



October 16, 2024

Ms. Geneice Gary-Adams, Director/Zoning Official  
Township in West Orange  
Planning and Development  
66 Main Street  
West Orange, NJ 07052

**Re: Supplemental Report re: Environmental Conditions per Settlement Agreement:  
West Essex Highlands with Recommendations for Site Plan Improvements Related to that  
Agreement**

**Via Electronic Mail**  
[zoningofficial@westorange.org](mailto:zoningofficial@westorange.org)

Dear Ms. Gary-Adams,

After comments received at the hearings conducted on July 30; August 14 and September 11, 2024, an additional site visit and a follow up review, DeFeo Associates hereby submits the following supplemental report with recommendations related to the environmental conditions at the West Essex Highlands (Applicant) site.

This report contains a FAQ section based on comments made during the public hearings with answers to those questions. Additionally, I have attached the power point presentation and the New Jersey Department of Agriculture (NJDA) High-Tensile Woven Wire Deer Fencing Design and Installation Specifications. Additional information on native plant selection is provided for use by the Applicant in selecting plants for cosmetic and pollinator installations.

**A. Summary of Findings; Forest Condition:**

1. Field observations performed in 2019 and 2024 show virtually no change in overall understory growth. There is a severe lack of understory growth consisting of shrubs, seedlings or wildflowers.
  - a. The primary understory growth consists of invasive Japanese barberry (*Berberis thunbergii*). This shrub is not browsed by deer, is not native and displaces native species.
  - b. Field observations indicate that the forest is very open with viewing distances of 80-100 yards.



- c. During the August 2024 site visit, ten white-tailed deer were observed individually and in small groups.
2. As noted the forest consists primarily of large trees. The initial study showed no trees under four inches in diameter within the study plots.
  - a. The observational walk through conducted in August of 2024 did find small stands of trees ranging from 1-2". However, as in the original study, these were much less common than the larger sizes. (See histogram in power point for clarity).
3. There are a number of tree species present in this forested area including:
  - a. Oak (*Quercus alba*, *Q. velutina* and *Q. rubra*), several maples (*Acer* sp.), hickory (*Carya glabra*, *C. ovata* and others; flowering dogwood (*Cornus florida*); sassafras (*Sassafras albidum*); American beech (*Fagus grandifolia*) and black cherry (*Prunus serotina*).
    - i. Note that with limited exception, the trees observed were as large as 24-36" diameter at breast height (DBH).
4. The 2024 walk through of the site found the signs and symptoms of beech leaf disease. This disease has reached the northeast in the past several years and is caused by a nematode. The disease is currently untreatable and is anticipated to cause the death of infected beech trees within 10 years.

## **Conclusions:**

The observations and findings indicate that while the largest trees in the forest appear healthy (except for American beech), it is a simple fact that where there is excessive deer browse, there is no opportunity for seedlings to regenerate the forest over time. While the trees in this forest today may live for many years, so long as the forest cannot regenerate itself, it is a forest in decline.

Deer fencing is one tool that can help the forest to heal and begin the process of regeneration. Over time, when native seedlings are protected from deer browse, invasive grasses (such as Japanese stilt grass) are crowded out and native plants begin to effectively compete. As the site will be planted with approximately 2166 native perennials/grasses and ground covers as well as 1065 native shrubs to function as seed generators, the protected area has a high probability of new, native plant growth.

## **B. Summary of Findings; Planting Selection**

The planting list submitted by the Applicant to date is not final. As noted in the preliminary report, some minor modifications to this list should be made based on the most recent USDA Plant Hardiness Zone Map and the inherent changes in local climate as it relates to plants and health.



The Planning Board raised questions about the need to shield ventilation grates on the parking garages. Concurrently, the Board requested possible use of plants that would flower and support pollinators.

There are multiple native vines that can be planted for both aesthetic and insect use. A listing of recommended native plants is attached along which includes a list of native vines. This list is meant as a point of discussion and other plants may be appropriate.

### **C. Summary of Findings; Pollinator Gardens:**

The Planning Board has requested that the Applicant consider reducing some open - air parking spaces and replacing them with pollinator gardens. Pollinator gardens can provide a greater opportunity for bees, butterflies and other pollinating insects to thrive in the area.

There is a large body of work on pollinator gardens that the Applicant can utilize to achieve this result.

### **Recommendations:**

#### **Tree Preservation:**

Based on the findings of the August 2024 field survey, DeFeo Associates is recommending that the Planning Board consider requiring that a GPS documentation of select specimen trees and/or areas within the LOD be mapped as a condition of approval. This tool will allow for a visual overlay to the final site plans that will:

- Allow for greater control and accuracy during any tree removal activities.
- Allow for the identification and possible preservation of potential “seed” trees that might more rapidly allow for forest regeneration in the protected and fenced areas.

#### **Plant Selection:**

DeFeo Associates recommends that the Planning Board consider requiring the Applicant to review the attached listings and propose a selection of one or more vines to provide cover to the ventilation grates as requested.

#### **Pollinator Gardens:**

DeFeo Associates recommends that the Planning Board consider requiring the Applicant to review the attached listings and design the pollinator gardens as appropriate.



As additional information is made available, further reviews will be conducted as required.

Should you have any questions, please contact me at your convenience.

Very truly yours,

A handwritten signature in black ink, which appears to read "Wayne D. DeFeo", is centered below the closing. The signature is fluid and cursive.

Wayne D. DeFeo, LEED AP, BD&C  
Principal  
DeFeo Associates

Cc Jamilet Baquerizo - [jvite@westorange.org](mailto:jvite@westorange.org)



## Frequently Asked Questions (FAQ)

1. Did your tree study look at tree species?
  - a. Yes. Species identified include:
    - i. Oak (*Quercus alba*, *Q. velutina* and *Q. rubra*), several maples (*Acer* sp.), hickory (*Carya glabra*, *C. ovata* and others); flowering dogwood (*Cornus florida*); sassafras (*Sassafras albidum*); American beech (*Fagus grandifolia*) and black cherry (*Prunus serotina*).
2. Has the site been surveyed since the original tree study was performed?
  - a. Yes, a subsequent field observation was conducted in August 2024.
3. What changes were observed?
  - a. The forest has essentially remained unchanged with the exception that beech leaf disease was observed.
4. Why is deer fencing needed?
  - a. As noted in the presentations made in 2023 and this evening, the forest has very limited undergrowth including seedlings of young trees. Deer fencing allows a forest to regenerate through the growth of understory plants (shrubs and herbaceous plants) as well as new trees.
5. How will plants enter the fenced area?
  - a. Seeds will be transported by wind, direct transport by small animals including birds and insects and water. Seeds can travel long distances by these means. In addition, the trees that are within the fenced will provide seeds for new seedling growth.
6. What will happen to the deer within the fenced area?
  - a. There will be no deer in the fenced area after completion. The Applicant will be required to move the deer out of the area just prior to the final gate installations.
7. What will happen to the deer in the area?
  - a. As noted in the report, there is little left for the deer to eat in this area. However, it should be noted that over 70 acres of land will neither be fenced or disturbed.
8. What will happen to other wildlife in the fenced area?
  - a. Deer fencing does not impede the passage of smaller animals. The openings are graduated in size up to 8" openings. Animals such as fox and raccoons generally either climb the fence or burrow under it. Smaller animals simply pass through the fencing.
9. What advantages does increased understory growth provide to the surrounding area?
  - a. Increased understory growth, both woody and herbaceous, will:
    - i. Increase the visual barrier between the developed area and surrounding properties.
    - ii. Decrease the flow and the speed at which the water travels and increase



water absorption, thus decreasing run off.

10. How will the Applicant be monitored to protect against excess tree removal?

- a. DeFeo Associates has retained Davey Resource Group to provide necessary staff to monitor tree removal and compliance with the Settlement Agreement. In addition, Wayne DeFeo will provide spot inspections as required.

# West Essex Highlands Affordable Housing Development



Environmental Safeguards and Enhancements Incorporated Within the  
Development

October 30, 2024

West Orange Planning Board Hearing

Presented by:

Wayne D. DeFeo, LEED AP,BD&C

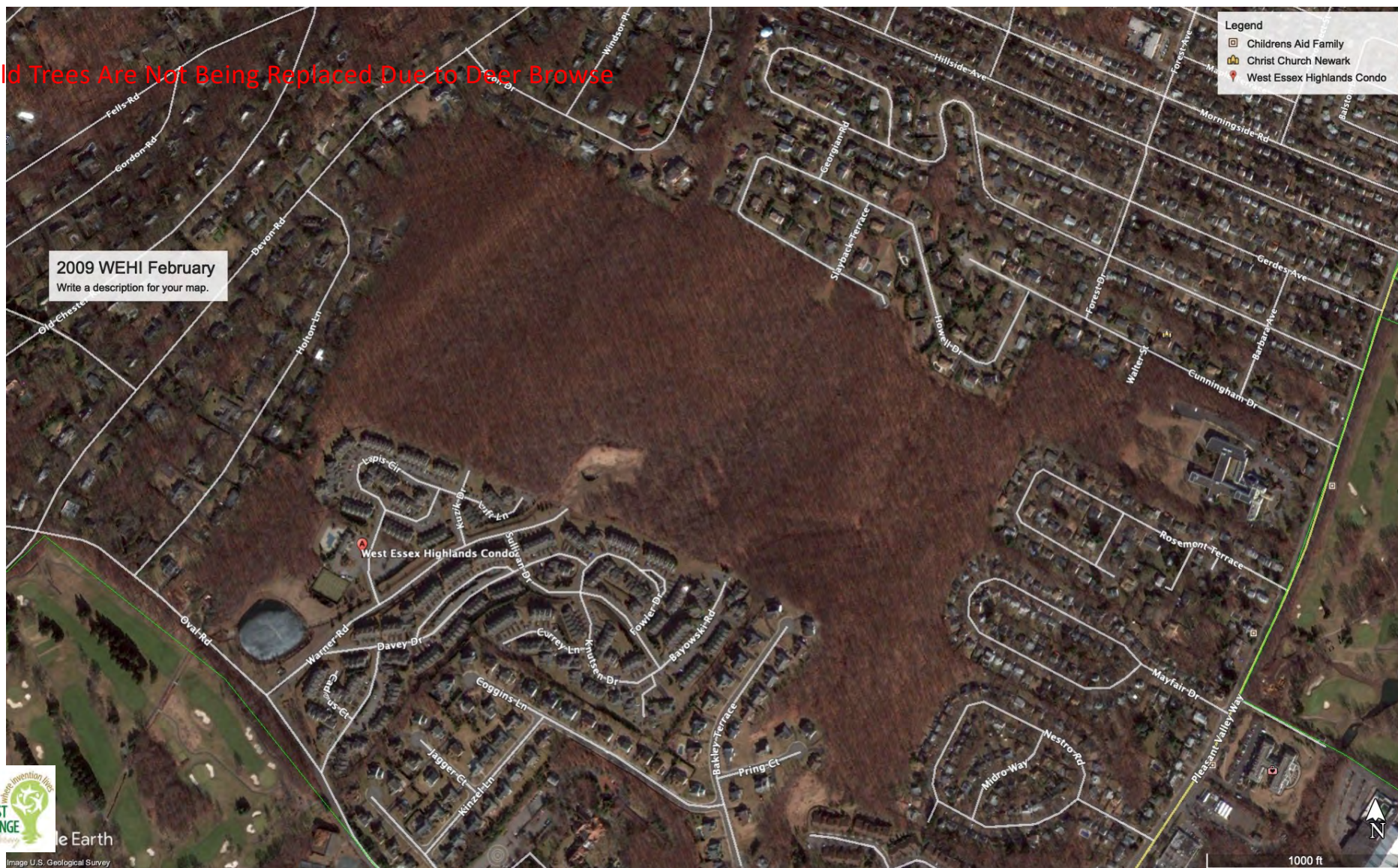
Environmental Compliance Officer, West Orange



