in part, to habitat loss. According to the 2015 SCDNR State Wildlife Action Plan (SWAP), these open land cover types, sometimes called early-successional habitat, have declined dramatically in the last 70 years primarily due to changing agricultural practices, forestry succession, fire suppression and urban/suburban encroachment. The planting of native pollinator plant species not only improves early-successional habitat for a variety of wildlife, but it also aids in reducing soil erosion, protecting water quality and enhancing the aesthetic beauty of a site. Adding pollinator habitat to a solar site can provide benefits to the solar developer and the solar farms' neighbors. This can be done by supporting insects that pollinate agricultural crops, and by reducing maintenance costs associated with mowing and spraying around the panels.



Loggerhead Shrike.
Early-successional Species:



Eastern Kingbirds.



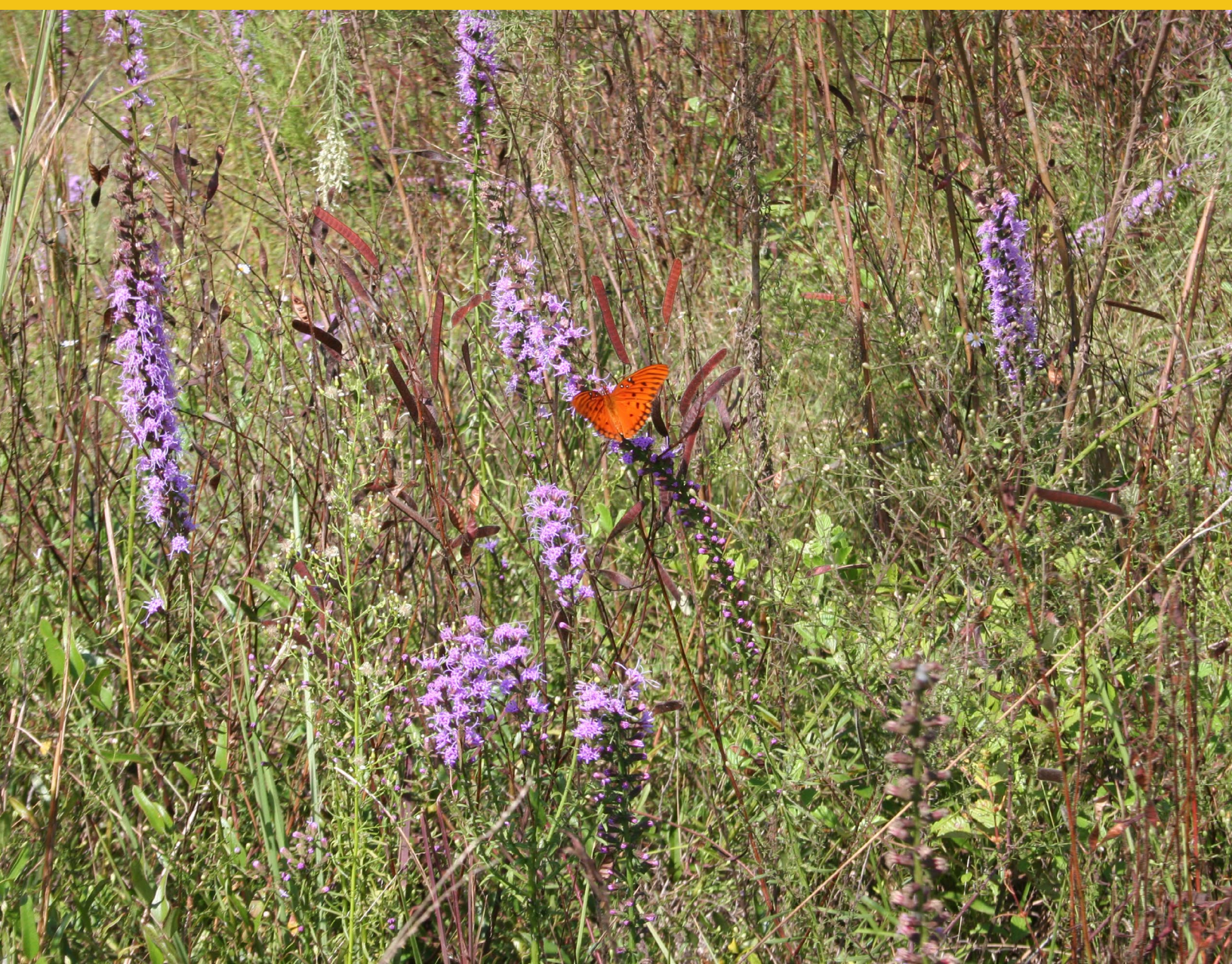
Indigo Bunting.

Spurred from an initiative by Audubon South Carolina with the support of SCDNR, the South Carolina Solar Habitat Act (§50-4-10) was signed into law by Governor Henry McMaster, taking effect on June 1, 2018. The Act provides a voluntary framework to encourage owners of ground-mounted commercial solar energy generation sites to follow voluntary site management practices that:

- Provide native perennial vegetation and foraging habitats beneficial to gamebirds, songbirds and pollinators; and
- Reduce stormwater runoff and erosion at the solar generation site.

Under the authority of the Solar Habitat Act, SCDNR has worked with other state agencies, nonprofit conservation organizations, utilities and solar developers to establish this native habitat and pollinator management guidance for the planning, establishment and management of pollinator-friendly habitat at solar sites in South Carolina. Additional resources pertaining to solar site selection and design consideration are also included in this document.

Gulf Fritillary on *Liatris spicata*
Photo credit: Southern Habitats, LLC



Choosing a Solar Site

The least impactful solar installations occur on top of existing human developments. Rooftop arrays, or arrays built on top of existing disturbed surfaces such as landfills, decommissioned industrial sites and parking lots, are best suited for solar power generation and do not require further habitat conversion, fragmentation or degradation when chosen as locations for solar farms. A tax credit is available to an individual or business that constructs, purchases or leases solar facilities on property located on the Environmental Protection Agency's National Priority List, or equivalent sites, and on a list of related removal actions as certified by the SC Department of Health and Environmental Control (DHEC), such as former industrial sites or landfills¹.



Hannah Solar North Charleston Site.



Hannah Solar Spartanburg Site.

Idle or low-production agricultural lands are often chosen as solar sites. These areas can provide excellent opportunities to establish pollinator habitat and the "edge" habitat utilized by a wide variety of birds, mammals and herpetofauna. Low-production agricultural lands could potentially be improved by several years of proper solar habitat management. If the land will be returned to agriculture following the decommissioning of the solar farm, an explicit decommissioning or reclamation plan should be established early in the planning process.



Pine Gates Renewables Cameron Solar Farm.



Pine Gate Renewables Odyssey Solar Farm.

¹ SC Code of Laws §12-6-3770

All sites require careful consideration of the potential environmental impacts by addressing a few simple questions.

- What natural resources are present?
- Will the site need to be cleared and graded?
- Will new access roads or transmission line right-of-ways need to be built?
- Are wetlands or streams present on the site?
- Will adjacent forests need to be cleared or trimmed due to shading effects on panels?
- Are state or federally-listed threatened & endangered species present? Are there any other conservation or cultural resources concerns?

Proper site selection and planning is the first step in determining how project development may affect natural resources. Habitat fragmentation is one of the greatest impacts to the state's natural resources; the loss of contiguous available habitat with food, cover and water for wildlife is a consideration when siting a solar farm near already protected lands.

In general, solar farms should not be sited on or adjacent to:

- Wildlife Management Areas,
- Heritage Trust Preserves,
- State Parks & Forests,
- National Parks & Forests, and
- Other protected lands (conservation easements).

Design Considerations

Streams and Wetlands

Wetland and riparian areas should be protected with a minimum 50-foot upland buffer. A review of the soils onsite via the U.S. Fish & Wildlife Service's (USFWS) National Wetland Inventory² and the U.S. Department of Agriculture's Natural Resources Conservation Service's (NRCS) Web Soil Survey Tool³ can be useful to help identify the potential for wetlands or hydric soils on the proposed solar site. If hydric soils are present on the project site, the site should be configured to avoid all impacts to wetlands or streams and provide a minimum 50-foot vegetated upland buffer to help protect water quality and provide a wildlife corridor. If impacts are unavoidable to wetlands or streams, consult with the U.S. Army Corps of Engineers (USACE) Charleston District⁴ to determine if jurisdictional waterbodies are present and if a permit and mitigation is required for activities impacting these areas. Please note that solar site development may also require permits or compliance with local (county or municipal) ordinances or regulations.

2 <https://www.fws.gov/wetlands/Data/Mapper.html>

3 <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

4 www.sac.usace.army.mil/Missions/Regulatory



Adding roads or stream crossings on a project site will increase environmental impacts and regulatory burden; these features often require permits for construction. Contact the USACE Charleston District before planning construction in or near streams or wetlands. In-stream structures, such as low flow crossings, bridge footings and culverts, interrupt the natural stream bed and cause sedimentation. If stream crossings must occur, SCDNR recommends the use of bridges or bottomless culverts for all permanent stream or wetland crossings. If traditional culverts are chosen, they should be installed at a minimum of 12 inches below the stream bed and of suitable size to pass bankfull flows; this will ensure continuous aquatic movement up and downstream of the culvert. Improperly sized culverts often erode roadways, streambanks and stream beds, leading to sedimentation, dangerous wash-outs and isolated aquatic organisms. Fords may be appropriate for crossings if used only once or twice a year in ephemeral or intermittent streams.

Stormwater

If construction activities or land clearing activities disturb one or more acres of soil, a stormwater permit from the DHEC is needed⁵.

Regardless of the requirement of a permit, erosion control and sediment management should be considered in all phases of the solar site, including the planning, construction, management, and reclamation phases. On steeper slopes, it should be pertinent to protect topsoil and evaluate where flow may concentrate (drip lines) off the panels toward the nearest low-lying area. It is important to slow the rate of flow on steeper slopes by creating areas perpendicular to the flow paths to slow the rate of flow, which increases infiltration of water into the soil.

If a waterbody is located nearby, flow from the construction area and flow paths from established solar panels should be allowed to infiltrate the soil in created wetlands (vernal pools or swales) to protect water quality of the nearby waterbody.

A review of the DHEC Stormwater Best Management Practices Handbook⁶ is recommended. To prevent entangling and killing wildlife, wildlife-friendly sediment and erosion control devices should be used. Devices should be composed of biodegradable, natural fibers whenever possible.

Farmlands

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. Prime farmlands are protected under the Farmland Protection Policy Act for solar projects associated with, or funded by, the Federal Government. Consultation should occur with the NRCS if soils onsite are classified as prime farmland or farmland of statewide importance and if the solar site is associated in any way to federal funding (cost-share program, wetland reserve program, etc.). The NRCS Web Soil Survey Tool⁷ can be utilized to assist you in identifying if these protected farmlands are on your site.

Infrastructure – Lines, Lighting & Fences

Overhead utility lines should be designed to prevent bird electrocution and collisions. Avoid siting lines in areas where birds concentrate, when possible. Self-supporting towers, which do not require stay wires, are preferred. When possible, design power lines without earth or shield wires. Shield wires are the lines most often associated with bird collisions because they are the highest wire and are smaller in diameter. Install visibility enhancement devices such as marker balls, bird diverters or other line visibility devices on wires to reduce the risk of collision, especially on shield wires. Adequate clearances between energized or grounded parts requires

5 <https://scdhec.gov/environment/water-quality/stormwater>

6 SCDHEC Best Management Practices

<https://www.scdhec.gov/Environment/WaterQuality/Stormwater/BMPHandbook/>

7 <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>



Black Vulture.
Photo credit: SCDNR Biologist Pam Corwin

60 inches of horizontal separation and 48 inches of vertical separation. In areas with potential wood storks, the vertical separation should be increased to 60 inches. Where the minimum distance is not feasible, insulate wires, conductors and other critical equipment to render those components neutral. Cross-arms, insulators and other parts of the power lines should have exclusion devices or perch discouragers installed to prevent birds from landing on energized wires. Artificial bird safe perches and nesting platforms should be placed at a safe distance from the energized infrastructure.

