



Keystone
10 MILLION TREES
PARTNERSHIP

TREE PLANTING GUIDE

Partners may find this instructional guide compiled by CBF's restoration staff to be useful when planning successful tree planting events.

The guide outlines the necessary steps, from finding a suitable site to making sure the trees stay healthy in the long-term. There is also a timeframe for working through the steps, assuming a spring planting timeframe, which is generally considered ideal in a temperate climate. Fall plantings may also be feasible in some locations.

Step 1: Site Selection

LATE SUMMER-LATE FALL, THE YEAR BEFORE PLANTING

We recommend that prospective planting groups network with land managers and interest groups to help identify sites that would benefit from additional trees. These include:

- Holders of large tracts of private land (commercial, industrial, and agricultural)
- Holders of large tracts of public land (state or federal facilities)
- Local watershed groups and/or other grassroots organizations
- Municipal officials and town employees (town supervisors, public works departments, park and recreation departments)
- School superintendents

Once a site is identified, make sure that it is suitable for trees. The most important consideration here is safety—trees should not be planted very close to buildings or in locations where they could impair driver visibility or otherwise cause traffic problems.

Another important consideration is that trees should not be planted in a location where they are likely to interfere with existing underground or overhead utility infrastructure. Conduct a visual inspection and use [PA One Call \(pa1call.org/PA811/Public/\)](http://pa1call.org/PA811/Public/) to ensure that the proposed site will not require tree planting in a utility right of way.

Step 2: Project Goals

LATE SUMMER–LATE FALL, THE YEAR BEFORE PLANTING

Defined goals could include restoring and protecting a nearby water body, or creating habitat for wildlife. Other goals could be to create more shade, establish canopy cover (usually measured in percentage) once the trees are mature.

Step 3: Budget

LATE SUMMER–LATE FALL, THE YEAR BEFORE PLANTING

Consider how much money you have available to plan the project, prepare the site, and conduct the planting. How much money within the budget can be reserved for maintenance and tree replacement, if any?

The two largest factors that determine how many trees can be planted within a fixed budget are labor and tree size. Labor costs can be reduced or eliminated if volunteers do the initial planting and to assist with long-term maintenance. Alternately, certain landowners may have grounds crews who can do these jobs. Otherwise, a forestry or landscaping crew may need to be hired for planting and maintenance.

There is also a big price difference between sizes of trees. The smallest of bare root seedlings can generally be bought in bulk for a dollar or less each. Larger ball-and-burlapped trees can cost into the hundreds of dollars each. If budget is a limiting factor, the planting plan can sometimes be written in favor of smaller stock, if the site conditions will support small trees. The trade-off is that the smaller the tree is at planting, the less likely it is to survive, even with best maintenance practices.

The size of the trees may also impact the cost of planting. Small trees can easily be hand-planted with relatively inexpensive hand tools. Depending on soils and labor resources, it may also be possible to hand-plant larger trees. But for compact soils or small planting crews, renting a backhoe or similar equipment may be necessary.

There are grants available to fund community tree plantings in Pennsylvania, but keep in mind that funding may need to be sought several months to a year or more before the desired planting date, depending on the grant source. For more information, see [Treevitalize](#), the [Arbor Day Foundation](#), and [Pennsylvania Department of Conservation and Natural Resources](#).

Step 4: Site Evaluation and Planting Plan

FALL, THE YEAR BEFORE PLANTING

There are a number of factors about a site that will determine what tree species will do well, and what type of planting stock will be the most successful. These factors include:

- Soil type and level of compaction
- Soil moisture and average precipitation rates
- Light availability
- Slope
- Air quality
- Level of foot traffic
- Existing vegetative cover

It is best to have an arborist or other landscape professional assess the site prior to developing a planting plan. Low or no-cost services may be available through [local master gardeners](#) and [Penn State Extension](#). Certain landowners may have people on staff, such as grounds managers or landscape architects, who can also help.

Once a site evaluation is completed, the next step is to develop a planting plan that reflects both site conditions and landowner and project planner goals for the tree planting. Again, it is best to have the planting plan developed by an arborist or other landscape professional, ideally the same person who conducted the evaluation. Essential elements of a planting plan will be influenced by the site conditions, project goals, and available budget, and include the following:

- Size of area to be planted
- Recommended tree density
- Species selection and number of each species
- Location of various species and spacing on the site
- Recommended planting stock type (bare root vs. containerized vs. ball and burlap)
- Inventory of other supplies needed (e.g. tree shelters, stakes, support cables or zip ties)

Step 5: Maintenance Plan

FALL, THE YEAR BEFORE PLANTING

If you plant trees and forget about them, there is a good chance they will not make it to maturity. A long-term maintenance plan is a good idea for any tree planting.

Irrigation/watering plan: Does the planting plan call for any watering in addition to normal precipitation? If so, the maintenance plan should describe who will water the trees and how often.

Vegetation clearing: Vegetation should be cleared from around the base of newly-planted trees at least once per year to decrease cover for voles and other rodents that like to chew on small trees.

This can be accomplished through careful use of an herbicide in conjunction with mowing, or by mulching. The herbicided or mulched spot around the young tree should be 4- to 6-feet in diameter. The maintenance plan should identify who will clear the vegetation and what method will be used. Vegetation clearing can generally be stopped once the trees reach 4- to 5-inches in trunk diameter.