Note The Lack of New Growth



Old Trees Are Not Being Replaced Due to Deer Browse



No Change = Poor Long Term Health

2016 WEHI

- Legend
- Childrens Aid Family
  - Christ Church Newark
  - West Essex Highlands Condo

## Tree Survey Conducted December 10, 2019



# General Findings

| Tree Estimates | Site Size     | Trees Per Acre | Total Trees on Site |
|----------------|---------------|----------------|---------------------|
| Survey Results | +/- 120 Acres | 212*           | 25,440 +/-          |

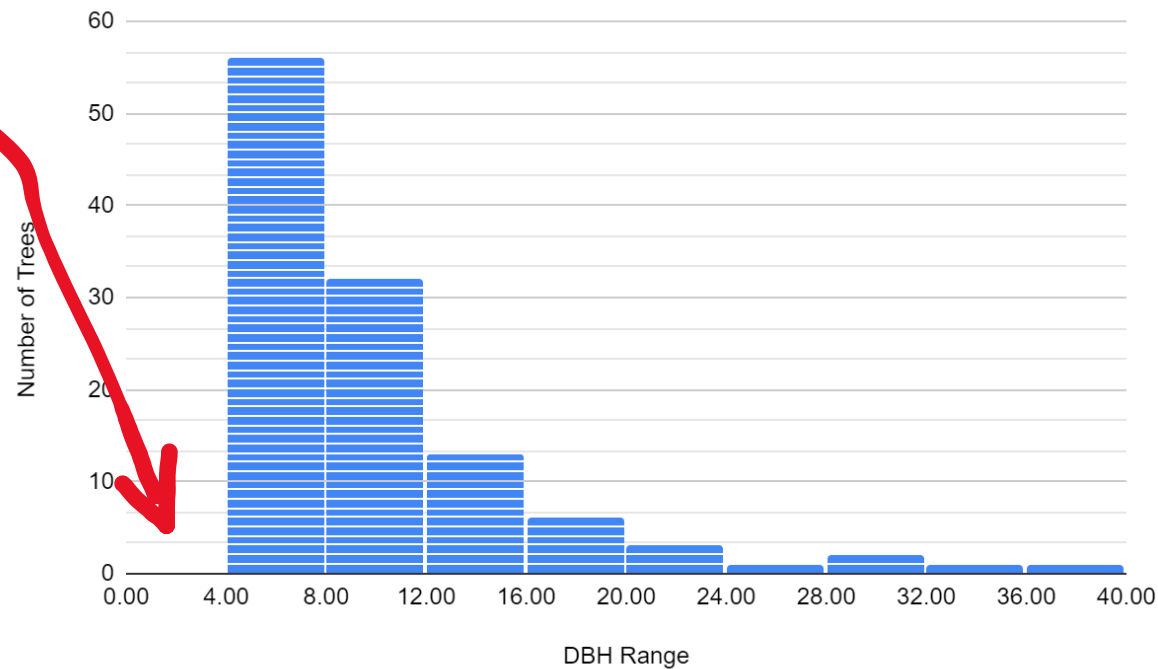
\* Note: Used the highest density within the study to create worst case scenario



## Tree Study Findings Regarding Tree Sizes and Distribution

Chart 3: Histogram displaying number of trees in four-inch DBH categories (0"-3.9", 4"-7.9", 8"-11.9", etc.).

Note the Lack of Small Trees



Lack of Small Trees = Unhealthy Conditions



## Basic Finding

- Forest is unhealthy due to lack of diversity of Plants.
- Mostly older trees
- No seedlings or saplings
- Little understory except invasive plants

# Example of Excessive Deer Browse:



Actual Site



Example Photo

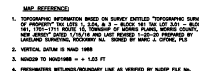
# What a Healthier Forest Looks Like



Note Seedlings and undergrowth







# Impact of Deer Fencing on Growth

NO Protection



Protected after 9 years

# Effective Deer Fencing Design

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# Growth Within Three Years

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Deer Fence Impact is New Growth



Find the Deer  
Fence



# Tree Removal Calculation

| Tree Estimates | LOD        | Trees Per Acre | <u>Maximum Tree Removal</u> |
|----------------|------------|----------------|-----------------------------|
| Survey Results | 27.5 Acres | 212            | 5830 Trees                  |

Total Trees on Site = 25,440+/-

A Minimum of 77% of  
Trees Preserved Forever



# TREE PRESERVATION/RESTORATION PLAN

1. WEHI will install 33.6 acres (3.6 acres more than required) of deer fencing that is 8 feet in height outside of the Limit of Disturbance. This is designed to help regenerate the forest.

- Deer fencing must be maintained in perpetuity.

2. Tree Loss = 5803

Trees Saved = 0 (Note that this is per the plan. Will be reviewed and adjusted in the field).

3. Tree Planting Credit = 279 (All Native Species)

4. Deer Fence Credit = 7123 Trees

Net Required Replacement is 1498 Trees over the requirement



## Total Native Plant Additions as Proposed

Trees – 279

Shrubs – 1065

Perennials/Grasses/Ground Covers – 2166

TOTAL = 3510 Native Plants. All will be seed stock to help regenerate the forest.

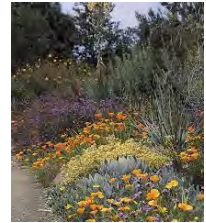
Native Seed Mixture - 37,388 square feet

There Are Many Environmental Safeguards In  
the Now Agreed Upon Plan Including:



## Buildings to be Designed to a Higher Standard of Environmental Design

1. Maximize Covered Parking (Reduces Site Footprint)
2. Agreed to 100% Native Plants
3. Maximize Wooded Area Retention (77% +/- of Property)
4. Includes Passive Recreation
5. Includes Permeable Parking areas to reduce runoff



New Jersey Department of Agriculture (“NJDA”)

Wildlife Fence Cost-Share Program for Unpreserved Farms  
 (“WFCS Grants”)

Appendix A

High-Tensile Woven Wire Deer Fencing  
Design and Installation Specifications



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## **Introduction**

The specifications included in this Appendix must be followed at a minimum for the effective implementation of exclusionary deer fence. Farmers wishing to deviate from the specifications must seek and get approval from the Division of Agricultural and Natural Resources (“Division”) in writing prior to installation.

## **General Requirements**

- All fence materials must be new and in unused condition.
- The minimum fence height is 96 inches (8 feet).
- Two fence systems are permitted:
  - System using full 96-inch high-tensile fixed-knot woven wire.
  - System using 75 to 96-inch high-tensile fixed-knot woven wire, with high-tensile wires spaced a maximum of 9 inches apart to reach the full 96-inch height.

## **Additional Awardee Responsibilities**

Awardees must:

- Obtain all applicable permits and comply with all permit conditions.
- Act as General Contractor to obtain the services of all subcontractors required to perform the works of improvement.
- Contact the NJ One Call system at 1-800-272-1000 three to ten days prior to any construction activity to verify the location of any buried utilities. (The protection of private utilities is the responsibility of Awardee.)
- Seek and get prior approval from the Division, in writing, for any deviations from the design and installation specifications in this Appendix.

Awardees can contact the NJDA at:

PO Box 330, Trenton NJ, 08625-0330

[nidadeerfence@ag.nj.gov](mailto:nidadeerfence@ag.nj.gov)

Ph: (609) 913-6490

## **Fence Materials and Specifications**

- High-Tensile Woven Wire Fence and High-Tensile Wire
  - All wire must be high-tensile 12.5-gauge steel class 3 galvanized or greater.
  - High-tensile woven wire shall be fixed-knot.
  - The horizontal wires of a high-tensile woven wire fence shall have graduated spacing from 3 to 8 inches, with the smaller spacing placed nearest the ground. Vertical wires shall have a maximum spacing of 6 inches apart.
  - High-tensile woven wire shall be a minimum height of 75 inches. This minimum height must be achieved using a single roll of wire. Additional strands of high-tensile wire then must be added on top, at a maximum of 9-inch intervals, until reaching the full height, 96 inches.
  - All high-tensile woven wire and high-tensile wire shall be attached to the outside of the posts where practical. In all cases, it shall be attached to the outside of corners.
- Posts
  - Post shall be preservative pressure treated such as CCA 0.40 lbs., e.g., Southern Yellow Pine or equivalent. Do not use Red Pine. Posts shall be well-seasoned or kiln-dried to minimize warping. Well-seasoned means cut, debarked, and dried for a minimum of 1 year.
  - Alternatively, untreated posts also may be used, provided they are well seasoned, durable posts of species such as red cedar, black locust or Osage orange with the bark removed. Well-seasoned means cut, debarked, and dried for a minimum of 1 year.
  - Posts shall be a minimum of 12 feet long.
  - Line posts shall be a minimum 4"x4" or 4" round, installed at least 36 inches in the ground.
  - Brace posts shall be a minimum 5"x5" or 5" round, installed at least 36 inches in the ground.
  - Corner and end posts shall be a minimum of 6"x6" or 6" round, installed at least 42 inches in the ground.
  - Post spacing shall be 25 feet or less. See page 12 regarding post spacing along curves.
  - Posts may be pounded or augured. When augured, posts must be anchored on corners, ends, and low points. See page 12 regarding setting posts in the ground.
- Fasteners
  - 1 3/4" barbed, class 3 galvanized steel staples shall be used.