The use of minimization measures to reduce impacts to birds can include increasing line visibility, insulating wires to cover exposed connections and increasing the distance between wires to eliminate contact with ground or other energized wires⁸.

To minimize impacts to birds during nocturnal activities, lights should be installed such that lamps and reflectors have cut-off shields and use down-lighting to avoid illuminating the nighttime sky. This would also serve to reduce excessive reflection glare and ensure that artificial light is not visible from beyond the project site. All lighting should be of minimum necessary brightness, consistent with operation safety and security. Use lights with automatic controls such as timers, photo-sensors or motion detectors.

Wildlife Corridors

Habitat fragmentation occurs when habitats are bisected or broken down into smaller areas by roads, structures and other development. Fragmentation is problematic for wildlife as it makes it difficult to access the necessary resources to survive and to find mates for reproduction. Many animals need forested areas at least 150-feet wide and ideally more than 300-feet wide to travel between habitats. All efforts should be made in the planning stages for facility activities and uses to avoid bisecting any existing high priority habitats and wildlife corridors on, and adjacent to, the site. This includes the clearing of land and placement of infrastructure, such as panel arrays, transmission lines, roads and other appurtenances that may bisect the important habitat or wildlife corridors.

Wildlife Movement and Security Fencing

Solar facilities often require security perimeter fencing that may act as a barrier to ground-based wildlife movement. The SCDNR encourages the use of adaptive strategies to allow for the movement of small wildlife. These may include:

- dividing large sites into smaller fenced sub-parcels to establish unfenced wildlife corridors (wetlands or other long-term refuge zones left unfenced can serve as wildlife corridors);
- use of larger mesh fence as ground level (e.g., wildlife-permeable fencing); or
- facilitate wildlife passage via ground-level openings or pipes (approximately 8-inch in diameter through the fence).

To exclude deer from the site, the SCDNR recommends that security fencing be at least 96 inches in height (including barbed wire if desired).

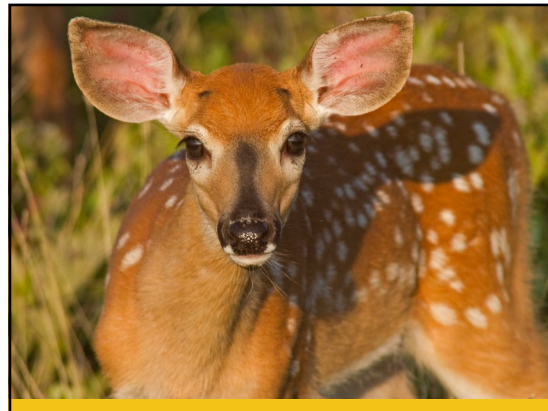
⁸ <https://www.fws.gov/birds/management/project-assessment-tools-and-guidance/guidance-documents/electric-utility-lines.php>

Permeable Wildlife Friendly Fencing Examples

Pine Gate Renewables installed permeable fencing at one of its North Carolina facilities in 2018; passage was provided for small-to-medium sized wildlife species such as rabbits, squirrels and raccoons (Misbrenner 2019)⁹. Similarly, Cypher et. al¹⁰ describes two solar farms in California with alternative wildlife passage options. The first, the Topaz Solar Farm allowed permeable fencing with the main goal of allowing passage by kit foxes and prey species. The Topaz Solar Farm project had a typical approximately 8-foot-tall chain-link fence, but a gap of 4 to 6 inches was left between the bottom fence and the ground. Additionally they had a single chain-link fence rail installed at the bottom of the gap to discourage larger animals from digging under the fence. The California Valley Solar Ranch site utilized a deer-proof style 6 x 6 inch mesh fencing that also provided kit fox passage through the solar site.

Species Concerns

All practicable efforts should be made to avoid and minimize impacts to state and federally listed threatened and endangered species, SC State Wildlife Action Plan (SWAP)¹¹ conservation priority species, and habitat important for these species. SWAP conservation priority species are those species of greatest conservation need, not traditionally covered under any federally funded programs, and were granted priority status as described in the SWAP.



Juvenile White-tailed Deer.
Photo credit: SCDNR Biologist Pam Corwin

Species are listed in the SWAP because they are:

1. rare, declining or designated as at-risk;
2. there are knowledge deficiencies regarding the species;
3. the species is common in South Carolina but listed rare or declining elsewhere; or
4. the species serves as an indicator of detrimental environmental conditions.

SCDNR staff are available to assist you in determining if rare, threatened or endangered species are known to occur on a proposed project site. Please contact SCDNR's species review staff¹² for more information. Please note the take of a state listed species is prohibited under S.C. Code of Laws §50-15-30.



Juvenile Yellow-bellied Turtle.
Photo credit: SCDNR Biologist Will Dillman

The USFWS recommends surveys be conducted on the project site and surrounding area for any potential federally listed species, as well as for those that are federally considered an At-Risk-Species (ARS). It is possible that some of the ARS may be listed under the Endangered Species Act (ESA) during the solar farm's operational life. Coordination with the USFWS should occur in the early planning stages. If federally listed species may be affected by the activity, or if

9 Misbrenner, K. 2019. Pine Gate Renewables and The Nature Conservancy Test Wildlife-Permeable Fencing for Solar Plants. Solar Power World. <https://www.solarpowerworldonline.com/2019/02/pine-gate-renewables-the-nature-conservancy-wildlife-permeable-fencing/>

10 Cypher, B., B.B. Boroski, R.K. Burton, D.E. Meade, S.E. Phillips. 2021. Photovoltaic solar farms in California: can we have renewable electricity and our species, too?. California Fish and Wildlife Journal. 107(3); 231-248.

11 www.dnr.sc.gov/swap

12 speciesreview@dnr.sc.gov; www.dnr.sc.gov/species/

the project has a federal nexus, ESA Section 7 requires consultation with the USFWS¹³. SCDNR and USFWS recommend that the project avoid impacts to all federally listed species.

State-listed Species Permit Procedures

Gopher tortoise (*Gopherus polyphemus*) occur in sparse longleaf pine savannas and forests that may seem like prime locations for solar sites. Thus, SCDNR has concerns regarding solar development and the potential impact to the state endangered gopher tortoise¹⁴. Gopher tortoise cannot be moved, their burrows destroyed, or their burrows scoped, without first obtaining a permit from SCDNR. Before any disturbance or take of gopher tortoise occurs, the areas of impact must be completely surveyed¹⁵ by qualified individuals able to identify all burrows and tortoises. All burrows should be scoped to determine gopher tortoise occupancy. Gopher tortoise may be allowed to be relocated into approved areas as long as relocation plans have been reviewed and approved by SCDNR (contact the SCDNR Herpetologist at 803-546-6062). Before planning a solar farm, check with SCDNR to see if gopher tortoise may be present in your area by contacting the SCDNR Species Review staff.



Gopher Tortoise.
Photo credit: SCDNR

In South Carolina, gopher tortoise are most likely to occur in the Sandhills and Coastal Plain ecoregions of Jasper, Hampton and Aiken Counties; however, there are also known occurrences in Colleton, Dorchester, Bamberg and Allendale Counties. SCDNR recommends gopher tortoise surveys and consultation with the USFWS, in addition to SCDNR, should always occur in the following counties: Aiken, Allendale, Bamberg, Colleton, Dorchester, Hampton and Jasper.



Spotted Turtle
Photo Credit: SCDNR Herpetologist Andrew Grosse

Spotted turtle (*Clemmys guttata*)¹⁶ are a state threatened species and a federal ARS. These semi-aquatic turtles are not an abundant species in South Carolina, but they can be common in appropriate habitat throughout the Coastal Plain. Spotted turtle can be found inhabiting a variety of wetland types including small ponds and streams, swamps, flooded forests and other shallow bodies of water such as isolated wetlands. However, there are individuals, particularly males, that wander some distance from wetlands, especially during the spring. This species is difficult to find during the summer months and may undergo a period of summer dormancy (aestivation) in some areas. If the project could permanently alter spotted turtle habitat or temporarily disturb spotted turtle, relocations may be allowed, as long as

relocation plans have been reviewed and approved by SCDNR (contact the SCDNR Herpetologist at 803-546-6062). Before planning a solar farm, check with SCDNR to see if spotted turtle may be present in your area by contacting the SCDNR Species Review staff¹⁷.

¹³ <https://www.fws.gov/southeast/charleston/project-planning>

¹⁴ www.dnr.sc.gov/cwcs/pdf/GopherTortoise.pdf

¹⁵ www.fws.gov/southeast/pdf/methodology/gopher-tortoise-survey-handbook.pdf

¹⁶ <http://www.dnr.sc.gov/cwcs/pdf/SpottedTurtle.pdf>

¹⁷ speciesreview@dnr.sc.gov; www.dnr.sc.gov/species/

Federally-listed Species Permit Procedures

Due to their federal protections under the ESA, the following species have established impact areas in which a permit for activities would be triggered. Please contact USFWS for further information regarding their consultation or survey requirements.

Red-cockaded woodpecker (*Picoides borealis*) are listed as endangered by the state and federal government, as well as protected under the Migratory Bird Treaty Act. Red-cockaded woodpecker nest in mature pine forests in the Piedmont and Coastal Plain of South Carolina. This species cannot be taken, killed or possessed, nor can their cavity trees be destroyed or disturbed without a permit from the USFWS. Areas of impact must be surveyed by qualified individuals able to identify red-cockaded woodpecker by sight and sound, as well as identify foraging and nesting habitat and the associated cavity trees. All red-cockaded woodpecker cavity trees should be reported to SCDNR via email at rcwreport@dnr.sc.gov. If a red-cockaded woodpecker nest or cavity tree is located within 0.5 miles of the impact area, the USFWS must be contacted to determine if a permit is required. During the planning phase of a solar site, check with SCDNR species review staff¹⁸ to see if red-cockaded woodpecker may be present in the project area. Please contact USFWS for further information regarding their consultation process and contact SCDNR or USFWS for survey requirements.



Red-cockaded Woodpecker.
Photo credit: SCDNR

Wood stork (*Mycteria americana*) are listed as a federally threatened and state endangered species, as well as protected under the Migratory Bird Treaty Act. Although nesting sites or wading bird rookeries may not be located nearby or on the project site, wood stork and other wading birds may seasonally use the water features located on or near the property. If the project site is within 2,500 feet of a wood stork rookery or within 1,000 feet of a known wood stork roosting area the USFWS must be contacted to determine if additional requirements or actions are necessary. During planning for the solar site, check with SCDNR species review staff¹⁰ to see if wood storks may be present in the project area. Please contact USFWS for further information regarding their consultation process and SCDNR or USFWS for survey requirements.



Wood Stork.
Photo credit: SCDNR



Egret Rookery, very similar to the appearance of a wood stork rookery.
Photo credit: Retired SCDNR employee Bill Anderson

¹⁸ speciesreview@dnr.sc.gov; www.dnr.sc.gov/species/

Bald eagle (*Haliaeetus leucocephalus*) are a state listed threatened species and are also protected under the federal Bald and Golden Eagle Act and Migratory Bird Treaty Act. Bald eagle nest in large trees with an open limb structure that are usually located on the edges of forests and marshes within approximately 0.5 mile from open water. Bald eagle cannot be taken, killed or possessed, nor the nests destroyed or disturbed without a USFWS permit. Areas of impact must be surveyed by qualified individuals able to identify bald eagles by sight and sound, as well as identify preferred habitats and nests. All bald eagle nests should be reported to SCDNR¹⁹. If a new nest is discovered, please ensure it is an undocumented nest by using the current SCDNR documented bald eagle nests information available online. To report an undocumented nest, please visit the SCDNR website and complete the reporting form. If a bald eagle nest is within 660 feet of the impact area, the USFWS must be contacted to determine if a permit is required. During planning for the solar site, check with SCDNR to see if bald eagle may be present in the project area. Please contact USFWS for further information regarding their consultation process and SCDNR or USFWS for survey requirements.



