

Green Side UP



*A Guide for
Leading and Promoting Volunteer Tree Plantings*

*A Virginia Department of Forestry Project Funded by
The Chesapeake Bay Trust 2019 - 2020*

Acknowledgements:

This publication is possible through a grant from The Chesapeake Bay Trust. We thank the Trust for this opportunity to educate volunteers particularly Virginia Master Naturalists and Trees Virginia Tree Stewards. Many individuals were involved in the training and tree planting projects associated with the development of this guide.

The U.S. Forest Service Chesapeake Bay Program Liaison guided and supported this project proposal through the selection process. The Virginia Department of Forestry contributed advice and assistance through the Urban Forestry Coordinators, Lara Johnson and Barbara White (Retired). Ms. Johnson was the line of communication with the Trees Virginia Tree Stewards. The help of Virginia Master Naturalist Director Michelle Prysby was invaluable with sending numerous emails to the Central Region Virginia Master Naturalist Chapters. Without that assistance there would not have been the opportunity to train groups of Master Naturalists and Tree Stewards.

COVID 19 had a considerable impact on this project. The project goal was to train volunteers to lead tree plantings that would have a positive impact on Chesapeake Bay Restoration Goals. The 2020 planting season was in progress at the time “Stay at Home Orders” were issued in Virginia. Volunteers were not allowed to gather to carry out plantings they had planned. Most of the plantings for this project took place in the midst of the pandemic. There were many Virginia Master Naturalists who led projects within the restrictive orders of the State. The Virginia Master Naturalists and Tree Stewards used extra-ordinary measures to get seedlings in the ground at three planting sites. A fourth planting that was at risk of being terminated was salvaged by Virginia Department of Forestry Area Foresters. The Foresters from the Central Region “Five Forks Work Area”, when approached to help, picked up their tools and planted with Park Staff for two days at Powhatan State Park. They were able to salvage over 400 bare root seedlings and get them in the ground before they broke dormancy.

This publication, “Green Side Up” relates many lessons learned from the experiences of Master Naturalists as they navigated the challenging times to be leaders of local planting projects. They had to develop alternate plans, work in small groups, cancel original planting dates, all while being vigilant with social distancing. A tremendous congratulations to a selfless, creative, group of volunteers. The Virginia Master Naturalists and Trees Virginia Tree Stewards we met at trainings and in the field worked in a professional manner. They were very flexible in their plans. They came up with ways to get the job done. Thank you to them, the Virginia Department of Forestry, and The Chesapeake Bay Trust for sponsoring a tremendous project that positively affects stream health and forest sustainability in the Virginia Commonwealth and the Chesapeake Bay.

J&J Okay Consulting, Inc., Contractor for this project.

Project funded by the U.S. Environmental Protection Agency (USEPA) through the Chesapeake Bay Trust (Trust). The Trust receives federal funds from the USEPA through a Cooperative Agreement 963414-01-0 as part of the Chesapeake Bay Program Goal Implementation Team Project Initiative to advance outcomes from the 2014 Chesapeake Bay Watershed Agreement.

Contents

Introduction	1
Training Volunteers.	2
Selecting a Venue:	2
Selecting Speakers:	2
Recruit Training Participants.	3
Selecting A Planting Site	4
Case Study 1 Site Visit – Home Owners Association Property	5
Case Study 2 Site Visit – Park Site	6
Case Study 3 Site Visit – Scout Reservation	6
Planting Coordination.....	7
Set Planting Date	7
Order Plant Material	7
Species Selection:	7
The Order:	8
Recruit Volunteers	9
Preparations for Planting Day	10
Plant storage	10
Tools and Equipment	10
Determine a Staging Area	11
Check list	11
Do a planting demonstration	11
Planting	12
Maintenance of New Plantings	13
References/Resources	16

List of Figures:

Figure 1. Variation in Tree Shelters.....	9
Figure 2. How to Plant Bare Root Seedlings.....	12
Figure 3. Proper Installation of Shelter Net.....	14
Figure 4. Tree Shelter Installation.....	14
Figure 5. Project Aerial Photo.....	15
Figure 6. Pink Flags Mark Seedling Hole Locations.....	15
Figure 7. Color Code Tubes for Future Tree Identification.....	15
Figure 8. Signage to Educate the Community and Protect New Plants.....	15

List of Tables:

Table 1. Planting Stock	9
Table 2. Some Shrub and Tree Species Common to the Mid-Atlantic Region.....	13

I. Introduction

“Green Side Up” is a fun instructional phrase used to be sure young plants are put in the ground roots first. This guide provides much more than a hint on how to plant. It has great detail on choosing sites, selecting species, and putting together a planting plan. Why do we need more trees? Why do we need more people to plant trees?

