

# Regional Breeding Program

**Locate** flowering American Chestnut trees for pollination and nuts.

**Identify** prospective “mother trees” for American characteristics.

**Pollinate** native American chestnut trees using hybrid TACF pollen.

**Harvest** open pollinated Americans and hand pollinated hybrids.

**Seed** storage and winter stratification.

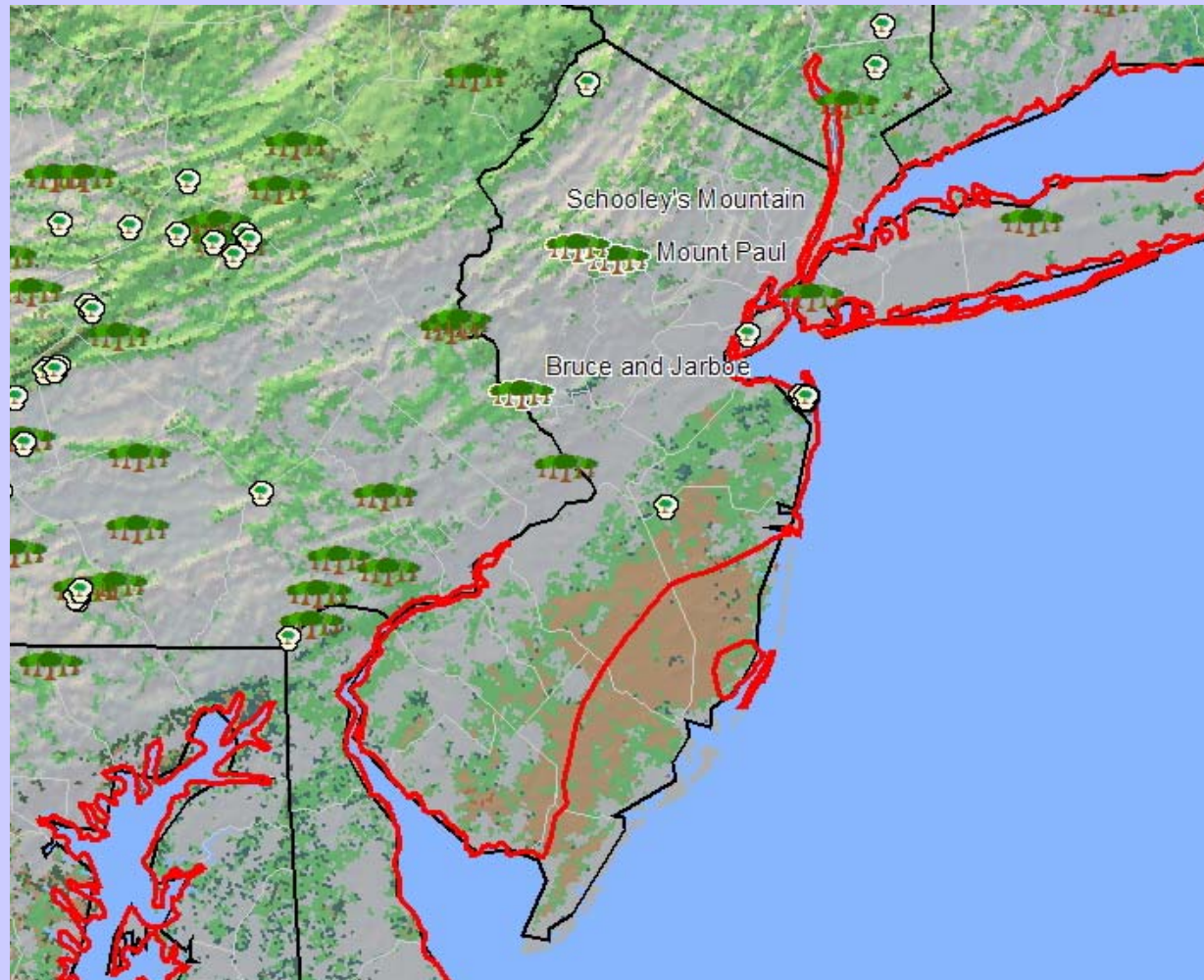
**Planning** orchard locations and selecting prospective growers.