Immature Bald Eagle.
Photo credit: SCDNR Biologist Pam Corwin



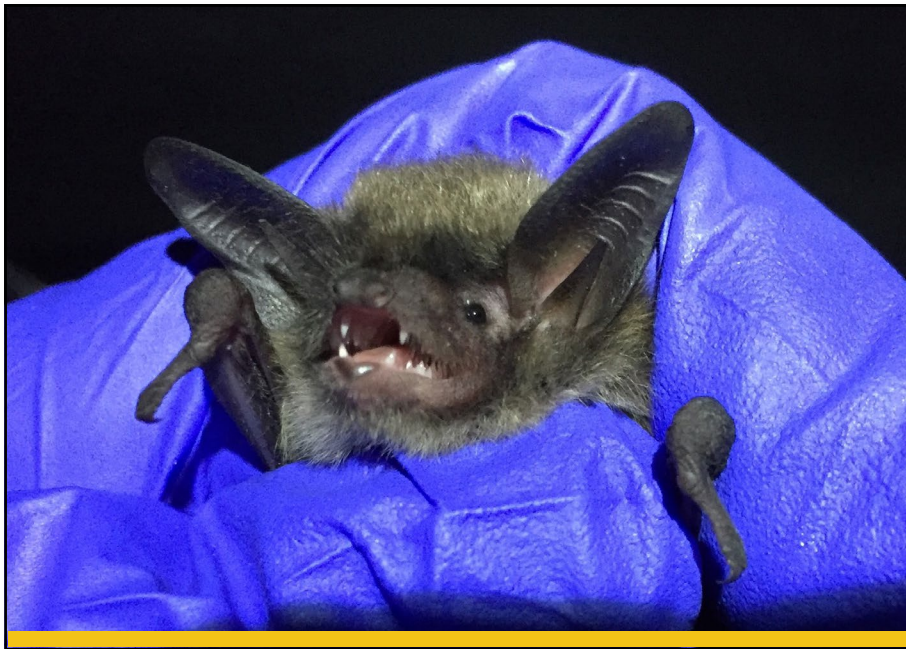
Adult Bald Eagle.

¹⁹ <http://www.dnr.sc.gov/wildlife/baldeagle/locations.html>

Northern long-eared bat (*Myotis septentrionalis*) are listed as federally threatened. Incidental take of northern long-eared bats is allowed for actions outside of the WNS Buffer Zone²⁰. An incidental take permit from the USFWS, under Section 10(a)(1)(B) of the ESA, may be required if activities are occurring within the WNS Buffer Zone and they are not related to specific forest management, native prairie management, minimal and hazardous tree removal, or maintenance/expansion of existing right-of-ways and transmission corridors, as outlined in the 4(d) rule as exemptions. Minimal tree removal only refers to an impact of one acre or less of contiguous habitat or one-acre total within a larger tract. Additionally, an incidental take permit would be needed, under Section 10(a)(1)(B) of the ESA, if activities were:

- occurring within ¼ mile of a known northern long-eared bat maternity roost tree or hibernacula (areas occupied by bats during the winter months);
- cutting or destroying an occupied roost tree from June 1 to July 31 (during the pup season); or
- clearcutting within a ¼ mile of known, occupied roost trees from June 1 to July 31.

Again, if the project activities were related to specific forest management, native prairie management, minimal and hazardous tree removal, or maintenance/expansion of existing right-of-ways and transmission corridors, as outlined in the 4(d) rule, an incidental permit would not be needed. During the planning phase of a solar site, check with SCDNR species review staff²¹ to see if northern long-eared bat may be present in the project area. Please contact USFWS for further information regarding their consultation process and contact SCDNR or USFWS for survey requirements.



Northern Long-eared Bat.
Photo Credit: SCDNR Biologist Jennifer Kindel

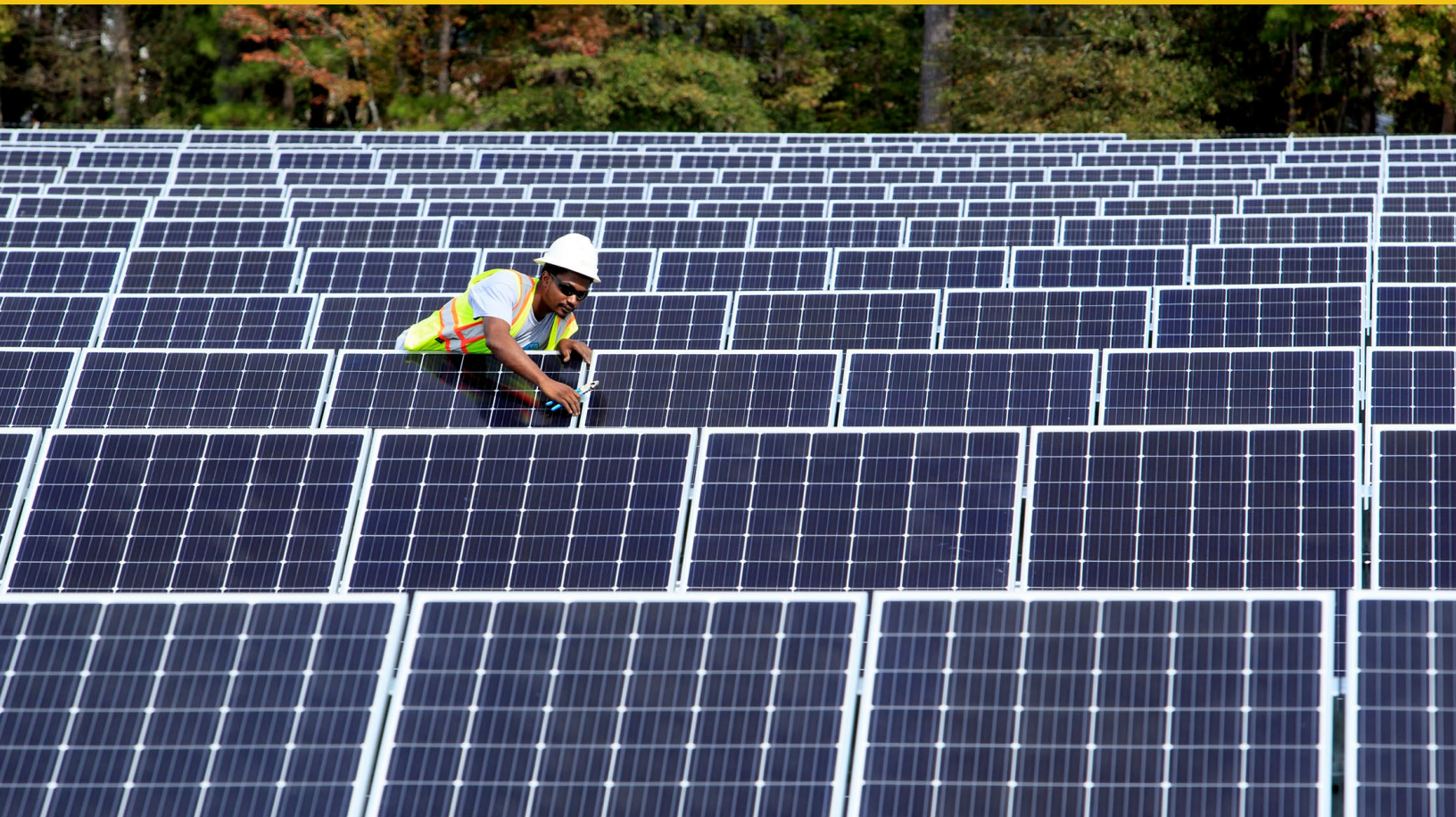
²⁰ <https://www.fws.gov/Midwest/endangered/mammals/nleb/pdf/WNSZone.pdf>

²¹ speciesreview@dnr.sc.gov; www.dnr.sc.gov/species/

BMPs for Site Selection, Design & Construction

- **Setback** facilities away from streams, wetlands and protected lands. Wetland and riparian areas should be protected with a minimum 50-foot vegetated upland buffer.
- Maximize stream and wetland buffer widths and avoid use of chemical treatment within recommended buffers, other than when necessary to control invasive species. Be sure to follow manufacturer's instructions when applying chemical herbicides.
- Plan **wildlife corridors/habitats** around and within large arrays. Maintain connectivity of forest patches.
- To prevent entangling and killing small wildlife, install biodegradable, natural fiber, non-plastic, wildlife-friendly sediment and erosion control devices prior to any land clearing.
- Consult with SCDNR for design considerations and species review of the project site.
- Coordinate with DHEC and the USACE for necessary permits.
- **Lights** should be installed such that lamps and reflectors have cut-off shields and use down-lighting, so the direct lighting does not illuminate the nighttime sky, is not visible from beyond the project site. All lighting should be of minimum necessary brightness consistent with operation safety and security. Use lights with automatic controls such as timers, photo-sensors, or motion detectors.
- If additional overhead **transmission lines** will be installed, measures to minimize impacts to birds should be implemented. These can include increasing line visibility, insulating wires to cover exposed connections, and increasing the distance between wires so no contact with ground or other energized wire can be made.

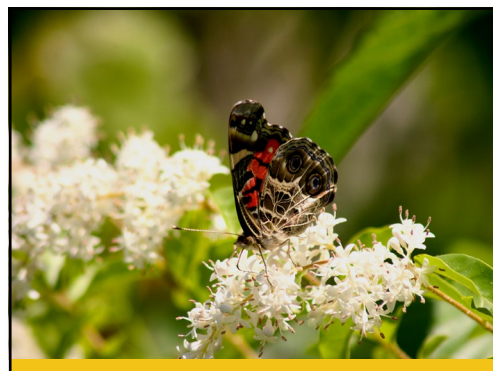
Santee Cooper Bell Bay Solar Site.
Photo by Paul Zoeller



Establishment and Management of Solar Habitat

Soil

Identify the soil types on the project site. Contact Clemson Extension²² and/or the local Soil & Water Conservation District Office. Identify the predominant soil type for the solar site with the NRCS Web Soil Survey.²³ Once the soil type has been identified, contact the local conservation district and discover what the most appropriate native pollinator mix is for the site and at what planting density. The district staff can provide assistance in identifying vendors that can provide these native seed mixes and/or live stakes.²⁴



Painted Lady Butterfly.
Photo credit: SCDNR Biologist Pam Corwin

Pollinator Seed Mixes

The more diverse the native pollinator seed mix, the greater the potential benefit. When possible, include a variety of herbaceous plants and grasses in the seed mix. Native pollinator seed mixes may be more expensive than other wildflower seed mixes that often include non-native species. However, the higher initial cost of native seed mixes will be offset by the reduced maintenance costs (i.e., frequency of mowing), the need for fertilizers and supplemental watering. When selecting a seed mix, be sure seeds are from a reputable vendor that can certify that the mix is free of noxious, invasive weeds. Local Soil & Water Conservation District or local Clemson Extension offices can assist you in locating a reputable seed supplier.

Identify planting zones in the solar array and select native seed mixes suitable to each zone. Be sure to use native seed mixes appropriate for the ecoregion and soils of the site. To provide variation of habitat and increased diversity for the solar site, SCDNR recommends three zones:

(1) Panel Zone (maximum height on average 24 inches, but will vary dependent on mounting system inside the security fence): These very-low-growing pollinator mixes may include low-growing grasses, native forbs and naturalized (non-native) clover species for planting beneath and between panels. Ideally, there should be at least three plant species in bloom from April to September. Avoid including taller native warm season grasses in this mix, as such species would require frequent mowing to avoid shading panels. The taller warm season grasses, such as big bluestem (*Andropogon gerardii*), and Indiangrass (*Sorghastrum nutans*) should not be used in the Panel Zone, but instead be included in the Buffer Zone seed mixes. It is recommended, when possible, to increase the height of the bottom edge of the panels to accommodate a greater diversity of native species and allow for easier and less-frequent mowing. A distance of 36" from the ground surface is recommended to increase benefits while keeping installation costs relatively low.