In the past 10 years there has been a drastic reduction in the rate of forest buffer restoration and tree planting. Much of the restoration accomplished has been implemented with federal and state agricultural cost-share funds. Some of the strongest barriers to outreach in nonagricultural areas are:

- a lack of staffing to initiate local and regional environmental efforts.
- a lack of program funding to support non-agricultural tree planting efforts.

No matter where you live or the type of housing you live in, no one lives too far from a drainage conveyance, stream, pond, lake, river or embayment. In the U.S., the largest bay we have is the Chesapeake Bay. It is a national treasure that even touches the lives of those who do not see it or spend time near it. It produces many tons of fish, shell fish, and fish products. It also provides numerous recreational opportunities to millions of people on an annual basis. It supports many jobs outside of the fishing industry. You can look at it from different perspectives, but the bottom line is, the Chesapeake Bay is important to a multitude of people for a multitude of reasons. It is too important to allow it and the resources it provides to decline to a point of no return.

Land use changes from forest to development (roads, housing, commercial uses, and turf areas) increase sediment loads and polluted surface sheet flow to Bay feeder streams. Growing houses instead of forests or crops changes landcover from green vegetation to gray concrete. One of the resources that provides many ecosystem services for the Chesapeake Bay is its forests. From high up in the Bay watershed forests are working to protect soils, to provide clean air, filter upland stormwater, and in general protect the water quality of the Bay.

This guide “Green Side Up” resulted from a partnership between the Virginia Department of Forestry (DOF) and Virginia Cooperative Extension Master Naturalists and Trees Virginia Tree Stewards Programs with financial support from the Chesapeake Bay Trust. It presents an opportunity to develop stronger support for forest restoration in more developed, non-agricultural areas. This project builds forest restoration capacity through Virginia’s Master Naturalists and Trees Virginia Tree Steward Programs for the purpose of getting trees in the ground to protect local watersheds. One of the outcomes is the development of a knowledgeable group of leaders to work in local watersheds educating others about the need for reforestation and how to make it happen. Volunteer Tree Stewards and Master Naturalists contribute many hours of service in their communities. Their time is spent learning how to make their communities more environmentally friendly. They learn about ecosystems and their

values to the community. Their generosity of time has made a difference to many Virginia Communities. Other volunteer groups can also be trained to green their communities.

II. Training Volunteers: Volunteers come in a range of ages and sizes. They can be young school children or they can be senior citizens or anyone between. The experience they have can also range from none to proficient in the activity. Experience is a serious consideration when planning a training session focused on planting trees. The differences in experience can usually be addressed by holding more than a single training. The volunteers can be grouped as beginners, moderately experienced, and highly experienced. If you only have funds for one training the attendees can be divided into a classroom sized group (10-15) with suitable sessions for each group. The trainers for the training should be alerted ahead of time if they are expected to address different levels of experience in multiple presentations. Trainers can rotate through the groups in timed sessions.

Selecting a Venue: The decision regarding a location to have volunteer training is critical to attendance. Make it as easy as possible for those invited to the training. A central, convenient location with free parking accommodations is helpful. The size of the venue will be dependent on your attendance expectations. Some features to consider are:

- A room that has audio visual equipment if you will need it
- Restroom proximity to the space
- Do you need one large or multiple small rooms
- A kitchen if food (coffee, lunch, snacks) is being served
- Space for a sign in table and or buffet table(s)
- The cost of the space

Some places to consider are: schools, community colleges, libraries, agency meeting rooms, hotels, restaurant party rooms, community centers.

For our Trainings we chose a state agency meeting room for one and a community college meeting room for the other. One venue was central in the state while the other was in the northeast portion of the state. This worked well since the counties of the state of Virginia in the Chesapeake Bay watershed are mainly North, Central and East.

Lesson Learned: Our field training session was not at full capacity. Although it was an outstanding site, it was not centrally located. In retrospect we would find a location closer to a population center.

Selecting Speakers: The agenda should be established before you decide who to approach for instructing your volunteers. The agenda will vary dependent on your groups experience and your training objectives. Tree planting professionals can be drawn from local or state government forestry agencies. You can also approach the commercial or industry professionals who do tree planting such as those working in garden centers, nurseries, or as arborists.

For our Training we needed speakers to address: Forest Buffer Establishment, Planting Site Selection, Outreach to Landowners, Preparations for A Typical Planting. We recruited four Virginia Department of Forestry foresters and one private firm individual as speakers.