**Spring Planting** American, hybrid, and experimental orchards.

**Orchard Maintenance** fertilizing, weeding, watering, protecting inoculation and selecting.

**Documentation** “We always finish the paperwork!”

# New Jersey – Active Locations



# Locating American Chestnut Trees

- Tree Locator Form
  - Document location as well as possible.
- Finding trees
- Proper Identification

<b>Tree Locator Form</b> Pennsylvania Chapter The American Chestnut Foundation PA-TACF 691 Pumping Station Road Hanover, PA 17331 (717) 632-8669 E-mail: darm@blazenet.net	<b>Purpose.</b> This form is to help PA-TACF record, map, and analyze Chestnut trees across Pennsylvania and the Mid-Atlantic Region. This form should be printed and filled out with as much information as available and submitted with a leaf and twig sample to the York, PA office shown.. An analysis of the characteristics and microscopics will be completed by PA-TACF and the results will be sent to the submitter. <b>Leaf and Twig Sample.</b> Please cut a mature leaf that has been growing in the full sun and a twig with some leaf buds and place them in an envelope. Do not use plastic due to the molding effect. Wrap the samples in a single paper towel to cushion in the mail. <b>We appreciate your participation!</b>
<b>Submitted by:</b> _____ Telephone: <u>732-671-7283</u> Name: <u>Tony Rosati</u> Telephone: <u>732-673-1440</u> cell Address: <u>30 Scenic Way</u> E mail: <u>@r728@comcast.net</u> City: <u>Middletown</u> State: <u>NJ</u> Zip: <u>07748</u>	
<b>Tree Information:</b> <input checked="" type="checkbox"/> Single Tree or <input type="checkbox"/> Group of Trees (#): _____ Size: Diameter at Breast Height (4 1/2 Feet from Ground): <u>10"</u> Height: <u>30 ft</u> Producing: <input checked="" type="checkbox"/> Flowers or <input checked="" type="checkbox"/> Nuts Estimated number of nuts <u>100</u> <input checked="" type="checkbox"/> Blight is Present on the tree (s) Size of largest Cankers: <u>6 inches</u> PA-TACF may use the tree for: <input checked="" type="checkbox"/> Pollinating <input checked="" type="checkbox"/> Harvesting	
<b>Location:</b> Nearest Town/State: <u>Sussex, NJ</u> County: <u>Sussex</u> GPS Location: _____ If no GPS Location is available, describe location or attach a map: <u>High Point State Park, N.J.</u>	
<b>Owner Information:</b> Name of Owner if other than Submitter: <u>N.J. State Forestry Service</u> Address: <u>1480 Route 23</u> Telephone: <u>978-875-4800</u> City: <u>Sussex</u> State: <u>NJ</u> Zip: <u>07461</u> Permission to harvest granted by: <u>N.J. DEP</u>	
<b>PA-TACF Analysis and Information:</b> Tree Name: _____ Checker: _____ Date: _____ Classification: <input type="checkbox"/> A—Classic American <input type="checkbox"/> B—Am. Hybrid (Acceptable) <input type="checkbox"/> C—Am. Hybrid (Unacceptable) <input type="checkbox"/> D—Non-Am. _____ Comments: _____	



# Finding Chestnuts

- The best time is during blooming season, particularly when male flowers are in full bloom
  - Smell
    - Wet rags; bleach
  - Sight
    - Drive around forest roads
    - Stand on top of a ridge to look for bloom in valleys and on other ridges
- Tree Locator Form
  - Leaf and twig



# Identification

- Several species
  - American, European, Chinese, Japanese
    - Chinkapin – Allegheny (also Ozark)
  - Primarily will find American and Chinese chestnuts