Spot inspections: The planting site should be spot-inspected twice a year, preferably once after leaf-out in May and once in October or November. During inspection, any downed or leaning trees should be straightened. Any damage to shelters or cages used to protect trees from animals should also be noted and corrected, if possible. Finally, any dead or obviously unhealthy trees should be noted. The maintenance plan should identify who will conduct these inspections and who will keep inspection notes from year to year.

Replacing dead trees: It is normal that some planted trees will die before maturity, and there is generally a strong relationship between the size of trees at planting and the rate of survivorship. Ball and burlapped trees and large containerized trees will survive at significantly higher rates than small bare root seedlings. If there are projects goals related to canopy cover or to buffering a water body, replacement of some or all of the trees that perish may be necessary. The maintenance plan should identify who will make decisions about replacements and who will be responsible for coordinating replacements.

Invasive species monitoring: Invasive species are species that are not native to a particular area, and are prone to establishing in large numbers, out-competing or otherwise harming native species. All newly planted tree sites should be monitored for new invasions with special care to eliminate any species that are either known pests to trees or on the state noxious plant list. These species are usually much easier to eliminate if they are caught early, rather than when they are well established. The maintenance plan should identify who will monitor for invasive species and who will formulate a removal plan, should it become necessary.

Step 6: Order Trees and Supplies

WINTER, THE YEAR BEFORE/OF PLANTING

Most people aren't thinking too much about trees in the winter. But most large nurseries start collecting orders, particularly large orders, during winter, several months in advance of planting. Ordering too late means you run the risk that nurseries will be out of trees in the species and sizes desired, requiring substitutions.

Orders should also be planned for other supplies such as tree shelters or cages (the number and type should be specified in the planting plan), mulch, and stakes (numbers and lengths should be stated in the planting plan). Stakes made of white oak wood are the most rot-resistant and are recommended for wet sites. Drier upland sites will be fine with stakes made of other hard woods, such as locust. Work gloves and shovels or planting bars will be required for hand planting, while

larger digging equipment (augers or digging machines) may be necessary for larger trees. A site covered in heavy underbrush will need to be cleared.

Step 7: Volunteers or Hired Labor

LATE WINTER/EARLY SPRING, THE YEAR OF PLANTING

Tree planting is a great way to get people of all ages involved in bettering their local community. The following types of groups may be ready and willing to supply volunteers. Multiple groups are recommended for a large site with many trees.

- Watershed organizations and other non-profits (land trusts, Trout Unlimited or The Nature Conservancy chapters, etc.)
- Local schools (public and private)
- Local churches or other faith communities
- Local boy and girl scout chapters
- Veterans groups
- College forestry or environmental clubs

Early on, agree on a planting date with each volunteer group, get a rough estimate of how many volunteers will be on site, and obtain any government clearances that may be necessary to work with child or youth volunteers. Decide if there will be a rain date. The best time for tree planting is mid-to-late April when soil is hopefully unfrozen, temperatures are cool but not frosty, and weather patterns include frequent rain but few intense storms.

A volunteer workforce can be supplemented or replaced by a hired labor crew and it is important to match the labor to the site. For example, a small group of volunteers with a large percentage of youth or children will likely struggle on a large site putting in many heavy ball and burlapped trees. On the other hand, it would likely be unnecessarily expensive to hire a landscaping crew to put in smaller containerized seedlings if volunteers are readily available.

Step 8: Site Preparation

A WEEK TO A FEW DAYS BEFORE PLANTING

Remove any existing, unwanted plants through physical means (mowing or use of a brush hog if necessary), or with herbicide treatments.

Use lawn flags to mark the spots where trees should be planted according to the planting plan. Flags should be color coded or otherwise marked to indicate tree species.

If the maintenance plan calls for mowing and herbicide to keep the vegetation around the base of trees, it is best to mow and conduct the first herbicide application before the trees are planted, spraying a spot roughly 4 to 6 feet in diameter around the space where the tree will be planted. Use

of herbicide should always be done by a trained professional and/or strictly in accordance to label instructions.

If heavy equipment is used for digging holes, have the equipment dig the holes prior to the planting. Likewise, if the volunteer or labor pool for hand planting is small compared to the project size, it may be a good idea to break digging and planting into two different days.

If there is secure storage available, transport all materials to the site the day before planting to save time on the big day.

Step 9: Plant Trees!

MID-TO-LATE APRIL

Start with a volunteer or work team briefing. Let participants know what to plant and where, and how to identify tree species if the stock is not readily labeled.

Have someone familiar with tree planting demonstrate good planting technique before less-experienced volunteers try it. The holes need to be deep and wide enough that all roots can point downwards without bending back up. Ideally each tree should be planted to the depth it was planted at the nursery. For bare root trees, there is often a visible line on the stem. For containerized and ball and burlap trees, make sure the base of the planted tree is even with the existing ground – no dents and no mounds. Soil should be pressed and stamped down around the newly planted roots to eliminate air bubbles.

The Arbor Day Foundation has some specific [advice \(arborday.org/trees/planting/\)](http://arborday.org/trees/planting/) on planting techniques for various types of stock.

Stakes and any shelters or cages should be installed on the same day if possible. Also, if mulch is being used to trap soil moisture and/or to keep cover at bay, it should also be spread right after planting.

Never underestimate the ability of free food and beverages to revive the spirits of tired volunteers!

Step 10: Enact the Maintenance Plan

FALL, YEAR OF PLANTING AND TWICE ANNUALLY THEREAFTER

Remember all that important stuff put into the site maintenance plan in Step 5? Now it's time to do those things!