Recruit Training Participants: Decide who your target group of volunteers will be. Do they operate locally, regionally, countywide or statewide? Have they led projects or been members on volunteer projects? Reach out to scout groups, high school and community college environmental clubs. Students often volunteer because they need community service hours. Adult service groups such as Civic Associations, Rotary Groups, and Outdoor Clubs often volunteer in their communities. Soil and Water Conservations Districts and County Cooperative Extension Agents have newsletters and websites to help announce training opportunities.

Start with branding your project by selecting a colorful logo/graphic for your invitation. Your training date will likely be determined by when you can secure a venue, as well as by speaker availability. Include a starting and ending time and the agenda on the invitation. Let participants know if lunch will be provided. Finding a sponsor for lunch or snacks helps your budget. Avoid dates that conflict with activities of your target groups. Electronic invitations can be posted on appropriate websites your target group might visit. Set up a spreadsheet to record responses to the invitation. Use the same spreadsheet for sign up at the Training session.



We branded our project with the above graphic placed on agendas, invitations and folders.

Lesson Learned: It takes more than one invitation to get training participants. A save the date notice is helpful for scheduling. Send a second and third reminder at two-week intervals. Start recruiting 5-6 weeks in advance of training session. Check your funding source to determine if you can purchase food and beverages, if not seek a sponsor for lunch and snacks.

III. Selecting A Planting Site

Trees provide many benefits in communities. Help landowners to recognize and appreciate the many benefits of trees. As you look for planting sites, think about the purpose a tree planting can serve. They can be used for screening structures and activities. They can turn an area of turf into a shaded parklike setting. Trees can provide habitat for many species of wildlife or pollinators. Look for places in your community or neighborhood that lack landscape diversity or places that have turf being mowed only because no one has thought of a better landcover. Look along water features where trees could provide habitat and recreational opportunities. Think of landowners with parcels of land like municipalities, organizations, and homeowner associations. Setting up a meeting with park and recreation managers is often a good starting point. Others to approach are school principals, church leaders, and public works directors.

Assess the Site. Once you have potential sites, make a list of site characteristics. Ask yourself:

Who owns the parcel?

Public		Private		Quasi- private (HOA)	
--------	--	---------	--	----------------------	--

What does the topography look like?

Flat/level		Rolling		Steep	
------------	--	---------	--	-------	--

How big is the site?

< 1 acre		1-5 acres		> than 5 acres	
----------	--	-----------	--	----------------	--

Does the site have a water feature?

Pond		River/stream		Stormwater facility		Lake		Reservoir	
------	--	--------------	--	---------------------	--	------	--	-----------	--

What is the cover type now?

Mowed Turf		Scrub- shrub		Sparsely wooded		Open field Un-mowed	
------------	--	--------------	--	-----------------	--	---------------------	--

Are there public utilities located on the site?

Power		Sewer		Gas		Water		Cable	
-------	--	-------	--	-----	--	-------	--	-------	--

What do the surrounding properties look like?

Residential		Public use		Rural		Next to road	
-------------	--	------------	--	-------	--	--------------	--

Is it wet or dry?

Ponded water		High & Dry		Wetland Indicators	
--------------	--	------------	--	--------------------	--

Is there access to the site?

Entrance for volunteers		Equipment access		Space for parking	
-------------------------	--	------------------	--	-------------------	--

Lesson Learned: There should be a clear understanding of who is responsible for finding sites to plant. This is an intimidating job for first time leaders. Have plenty of advance time for the process of visiting sites.

A. Site visit

Site visits are very important to determining what to plant, when to plant, and how many volunteers you need. Several Virginia Master Naturalists or Tree Stewards proposed planting projects for the Virginia Department of Forestry tree planting project with the Chesapeake Bay Trust funds. With a goal to plant 25 acres project size was important. Doing 25 smaller projects would be logistically much harder than 5-10 larger projects. The following three case studies are examples of what can be learned from site visits. They also demonstrate different approaches to planning projects.