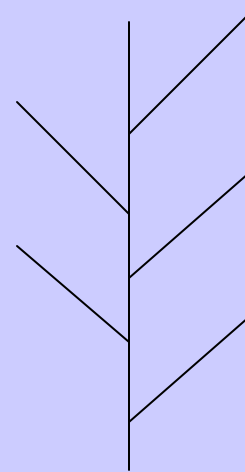


# Leaf Traits

Canoe shape vs. Oval shape

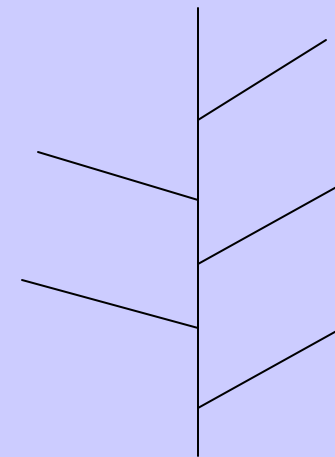


Acute vs. Wide Angle at  
Petiole



Usually,  
American  
chestnuts exhibit  
acute branch and  
leaf angles.

But Chinese  
chestnuts have  
wider branch and  
leaf angles.





# Selection for Leaf Traits

Dull vs. Shiny



Teeth (dentation)



Note strong hook along leaf margin.

Note strong wedge-shaped in dentation of this Chinese chestnut.





## Stipules

- Stipules are best observed in the spring and early summer.



Thin, non-flared  
stipules on  
American



Wide, flared  
stipules on  
Chinese

## Leaf Hairs

There should be no leaf hairs on the underside of the leaf (interveinal). Along the veins, particularly the midvein, simple hairs should be sparse.

Under a microscope, over 40x, one can see star-shaped (stellate) hairs on the underside of a leaf.

With a hand lens, the presence or absence of hairs may be determined. Questionable specimens may be further examined.

# New Jersey Native Trees

- Big, ugly cankers ...
- Ken Thoman and Tony Rosati have inventoried about 150 trees in Hartshorne Woods Park in Middletown, NJ.
  - Largest: ~60' tall, 12" dbh

