

# Summary of Portage Park District's 2021 Reforestation Efforts

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## Rationale (As presented in spring 2021)

In commemoration of its 30<sup>th</sup> anniversary, Portage Park District is reforesting 30 acres in 2021. As challenges to forest health, including invasive species, disease and fragmentation continue to mount, Portage Park District aims to do its part to improve and increase the forested landscape for our future. Planting trees and reforesting aligns with our mission to conserve Portage County's natural heritage in many ways (*Adapted from <https://www.nationalforests.org/get-involved/tree-planting-programs/benefits-of-reforestation>*):

- Forests supply clean water that supports life in all forms. Forests shade and cool our streams, reduce flooding, reduce erosion, and filter sediment to improve water quality. Reforesting along our streams and other water resources is essential to protecting our water supply.
- Reforesting disturbed landscapes with a variety of species makes our forest communities more resilient to future challenges such as invasive species and changes in growing conditions.
- Forests provide critical habitat for wildlife and vascular plant communities. As our forests in Portage County become more fragmented, wildlife species such as some of our breeding birds face further population declines because there is not enough deep forest for successful nesting. Diminished water quality impacts our diverse aquatic animal communities. Rare vascular plant communities and plant species dependent on forests are more easily affected by invasive plants and herbivory. Reforesting to expand existing forest can create large blocks of unbroken, contiguous habitat, ensuring the conservation of forest dependent species and promoting biodiversity.
- Land that has long been deforested can take an estimated 150 years to become forest again through natural processes. An established forest can be removed and converted to another use in less than a year. Active reforestation helps to mitigate such changes.
- Forests offset our emissions by supporting and increasing carbon sequestration potential.
- Planted trees become seed sources that contribute to natural succession and spread of forest cover.
- Forests provide space for peace, renewal and recreation for our mental and physical health and enjoyment.

## **Summary of Highlights from the 2021 Reforestation Effort**

- The majority of tree planting occurred in April and May of 2021. Planting at Tinkers Creek Greenway was completed for the year during this time. Eagle Creek Greenway was partially completed, with the remainder of planting finished up in the fall.
- Spring planting included all bareroot seedlings. PPD staff and volunteers were assisted by staff and students from the following agencies and schools:
  - Hiram College
  - Kent State University
  - Theodore Roosevelt High School Urban Forestry and Landscape Management
- Protective grow tubes purchased for the spring seedlings continue to be installed by staff and volunteers
- Eagle Creek Greenway planting for 2021 was completed in September with the planting of 170 saplings in 3-gallon pots. The 2021 Leadership Portage County Class performed the planting along with PPD staff.
- Wire fence cages were installed immediately to protect the larger fall trees
- Approximately 31 acres were reforested at Portage Park District in 2021, exceeding our goal of 30 acres.
- A spending summary is included at the end of this document

## **Planting Areas**

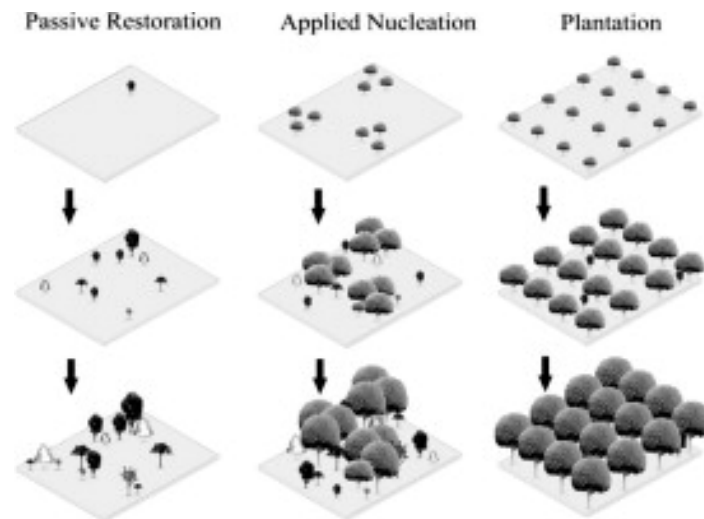
For the purpose of reforesting 30 acres in 2021, areas for planting were selected at Eagle Creek Greenway Phase I and Tinkers Creek Greenway Phase II. Draft management plans for each of these properties recommend reforestation to some level. The Clean OH grant used to fund ECG I included funding specifically for reforestation. For both properties, planting areas were mainly selected based on the potential to best do the following: increase the forested buffer along streams and wetlands, build outward from and close gaps between existing forest and stabilize erodible slopes. The anticipated level of site preparation was also considered. ECG had more recently been used for row crop farming. Thus, weeds were suppressed, and bare ground was more exposed. Plantings at ECG would have less competition immediately after planting. Planting sites at TCG II had been fallow for over 2 years, and a dense herbaceous cover had developed over the last 2 years. With the intent of taking advantage of the more desirable site conditions, 23 acres were selected at ECG I and 7 acres at TCG II (**Figures 1 and 2**).