## **Brace Assemblies**

### **Locating Braces Assemblies at Corners, Ends, Gate Posts, and Mid-Line (Line)**

| <b>Length of Straight Run of Fence between Corner, End, Gate Posts, and/or Line Brace</b> | <b>Type of Brace Assembly needed at Corner, End, and/or Gate posts</b>                                                                                                                                                                                                                       | <b>Line Brace Assemblies: Whether they are required, and if so, at what Intervals in a straight run of fence</b>                                                                                            |
|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Less than 700 feet</i>                                                                 | Single-Span Brace                                                                                                                                                                                                                                                                            | Line braces are not required at fixed intervals for this run of fence. Use line braces as needed at top and bottom of hills.                                                                                |
| <i>700 to 1,300 feet</i>                                                                  | Double-Span Brace                                                                                                                                                                                                                                                                            | Line braces are not required at fixed intervals for this run of fence. Use line braces as needed at top and bottom of hills.                                                                                |
| <i>More than 1,300 feet</i>                                                               | Depends on the spacing of line braces used in the run of fence: <ul style="list-style-type: none"><li>• Use a single-span brace if the distance to the line brace is less than 700 feet.</li><li>• Use a double-span brace if the distance to the line brace is 700 to 1,300 feet.</li></ul> | Line braces are required: <ul style="list-style-type: none"><li>• Use at least one line brace (double-span) every 1,300 feet in the run of fence, and as needed on the tops and bottoms of hills.</li></ul> |

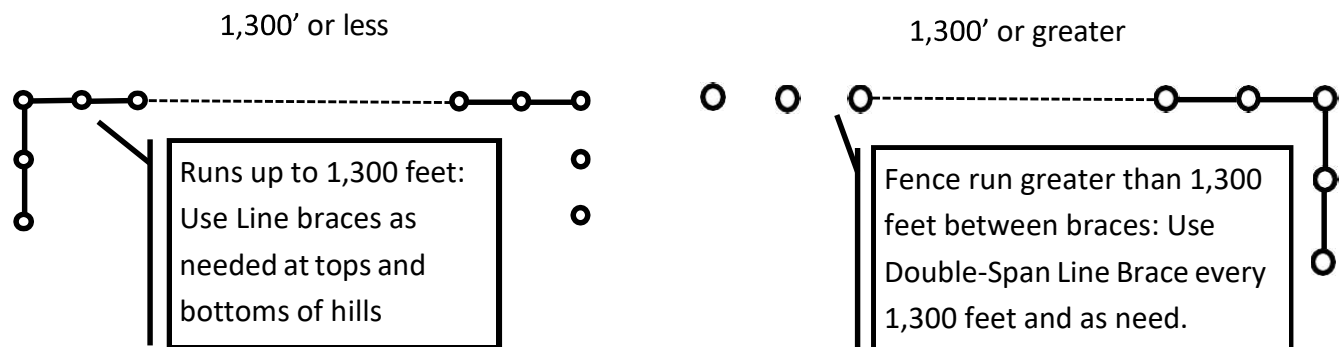
Note: A **run** is the distance between a corner, end, gate, or brace post and the next corner, end, gate, or brace post.

### **Brace Assembly Length**

Single-span brace assemblies shall be a minimum of 10 feet long. Double-span brace assemblies shall be a minimum of 16 feet long.

## Brace Assembly Placement in Line

Line brace assemblies shall be installed at appropriate intervals in a run of fence and at all sharp breaks in grade, typically when the change in slope is greater than 15%.



## Brace Assembly Placement at Corners, Ends, and Gates

Single-span or double-span brace assemblies are required at all corners, ends, and gates, and where the fence alignment changes direction by more than 40 degrees.

If a wide stream or gully is to be crossed, the fence section shall be terminated on one bank with a brace assembly, and a new section with a brace assembly shall be started on the other bank.

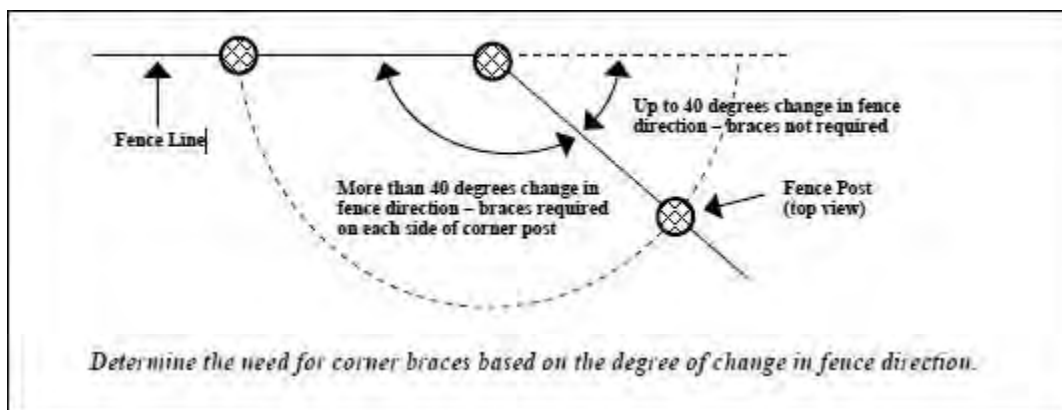
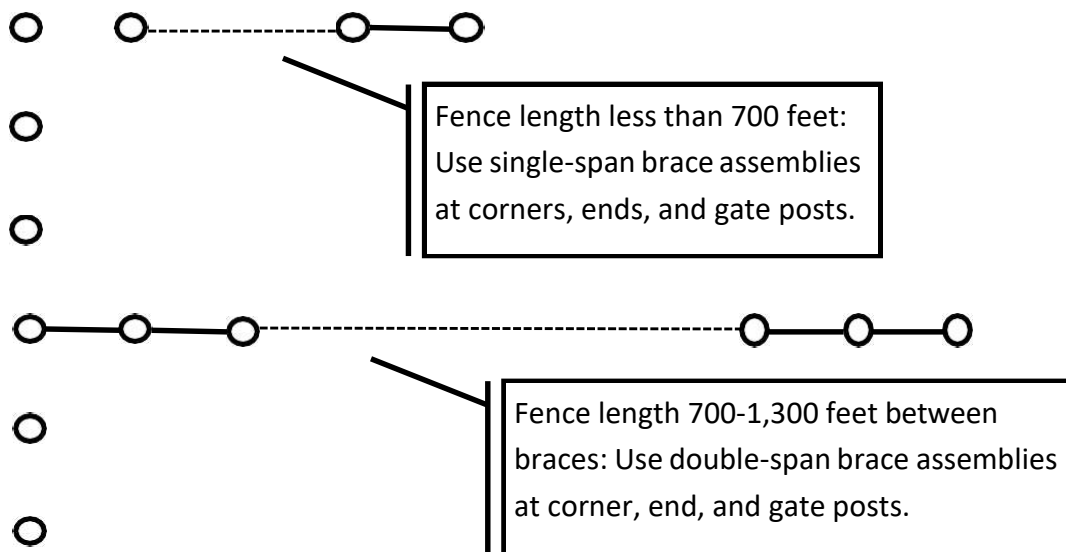


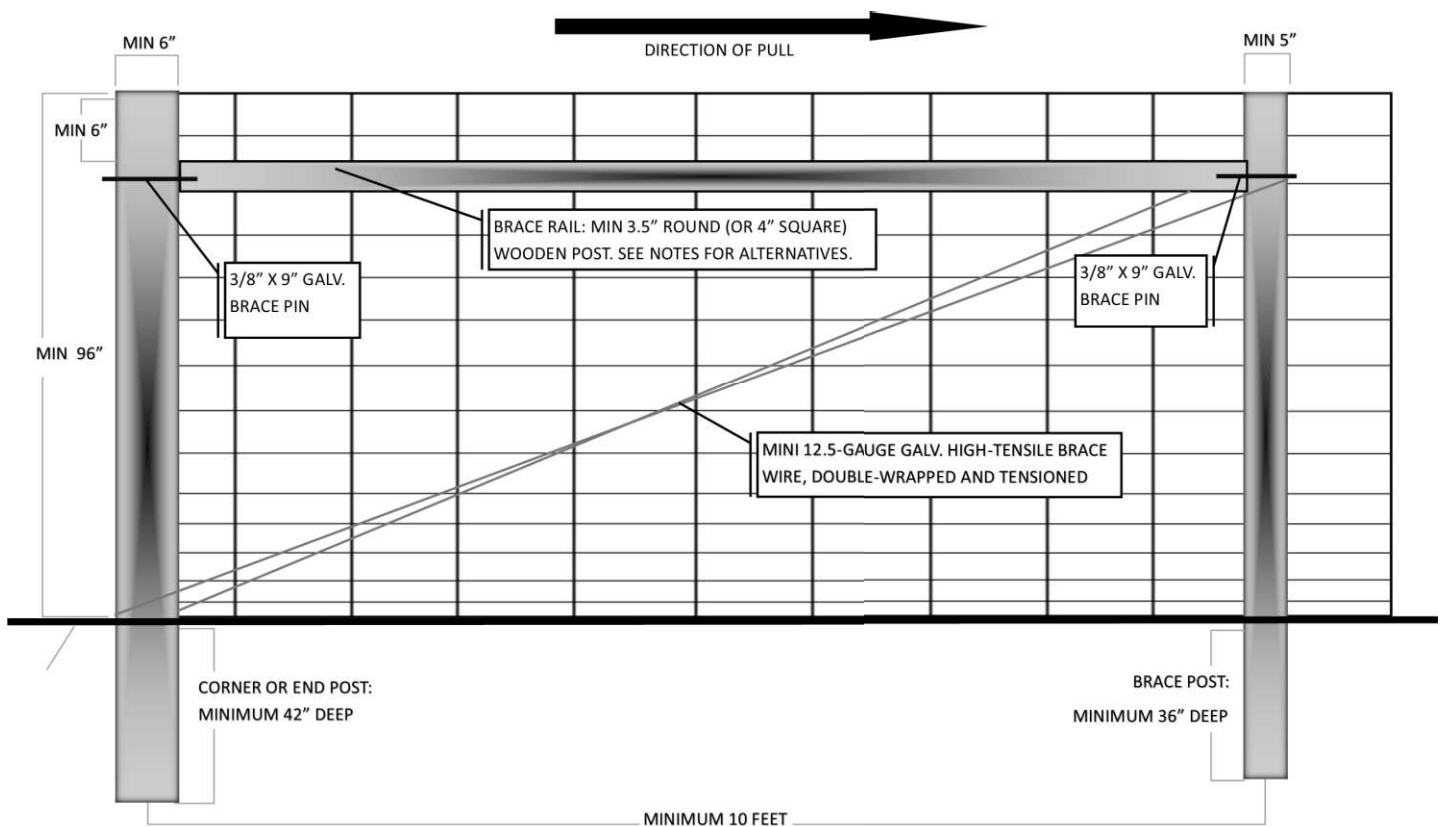
Diagram courtesy of  
NRCS

## Brace Assembly Components

- Horizontal Brace Rails shall be wooden posts a minimum of 4" x 4" square or 3 1/2-inch diameter round. One alternative is to use galvanized steel pipe with a minimum 2-inch diameter and with the minimum wall thickness as specified for a water supply pipe.
- Brace post pins shall be steel rods a minimum of 3/8-inch x 9-inch.
- Brace wires shall consist of 12½ gauge or stronger, galvanized, high-tensile wire, double wrapped with a 1½-inch x 2-inch x 2-foot twist stick. A double wire with a tightener also may be used. Brace wires shall be tightened to secure the brace and post assemblies. Other commercially available tension systems may be used with prior SADC approval.