Case Study 1 Site Visit – Home Owners Association Property

Observations from site visit include:

- An active waterfront community
- Evidence of foot traffic on downhill slope to boat storage and water
- A lack of understory vegetation from the asphalt trail to the shoreline
- Serious erosion under a few trees and the observation deck
- Erosion of downhill drainageway
- Approximate area 3.5 acres
- Sewer line along path



Suggested solutions for the site visit observations are:

- Discourage downslope traffic by planting understory plants that divert foot traffic between the trail and the boat storage
- Plant shrub species around the downslope parking pad
- Plant shrubs that do not interfere with view and access around the gazebo
- Plant large shrubs/small trees along shore to retain soil but avoid blocking views

Case Study 2 Site Visit – Park Site

Observations from site visit include:

- Removal of privet that invaded forest area
- Extensive gaps between large trees from privet removal
- Lake area with very sparse buffer • All areas are public use spaces
- No utilities involved
- Total approximate area 7 acres



Suggested solutions for the site visit observations

- The addition of a shrub layer around the edge of the pond would add interest, as well as intercept sheet flow from the uphill impervious path.
- Shrubs would also provide some nutrient reduction and help reduce any erosion.
- Reforestation of invasive removal gaps will provide shade, habitat and increase canopy cover.

Case Study 3 Site Visit – Scout Reservation

Observations from site visit include:

- A large sloping expanse going downhill to pond
- A large gap in Salamander habitat area around pond
- Invasive removal left gaps on field borders
- Screening and wind breaks needed along internal roadways
- No utility conflicts
- Education is a primary goal
- Total acreage approximately 5 acres



Suggested solutions for site visit observations:

- Plant seedlings in open field above pond to intercept downhill flow to pond
- Fill gap in salamander habitat with diversity of seedlings
- Plant areas of invasive removal along fence lines
- Provide a screen/ windbreak of evergreens along roadside

IV. Planting Coordination

A. Set Planting Date

The time of year to plant is dependent on the plant material you choose to use for the project. If you are using **potted stock** the time of year is somewhat flexible. Potted stock is usually available from the end of February through to the end of November. Checking frosts dates for your planting zone is the best way to determine the seasonal timing to plant potted stock. Potted stock can be planted almost anytime as long as you have water available for droughty periods.

Bare root seedling planting is usually done when the seedlings are dormant. After leaf loss in the Fall or before leaf out in the Spring are the ideal times for planting bare root seedlings. The young seedling will have time in dormancy to establish a good root system before there is a need to support leaf structure. Less water is needed if photosynthesis and evaporation are not taking place. It should be noted that the only time bare root seedlings are available from nurseries is late Fall to early Spring. Check with the nursery you plan to work with for their timing for seedling sales. (See “Lessons Learned” for more information). ***Be sure to allow time before the planting date to call Miss Utility (811) if you know or are not sure about utilities crossing the planting site.** Planting dates will need to be synchronized with the availability of volunteers. Just like planning other events, consider calendars for those involved, community activities/events, and weather conditions. Avoid the dates of major holidays.

Lesson Learned: Always have an alternate “rain” date. It may actually rain, or there may be other delays. Flexibility is important.

B. Order Plant Material

Species Selection: Conditions observed during the site visit are invaluable in deciding the right trees for the planting site. The presence of other trees can be indicators of species that grow well at the site. The aspect of the site can reveal if it receives morning or afternoon sun. Is the site overly moist verging on a wetland? Pick species to suit the site and community needs. Select native species since they acclimate better and also provide better habitat for wildlife. Seedlings can be planted in rows or clusters. The standard mature forest density is approximately 200 trees per acre. To reach this density plant between 300-400 bare root seedlings on 10-12 foot centers. After 10-15 years this will result in the standard 200 trees. If you plant larger stock of 5-10 gallon sizes and plant on 20 ft. centers, you will get a similar result. To figure what you need, calculate your acreage and then order according to the end

point density desired. An acre equals 43,560 square feet. See **Table 1 (page 9)** for a comparison of bare root seedlings and potted stock planting issues.

The Order: Once you know the number and species of plants, you need to research local nurseries for your purchase. Have a predetermined amount you can spend for plants. Shop around for the best price within your budget. For bare root seedlings, usually State Forestry Nurseries have the best prices. They have catalogs for you to use for selection of species. The catalogs have pictures, descriptions, and growth expectations. The bare root seedlings usually have a minimum purchase quantity (25). The more you order the less expensive they are. There are local nurseries that carry bare root and potted stock of various sizes. Use their catalogs to get descriptions and prices. Have a list of substitute species to fill in for sold out/unavailable species. The following bulleted points are specifics to keep in mind when ordering:

- Be sure to check on delivery policies. Some nurseries do not deliver out of state.
- Schedule delivery for the week of your planting not the day of your planting. This leaves flexibility for delays. It also leaves an opportunity to make changes in case plants do not meet expectations.
- Plant orders are sometimes split for delivery and do not arrive all on the same day or same time.
- If you need to cancel for some reason, it must be done at least a week ahead of the expected arrival date. **Cancellation fees can be \$20 or more.**
- Track and confirm your delivery time and date through communication with the nursery.