(2) Buffer Zone: (maximum height on average 4 feet, around the perimeter both inside and outside the security fence): The Buffer Zone should be more diverse and include some of the taller native plants, providing a contrast with the very-low-growing pollinator mix in both height and species composition. Include at least 5% of native warm season grasses (Indiangrass, big bluestem and little bluestem (*Schizachyrium scoparium*)) and incorporate other pollinator species that would not otherwise be suitable in the Panel Zone due to height restrictions. Greater plant diversity in the Buffer Zone will help attract a wide variety of butterflies, hummingbirds, moths and bees to the site. In addition, this zone will

22 www.clemson.edu/public/regulatory/ag-srvc-lab/soil-testing/index.html

23 <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

24 <http://www.dnr.sc.gov/conservation/index.html>

provide cover for many songbirds and small mammals that will forage and find refuge on the solar site. Be advised that the maximum height of these plants may be limited by your security requirements. Work with your seed supplier to maximize height and diversity of the species in this mix according to your security needs. Please see Appendix A for a list of buffer species that may be utilized outside of the security fence to provide wildlife benefit and an aesthetically pleasing visual barrier for the solar site.

(3) Long-Term Refuge Zone: Many solar sites may come with existing isolated, forested wetlands or areas that are otherwise undesirable or undevelopable for solar arrays or infrastructure. It is recommended that you designate these areas as Long-Term Refuge Zones to be managed for wildlife. Additionally, if the site does not include one of these Long-Term Refuge Zones, create one by setting aside an area at least 10% of the size of the Buffer Zone. The Long-Term Refuge Zone should be managed as a long-term wildlife refuge and be excluded from frequent maintenance activities. The placement of this zone should take into consideration potential long-term shading effects that may impact solar panel operation. Approximately 1/3 of this zone should be mowed every other year to prevent establishment of weedy and invasive species. Consider planting small trees and shrubs that are beneficial to wildlife but be sure to clearly mark planted woody species to avoid damage during mowing. Recommended low-growing native pollinator tree and shrub species include: Chickasaw plums (*Prunus angustifolia*), southern wax myrtle (*Myrica cerifera*), smooth sumac (*Rhus glabra*), southern crabapple (*Malus angustifolia*) and American beautyberry (*Callicarpia americana*).



Example of a typical solar habitat site with a Panel and Buffer Zone.

(4) Aesthetic Fencing Zone: Many solar sites are required by county ordinances to provide a planted buffer to prevent the solar farm from being visible to the community. While this area is outside of the security perimeter fence, it can be planted in native plants that are beneficial to wildlife and provide an aesthetically pleasing visual buffer year-round. See Appendix A for a list of aesthetic plantings that would be appropriate for areas on the outside of the solar site's security fencing.

5) Residual Land in Pollinators: Many solar sites are developed where there is residual land that may be in agriculture or barren due to a recent clearcut, but may not be needed for the solar site's development; however, the landowner may require the entirety of the parcel or area to be leased by the solar developer for ease of property management. These areas known as "residual lands" may be planted in any of the native pollinators suggested in Appendix A and can contribute to a Silver Certified Solar Habitat rating.

Preparation & Planting

Prior to beginning any land disturbing activity, appropriate erosion control measures, such as silt fences, silt barriers or other devices, should be placed between the disturbed area and any nearby waterways and maintained in a functioning capacity until the area is permanently stabilized. If a project involves more than one acre of land clearing or ground disturbance, or if disturbance occurs less than one half mile from a receiving body in the coastal zone, a DHEC stormwater construction permit is required. Please note that many permits issued by DHEC require temporary soil stabilization within 14 days after construction. DHEC is willing to work with solar site developers who intend to plant native vegetation in order to reduce the inspection frequencies required once temporary stabilization has been implemented, as allowed under the current National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Construction Activity²⁵.



Santee Cooper Colleton Solar Site.
Photo by Paul Zoeller

Since native pollinator species may be slow to establish, annual plant species, such as brown top millet, rye, wheat or oats may be used to temporarily stabilize the soil, depending on the soil and season.²⁶ Please see DHEC's recommendations²⁷ for timing and soil stabilization as part of the stormwater permit process. Please note that SCDNR strongly recommends against the use of several plant species on the DHEC list for temporary stabilization measures, especially *Sericea lespedeza*, turf grasses (Bermuda and Bahia grass) and other perennial non-native grasses (e.g., weeping lovegrass). These plants can grow aggressively, crowding out native plants and would require expensive herbicide application to eliminate these species before planting a native pollinator seed mix.



Photo credit: Southern Habitats, LLC

25 See Section 4.2. B <https://www.scdhec.gov/sites/default/files/docs/Environment/docs/CGP-permit.pdf>

26 http://www.scdhec.gov/sites/default/files/docs/Environment/docs/Appendix_C.pdf

27 DHEC Stormwater Temporary Seeding <http://www.scdhec.gov/sites/default/files/docs/Environment/docs/eros-tSeeding.pdf>

Established turf grasses and weeds outcompete native pollinator species. Existing vegetation must be removed before establishing the solar pollinator habitat. Apply a non-persistent herbicide while undesirable plant species are actively growing. Cool-season plants, usually dormant in the summer, may require a second treatment in the winter. Many herbicides require that you wait at least 72 hours after any application before planting the seed mix. Be sure to follow all label instructions and advisories.

In South Carolina, planting should occur in the coolest months, typically between November and January. Be sure to check with local Clemson Extension or Soil & Water Conservation District offices for optimal planting times. Ensure that the ground is free of turf grasses and weed species. Prepare the ground for planting by raking away the bulk of the dead plant material. Broadcast seeding may work well on bare, prepared ground, but otherwise the use of a native grass seed-drill is recommended. With the broadcast method, only the light raking associated with the clearing of debris is recommended as this will not expose additional dormant weed seeds in the soil. A native grass seed drill is recommended for effective germination in all soils, but will likely be the only effective method in harder clay soils. Different native pollinator seed mixes should be planted in each zone following the application rates recommended by the seed supplier. For more detailed instructions, consult the local Clemson Extension or Soil & Water Conservation District Offices. SCDNR prefers and recommends the use of native warm season grasses and/or other native forbs that would be beneficial for wildlife and pollinators based on the appropriate planting zone. A list of suggested species can be found in Appendix A.

Maintenance

With proper care, solar pollinator habitat should be well established by the end of the second growing season, after which, a regular maintenance schedule should be implemented. A more detailed timeline is as follows:

Year 1 - Mow often, before the vegetation reaches a height of 12 inches. Most of the plants cut during the first year will not be the planted pollinator species. Frequent mowing will reduce pressure from competing species on pollinator species, which spend the first growing season developing deep root systems. Later in the growing season, mow with the mower deck height set 5 inches above the ground (12 inches above the ground if gopher tortoise may be present) before the vegetation produces seed.

Year 2 - Rake away debris just before the growing season; this will help distinguish weeds from pollinator plants. Look for biennial weed species; remove manually or by spot treatment with herbicide. Mow sparingly, just as biennial weed species are about to flower. Keep the mower deck high enough, greater than 6 inches (12 inches above the ground if gopher tortoise may be present) to stay above the native pollinator plants, but low enough to remove flower heads from weed species before they have a chance to produce seed.

Year 3 - Pollinator species should be well established, but select spraying and/or mowing may still be needed. Mow just before the growing season with the mower deck height 5 inches above the ground (12 inches if gopher tortoises may be present). Other than spot-mowing for weeds, try not to mow again until after the growing season or, if possible, wait until next spring since the seeds and stems of the native plant species provide food and shelter for overwintering wildlife. By now, migratory birds may be nesting in the ample ground cover. To avoid impacts to birds during nesting season, SCDNR recommends that mowing should not occur in established pollinator habitat between April 1 and September 1. When mowing during the growing season cannot be avoided, set the mower deck as high as possible (no lower than 6 inches, preferably higher; 12 inches if gopher tortoises may be present) so native herbaceous vegetation will not be damaged.

Note: If the state-endangered gopher tortoise is present on the site, the mower deck should not be lower than 12 inches. Mowing lower than 12 inches may result in the take of this protected species. Any take of gopher tortoise requires a permit from SCDNR.

When using pesticides, proper application and careful and coordinated timing can significantly reduce pollinator mortality. Use an Integrated Pest Management (IPM) approach which includes proper pest identification, monitoring, and evaluating all available factors in the environment potentially contributing to a pest problem. IPM solutions can include mechanical removal of pests or setting a tolerance threshold. IPM does not mean land stewards automatically use pesticides to eliminate pests. Carefully diagnose your pest problem, and, before you apply a pesticide, make sure the pest population has reached a level where chemical control is necessary. As always, consult with your local County Extension Agent and if a pesticide is needed remember to follow the label instructions. Further information on the rules and regulations regarding pesticides and if the applicator must obtain a pesticide applicators license prior to making a pesticide application in the state of South Carolina can be obtained from Clemson Regulatory Services Department of Pesticide Regulations.²⁸



Eastern Tiger Swallowtail.
Photo credit: SCDNR Biologist Pam Corwin

Long-Term Management

Once pollinator habitat is well established, which generally occurs following two to three successful growing seasons, it should no longer require regular mowing during the growing season. However, keep in mind that South Carolina native plants are well adapted to regular disturbance. Historically, this occurred when wildfires swept across the landscape or as a result of grazing from large herbivores, such as bison or elk. Occasional mowing during the winter or early spring can mimic that historic disturbance regime and help keep invasive weeds and woody plants from colonizing.

Mowing should occur well after the growing season, ideally in the late winter or early spring (February – March). Routine mowing should occur on only one third of the site every year, so that

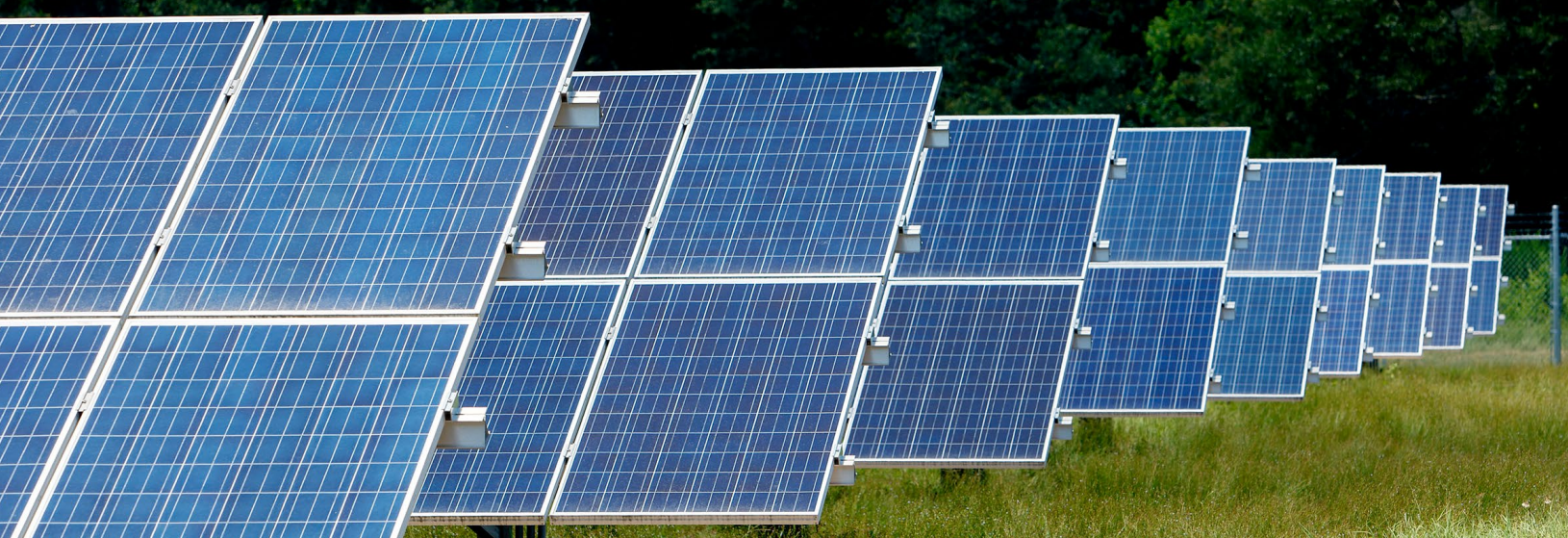
²⁸ <https://www.clemson.edu/public/regulatory/pesticide-regulation/>

every stem is cut only once every 3 years. Mowing small paths for regular maintenance check-ups, conducted on an annual basis, should not cause substantial damage to the site provided that the mower deck is set higher than 6 inches above the ground (12 inches if gopher tortoises may be present). In the Long-Term Refuge Zone, mow less often, mowing only one third of the site every other year, avoiding planted native shrubs and trees, so that every stem is cut only once every 6 years.