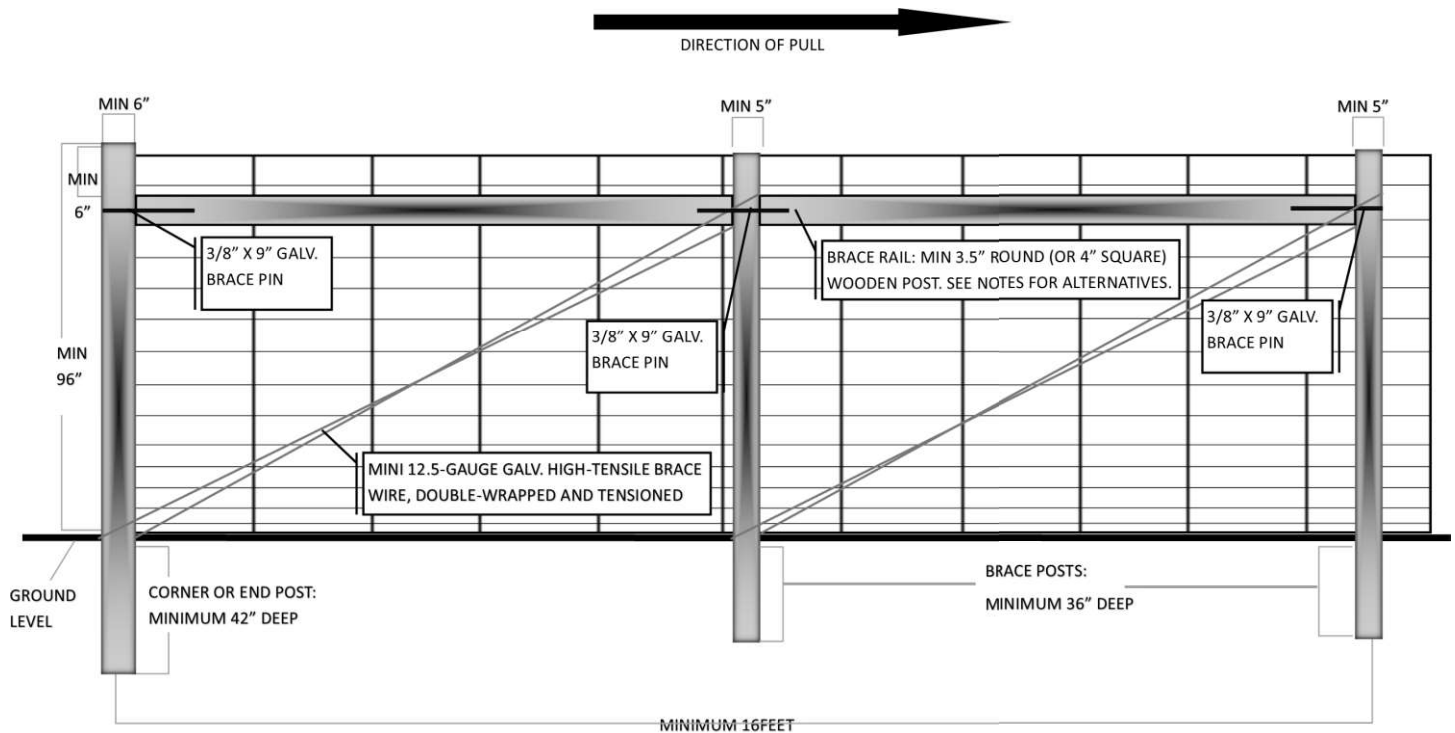
## Typical Single-Span Brace Assembly at a Corner or End

- Used when the run of fence is less than 700 feet



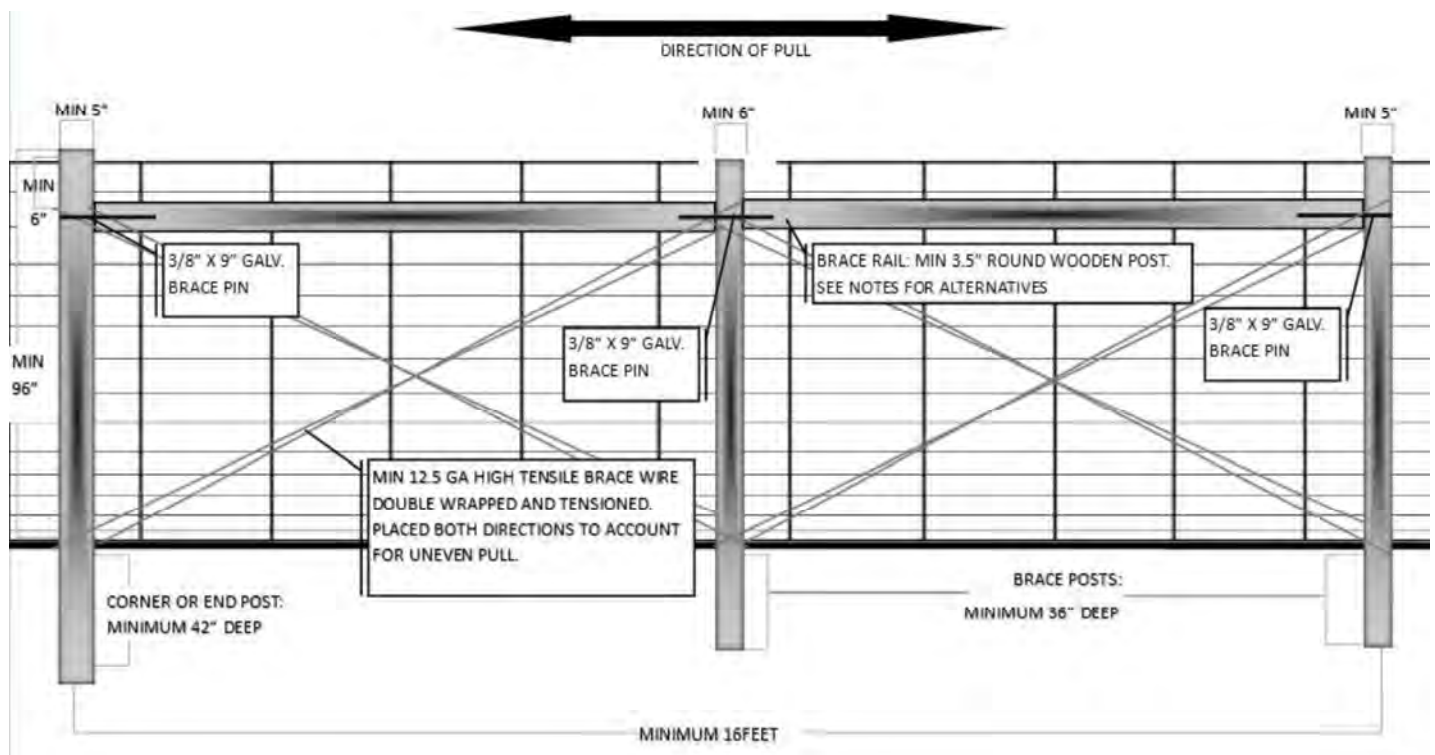
## Typical Double Span Brace Assembly at a Corner or End