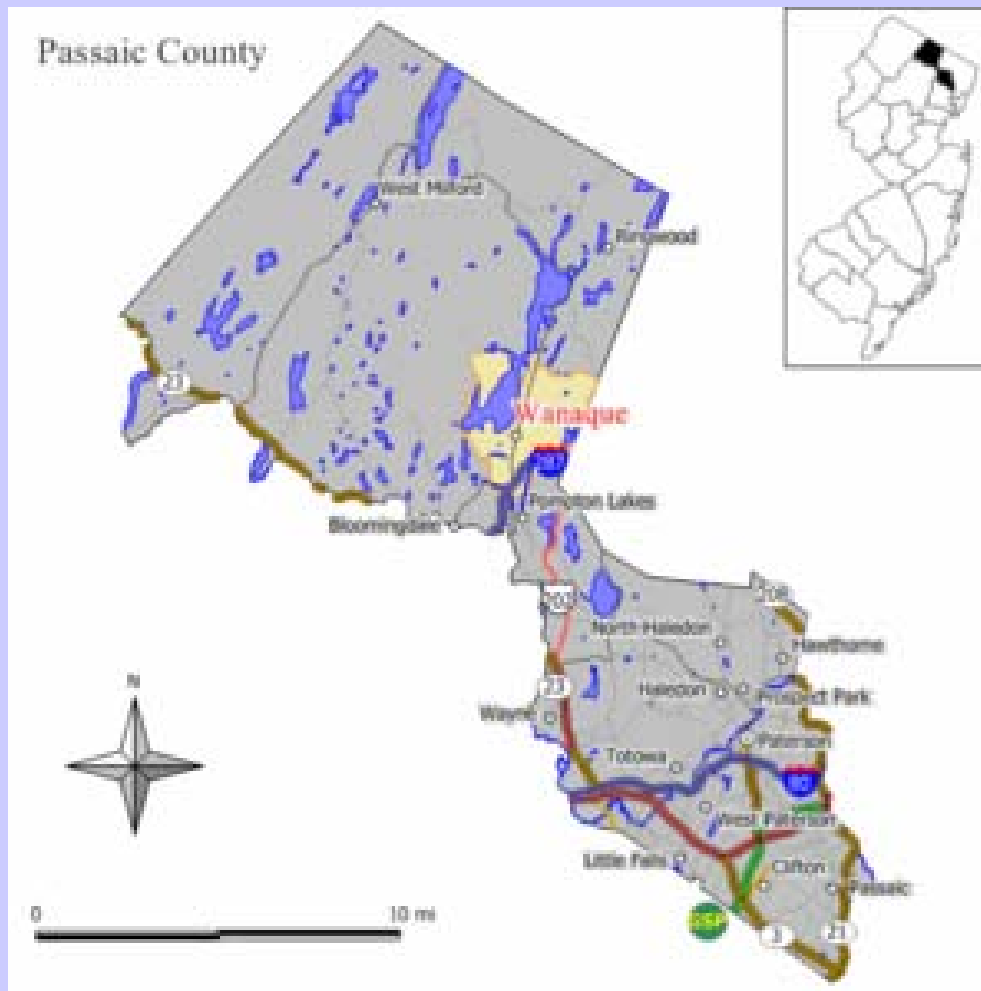




# Harthshorne Woods Park



# Wanaque Reservoir



- Some native chestnuts
- Difficult land to plant
  - Hardpan found in 2005 attempt.
  - May identify new areas.



# NJCF - Bruce and Jarboe



- Bruce: Graves Source BC3
  - Established in 2003
  - Poorly drained soils at low elevation near stream
- Jarboe: Eventual Graves B3F2
  - Much testing of property
  - Hazelton soils
    - Well drained, fertile

# Stokes State Forest

- Chinese chestnut orchard established in 1930s
  - adaptability study



- Planting of ~1000 Chinese chestnuts in late April







# Pollination Activities

- Beginning of organized activities in New Jersey
  - Focus:
    - Maintenance of existing orchards
    - Establishment of Graves BC3F2 orchard(s)
    - Pollination of surviving Americans with local Chinese chestnut trees
      - PA-TACF breeding program for Multiple Sources of Resistance utilizing Cytoplasmic Male Sterility.



# Introduction of Resistance Sources

- More Chinese trees to add to the diversity of resistance
- Easy to get involved
  - Find 2 American trees and 2 Chinese trees
  - Cross pollinate them, using controlled pollination with the American as a female
  - Collect 80 seed total
    - 20 from American 1 (open pollination)
    - 20 from American 2 (open pollination)
    - 20 from American 1 x Chinese 1
    - 20 from American 2 x Chinese 2





# Cytoplasmic Male Sterility



American Female

X



Chinese Male

# Male Sterile F1



American female x Chinese male

= all F1 progeny are male sterile

Male sterility photos by Dr.  
Paul Sisco, TACF's Southern  
Regional Science Coordinator