BMPs for Solar Pollinator Habitat Establishment and Maintenance

- **Know your soil.** Contact Clemson Extension and/or the local Soil & Water Conservation District Office. Identify the predominant soil type for the solar site to determine the most appropriate native pollinator mix and planting density.
- Establish **planting zones** and cultivate different native pollinator seed mixes in each zone. These zones should vary by the height and sunlight available in each zone. The recommended zones in order from shortest to tallest are: Panel Zone, Buffer Zone, and Long-Term Refuge Zone.
- If possible, wait until spring to conduct **routine mowing** in each zone once the native pollinator habitat is established. The seeds and stems of native pollinator plant species provide food and shelter for overwintering wildlife.
- Taller growing pollinator plant species should be planted around the **periphery of the site** and anywhere on the site where mowing can be restricted during the summer months. Taller plants, left unmowed during the summer, would provide benefits to pollinators, habitat for ground-nesting/feeding birds and cover for small mammals.
- Low-growing/groundcover consisting of native species should be planted **under the solar panels** and between the rows of solar panels. This would provide benefits to pollinators while also minimizing the amount of maintenance. Creating diversity in cover type is beneficial for a variety of wildlife.
- Ensure seeds from the vendor are free of noxious weeds.
- **Mowing** should not occur in established pollinator habitat between April 1 and September 1 to avoid impacts on nesting birds. The mower deck should be set no lower than 6 inches high so native herbaceous vegetation will not be damaged.
- If the state-endangered **gopher tortoise** is present on the site, the mower deck should not be lower than 12 inches. Mowing lower than 12 inches may result in the take of this protected species.

Santee Cooper Colleton Solar Site.
Photo by Paul Zoeller



Landowner Guidance: Reclamation of Solar Sites

Landowners may see increased agricultural yields from soils restored by decades of proper pollinator habitat management. However, the land may not be suitable for agricultural purposes following lease termination unless a site is properly decommissioned. To maintain the integrity of the landscape, SCDNR recommends the inclusion of a decommissioning or reclamation plan in solar contracts or leases with private landowners. A solar site reclamation plan should include provisions for what needs to be removed (posts, underground cables, concrete pads, etc.), who is responsible for reclamation or cleanup after the lease is terminated and details of financial assurances for cleanup. Early in negotiations, the landowner should be sure to include clauses in lease agreements or contracts with the solar developer intended to address the following scenarios:

- In the event the lease is terminated prematurely, who will be responsible for cleanup?
- Who is responsible if the developer leaves panels in place, or large concrete or gravel pads, wiring, etc.?
- What happens if a landowner dies, goes bankrupt, loses the land, etc., who is then responsible for the solar site?
- What happens if the developer goes bankrupt? Who is then responsible for maintenance and reclamation of the solar site?
- Are there protocols and financial assurances in place to deal with abandonment of a solar site?
- What agreements are in place with the solar developer to return the land to its pre-existing condition? What is the intended land-use once the lease term is complete?

BMPs for Landowners

- Be sure to include a **reclamation plan** in contracts or leases. Include provisions for what needs to be removed (posts, underground cables, concrete pads, etc.) and who is responsible for reclamation/cleanup after the lease is terminated.
- Make sure explicit **financial assurances** are included in lease agreements with the “solar prospectors” and the landowners to ensure the integrity of the land is returned upon decommissioning.
- Address the following questions early in your negotiations and be sure to include **clauses** in lease agreements/contracts explicitly addressing:
 - ◇ premature termination of lease,
 - ◇ cleanup of infrastructure and equipment,
 - ◇ transfer of property ownership or status, and
 - ◇ land reclamation state or land-use type (forested, farmland, etc.).

Solar Habitat Certification & Training Program

Solar Habitat Training

Clemson Extension provides an online training to help power companies, solar developers and other interested parties learn how to implement pollinator habitat on a solar site. Guidance will be given on:

- the importance and benefit of pollinators and wildlife;
- how to select the right plants or seed mixes for solar site development into a habitat beneficial for pollinators and wildlife while producing energy; and
- how to successfully plant and manage pollinator habitat.

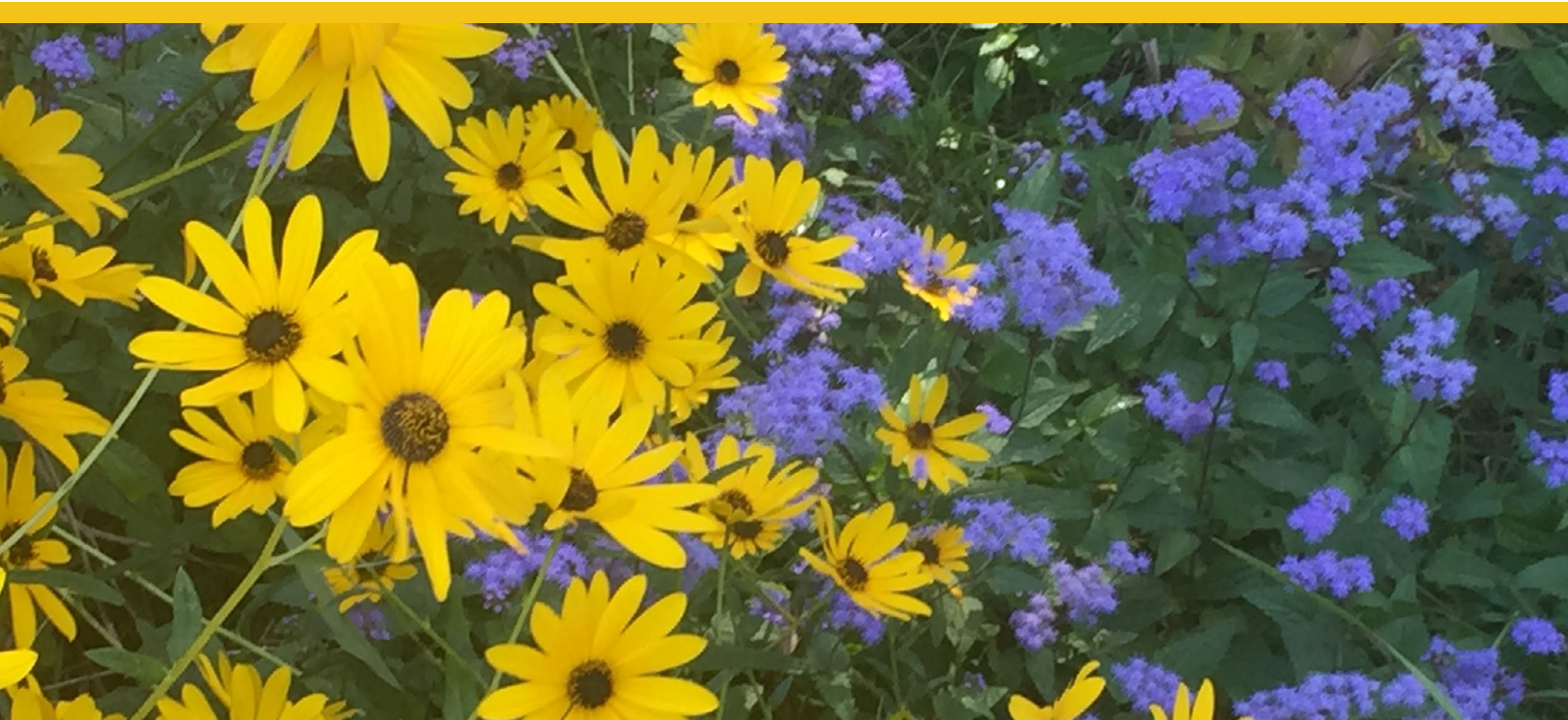
Solar Habitat Certification

To certify a site as solar habitat, a solar developer or landowner must first attend the online training provided by Clemson Extension. The training is available at www.dnr.sc.gov/solar. After attending a training, the solar developer or landowner will need to apply to Clemson's Department of Fertilizer and Certification Services for certification. A copy of the application is found in Appendix B, but the most recent version can be found on the solar website. As a part of your application, you will need to submit a proposed vegetation management plan for your solar site. A vegetation management template can be found in Appendix C.

Clemson's Department of Fertilizer and Certification Services will process the application, as well as monitor the solar site after planting. The Pollinator Habitat Scorecard for Solar Sites will be utilized to monitor the performance of the solar habitat. A copy of the Pollinator Habitat Scorecard is found in Appendix D.

Sites will be designated "Solar Habitat In Progress" with signage until the inspection occurs following two growing seasons. At such time, if all requirements are met, the site will become certified. Those sites that plant underneath the panels and on edges of property in pollinator plants will be certified as Gold Solar Habitat. Those sites that only plant the edges and not underneath the panels will be certified as Silver Solar Habitat. Certified Solar Habitat signs will only indicate that a site is a Certified Solar Habitat, but the Gold and Silver designations will be included online with the site's vegetation management plan.

Photo credit: Southern Habitats, LLC



Below outlines the steps and process a solar developer or landowner should expect for the Solar Habitat Certification Program.

- Step 1: Applicant must attend online training.
- Step 2: Application submitted to Clemson's Department of Fertilizer and Certification Services. Application submittal will require soil test results and a seed list and the percentage proposed to be planted. Additionally, the landowner will need to describe how they plan to prepare the site, plant and manage the solar site.
- Step 3: After application approval, the solar developer or landowner must keep and submit site prep records and any site vegetation maintenance completed (herbicide treatment, grading, disking, etc.) to Clemson's Department of Fertilizer and Certification Services. The site prep records must include dates for activities (planting, disking, herbicide treatment, etc), receipts of seed purchases and photos of the site. Proof of site prep and planting must be provided to Clemson's Department of Fertilizer and Certification Services within 30 days of activities occurring.
- Step 4: Following two growing seasons, Clemson's Department of Fertilizer and Certification Services will visit your site to inspect it using the South Carolina Pollinator Habitat Scorecard for Solar Sites form found in Appendix D. This will require an onsite inspection to determine vegetation cover and diversity.
- Step 5: Following four growing seasons, Clemson's Department of Fertilizer and Certification Services will visit your site to inspect it using the South Carolina Pollinator Habitat Scorecard for Solar Sites form found in Appendix D. This will require an onsite inspection to determine vegetation cover and diversity. If all plans have been executed, the solar site will be certified.
- Step 6: Recertification will occur every five years.