Lesson Learned: Orders for bare root seedlings are taken in late Fall (November) through March. There are years that seed is not available because of droughts, floods, or disease. In those years there are fewer plants and species available. If you plan to plant in February or early March get your order into the nurseries before the first of January.

If there is evidence of wildlife at your planting site it may be necessary to protect young seedlings. This will require some type of tree shelter or fencing. Shelters come in different heights, they are also available in different material compositions (Figure 1.) Do your homework and find the best shelter type for your planting site. Shelters need stakes to support them. Stakes range from bamboo, metal, plastic, to hardwood. Again, consider your site as well as the sturdiness required. If you prefer fencing for protection consider the height needed to keep deer out (~8 ft). You will also need stakes or fence posts. Research from the Stroud Research Center in Pennsylvania demonstrates that smaller compartments of fencing are more effective. Deer are reluctant to jump into the smaller confined spacing.

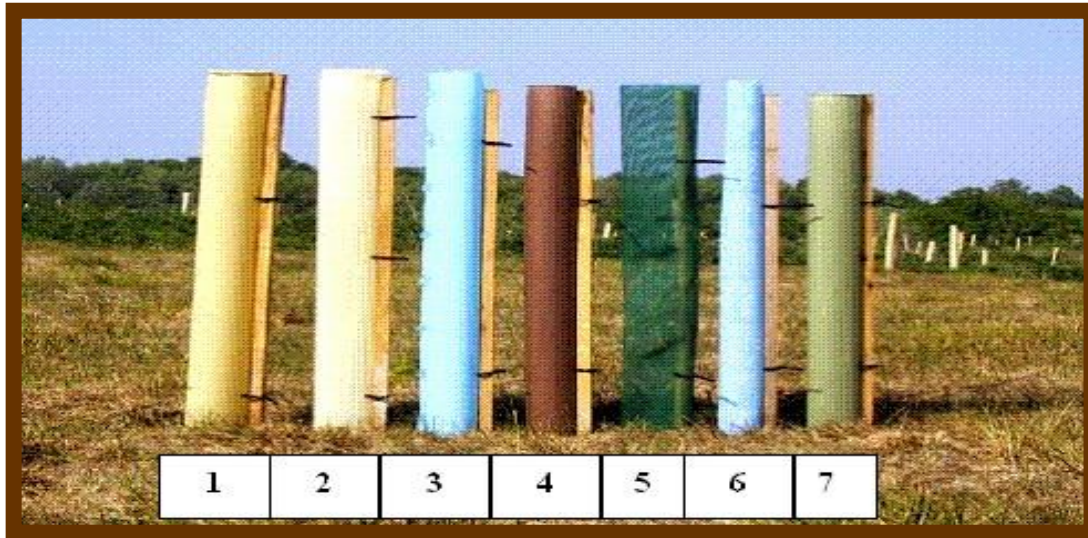


Figure 1. Variation in Tree Shelters. Miracle Tube, Tree-Pro®, Protex®, Tubex® brown, Mesh Guard, Blue-X®, and Tubex® green. (Virginia Dept. of Forestry Photo)

Lesson Learned: If you need to pick up tree shelters, they are very bulky. A “Caravan” type vehicle can hold 300 shelters and stakes. The stakes are quite heavy and more than one person is needed to load and unload them.

Table 1. Planting Stock

Stock Type	Bare root deciduous	Bare root evergreen	Potted deciduous	Potted Evergreen
Availability	Late Fall to Late Spring	Late Fall to Late Spring	Early Spring to Late Fall	Early Spring to Early Summer
Acclimation	Full growing season	Full growing season	Full growing season	Full growing season
Appearance	No leaves only stem and roots	Green needles stem and roots	Leaves, stem & roots in soil	Green needles, stem & roots in soil
Care	Good soil, water, stake /tree shelter	Good soil, water	Water possible staking	Water possible staking
Sizing	Avg.18-36”H .25” girth	12-24” H 0.25” girth	Varies by pot size 1-15 gallon	Varies by pot size 1-15 gallon
Cost	\$1.00-2.50 each	\$1.00-2.50 each	\$3.75 +	\$5.00+

C. Recruit Volunteers

From your site visit you know the size of the planting site. You also know how many plants need to be planted. You also know how many volunteers can access the site at one time due to parking conditions. It is usually best to have volunteers work in teams. If you plan to have

young volunteers, pair them with an adult. If you are planting bare root seedlings, two inexperienced individuals can plant 5-8 seedlings in one hour. Digging conditions influence the ease of planting. Potted stock requires larger holes. If you are installing tree shelters, consider extra volunteers for that activity.