# CMS F1 Orchard

Male Sterile F1 trees = female



X

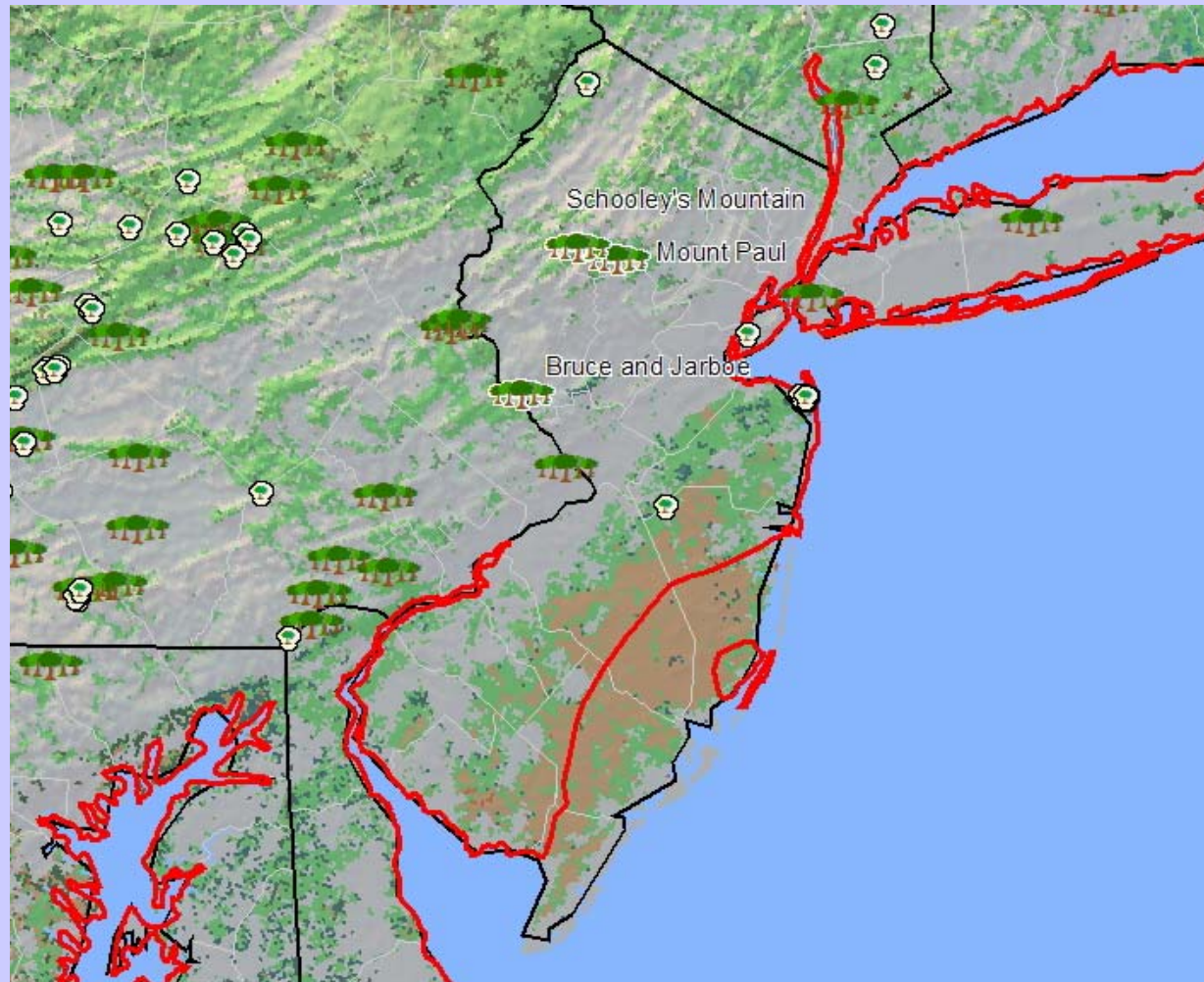


Male Fertile American trees

Male sterility photos by Dr.  
Paul Sisco, TACF's Southern  
Regional Science Coordinator



# F1 Orchards in Morris County





# Morris County Plantings

- Established in 2004
  - Mount Paul
  - Schooleys Mountain

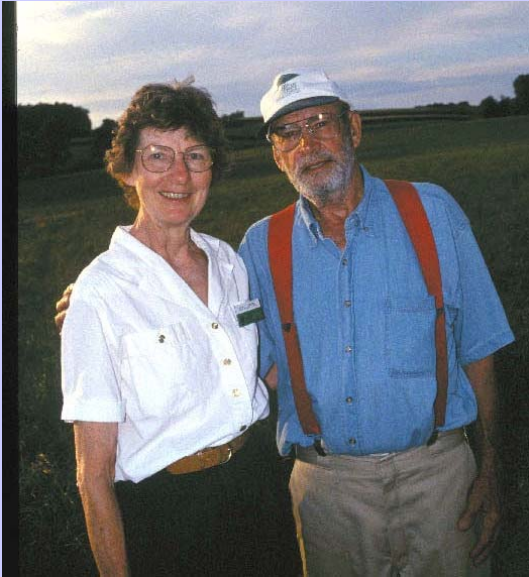


# 2006 Activities in New Jersey

- Locating trees – anytime!
- Planting
  - Stokes State Forest (~1000)
  - Mount Paul (~35)
- Pollination
  - High Point State Park
  - Hartshorne Woods Park
  - Where you find a tree this year!