APPENDICES

Butterfly on *Liatrix spicata*.
Photo credit: Southern Habitats, LLC



APPENDIX A | Solar Native Plant Species All Zones

SCIENTIFIC NAME	COMMON NAME	EST. MAX HEIGHT	BLOOM TIME
<i>Allium cernuum</i>	nodding onion	1-2'	Summer
<i>Amsonia ciliata</i> (SC ecotype)	fringed bluestar	1-2.5'	Spring
<i>Apocynum cannabinum</i>	hemp dogbane	3'	Summer
<i>Asclepias humistrata</i>	pinewoods milkweed	1-2'	Spring
<i>Asclepias michauxii</i>	Michaux's milkweed	1-1.5'	late Spring
<i>Asclepias tuberosa</i>	butterfly milkweed	1-2.5'	Spring - Summer
<i>Baptisia tinctoria</i>	yellow wild indigo	2.5'	late Spring-early Summer
<i>Chamaecrista fasciculata</i>	large-flower partridge pea	2'	Summer
<i>Chamaecrista nictitans</i>	small-flower partridge pea	1'	Summer-Fall
<i>Cirsium horridulum</i>	yellow thistle	3.5'	Spring-Summer
<i>Clinopodium georgianum</i>	Georgia savory	1'	late summer - fall
<i>Conoclinium coelestinum</i>	mist flower	1-2'	Summer - Fall
<i>Coreopsis lanceolata</i>	lance-leaved coreopsis	1-2'	Spring-Summer
<i>Desmodium lineatum</i>	sand tictrefoil	<6"	Summer into Fall
<i>Eupatorium hyssopifolium</i>	lance-leaved thoroughwort	2-4'	Summer
<i>Eutrochium purpureum</i> 'Baby Joe'	dwarf joe pye	2-3'	late summer - fall
<i>Fragaria virginiana</i>	wild strawberry/Virginia strawberry	0-1'	late Spring
<i>Gaillardia pulchella</i>	Indian blanket	1-2'	Summer - Fall
<i>Glandularia canadensis</i>	rose vervain	0.5-2.5'	Spring
<i>Helenium autumnale</i>	sneezeweed	3-4'	Summer - Fall
<i>Helianthus hirsutus</i>	rough sunflower	1-3'	Summer - Fall
<i>Lespedeza repens</i>	creeping lespedeza	1-3'	late Spring

SCIENTIFIC NAME	COMMON NAME	EST. MAX HEIGHT	BLOOM TIME
<i>Lespedeza virginica (VA)</i>	slender lespedeza (VA ecotype)	1-2'	Summer-Fall
<i>Liatris microcephala</i>	dwarf blazing star	1.5-2'	Summer
<i>Liatris squarrosa</i>	blazing star	1-2'	Summer
<i>Lobelia cardinalis</i>	cardinal flower	2-4'	Summer - Fall
<i>Monarda punctata</i>	spotted bee balm	1-3'	Summer - Fall
<i>Muhlenbergia capillaris</i>	hairawn muhly	3'	Fall
<i>Packera (Senecio) obovatus</i>	roundleaf ragwort	1-2'	Spring
<i>Phlox nivalis</i>	trailing phlox	1'	Spring
<i>Phyla nodiflora</i>	frogfruit	0.5'	late May - frost
<i>Pycnanthemum incanum</i>	hoary mountainmint	3-6'	Summer
<i>Pycnanthemum tenuifolium</i>	narrowleaf mountainmint	4'	Summer
<i>Rudebeckia hirta</i>	black-eyed susan	2-3'	Spring-Summer
<i>Salvia lyrata</i>	lyreleaf sage	1-2.5'	Spring
<i>Solidago erecta</i>	erect goldenrod	1-3'	Summer - Fall
<i>Solidago nemoralis</i>	gray goldenrod	1-2'	Fall
<i>Symphyotrichum (Aster) lateriflorus</i>	calico aster	4'	Fall
<i>Symphyotrichum patens</i>	late purple aster	2.5'	Summer and Fall
<i>Tephrosia spicata</i>	spiked hoarypea	<1'	Summer
<i>Tephrosia virginiana</i>	goats rue	1-2'	Spring-Summer
<i>Triosteum perfoliatum</i>	late horse gentian	3'	May, June
<i>Viola sororia</i>	common blue violet	0.5'	Spring
<i>Zizia aptera</i>	heart-leaf golden alexander	2'	April, May
<i>Zizia aurea</i>	golden zizia	1.5-3'	April, May

Grasses

SCIENTIFIC NAME	COMMON NAME	EST. MAX HEIGHT	BLOOM TIME
<i>Agrostis hyemalis</i>	winter bentgrass	2-4'	
<i>Carex cephalophora</i>	oval-leaf sedge	1'	Spring- Summer
<i>Carex leavenworthii</i>	Leavenworth's sedge	1'	Spring-Summer
<i>Carex stricta</i>	tussock sedge	3'	
<i>Carex tenax</i>	wire sedge	1'	Spring-Summer
<i>Eragrostis spectabilis</i>	purple love grass	1-2'	
<i>Schizachyrium scoparium</i>	little bluestem	2-4'	
<i>Sorghastrum nutans</i>	indian grass	2-8'	
<i>Tridens flavus</i>	purple top	3-5'	

Aesthetic Plantings for Areas Outside of the Solar Site Fencing

SCIENTIFIC NAME	COMMON NAME	EST. MAX HEIGHT	BLOOM TIME
<i>Ceanothus americanus</i>	New Jersey tea	to 3.5'	
<i>Cephalanthus occidentalis 'Sugar Shack'</i>	dwarf button bush	3-4'	
<i>Gaylussacia dumosa</i>	dwarf huckleberry	to 1.5'	
<i>Hypericum hypericoides</i>	St. Andrew's cross	to 3.5'	
<i>Lyonia mariana</i>	stagger-bush	to 5'	
<i>Morella pumila/Myrica pumila</i>	Dwarf Wax Myrtle	2.5'	Spring
<i>Quercus pumila</i>	running oak	to 2.5'	
<i>Rhododendron atlanticum</i>	dwarf azalea	to 5'	
<i>Vaccinium tenellum</i>	small black blueberry	0.5-1.5'	

SCIENTIFIC NAME	COMMON NAME	HABIT	IRRADIANCE	NOTES
<i>Chasmanthium latifolium</i>	river oats	Grass	Sun to shade	
<i>Muhlenbergia capillaris, M. filipes</i>	muhly	Grass	Sun	
<i>Panicum virgatum</i>	switchgrass	Grass	Sun	
<i>Schizachyrium scoparium</i>	little bluestem	Grass	Sun	
<i>Sorghastrum nutans</i>	Indiangrass	Grass	Sun	
<i>Tripsacum dactyloides</i>	gama grass	Grass	Sun to part sun	
<i>Asclepias incarnata</i>	swamp milkweed	Herb	Sun	
<i>Asclepias tuberosa</i>	butterfly weed	Herb	Sun	
<i>Bidens sp.</i>	tickseed	Herb	Sun	
<i>Conoclinium coelestinum</i>	blue mistflower	Herb	Sun	
<i>Coreopsis sp.</i>	tickseed	Herb	Sun	
<i>Eupatorium spp.</i>	dog fennel/boneset	Herb	Sun	
<i>Eutrochium</i>	Joe pye weed	Herb	Sun	
<i>Helenium autumnale</i>	sneezeweed	Herb	Sun	
<i>Helianthus angustifolius</i>	swamp sunflower	Herb	Sun	
<i>Liatris spicata</i>	blazing star	Herb	Sun	
<i>Lobelia cardinalis</i>	cardinal flower	Herb	Sun to shade	
<i>Monarda punctata</i>	horsemint	Herb	Sun	
<i>Physostegia virginiana</i>	obedient plant	Herb	Sun	
<i>Rudbeckia hirta</i>	black-eyed Susan	Herb	Sun	
<i>Salvia occinea</i>	scarlet sage	Herb	Sun	
<i>Solidago spp.</i>	goldenrods	Herb	Sun	
<i>Stokesia laevis</i>	Stoke's aster	Herb	Sun	
<i>Symphotrichum spp.</i>	asters	Herb	Sun	

SCIENTIFIC NAME	COMMON NAME	HABIT	IRRADIANCE	NOTES
<i>Vernonia spp.</i>	ironweeds	Herb	Sun	
<i>Ilex vomitoria</i>	yaupon holly	Shrub	Sun to part sun	Evergreen
<i>Aesculus pavia</i>	red buckeye	Shrub	Sun	
<i>Baccharis halimifolia</i>	saltbush	Shrub	Sun	
<i>Callicarpa americana</i>	American beautyberry	Shrub	Sun	
<i>Calycanthus floridus</i>	sweetshrub	Shrub	Sun to shade	
<i>Cephalanthus occidentalis</i>	buttonbush	Shrub	Sun	
<i>Clethra alnifolia</i>	sweet-pepperbush	Shrub	Sun	
<i>Fothergilla gardenii</i>	fothergilla	Shrub	Sun	
<i>Hamamelis virginiana</i>	witch-hazel	Shrub	Sun to shade	
<i>Hibiscus moscheutos</i>	rose mallow	Shrub	Sun	
<i>Hypericum spp.</i>	St. John's wort	Shrub	Sun	
<i>Itea virginica</i>	Virginia willow	Shrub	Sun	
<i>Morella cerifera</i>	wax myrtle	Shrub	Sun	
<i>Sambucus canadensis</i>	elderberry	Shrub	Sun	
<i>Viburnum spp.</i>		Shrub	Sun	
<i>Cyrilla racemiflora</i>	ti ti	Shrub, Small tree	Sun to shade	
<i>Opuntia humifusa</i>	prickly pear	Succulent	Sun	
<i>Yucca filamentosa</i>	Adam's needle	Succulent	Sun	
<i>Chaaecyparis thyoides</i>	Atlantic white cedar	Tree	Sun to part sun	Evergreen
<i>Gordonia lasianthus</i>	loblolly bat	Tree	Sun to part shade	Evergreen
<i>Ilex opaca</i>	American holly	Tree	Sun to part shade	Evergreen
<i>Juniperus virginiana</i>	Eastern red cedar	Tree	Sun to part sun	Evergreen
<i>Magnolia grandiflora</i>	Southern magnolia	Tree	Sun to part sun	Evergreen

SCIENTIFIC NAME	COMMON NAME	HABIT	IRRADIANCE	NOTES
<i>Prunus caroliniana</i>	Carolina cherry-laurel	Tree	Sun to part sun	Evergreen
<i>Quercus virginiana</i>	live oak	Tree	Sun to part sun	Evergreen
<i>Sabal palmetto</i>	cabbage palm	Tree	Sun	Evergreen
<i>Cartrema americana</i>	devilwood	Tree	Sun to part sun	Evergreen
<i>Magnolia virginiana</i>	sweet-bay magnolia	Tree	Sun to part sun	Semi-evergreen
<i>Acer leucoderme</i>	chalk maple	Tree	Sun to shade	
<i>Acer rubrum</i>	red maple	Tree	Sun to part sun	
<i>Asimina triloba</i>	pawpaw	Tree	Shade to part sun	
<i>Betula nigra</i>	river birch	Tree	Sun to part sun	
<i>Carpinus caroliniana</i>	ironwood	Tree	Shade to part sun	
<i>Chionanthus virginicus</i>	fringe tree	Tree	Sun to part sun	
<i>Cornus florida</i>	flowering dogwood	Tree	Part shade to part sun	
<i>Diospyros virginiana</i>	persimmon	Tree	Sun to part sun	
<i>Nyssa sylvatica</i>	black gum	Tree	Sun to part sun	
<i>Prunus serotina</i>	black cherry	Tree	Sun to part sun	
<i>Sassafras albidum</i>	sassafras	Tree	Sun to part sun	
<i>Taxodium spp.</i>	bald cypress/pond cypress	Tree	Sun to part sun	
<i>Gelsemium sempervirens</i>	Carolina jessamine	Vine	Sun to part sun	Evergreen
<i>Lonicera sempervirens</i>	coral honeysuckly	Vine	Sun to part sun	

APPENDIX B | SC Native Plant Vendor List

When planting native species, please ensure that you include a mixture of species, such as grasses and wildflowers, that will benefit wildlife and pollinator species. Species chosen should have origin from the Southeast, preferably South Carolina.