Sources for volunteers include:

- Community associations
- Scout groups
- Youth groups from church or schools
- Environmental Clubs
- Conservation Organizations
- Corporate Community days

Always have a way to contact volunteers in case of bad weather or other emergencies.

Lesson Learned: To plant 200 bare root seedlings, you should plan to have 15 - 20 people planting for 4 hours. This timing includes shelter installation and mulching.

V. Preparations for Planting Day

A. Plant storage

From the time plants arrive until the time of planting they will require some care. Bare root seedlings need to be kept cool and moist to prevent early leaf out. They are usually shipped in boxes. The roots are often dipped in clay to maintain moisture levels. A cool basement or garage make a good storage space. If refrigeration is available temperatures between 37-40 degrees Fahrenheit are ideal. For potted stock, a shady space outside is suitable. Check the soil moisture of the plants daily. Water if/when needed. Keep the plants safe from rabbit or deer browsing.

B. Tools and Equipment

Shovels are the usual tool of choice for planting bare root or potted stock seedlings. When you recruit volunteers, you may request they bring their shovels. It is best to have a source of planting tools at the planting site. Planting bars are also good tools for planting bare root seedlings. They are easy to use and they make an appropriately sized slit for bare root stock. Planting bars do require good arm and foot strength particularly if soils are dry or rocky. A pick ax is helpful for rocky, dry soil to get holes started. If the soil is difficult to dig, a suggestion is the use of a gas- powered auger to start all holes before the planting day. Pitch forks and rakes are useful for moving and spreading mulch. If you are installing tree shelters, hammers are needed to drive stakes into the ground to support shelters. If the site is an acre or larger for efficiency and ease, consider some extra equipment to move plants from the staging area to planting location. A truck, a small tractor and wagon,

or a fork lift will do the job. The movement of tree shelter and stakes may also require extra equipment. A mower or weed trimmer may be needed for site preparation. High grass should be removed before planting. Mow the whole site or mow planting rows. A line trimmer can be used to cut vegetation short where each seedling is going to be planted. Invasive plants should always be removed before planting day.

C. Determine a Staging Area

A staging area is important for greeting volunteers. There should be space for a sign in table. It should be visible and prominent. Plant material should be located in the staging area. Tools should also be in the staging area. Volunteers should be able to pick up tools and plant materials before proceeding to area to be planted. The staging area is a good place to demonstrate how to plant. The size of the hole, both depth and width, as well as tree shelter installation if needed. How to mulch is another good process to demonstrate. Emphasize the problems of “volcano mulching” (putting mulch too high on the tree stem/ trunk).

D. Check list

Miss Utility Report (if applicable)	
Volunteer Sign in Sign-out Sheet	
Medical release forms if necessary	
Tools: shovels, trowels, buckets, sharpie pens, flags/spray paint, hammers, clippers	
Plants and water source	
Tree shelters, stakes, nets	
Mulch bags or wagon/wheel barrow	
First Aid Kit	
Cell phone	

Arrive early to the planting site. Have an Assistant Leader to staff the check in table. Flag or spray paint the location for each plant hole before volunteers arrive. You may be able to do this the day before weather permitting.