- Used when the run of fence is greater than 700 feet



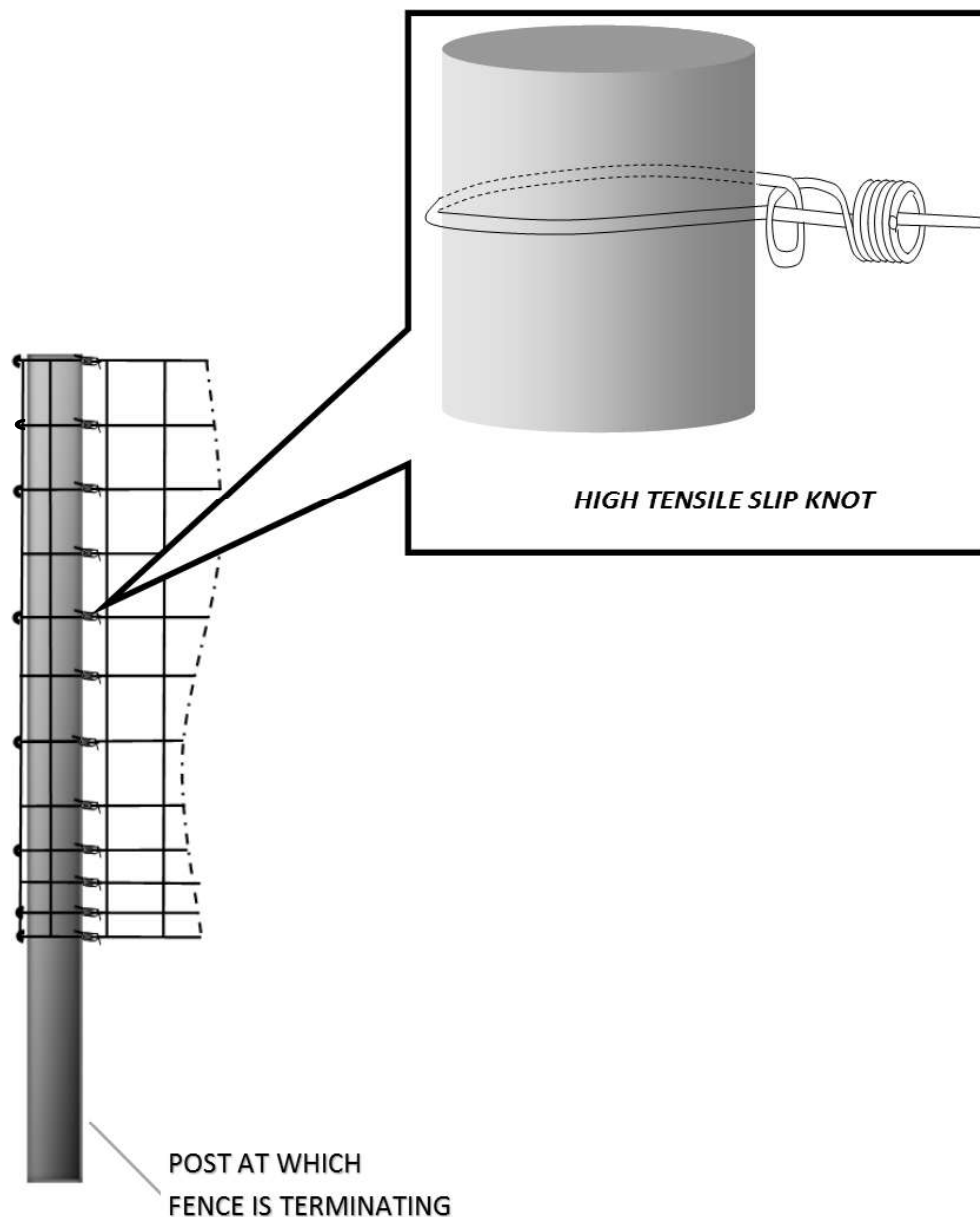
## Typical Line Brace Assembly

- Used when the run of fence is greater than 1,300 feet, or otherwise as needed



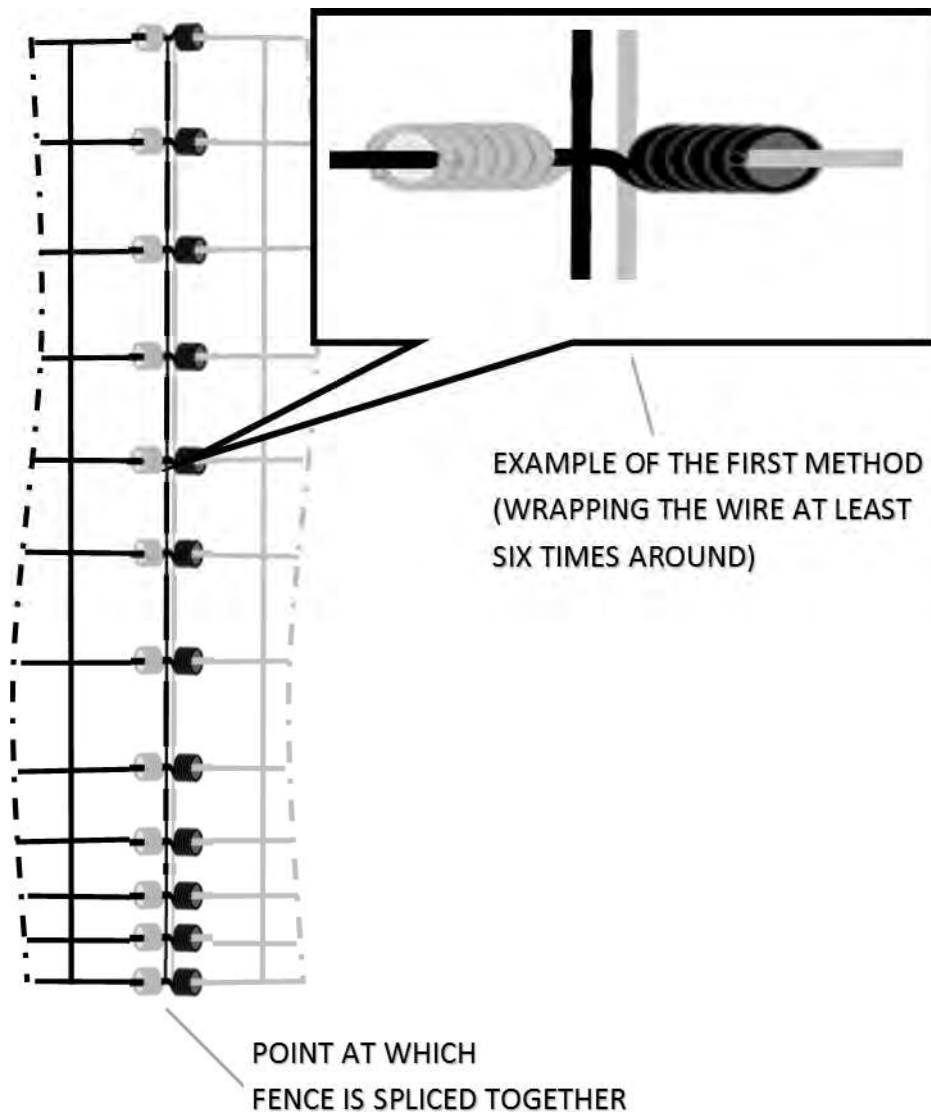
## Terminating a Fence

- When fence is terminated at a post, it shall be terminated using one of the following methods:
  - High-tensile slip knot;
  - Crimp sleeves rated for the appropriate gauge wire according to manufacturers instructions; or
  - Any other commercially available termination device, rated for the appropriate gauge wire according to manufacturers instructions.



## Splicing a Fence

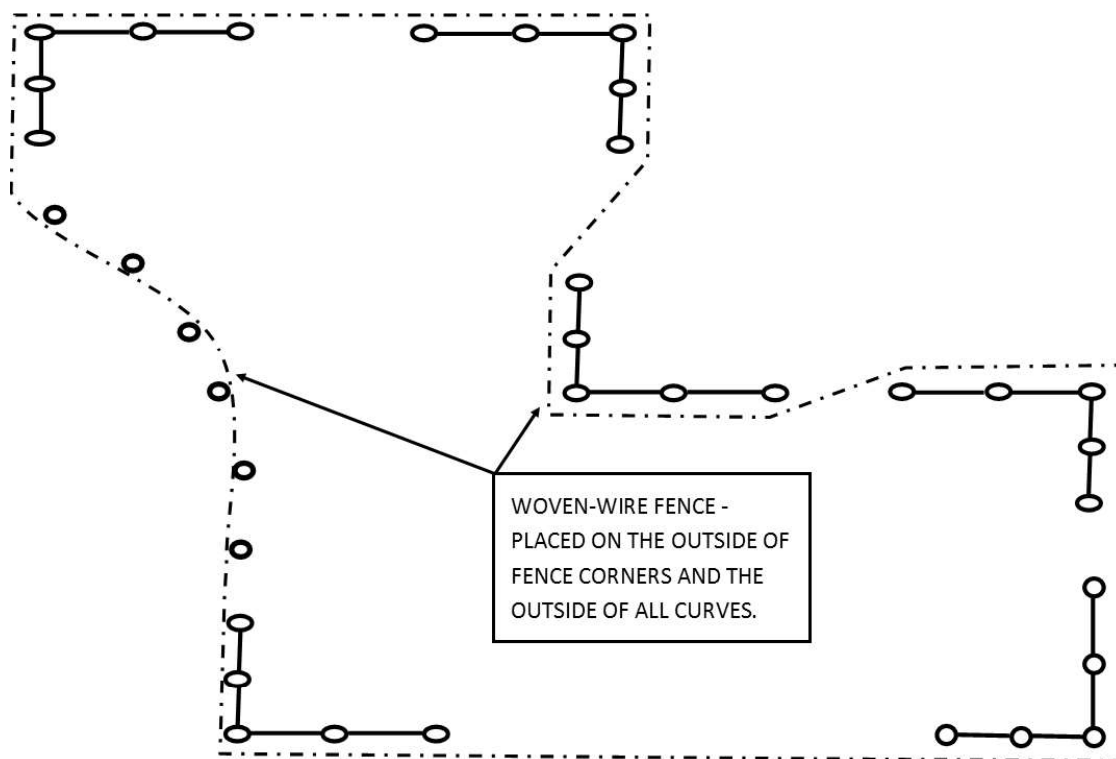
- When it is necessary to splice two sections of fence together, one of the following methods shall be used:
  - Place each fence's vertical stays over each other and wrap the loose horizontal ends of the wires around the corresponding horizontal wire not less than 6 times around;
  - Apply crimp sleeves rated for the appropriate gauge wire according to manufacturers instructions; or
  - Employ any other commercially-available splicing device rated for the appropriate gauge wire according to manufacturers instructions.



## Woven Wire Fence Placement

Woven wire fencing shall be placed on the outside of all corners, brace assemblies, and curves. When tensioned, the wire fencing should pull against the post, not the staples. **All fencing shall be sufficiently tensioned using commercially available methods. Tightening by hand is not acceptable.**

In all other areas, fence should be stapled on the side of the posts that will experience the most deer pressure. This side is typically the outer (non-cropped) side of the post. Exceptions may be made when site conditions make placement on the outside of the post impractical.



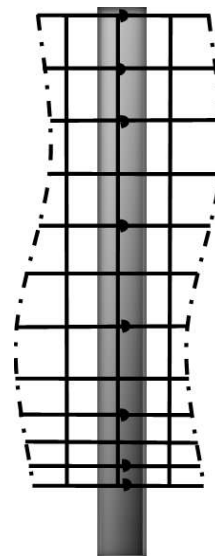
## Fastening Woven Wire Fence to Posts

Staples shall be used to fasten woven wire fence to posts. The bottom two and top two horizontal wires shall be stapled to each post, and every other horizontal wire in between shall be stapled to each post.

If a fence includes single-strand high-tensile wires above the woven wire portion of the fence, the single strand high-tensile wires shall be stapled to each post.

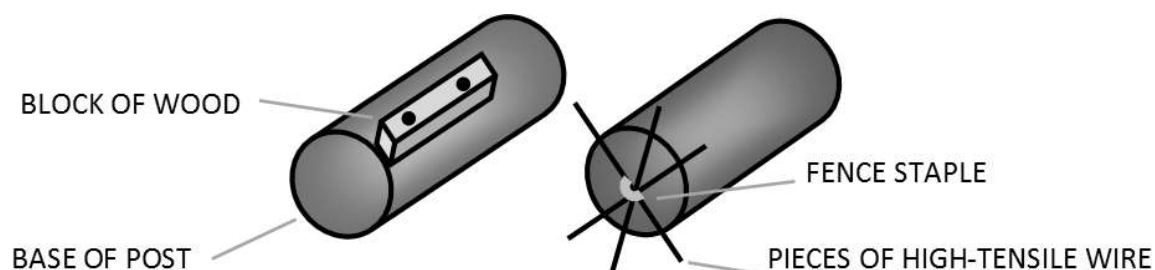
Wire should be held in place by the staple, but the staple should allow the wire to move back and forth freely.

When driving staples, rotate the flat face of the staples 30-45 degrees from the flat face of the post to prevent splitting.



## Setting Posts in the Ground

Posts may be pounded or augured. When augured, posts must be anchored at corners, ends, and low points. The following are two ways to anchor and set a post: 1) Attach a wood block near the bottom of the post (block system); or 2) Attach pieces of high-tensile wire and a fence staple at the bottom (spider system).