## **Planting Density & Design**

The amount and spacing of bareroot seedlings required to reforest varies depending on long term objective of the planting. The Ohio Division of Forestry offers planting density and spacing guidelines for reforestation based on planting objectives. For wildlife and reclamation, seedlings can be placed 3 to 6 feet apart. This would require 1210 to 4840 trees per acre. For purposes of timber production, recommended rates drop to as low as 300 seedlings per acre with 12 feet between plants. Portage Park District's objective was to establish forest habitat for ecological restoration thus our objective aligned most closely with the guidelines for wildlife and reclamation. The number and density of seedlings for our effort are based on the lower end of those recommendations.

Along with achieving the goal of reforesting 30 acres in 2021, other desirous outcomes included an accelerated development of diverse forest communities having a variety of species and growth

characteristics, with an establishment form similar to how a forest would develop through passive restoration. To accomplish this, planting design was largely based on the concept of applied nucleation. Randomly placed plots, or cells, were placed within each chosen area. The figure below demonstrates the development of a diverse mixed age developing forest through the use of applied nucleation:



The outcome depicted for applied nucleation is similar to that created through passive restoration but with accelerated development. Each plot is planted densely, encouraging the rapid establishment of a canopy, conserving water and developing a litter layer on the soil. Trees may mature and produce fruit more quickly, encouraging use by wildlife that help disperse seeds into other areas. Thus, a mixed age diverse community develops around the original planted plots, while slowly spreading outward closing the gaps between plots.

We chose to use a combined approach to our 2021 planting efforts (**Figures 1&2**). For spring, bareroot seedlings were planted in 60-foot diameter plots placed randomly throughout each area, and in larger irregular plots located along edges of existing forest. The 60-foot diameter plots were each planted with 110-115 seedlings, which is equivalent to 1742 seedlings per acre. The larger plots were planted at a rate of 1350 seedlings per acre. Fall planting included all container stock in 3-gallon pots. These were planted in randomly placed 60-foot diameter plots, with about 20 trees each. Since the potted trees were larger and more established, this lower rate was chosen. Bareroot seedlings may be added to these plots in 2022 to increase the population.