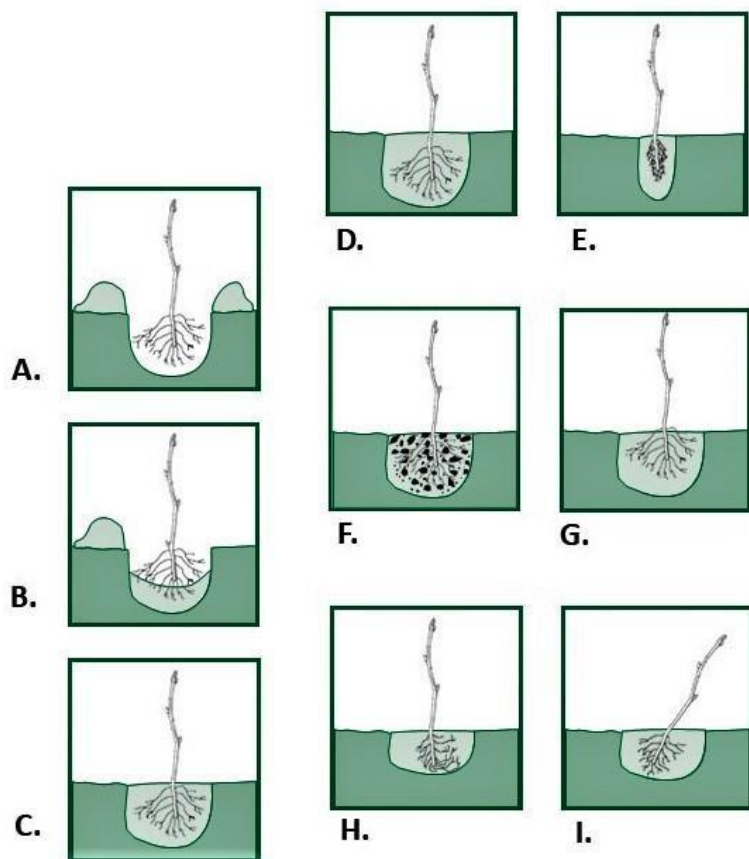
E. Do a planting demonstration

Hands on demonstrations are helpful to new or returning volunteers. Have a handout to be used after the demonstration to remind volunteers of the process (**Figure 2.**) Assign volunteers to tasks: Planting, shelter installation, watering and mulching. It is good to allow volunteers to have an opportunity to rotate to all tasks if possible. Express gratitude to all volunteers. At the end of the day check the site after planting for: Planting quality, tools, plants, and for personal belongings left behind.

VI. Planting

The procedure for planting container trees is similar to that for balled and burlap (B & B) trees. In the case of metal or plastic containers, remove the container completely. In the case of fiber containers, tear the sides away. Once carefully removed from the container, check the roots. If they are tightly compressed or 'pot bound', carefully tease the fine roots away from the tight mass and then spread the roots prior to planting. The root system is then pulled apart or 'butterflied' prior to planting. Loosening the root structure in this way is extremely important in the case of container plants. Failure to do so may result in the roots 'girdling' and killing the tree. At the very least, the roots will have difficulty expanding beyond the dimensions of the original container. To further assist this, lightly break up even the soil outside the planting zone. This allows roots that quickly move out of the planting zone to be more resilient as they anchor into existing surrounding soil conditions. Once the tree is seated in the hole, the original soil is then back-filled into the hole to the soil level of the container. Again, remember not to overly compress the back-filled soil especially by tramping it with your feet. Compress gently using your hands instead.

Figure 2. How to Plant Bare Root Seedlings



The Right Way

- A. Dig a hole large enough to spread out roots
- B. Place seedling with root collar at ground level
- C. Fill hole, firm soil so there are no air pockets

Common Errors:

- D. Hole too deep
- E. Hole too narrow
- F. Air pockets and debris in hole
- G. Collar and roots above ground level
- H. Hole too shallow
- I. Seedling is not vertical

Source: Virginia Dept. of Forestry
Harwood Seedling Guide

Table 2. Some Shrub and Tree Species Common to the Mid-Atlantic Region

Wet sites /Riparian	Dry sites/Turf to trees
<u>Shrub Species</u>	<u>Shrub Species</u>
Button Bush	Gray stem Dogwood
Elderberry	Indigo Bush
Hazel Nut	Spice bush
Red Twig Dogwood	Witch hazel
<u>Tree Species</u>	<u>Tree Species</u>
Bald Cypress	Black Gum
Black Walnut	Black Walnut
Black Gum	Chestnut Oak
Persimmon	Pin Oak
Pin Oak	Serviceberry
Sycamore	Short Leaf Pine
Willow Oak	Southern Red Oak
	Yellow Poplar
	Willow Oak
(Not an all-inclusive list of species)	

Tree Shelter Installation

If there is evidence of a high deer population at the site the use of tree shelters is recommended. Select a shelter that is biodegradable preferably with a laser perforation (dotted line). Use hardwood oak stakes for greater durability. Steps for installation:

- Settle the shelter 2-3 inches into the soil.
- Place stake next to shelter and through ties on the tube, then pound the stake into the soil 3 inches or more.
- Pull ties tight to secure tube to stake
- Leave tree shelters in place until seedlings are 2 inches or greater in diameter or until the shelter splits on the perforated line.

VII. Maintenance of New Plantings

Check the planting regularly (a minimum of 3 times a year) for needed maintenance. If tree shelters were used, straighten any leaning shelters. Be sure the shelter is seated 2 to 3 inches in the ground (Fig 4). Remove wasp nests or vegetation inside the shelter that will compete with the seedling for light and nutrients. Be sure the bird netting is pulled down to leave a one-inch

hole (Figure 3); remove the net before the seedling reaches the top of the shelter. Replace broken stakes. Check for wildlife damage from beaver, deer, voles, rabbits. Check for and control invasive species. Mow or trim around seedlings that have grass competition.