# Getting Involved

- Contact the Leffel Chestnut Center



[sko2@psu.edu](mailto:sko2@psu.edu)



[sara@acf.org](mailto:sara@acf.org)



- Visit our websites to see what activities are going on:
  - <http://www.patacf.org>
  - <http://chestnut.cas.psu.edu>
    - Join our mailing lists!





# Increased Cooperation



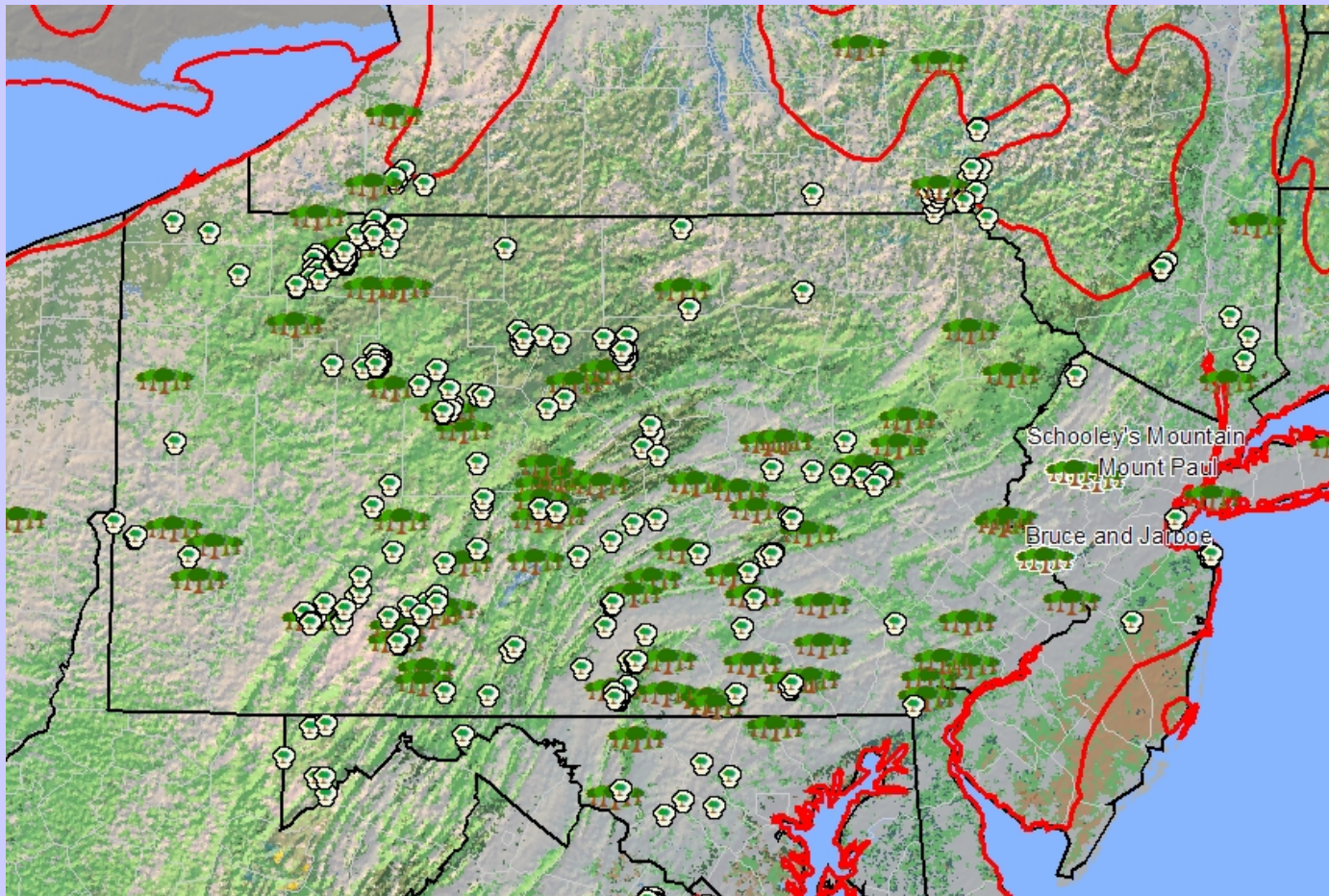
- Monmouth County Park System
  - Hartshorne Woods Park
- Morris County Parks
- New Jersey Conservation Foundation
- New Jersey Forestry Association
- New Jersey Forest Service
  - Nursery in Jackson
  - High Point and Stokes State Forest
- Wanaque Reservoir