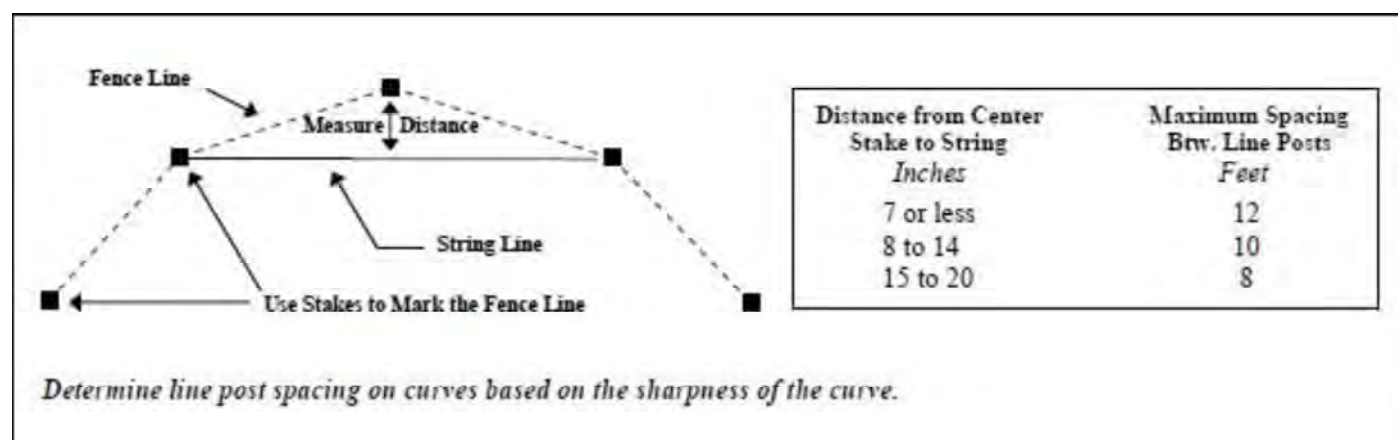


## Line Post Spacing on Curves

The spacing of line posts on curves is determined by the sharpness of the curve. Refer to the diagram below to determine the correct spacing.

Fence alignments that change direction by less than 40 degrees are considered curves.

Fence alignments that change direction by more than 40 degrees are considered corners.



*Diagram courtesy of NRCS*

## **Deer Fence Installation Training Video**

To be eligible for NJDA Matching Grants for Deer Fencing on Unpreserved Farms, applicants must watch the “SADC Deer Fence Installation Training Video”\*. The video is available here: <https://youtu.be/Ok00ObslHSg>. You are only required to watch the fence installation portion of the video, which begins at 1:02:26 and concludes at 1:27:36.

### **Source Notes**

The specifications in this Appendix are derived from the following sources:

- High-tensile Woven Wire Fences for Reducing Wildlife Damage – FS889 – Rutgers University, March 2010.
- Deer Fence Bid Specifications – NJ Department of Agriculture, Division of Agriculture and Natural Resources, November 2004.
- Fence Technical Reference (382) – NJ-NRCS, November 2014.
- NJ Deer Exclusion Fence Installation and Removal Guidance for (382) Fence – NJ-NRCS October 2015.
- SADC Farmland Stewardship Deer Fencing Program Training on Proper Installation and Maintenance, July 2017. <https://youtu.be/Ok00ObslHSg>.

*Where discrepancies exist between these sources and this Appendix, the standards set forth in this Appendix shall apply.*

\* The training video was produced by the SADC, but the NJDA requires the same specifications for deer fences constructed pursuant to this Program.

# Going Native

## A Guide to Landscaping with Native Plants in Northern New Jersey



### What are native plants?

Native plants have evolved over thousands of years to be adapted to conditions in a particular region. All other wildlife depends on native plants.

### Why should I grow them?

#### To bring in the birds and butterflies!

Native plants provide necessary food, shelter, and nesting sites for wildlife. Insects won't survive without native plants, and birds require insects to feed their babies.

#### To enjoy beautiful, hardy plants!

There are native plants for every growing condition (e.g., dry shade, moist sun, and clay soil). In their preferred conditions, natives thrive without pesticides or fertilizers and only require watering until established.

#### To improve water quality!

Native plant roots hold soil in place, increase infiltration of rainwater into the ground, and remove pollutants from water. By reducing or eliminating the need to use fertilizers and pesticides, native plants help keep our water clean.

### How can I choose the right plants?

Use the chart inside to select plants suited to your growing conditions. Find more information at [jerseyyards.org/plant](http://jerseyyards.org/plant).



## GETTING STARTED

**1. Start Small:** By starting small, you can experiment and learn. The goal is a beautiful, healthy, and wildlife-friendly yard with a diversity of native plants that bloom from spring to fall.

**2. How to Buy:** Find nurseries that sell native plants at [jerseyyards.org/jersey-friendly-plants/where-to-buy-native-plants/](http://jerseyyards.org/jersey-friendly-plants/where-to-buy-native-plants/) and [npsnj.org/native-plants/where-to-buy-natives/](http://npsnj.org/native-plants/where-to-buy-natives/). Use the full scientific name (Genus/species) to be sure you are getting the right plant, and confirm that the plants have not been treated with systemic pesticides.

**3. Landscape Style:** Native plants are well-suited to both formal and informal landscapes. They can be mixed with your favorite non-natives, but please remember that ideally our yards should be >70% native biomass (including native trees) to sustain pollinators, birds, and other wildlife.

### 4. For Easy Management:

- Select plants adapted to your site's growing conditions.
- Build native plant layers: ground covers, flowers, shrubs, and trees.
- Use dense native plantings to build a "green mulch" that reduces weeds. "Landscape plugs" can make this fast and simple.
- Convert a patch of lawn – an easy way is to mow it short, cover with cardboard or several sheets of newspaper, wet it, and layer on 3 to 4 inches of composted mulch. After waiting 3 to 6 months, plant right through it.

**5. Invasive Plants: Do not plant invasive species.** They naturalize into our forests and outcompete the native plants required for ecosystem health. The NJ Invasive Species Strike Team's DO NOT PLANT list identifies plants to avoid ([fohvos.info/invasive-species-strike-team/info-center/](http://fohvos.info/invasive-species-strike-team/info-center/))

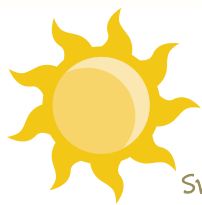
**6. Deer:** Discourage deer by selecting plants they do not prefer and using barriers, *e.g.*, fences, cages, or deer repellents. Note that "Deer Resistance" varies in different areas, and hungry deer will eat plants they normally avoid.

**7. Pest Management: Avoid Chemicals.** Synthetic and organic insecticides and herbicides kill everything on the label, including the "good guys" you want to protect! Diverse plantings naturally reduce pests.

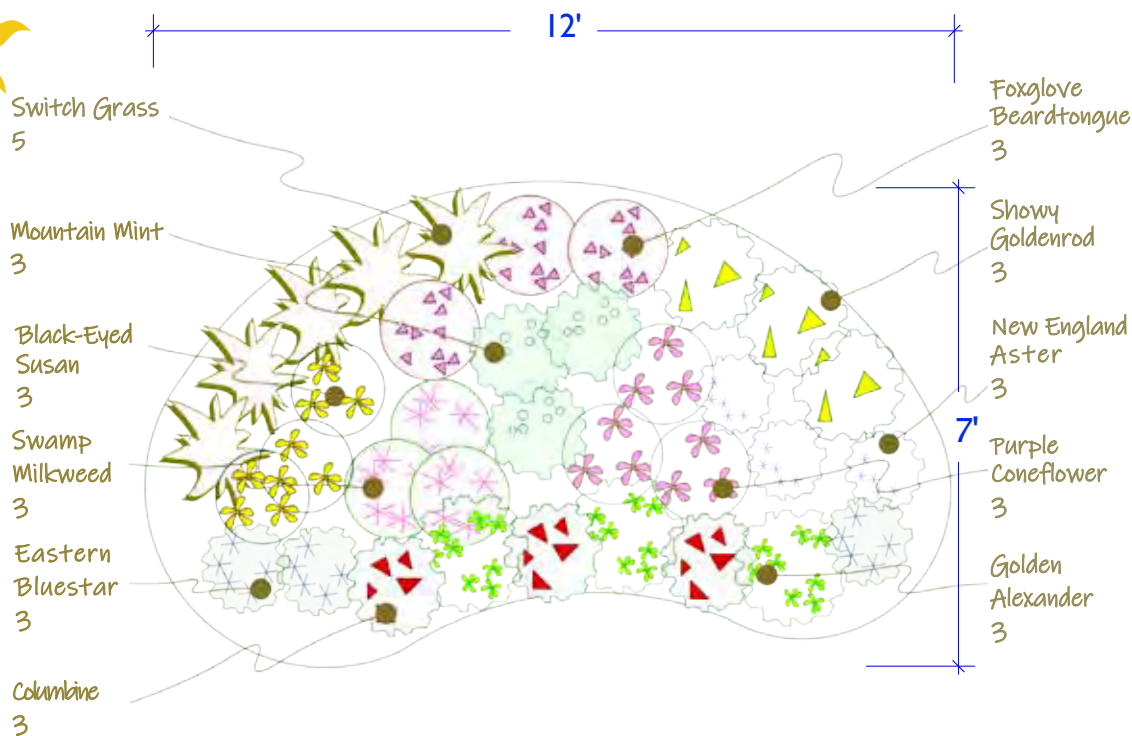
**8. Cultivar vs. Straight Species:** A simple cultivar selected for size or hardiness can be fine, but a cultivar with a different leaf or flower color or structure may not support the pollinators that depend on the original native species (*i.e.*, a fancy cultivar may be ecologically useless).

**9. Winter Wildlife Garden:** Minimize fall cleanup by leaving the leaves and stems with seed heads in your winter garden. Many important pollinators overwinter in the leaves and birds feed on the seed heads. In May, cut stems to about 12-18 inches so that native bees can use them for nesting.

**10. Plant Native Trees:** Big trees provide big benefits: they cool your house and neighborhood; manage stormwater; and "host" insects that birds and other wildlife depend on for food. Find the right tree for your location at [jerseyyards.org/plant/](http://jerseyyards.org/plant/).