Figure 3. Proper Installation of Shelter Net.

(Virginia Department of Forestry Photograph)

Figure 4. Tree Shelter Installation During Field Day Training and Seating Shelter in Soil.



Additional Lessons Learned for Project Organization:

1. Use aerial photos/maps of the planting site to identify planting areas Fig 5.
2. Use survey flags with species names on them to indicate what gets planted where Fig.6
3. Set up a color code as in Fig 7. for quick identification of species in future surveys.
4. Signage may be a good idea to educate local residents and protect new plantings from careless foot traffic Fig.8
5. If you unexpectedly cannot get all seedlings planted in the Spring dig a trench and heel them in for Fall planting.

Figure 5. Project Aerial Photo



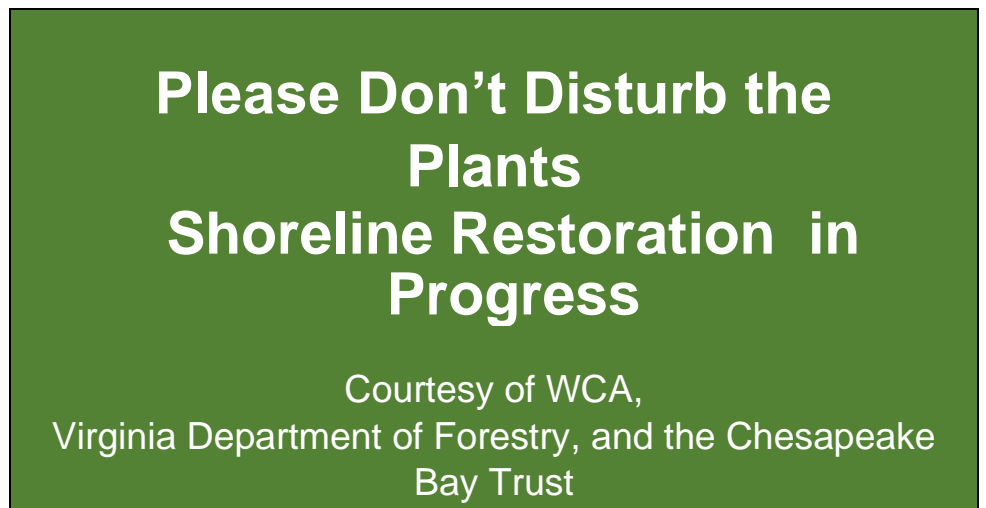
Figure 6. Pink Flags Mark Seedling Hole Locations



Figure 7. Color Code Tubes for Future Tree Identification



Figure 8. Signage to Educate the Community



VIII. References/Resources

In preparing this publication a review of literature related to the objectives of this project were consulted. In instances where exact information was used, the source credited is found with the information. If you need more detail for your project please consult these resources or contact the Virginia Department of Forestry: www.dof.virginia.gov

Chesapeake Bay Foundation. 2007. "Landowner Guide to Buffer Success." www.cbf.org

Delaware Riverkeeper Network. 2003. "Adopt-A-Buffer Toolkit: *Monitoring and Maintaining Restoration Projects.*" Washington Crossing, PA. www.delawariverkeeper.org

Kays, J., Drohan, Downing, Finley. 2006. "The Woods in Your Backyard." Natural Resource, Agriculture and Engineering Service, Cooperative Extension. Ithaca, NY. NRAES-184.

Kirwan, J. 2018. "4H Forestry Tree Planting Project Book." Virginia Tech Cooperative Extension. Publication 420-025-(4H-823P). www.ext.vt.edu

Maryland Department of Natural Resources Forest Service. 2005. "Riparian Forest Buffer Design and Maintenance." Publication No. 02-5312005 Annapolis, MD 21401. www.dnr.maryland.gov

Northern Virginia Regional Commission. "A Citizen's Guide to Tree Planting Projects in Northern Virginia". www.novaregion.org

Virginia Cooperative Extension. "How to Plan for and Plant *Streamside Conservation Buffers with Native Fruit and Nut Trees and Woody Floral Shrubs.*" Publication ANR-69P. www.ext.edu

Virginia Department of Forestry. 2014. "Hardwood Planting Guide". VDOF P00137; 05/2014. www.dof.virginia.gov

Virginia Department of Forestry. Augusta Forestry Center. Crimora, VA. Personal Communication regarding timelines and species.