The following is a list of vendors who supply native plants that has been compiled from various sources, including the SC Native Plant Society and Natural Resources Conservation Service. This list is not exclusive and there may be additional vendors available. If you are a vendor and would like to be added to this list, please email environmental@dnr.sc.gov.

WIREFRASS PLANTINGS

Meek's Farms & Nursery, Inc.

187 Flanders Road
Kite, GA 31049
1-877-809-1737
steve@meeksfarms-nurserys.com
www.meeksfarms-nurserys.com

Southern Habitats, LLC.

418 NW Sand Dollar Way
Greenville, FL 32331
850-948-6294
sales@southernhabitats.com
www.southernhabitats.com/

Roundstone Native Seed

9758 Raider Hollow Road
Upton, KY 42784
270-531-3034
chris@roundstoneseed.com;
john@roundstoneseed.com
www.roundstoneseed.com

SC Forestry Commission Taylor Nursery

53 Girl Scout Camp Rd.
Trenton, SC 29847
803-275-3578 or 803-896-8800
<http://www.state.sc.us/forest/nuravail.htm>
<http://www.state.sc.us/forest/scother.htm>

SEED SUPPLIERS

Applewood Seed Company

5380 Vivian Street
Arvada, CO 80002
303-431-7333
sales@applewoodseed.com www.applewoodseed.com

Ernst Conserservation Seeds

9006 Mercer Pike
Meadville, PA 16336-9299
kim@ernstseed.com
800-873-3321
www.ernstseed.com

Bamert Seed Company

1897 CR 1018
Muleshoe, Texas 79347
1-800-262-9892
natives@bamertseed.com
<https://bamertseed.com/>

Florida Wildlife Growers Cooperative

P.O. Box 776
Crescent City, Florida 32112
352-988-8117
businessmanager@floridawildflowers.com
<http://floridawildflowers.com/pages/Bulk-Seeds-Available.html>

Garrett Wildflower Seed Farm

1591 Cleveland Rd.
Smithfield, NC 27577
919-989-3031
garrettwfseed@mindspring.com
<https://garrettseed.com/>

Sheffield's Seed Co., Inc

269 Auburn Road, Route 34
Locke, New York 13092
315-497-1058
seed@sheffields.com
<https://sheffields.com/-wild-flower>

<p>Meek's Farms & Nursery, Inc. 187 Flanders Road Kite, GA 31049 1-877-809-1737 steve@meeksfarms-nurserys.com www.meeksfarms-nurserys.com</p>	<p>Southern Habitats, LLC. 418 NW Sand Dollar Way Greenville, FL 32331 850-948-6294 sales@southernhabitats.com www.southernhabitats.com/</p>
<p>Mellow Marsh Farm 1312 Woody Store Road Siler City, NC 27344 919-742-1200 plantinfo@mellowmarshfarm.com www.mellowmarshfarm.com</p>	<p>Wannamaker Seed P.O. Box 85 Saluda, NC 28773 828-749-3613 mjwannamaker@gmail.com www.edamameseed.com</p>
<p>Rock Spring Restorations 12 Paces West Dr. NW Atlanta, GA 30327 404-626-8020 jwbland3@gmail.com www.rockspringrestorations.com</p>	<p>Woodlanders, Inc. 1128 Colleton Avenue SE Aiken, SC 29801 803-648-7522 info@woodlanders.net www.woodlanders.net</p>
<p>Roundstone Native Seed 9758 Raider Hollow Road Upton, KY 42784 270-531-3034 chris@roundstoneseed.com; john@roundstoneseed.com www.roundstoneseed.com</p>	

CONTAINERIZED, BARERoot AND PLUGS

<p>Baker Environmental Nursery 949 Marshall Clark Road Hoschton, GA 30548 706-654-9072 sales@bakerenvironmentalnursery.com www.bakerenvironmentalnursery.com</p>	<p>Carolina Native Nursery 1126 Prices Creek Road Burnsville, NC 28714 828-682-1471 info@carolinanativenursery.com www.carolinanativenursery.com</p>
<p>Beech Hollow Farms 1575 Elberton Rd Lexington, GA 30648 706-623-2020 pandra@beechhollowfarms.com www.beechhollowfarms.com/</p>	<p>Carolina Wetland Services Inc. 550 East Westinghouse Blvd Charlotte, NC 28273 704-527-1177 ext. 101 gregg@cws-inc.net www.cws-inc.net</p>

<p>Carolina Wild 314 Camellia Drive Anderson, SC 29625 864-261-0659 nativeplants@carolinawild.com www.carolinawild.com</p>	<p>Gardens of the Blue Ridge PO Box 10 Pineola, NC 28662 828-733-2417 www.gardensoftheblueridge.com</p>
<p>Cure Nursery 880 Buteo Road Pittsboro, NC 27312 919-542-6186 curenursery@mindspring.com www.curenursery.com</p>	<p>Georgia Forestry Commission Nursery PO Box 819 Macon, GA 31202 1-800-GA-TREES www.gatrees.org</p>
<p>Elk Mountain Nursery PO Box 599 Asheville, NC 28802 www.elk-mountain.com</p>	<p>Growing Wild Nursery 1455 Arthur Teague Road Siler City, NC 27344 919-200-2677 info@growingwildnursery.com www.growingwildnursery.com</p>
<p>Environmental Concern PO Box P, 201 Boundary Lane, St. Michaels, MD, 21663 410-745-9620 www.wetland.org</p>	<p>Mail-Order Natives/Superior Trees, Inc. P.O. Box 9366 Lee, FL 32059 850-973-4688 www.mailordernatives.com</p>
<p>Ernst Conservation Seeds 9006 Mercer Pike Meadville, PA 16335-9299 1-800-873-3321 kim@ernstseed.com www.ernstseed.com</p>	<p>Mellow Marsh Farm 1312 Woody Store Road Siler City, NC 27344 919-742-1200 plantinfo@mellowmarshfarm.com www.mellowmarshfarm.com</p>
<p>Florida Wildflower Growers Cooperative Wildflower Seed And Plant Growers Association, Inc. P.O. Box 776 Crescent City, Florida 32112 352-988-8117 businessmanager@floridawildflowers.com www.floridawildflowers.com</p>	<p>Nashville Natives, LLC 7443 Liberty Road Fairview, TN 37062 615-799-8719 nashvillenatives@bellsouth.net www.nashvillenatives.com</p>
<p>Gardens in the Wood of Grassy Creek PO Box 22 Crumpler, NC 28617 336-384-2288 dottie@gardensinthewood.com www.gardensinthewood.com</p>	<p>Native Gardens 5737 Fisher Lane Greenback, TN 37742 865-856-0220 www.native-gardens.com</p>

<p>Native Forest Nursery 11306 US-411 Chatsworth, GA 30705 706-483-3397 ashley@nativeforestnursery.com https://nativeforestnursery.com</p>	<p>Plant Delights Nursery, Inc. 9241 Sauls Road Raleigh, NC 27603 919-772-4794 office@plantdelights.com www.plantdelights.com</p>
<p>Native Roots Nursery 571 Moseley Ave. Clinton, NC 28328 910-385-8385 sales@nativerootsnursery.com www.nativerootsnursery.com</p>	<p>Rock Spring Restorations 12 Paces West Dr. NW Atlanta, GA 30327 404-626-8020 jwbland3@gmail.com www.rockspringrestorations.com</p>
<p>Naturescapes 843-525-9454 http://naturescapesofbeaufort.com</p>	<p>Roundstone Native Seed 9758 Raider Hollow Road Upton, KY 42784 270-531-3034 chris@roundstoneseed.com; john@roundstoneseed.com www.roundstoneseed.com</p>
<p>Nearly Native Nursery 776 McBride Road Fayetteville, GA 30215 770-460-6284 info@nearlynativenursery.com www.nearlynativenursery.com</p>	<p>SC Forestry Commission Taylor Nursery 53 Girl Scout Camp Rd. Trenton, SC 29847 803-275-3578 or 803-896-8800 http://www.state.sc.us/forest/nuravail.htm http://www.state.sc.us/forest/scother.htm</p>
<p>North Creek Nurseries 388 North Creek Road Landenberg, PA 19350 1-877-ECO-PLUG info@northcreeknurseries.com www.northcreeknurseries.com/</p>	<p>Wetland Plants Inc. 3067 Conners Drive Edenton, NC 27932 252-482-5707 www.coastalplainnursery.com</p>
<p>Painters Greenhouse 734 Roy Moore Road Old Fort, NC 28762 828-668-7225 paintersgreenhouse1@gmail.com www.paintersgreenhouse.com</p>	<p>Woodlanders Inc. 11128 Colleton Avenue Aiken, SC 29801 803-648-7522 www.woodlanders.net</p>
<p>Pinelands Nursery, Inc. 323 Island Road Columbus, New Jersey 08022 1-800-667-2729 sales@pinelandsnursery.com www.pinelandsnursery.com</p>	

APPENDIX C | Solar Habitat Application



South Carolina Solar Habitat Site Application

The purpose of this program is to encourage dual benefits of renewable energy with pollinator plants that provide benefit to wildlife and agriculture production.

Items needed for your submittal include:

- Seed list;
- Percentage of site proposed to be planted;
- Site photos; and
- Site map with boundaries and details regarding location of panels and the types of zones that will be planted in pollinator habitat (See the figure and associated text within the Pollinator Seed Mixes described in the Technical Guidance for the Development of Wildlife & Pollinator Habitat at Solar Farms).

Contact Information

Landowner Name: _____ Solar Site Size: _____ acres

Property Address: _____
(solar site)

Solar Site Coordinates: _____
(latitude/longitude)

Landowner Phone Number: _____ Email Address: _____

Solar Developer or Lease Holder Company Name: _____

Point of Contact Name: _____ Phone Number: _____

Email Address: _____

Vegetation Management Company Name: _____
(if applicable)

Point of Contact Name: _____ Phone Number: _____

Email Address: _____

IF THE PROPERTY CHANGES OWNERSHIP, PLEASE NOTIFY CLEMSON EXTENSION BY CONTACTING JENNIFER COOLEY AT cooley4@clemson.edu

South Carolina Solar Habitat Site Prep

The purpose of this section is to outline the steps you will take to prepare your site for planting.

1. Describe the existing condition of your proposed solar habitat site. Is it currently in agriculture, barren land or forested?

2. Describe any herbicide treatment that has been applied in the past 5 years and any herbicide treatments planned to prepare the site for planting of native pollinators. Detail which herbicides have been used, how applied and the approximate time of application (e.g., month/year).

3. Describe how you plan to prepare the soil and handle any existing vegetation prior to planting.

4. How do you plan to plant the site?
 - Broadcast seeding
 - Drill seeding
 - Drop seeding
 - Transplanting plugs or seedlings

5. Where do you plan to purchase your seed and or plugs/seedlings? Please see Appendix B in the Technical Guidance for the Development of Wildlife & Pollinator Habitat at Solar Farms.

6. Clemson Extension recommends 30% grass and 70% forbs be utilized for a successful Solar Habitat Site. List the percentage of your seed mix that will consist of the following:

_____ % grasses

_____ % forbs (herbaceous flowering plant)

7. All zones except for the Panel Zone: A minimum of 75% of the seed mix must be planted in native plant species. The remaining 25% can utilize non-native species; however, those species must be considered non-invasive and not included on the state's noxious weeds list (REFERENCE). Recommended non-native species to consider include the following: true clover (*Trifolium spp.*), *Coreopsis spp.*, Buckwheat (*Eriogonum spp.*)

What percentage of your seed mix is native plant species?