### Sunny Moist Sample Design



### For more great information:

Homegrown National Park: [homegrownnationalpark.org/](http://homegrownnationalpark.org/)

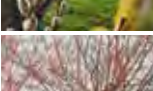
Wild Ones: [nativegardendesigns.wildones.org/](http://nativegardendesigns.wildones.org/)

Native Plant Society of New Jersey: [npsnj.org](http://npsnj.org)

National Wildlife Federation: [nwf.org/NativePlantFinder](http://nwf.org/NativePlantFinder)

Pollinator Pathway: [pollinator-pathway.org](http://pollinator-pathway.org)

# SMALL TREES, SHRUBS AND VINES

| PHOTO                                                                              | NAME<br>Common & Scientific                                      | HEIGHT    | FLOWERS<br>Bloom Time & Color                                    | LIGHT                                                                                                                                                                                                                                                       | SOIL<br>Moisture & Type                                                                                                                                                                                                                                                       | WILDLIFE                                                                                                                                                                    | DEER RESISTANT AND NOTES                                                 |
|------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
|    | <b>American Black Elderberry</b><br><i>Sambucus canadensis</i>   | 5' - 12'  | MAR APR <b>MAY JUN JUL</b> AUG SEP OCT<br>fluffy white clusters  |                                                                                           |  -  - <br>C L O         |       | graceful arching branches;<br>fruit for birds                            |
|    | <b>Arrowwood</b><br><i>Viburnum dentatum</i>                     | 6' - 15'  | MAR APR <b>MAY JUN JUL</b> AUG SEP OCT<br>flat white clusters    |                                                                                           |  -  - <br>L S O         |       | <b>Y</b> , blue-black berries; red fall foliage                          |
|    | <b>Black Chokeberry</b><br><i>Aronia melanocarpa</i>             | 3' - 5'   | MAR APR <b>MAY JUN JUL</b> AUG SEP OCT<br>white clusters         |                                                                                           |  - <br>C L S O                                                                                             |       | fall color, edible showy fruit                                           |
|    | <b>Buttonbush</b><br><i>Cephalanthus occidentalis</i>            | 6' - 15'  | MAR APR <b>MAY JUN JUL</b> AUG SEP OCT<br>fragrant white balls   |                                                                                           |  - <br>C L S O                                                                                             |       | <b>Y</b> , tolerates wet areas                                           |
|    | <b>Coral Honeysuckle (Vine)</b><br><i>Lonicera sempervirens</i>  | 8' - 15'  | MAR APR <b>MAY JUN JUL</b> AUG SEP OCT<br>red-orange with yellow |                                                                                           |  - <br>C L S O                                                                                             |       | twining vine can be groundcover or trained on trellis                    |
|    | <b>Eastern Redbud</b><br><i>Cercis canadensis</i>                | 20' - 30' | MAR <b>APR MAY JUN JUL</b> AUG SEP OCT<br>magenta                |          |  - <br>C L O                                                                                               |       | one of the earliest bloomers;<br>drought-resistant                       |
|    | <b>Highbush Blueberry</b><br><i>Vaccinium corymbosum</i>         | 6' - 12'  | MAR APR <b>MAY JUN JUL</b> AUG SEP OCT<br>white-pinkish          |                                                                                           |  -  - <br>C L S O       |       | blueberries July-Aug.; red fall color; add organic matter to soil        |
|    | <b>Inkberry</b><br><i>Ilex glabra</i>                            | 6' - 8'   | MAR APR <b>MAY JUN JUL</b> AUG SEP OCT<br>small, greenish-white  |                                                                                           |  - <br>C L S O                                                                                             |       | evergreen boxwood alternative;<br>berries on female plants w/ male       |
|   | <b>New Jersey Tea</b><br><i>Ceanothus americanus</i>             | 3' - 4'   | MAR APR <b>MAY JUN JUL</b> AUG SEP OCT<br>fragrant, showy, white |                                                                                         |  - <br>L S O                                                                                             |     | <b>Y</b> , stunning pollinator attractor;<br>needs well-drained soil     |
|  | <b>Ninebark</b><br><i>Physocarpus opulifolius</i>                | 5' - 8'   | MAR APR <b>MAY JUN JUL</b> AUG SEP OCT<br>white to pink          |                                                                                       |  - <br>C L S O                                                                                         |   | domed flower clusters;<br>lovely fall color and winter bark              |
|  | <b>Northern Bayberry</b><br><i>Morella pensylvanica</i>          | 5' - 12'  | MAR <b>APR MAY JUN JUL</b> AUG SEP OCT<br>small, yellow-green    |                                                                                       |  -  - <br>L S O   |   | <b>Y</b> , berries on female with male nearby; semi-evergreen            |
|  | <b>Pussy Willow</b><br><i>Salix discolor</i>                     | 6' - 15'  | <b>MAR APR</b> MAY JUN JUL AUG SEP OCT<br>white, yellow, green   |                                                                                       |  - <br>L S O                                                                                           |   | soft fuzzy early flowers; valuable host for diverse caterpillars         |
|  | <b>Red Twig Dogwood</b><br><i>Cornus sericea</i>                 | 7' - 9'   | MAR APR <b>MAY JUN JUL</b> AUG SEP OCT<br>white                  |                                                                                       |  - <br>C L O                                                                                           |   | bright red stems for winter interest                                     |
|  | <b>Serviceberry or Shadbush</b><br><i>Amelanchier canadensis</i> | 15' - 25' | <b>MAR APR</b> MAY JUN JUL AUG SEP OCT<br>small, white           |                                                                                       |  - <br>C L S O                                                                                         |   | <b>Y</b> , one of the earliest bloomers;<br>purple fruit in June         |
|  | <b>Shrubby St. John's Wort</b><br><i>Hypericum prolificum</i>    | 2' - 4'   | MAR APR <b>MAY JUN JUL AUG</b> SEP OCT<br>bright yellow          |                                                                                       |  - <br>C L S O                                                                                         |   | <b>Y</b> , compact; perfect shrub for border                             |
|  | <b>Spicebush</b><br><i>Lindera benzoin</i>                       | 6' - 12'  | <b>MAR</b> APR MAY JUN JUL AUG SEP OCT<br>fragrant yellow        |    |  - <br>C L O                                                                                           |   | <b>Y</b> , "forsythia of the wilds;"<br>berries on female plants w/ male |
|  | <b>Summersweet</b><br><i>Clethra alnifolia</i>                   | 4' - 8'   | MAR APR MAY <b>JUN JUL AUG</b> SEP OCT<br>fragrant white         |    |  - <br>C L S O                                                                                         |   | <b>Y</b> , blooms mid-summer in shade;<br>shrub border                   |
|  | <b>Virginia Sweetspire</b><br><i>Itea virginica</i>              | 3' - 8'   | MAR APR <b>MAY JUN JUL</b> AUG SEP OCT<br>fragrant white         |    |  -  - <br>C L S O |   | good fall color; shrub border                                            |
|  | <b>Wild Hydrangea</b><br><i>Hydrangea arborescens</i>            | 3' - 6'   | MAR APR <b>MAY JUN JUL AUG SEP</b> OCT<br>white                  |                                                                                       |  - <br>C L O                                                                                           |   | large showy flower clusters                                              |
|  | <b>Winterberry</b><br><i>Ilex verticillata</i>                   | 6' - 12'  | MAR APR <b>MAY JUN JUL AUG</b> SEP OCT<br>small, white           |                                                                                       |  - <br>C L S O                                                                                         |   | <b>Y</b> , red berries on female with male nearby                        |

# HERBACEOUS PERENNIALS

| PHOTO                                                                              | NAME<br>Common & Scientific                                      | HEIGHT    | FLOWERS<br>Bloom Time & Color                         | LIGHT                                                                                                                                                                   | SOIL<br>Moisture & Type                                                                                                                                                                  | WILDLIFE                                                                              | DEER RESISTANT AND NOTES                                                         |
|------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
|    | <b>Anise Hyssop</b><br><i>Agastache foeniculum</i>               | 24" - 48" | MAR APR MAY JUN JUL AUG SEP OCT<br>blue-purple        |       |  - <br>C L S O     |    | Y, columns of pollinator-attracting flowers                                      |
|    | <b>Black-Eyed Susan</b><br><i>Rudbeckia hirta</i>                | 24" - 36" | MAR APR MAY JUN JUL AUG SEP OCT<br>yellow             |       |  - <br>C L         |    | long bloom time                                                                  |
|    | <b>Blazing Star</b><br><i>Liatris spicata</i>                    | 24" - 36" | MAR APR MAY JUN JUL AUG SEP OCT<br>purple spikes      |                                                                                        |  - <br>C L S       |    | Y, drought-tolerant                                                              |
|    | <b>Butterfly Milkweed</b><br><i>Asclepias tuberosa</i>           | 18" - 36" | MAR APR MAY JUN JUL AUG SEP OCT<br>orange             |                                                                                        |  - <br>L S         |    | Y, butterfly favorite (hosts Monarchs); pretty seedpods                          |
|    | <b>Cardinal Flower</b><br><i>Lobelia cardinalis</i>              | 24" - 48" | MAR APR MAY JUN JUL AUG SEP OCT<br>red                |       |  - <br>C L         |    | Y, intense red color attracts hummingbirds                                       |
|    | <b>Eastern Columbine</b><br><i>Aquilegia canadensis</i>          | 12" - 36" | MAR APR MAY JUN JUL AUG SEP OCT<br>red to yellow      |       |  - <br>L S O       |    | Y, unique two-toned flowers; spreads by seed                                     |
|    | <b>Common Boneset</b><br><i>Eupatorium perfoliatum</i>           | 36" - 72" | MAR APR MAY JUN JUL AUG SEP OCT<br>white              |       |  - <br>C L S       |    | Y, flat top flower clusters attract butterflies; popular herb; good for wet site |
|    | <b>Culver's Root</b><br><i>Veronicastrum virginicum</i>          | 24" - 72" | MAR APR MAY JUN JUL AUG SEP OCT<br>white to pale blue |       | <br>L O                                                                                               |    | Y, stunning; slow to establish but long-lived                                    |
|   | <b>Eastern Blue Star</b><br><i>Amsonia tabernaemontana</i>       | 24" - 36" | MAR APR MAY JUN JUL AUG SEP OCT<br>blue               |     |  - <br>C L S O   |   | Y, easy to grow; clumping; yellow fall color                                     |
|  | <b>False Sunflower</b><br><i>Heliopsis helianthoides</i>         | 36" - 60" | MAR APR MAY JUN JUL AUG SEP OCT<br>yellow             |   |  - <br>L S     |  | Y, attractive daisy-like flower with a long bloom time                           |
|  | <b>Foamflower</b><br><i>Tiarella cordifolia</i>                  | 6" - 12"  | MAR APR MAY JUN JUL AUG SEP OCT<br>spikes of white    |   | <br>L                                                                                               |  | Y, interesting foliage; great choice for a shade garden                          |
|  | <b>Foxglove Beardtongue</b><br><i>Penstemon digitalis</i>        | 36" - 60" | MAR APR MAY JUN JUL AUG SEP OCT<br>white to pink      |   |  - <br>C L S O |  | Y, tolerates poor drainage; not a true Foxglove (Digitalis)                      |
|  | <b>Great Blue Lobelia</b><br><i>Lobelia siphilitica</i>          | 12" - 36" | MAR APR MAY JUN JUL AUG SEP OCT<br>blue spike         |   |  - <br>C L S   |  | Y, interesting, long-blooming blue flowers                                       |
|  | <b>Heartleaf Golden Alexander</b><br><i>Zizia aurea</i>          | 12" - 30" | MAR APR MAY JUN JUL AUG SEP OCT<br>yellow             |   |  - <br>C L S O |  | Y, supports early pollinators; tidy plant and attractive seedhead                |
|  | <b>New England Aster</b><br><i>Symphyotrichum novae-angliae</i>  | 36" - 72" | MAR APR MAY JUN JUL AUG SEP OCT<br>blue to violet     |   | <br>C L S                                                                                           |  | pollinator magnet; pinch in June to keep plant compact                           |
|  | <b>Purple Coneflower</b><br><i>Echinacea purpurea</i>            | 24" - 48" | MAR APR MAY JUN JUL AUG SEP OCT<br>purple-pink        |                                                                                      |  - <br>C L S   |  | Y, goldfinches love its seeds                                                    |
|  | <b>Showy Goldenrod</b><br><i>Solidago speciosa</i>               | 24" - 48" | MAR APR MAY JUN JUL AUG SEP OCT<br>yellow             |   |  - <br>C L S   |  | Y, easy to grow, late season pollinator workhorse                                |
|  | <b>Swamp Milkweed</b><br><i>Asclepias incarnata</i>              | 36" - 60" | MAR APR MAY JUN JUL AUG SEP OCT<br>pink               |   |  - <br>C L     |  | Y, attracts butterflies (hosts Monarchs); tolerates wet unlike butterfly weed    |
|  | <b>Virginia Mountain Mint</b><br><i>Pycnanthemum virginianum</i> | 24" - 36" | MAR APR MAY JUN JUL AUG SEP OCT<br>tiny white         |   |  - <br>C L S   |  | Y, blooms buzz with pollinators                                                  |
|  | <b>White Turtlehead</b><br><i>Chelone glabra</i>                 | 24" - 36" | MAR APR MAY JUN JUL AUG SEP OCT<br>white              |   |  - <br>C L S   |  | flower shaped like a turtle's head; good in a shade garden                       |