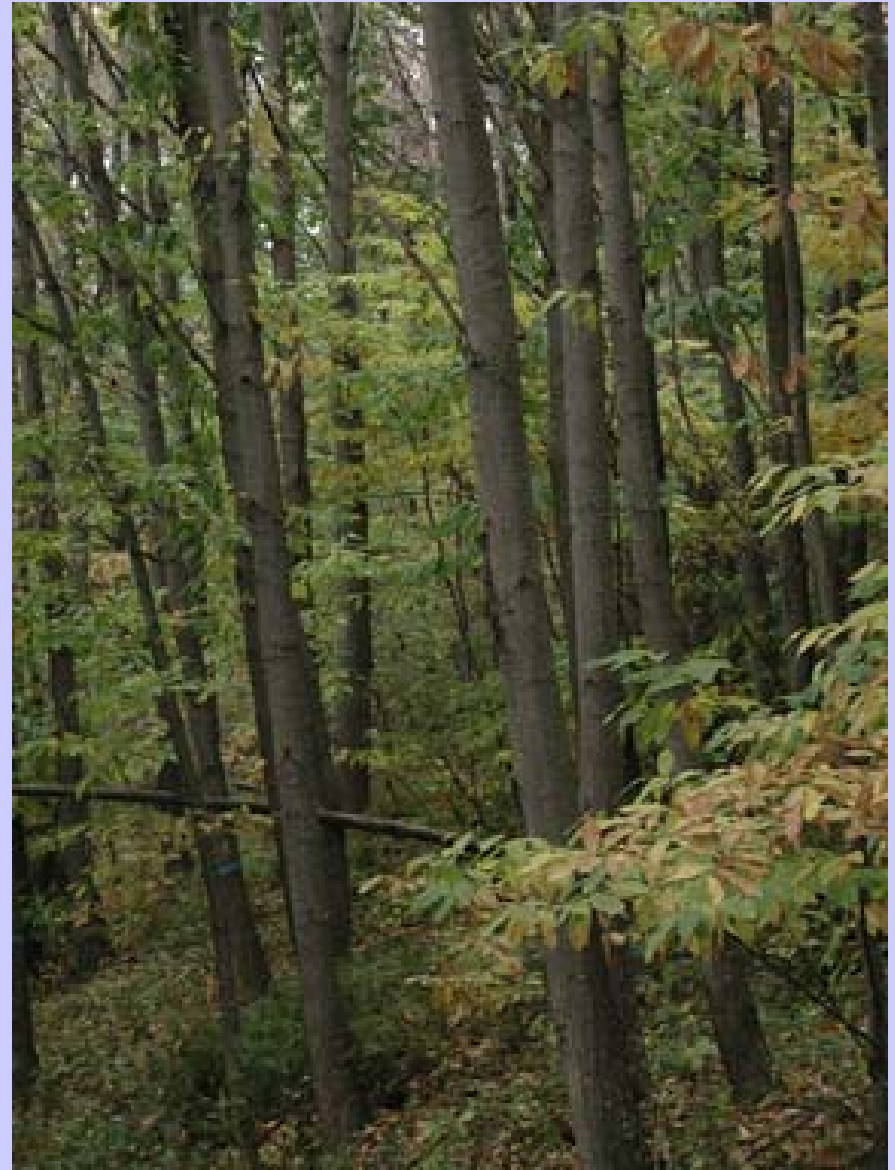




# TACF Holdings

Orchards and trees of the mid-Atlantic







# Questions?