_____ %

8. Panel Zone: Applicants can receive credit for the use of one non-native species planted in combination of a minimum of three native plant species. Recommended non-native species to consider include the following: true clover (*Trifolium spp.*), *Coreopsis spp.*, Buckwheat (*Eriogonum spp.*). Monoculture plantings will not generate any credit towards solar habitat certification. Clemson Extension recommends if clover is utilized, consider using multiple clover species to allow for a variety of blooms at different times of the year. Provide a list of which species will be planted in this zone and percentage of seed mixture.
9. Provide a list of plant species you plan to plant and the seeding rates of your seed mix. This can be done as an additional attachment to this form. Please note that it is recommended that at least 4-6 different species must be utilized. Additionally, it is helpful to have at least one (preferably three) blooming species per season (spring, summer or fall)
10. Where do you plan to plant pollinator friendly species on your solar site? Check all that apply.
- Panel Zone (beneath the panels and in between rows)
 - Buffer Zone (area on the periphery of the panels inside the security fence)
 - Aesthetic Fencing Zone (area on the outside of the security fence)
 - Residual Land in Pollinator
11. Is there an opportunity to do a vegetated buffer outside of the security fence?
- Yes No
- a. If yes, how wide is that vegetated buffer?
- Less than 30 ft wide
 - 30 ft – 49 ft wide
 - More than 50 ft wide
- b. Do you plan to manage this buffer with native species beneficial for wildlife?
- Yes No
- c. If yes, please list what native species are present that benefit wildlife or native species you may plant to benefit wildlife.
12. Will there be a Long-term Refuge Zone left or managed within your solar site?
- Yes No
- a. If yes, please describe your long-term refuge zone.
13. Will there be a wildlife-friendly aesthetic visual buffer planted outside the security fence?
- Yes No
- a. If yes, please describe your wildlife-friendly aesthetic visual buffer plantings.

14. Provide an overall timeline for the development of your solar site by completing the table below.

Solar Habitat	Activity	Date (Month/Year)
	Order seeds	
In Progress Status	Start site prep (herbicide application)	
	Start soil prep (grading, discing, etc)	
	Plant seeds	
	Year 1 maintenance (mowing, weedeating or herbicide spot spraying)	
	First inspection (after two growing seasons)	
Certified Solar Site	Certified Solar Site signage displayed	
	Second inspection (after four growing seasons)	

Following the implementation of your site prep plan, you will need to provide proof of site prep and planting within 30 days of activities occurring. This will include:

- Site prep records of any site vegetation maintenance completed (herbicide treatment, grading, disking, etc.) and the dates completed.
- Receipts of seed purchases
- Photos of the site

South Carolina Solar Habitat Management

The purpose of this section is to outline the steps you will take to manage the pollinator habitat at your solar site.

1. How will you manage your solar habitat site? Check all that apply.
 - Mowing
 - Herbicide
 - Weedeating
 - Other _____

2. If mowing or weedeating, how often do you plan to do so?
 - Once a year
 - More than once a year
 - Other _____

3. Do you plan to utilize plant growth regulators? If so, please describe which chemical, how applied and timing.

4. If planning to apply herbicide, which method of herbicide application do you plan to use?
 - Spot spraying
 - Grass selective herbicide
 - Other selective herbicide _____
 - Other herbicide method _____

5. Please list all herbicides you plan to use.

Provide a written management plan for your pollinator habitat at your solar site. A management plan outlines the purpose of the land management activity to maintain pollinator habitat and prescribes how that will be conducted. The Technical Guidelines for Development of Wildlife & Pollinator Habitat at Solar Farms should be consulted as you develop your management plan. The Guidelines provide overviews on site preparation and planting and long-term management.

Your management plan should include:

- A description of the plant species that you plan to plant and at what seeding rate and the time of year you plan to plant. If a cover crop (brown top millet, rye, wheat or oats) is planned for use, include that in the plan. Describe where you will plant, whether in the Panel Zone or Buffer Zone.
- Details about mowing frequency, time of year, height of mower deck, etc.
- Details about herbicide application, the type of chemicals used, the mode of spraying, the time of year you plan to spray, etc.

APPENDIX D | Vegetation Management Template



South Carolina Solar Habitat Site Vegetation Management Plan Template

The purpose of this document is to provide a framework for a Solar Habitat Vegetation Management Plan. A management plan outlines the purpose of the land management activity to maintain pollinator habitat and prescribes how that will be conducted. The Technical Guidelines for Development of Wildlife & Pollinator Habitat at Solar Farms should be consulted as you develop your management plan. The Guidelines provide overviews on site preparation and planting and long-term management.

The Vegetation Management Plan should be structured as follows:

- A. Existing Site Condition
 - a. Describe the existing condition of the site. Is it forested and will have to be cleared? Or is it a fallow or active agriculture field? Are there any stream or wetland features?
 - b. What soil types are onsite?
- B. Proposed Condition
 - a. Describe time of year planting is proposed and what species are planned for planting and at what seeding rate. Describe in percentage of the mixes you plan to plant by grasses and forbs (herbaceous flowering plants). Also, list what percentage of your seed mix is native plant species. Please note that it is recommended that at least 4-6 different species be utilized. Additionally, it is helpful to have at least one blooming species per season (spring, summer or fall).
 - b. List your seed sources where you plan to purchase the seed.
 - c. Describe where you will plant, whether in the Panel Zone, Buffer Zone or both. Do you plan to manage native species beneficial for wildlife in the vegetated buffer outside of the security fence? If so, describe the width of that vegetated buffer.
 - d. If a cover crop (brown top millet, rye, wheat or oats) is planned for use, include that in the plan.
 - e. Will your site have a Long-Term Refuge zone? If so, describe what type.
- C. Site Preparation
 - a. Has herbicide treatment been applied in the past 5 years? If so, list which ones that have been applied and when.
 - b. Describe how you plan to prepare the soil and handle any existing vegetation prior to planting.
 - c. Describe how you plan to plant the site (broadcast seeding, drill seeding, drop seeding, live plantings).
- D. Site Management
 - a. Describe and provide details about mowing frequency, time of year, height of mower deck, etc.
 - b. Describe and provide details about herbicide application, the type of chemicals used, the mode of spraying, the time of year you plan to spray, etc.
 - c. Include the name, address, phone number and/or email for any vegetation management company planned to contract for site vegetation management.
- E. Site Timeline
 - a. Provide an overall timeline for the development of your solar site by completing the table below.

Solar Habitat	Activity	Date (Month/Year)
	Order seeds	
In Progress Status	Start site prep (herbicide application)	
	Start soil prep (grading, discing, etc)	
	Plant seeds	
	Year 1 maintenance (mowing, weedeating or herbicide spot spraying)	
	First inspection (after two growing seasons)	
Certified Solar Site	Certified Solar Site signage displayed	
	Second inspection (after four growing seasons)	

APPENDIX E | South Carolina Pollinator Habitat Scorecard for Solar Sites

South Carolina Solar Habitat Scorecard

Below are questions that will be utilized to monitor Solar Habitat Sites following two and four growing seasons. A score of 85 is required to maintain recognition as "pollinator friendly".



Panel Zone – the area between the rows of solar panels and the area directly underneath the solar arrays.

1. How many species from the planting plan are present in between the rows and under the solar panels?
 - a. 4-6 species 5 pts
 - b. > 7 species 8 pts

2. How many native species of plants are managed or maintained in between the rows and under the solar panels? This includes native species that were planted and native volunteers.
 - a. 4-6 species 5 pts
 - b. 7-10 species 10 pts
 - c. >10 species 15 pts

Buffer Zone – the area around the perimeter of the solar panels inside the security fence.

3. How wide is the Buffer Zone that is managed in pollinator species from the security fencing to the Panel Zone?
 - a. Buffer is at least 30 feet wide measured from array fencing. 5 pts
 - b. Buffer is at least 50 feet wide measured from array fencing. 10 pts

4. How many native species of plants are managed or maintained in the Buffer Zone? This includes native species that were planted and native volunteers.
 - a. 4-6 species 5 pts
 - b. 7-10 species 10 pts
 - c. >10 species 15 pts

5. What is the percentage of the entire Buffer Zone dominated (50% or greater) by native plants?
 - a. 26-50% 2 pts
 - b. 51-75% 10 pts
 - c. > 75% 15 pts

Aesthetic Fencing Zone – the area around the perimeter security fence outside of the solar panels.

6. Is there an Aesthetic Fencing Zone planted in wildlife friendly plants in accordance with the approved list in Appendix A of the Technical Guidance for the Development of Wildlife & Pollinator Habitat at Solar Farms?
 - a. Yes 5 pts
 - b. No.

7. How many native species of plants are managed or maintained in the Aesthetic Fencing Zone? This includes native species that were planted and native volunteers.
 - a. 4-6 species 5 pts
 - b. 7-10 species 10 pts
 - c. >10 species 15 pts

8. What is the percentage of the entire Aesthetic Fencing Zone dominated by native plants?
 - a. 26-50% 2 pts
 - b. 51-75% 10 pts
 - c. > 75% 15 pts

Residual Land in Pollinator Zone – any areas within the property parcel boundary not currently forested included in the Panel Zone, Buffer Zone, Aesthetic Fencing Zone or Long-term Refuge Zone. These can be residual lands the landowner chooses to plant in pollinator habitat.

9. How many acres of residual land are in pollinator habitat within the project's parcel?
 - a. ½ acre – less than 1 acre 5 pts
 - b. 1 acre – 3 acres 10 pts
 - c. Greater than 3 acres 15 pts

10. How many native species of plants are managed or maintained in the Residual Land Zone? This includes native species that were planted and native volunteers.
 - a. 4-6 species 5 pts
 - b. 7-10 species 10 pts
 - c. >10 species 15 pts

11. What is the percentage of the entire Residual Land Zone dominated (50% or greater) by native plants?
 - a. 26-50% 2 pts
 - b. 51-75% 10 pts
 - c. > 75% 15 pts

Long-term Refuge Zone – areas that are existing isolated, forested wetlands, hardwood forests, etc. or areas that are otherwise undesirable or undevelopable for solar arrays or associated infrastructure that can be set aside and managed for wildlife.

12. Is there a Long-term Refuge Zone?
 - a. Yes 10 pts
 - b. No

General Site Questions

13. Has the site been checked for exotic and noxious weeds, as defined by the South Carolina Exotic Pest Plant Council, and appropriate control measures put in place? Please provide evidence (e.g., photos, receipts for herbicide application, etc.) of treatment.
- a. Yes 15 pts
b. No
14. What available wildlife habitat components exist within the project footprint (including the Panel, Buffer and Long-term Refuge Zone)? Choose all that apply.
- a. Native bunch grass for bee nesting. 2 pts
b. Native trees/shrubs for bee nesting. 2 pts
c. Clean, perennial water sources. 2 pts
d. Created habitat nesting features. 2 pts
15. Is milkweed visibly growing onsite to support Monarch Butterfly conservation?
- a. Yes 10 pts
b. No
16. For Site Planning and Management, choose all that apply.
- a. Detailed management plan is not provided as required. -10 pts
b. Signage legible at 40 or more feet stating pollinator friendly solar habitat. 3 pts

Bonus Points

Wildlife Permeable Fencing: If wildlife permeable fencing installed as described below, then an additional 15 points can be added to your total score.

The SCDNR encourages the use of adaptive strategies to allow for the movement of small wildlife. These may include:

- dividing large sites into smaller fenced sub-parcels to establish unfenced wildlife corridors (wetlands or other long-term refuge zones left unfenced can serve as wildlife corridors);
- use of larger mesh fence as ground level (e.g., wildlife-permeable fencing); or
- facilitate wildlife passage via ground-level openings or pipes (approximately 8-inch in diameter through the fence).

To exclude deer from the site, the SCDNR recommends that security fencing be at least 96 inches in height (including barbed wire if desired).

Bloom Coverage through the Seasons: To receive additional points for your Solar Habitat, please provide a photograph(s) of the solar site showing at least three blooming native forb species present for the following time periods: Spring (April-May), Summer (June-August) and Fall (September-October). If this is completed, an additional 15 points can be added to your total score.