## HERBACEOUS PERENNIALS

| PHOTO                                                                            | NAME<br>Common & Scientific                          | HEIGHT    | FLOWERS<br>Bloom Time & Color                                   | LIGHT                                                                                                                                                               | SOIL<br>Moisture & Type                                                                                                                                                                     | WILDLIFE                                                                                                                                                                | DEER RESISTANT AND NOTES                            |
|----------------------------------------------------------------------------------|------------------------------------------------------|-----------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
|  | <b>White Wood Aster</b><br><i>Eurybia divaricata</i> | 12" - 30" | MAR APR MAY JUN JUL <b>AUG</b> SEP OCT<br>white                 |   |  - <br><b>L S O</b>   |   | freely seeds; lights up fall shade                  |
|  | <b>Wild Bergamot</b><br><i>Monarda fistulosa</i>     | 24" - 48" | MAR APR MAY JUN <b>JUL</b> <b>AUG</b> SEP OCT<br>pink to purple |   |  - <br><b>C L S O</b> |   | <b>Y</b> , fragrant flowers and foliage; can spread |
|  | <b>Wreath Goldenrod</b><br><i>Solidago caesia</i>    | 18" - 36" | MAR APR MAY JUN <b>AUG</b> <b>SEP</b> OCT<br>small yellow       |   |  - <br><b>C L S O</b> |   | <b>Y</b> , blooms in shade; not aggressive          |

## GROUNDCOVERS, CAREXES AND GRASSES

| PHOTO                                                                              | NAME<br>Common & Scientific                                | HEIGHT    | FLOWERS<br>Bloom Time & Color                                                              | LIGHT                                                                                                                                                                                                                                                       | SOIL<br>Moisture & Type                                                                                                                                                                       | WILDLIFE                                                                                                                                                                    | DEER RESISTANT AND NOTES                                                              |
|------------------------------------------------------------------------------------|------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|    | <b>Christmas Fern</b><br><i>Polystichum acrostichoides</i> | 12" - 24" | MAR APR MAY JUN JUL <b>AUG</b> SEP OCT<br>no bloom, dark green leaves                      |                                                                                           |  - <br><b>L O</b>       |                                                                                          | <b>Y</b> , clumping; evergreen                                                        |
|    | <b>Golden Ragwort</b><br><i>Packera aurea</i>              | 6" - 18"  | MAR <b>APR</b> <b>MAY</b> JUN JUL <b>AUG</b> SEP OCT<br>yellow                             |                                                                                           |  - <br><b>C L O</b>      |       | <b>Y</b> , semi-evergreen ground foliage with a spring flower layer floating at 2'-3' |
|    | <b>Little Bluestem</b><br><i>Schizachyrium scoparium</i>   | 24" - 48" | MAR APR <b>MAY</b> <b>JUN</b> <b>JUL</b> <b>AUG</b> <b>SEP</b> OCT<br>green to reddish tan |                                                                                                                                                                            | <br><b>L S</b>                                                                                             |       | <b>Y</b> , drought tolerant; very ornamental; turns bronze-orange after frost         |
|    | <b>Moss Phlox</b><br><i>Phlox subulata</i>                 | 3" - 6"   | MAR <b>APR</b> <b>MAY</b> JUN JUL <b>AUG</b> SEP OCT<br>red, purple, or white              |                                                                                           | <br><b>C L S O</b>                                                                                         |                                                                                          | <b>Y</b> , spreading, mat-forming evergreen                                           |
|   | <b>Spreading Sedge</b><br><i>Carex laxiculmis</i>          | 12" - 18" | MAR <b>APR</b> <b>MAY</b> <b>JUN</b> JUL <b>AUG</b> SEP OCT<br>yellowish-white             |                                                                                       |  - <br><b>C L O</b>  |   | <b>Y</b> , mostly evergreen; grows in dense rounded clumps                            |
|  | <b>Switchgrass</b><br><i>Panicum virgatum</i>              | 36" - 72" | MAR APR MAY <b>JUN</b> <b>JUL</b> <b>AUG</b> <b>SEP</b> OCT<br>green to brown to rose      |                                                                                       |  - <br><b>C L S</b>  |   | <b>Y</b> , bunch grass with great fall color; tolerates wet areas                     |
|  | <b>Wild Strawberry</b><br><i>Fragaria virginiana</i>       | 3" - 6"   | MAR <b>APR</b> <b>MAY</b> <b>JUN</b> JUL <b>AUG</b> SEP OCT<br>white                       |                                                                                       |  - <br><b>L S O</b> |   | <b>Y</b> , spreads vigorously in sun; host for 80 caterpillar species                 |
|  | <b>Woodland Stonecrop</b><br><i>Sedum ternatum</i>         | 3" - 6"   | MAR <b>APR</b> <b>MAY</b> <b>JUN</b> JUL <b>AUG</b> SEP OCT<br>white                       |    |  - <br><b>L S O</b> |   | <b>Y</b> , evergreen; forms dense mats; easy-to-control                               |

### KEY

#### LIGHT



- Shade = less than 3 hours of direct sunlight a day, or filtered sunlight
- Partial shade = approximately 3 to 6 hours of direct sunlight a day
- Full sun = at least 6 hours of direct sunlight a day

#### SOIL CONDITIONS – Moisture



- Dry = water does not remain after a rain
- Moist = soil is damp, and occasionally saturated
- Wet = soil is saturated, except during droughts

#### SOIL CONDITIONS – Type

#### C L S O

- O**rganic soil (contains a high percentage of organic matter such as decayed leaves)
- S**andy or coarse-textured soil (drains rapidly)
- L**oamy or medium-textured soil (drains but holds moisture)
- C**lay or fine-textured soil

#### WILDLIFE



- Butterflies
- Hummingbirds
- Songbirds
- Beneficial Insects  
(Bees, other pollinators, and pest-controlling insects like lady beetles)

#### HERBACEOUS PERENNIAL

A non-woody plant that lives for more than two years. It dies back at the end of each growing season, then re-emerges each spring from the root stock.

#### DEER RESISTANCE

**Y** = Deer-resistant plant  
(Note that even listed plants may sometimes be eaten.)

#### PHOTO CREDITS

USDA-NRCS PLANTS Database: <https://plants.usda.gov/>

Missouri Botanical Garden Plant Finder:  
[www.missouribotanicalgarden.org/gardens-gardening/your-garden/plant-finder.aspx](http://www.missouribotanicalgarden.org/gardens-gardening/your-garden/plant-finder.aspx)

Lady Bird Johnson Wildflower Center: [www.wildflower.org](http://www.wildflower.org)



# Jersey-Friendly<sup>SM</sup> Yards

Landscaping for a  
Healthy Environment

**JerseyYards.org**

Get started with Going Native! Then try the searchable Plant Database on the Jersey-Friendly Yards website to find even more native plants for your yard. Using the database, you can create a custom list of plants suited to your yard's specific growing conditions. Locate nurseries that sell native plants by using the website's "Where to Buy" page and resources on the Native Plant Society of NJ website.

Jersey-Friendly Yards is packed with information and resources to guide you through the steps to a healthier yard. Learn how to maintain healthy soil, reduce use of fertilizers and pesticides, conserve water, and create habitat for wildlife. A healthier yard means a healthier environment and a healthier New Jersey!

The Barnegat Bay Partnership developed Jersey-Friendly Yards for the entire state of New Jersey with 319(h) grant funding from the NJ Department of Environmental Protection.

The Northern New Jersey Edition is based on the original brochure created by the Barnegat Bay Partnership for the Barnegat Bay watershed. Friends of Foote's Pond Wood, in consultation with the Native Plant Society of New Jersey, modified the original to create this Northern New Jersey edition.

A pdf is available at [fofpw.org](http://fofpw.org), [npsnj.org](http://npsnj.org), and [jerseyyards.org](http://jerseyyards.org). Please contact us with questions via any of these websites.

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For copies of the original edition, email Barnegat Bay Partnership at [bbp@ocean.edu](mailto:bbp@ocean.edu).

COVER PHOTO: Garden photo by Don Knezik.

COVER INSET PHOTOS (l. to r.): Bird photo by Raymond Truelove (iStockphoto.com). Butterfly photo by Edward Teune (Wikipedia Commons). Hummingbird photo by Joe Schneid (Wikipedia Commons). Bee photo by Hannah Gaines, provided courtesy of the University of Wisconsin-Madison.

ABOVE PHOTO: Black-Eyed Susans photo by Joseph Pirozek.



This message has been funded by the USEPA under a Clean Water Act grant agreement to Ocean County College and has not undergone USEPA review.