Figure 1: 2021 Eagle Creek Greenway Fall and Spring Reforestation Map

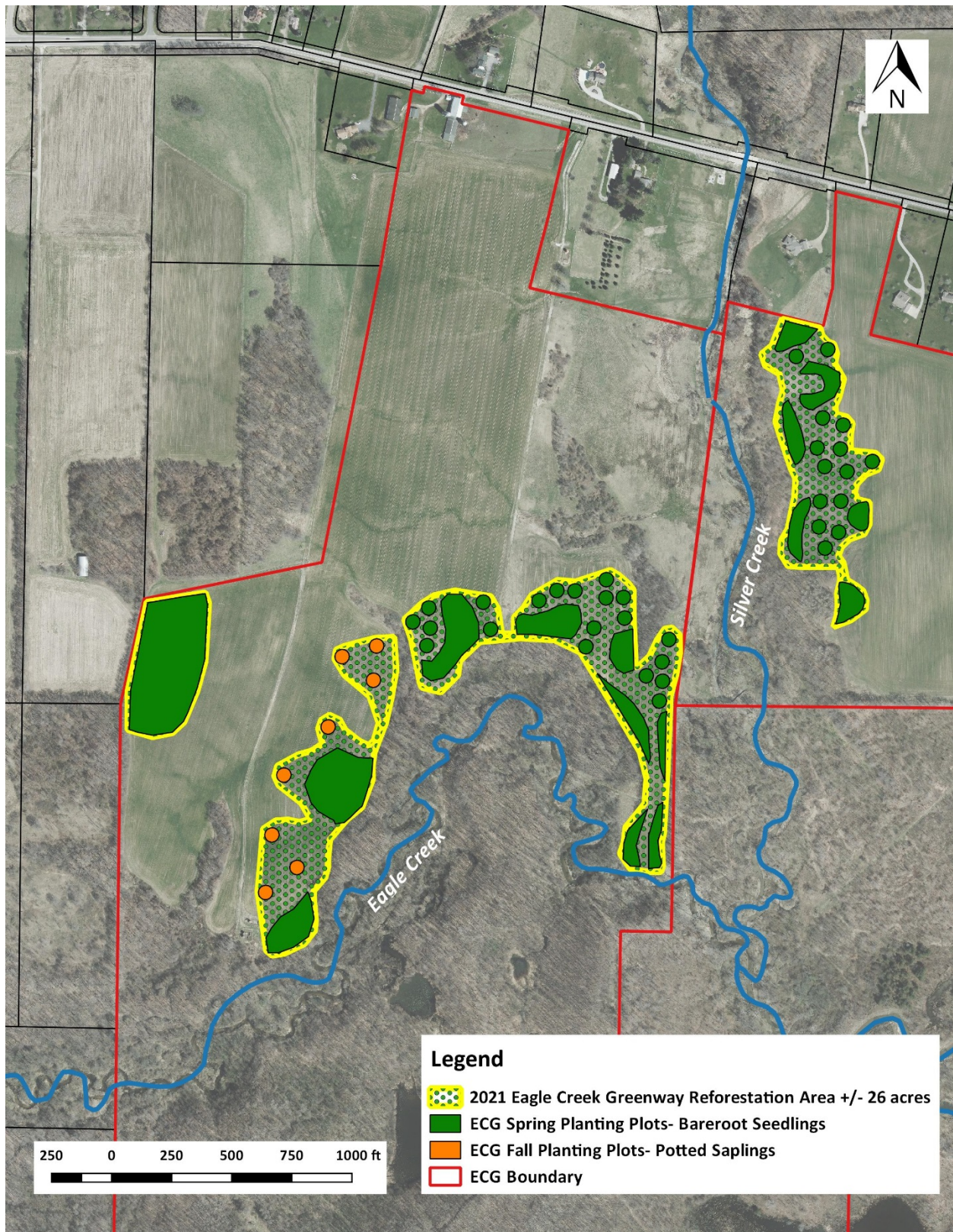
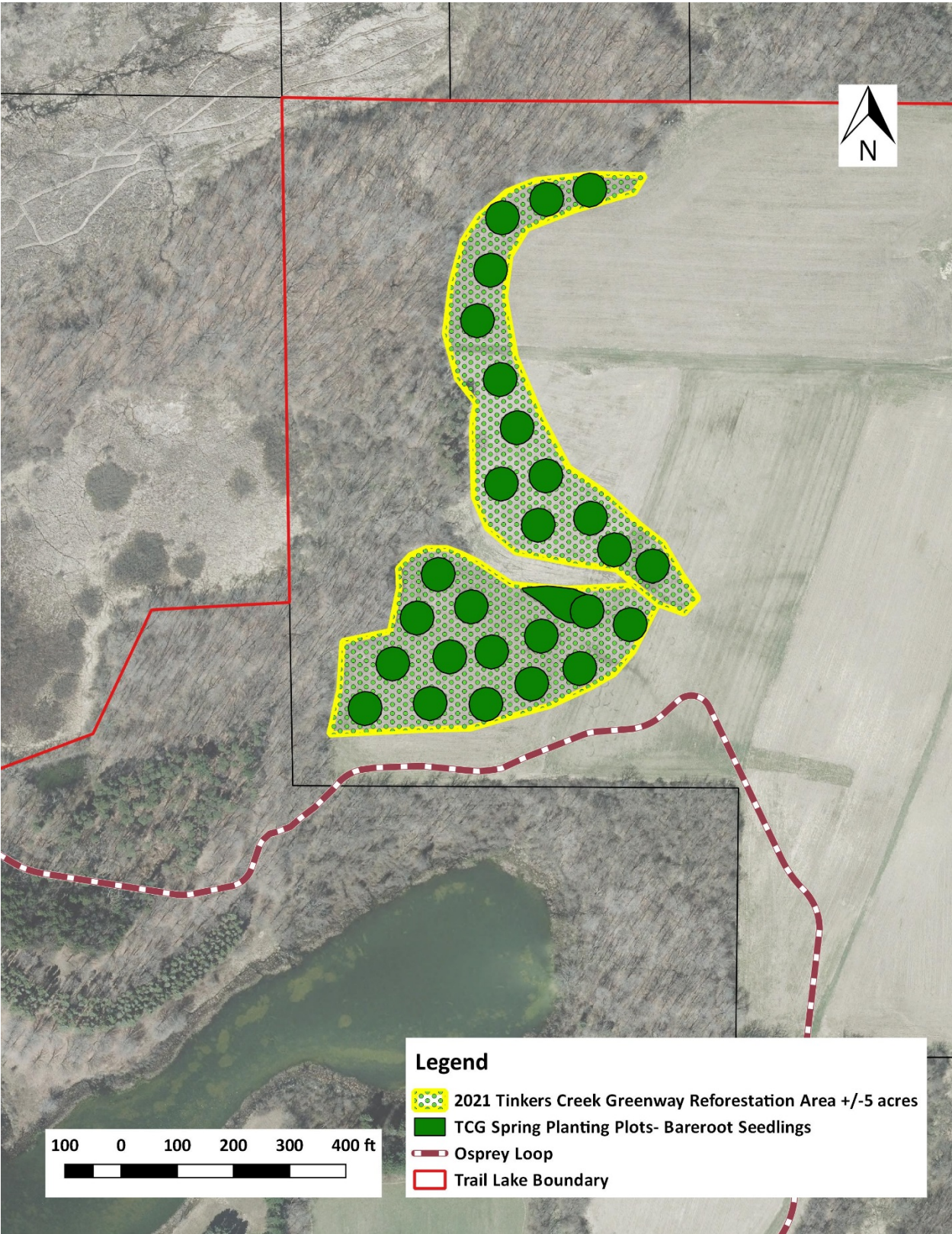




Figure 2: 2021 Tinkers Creek Greenway Fall and Spring Reforestation Map



## Species Selection

A large variety of species were selected for both the fall and spring plantings (**Table 1 & 2**). This was done to increase diversity and reduce the risk of mortality due to disease. Should a particular species be attacked by a pest or disease, its loss will have less effect on the planting as a whole. All of the selected trees are native to Ohio; however, some are more common in this area than others. Collectively, the mixture of species planted should be resilient to potential extreme or highly variable weather conditions. Growing conditions may now be more favorable for some of the species that were once typically less frequent in this area. We have also included many shrub species to help build understory communities as the plantings mature.

**Table 1: Container trees used in fall planting at Eagle Creek Greenway**

<b>FALL CONTAINER SAPLINGS- QUANTITIES- ALL AT ECG</b>			
<b>TOTAL QUANTITY</b>	<b>SPECIES</b>	<b>COMMON NAME</b>	<b>EAGLE CREEK GREENWAY</b>
12	Acer saccharum	Sugar maple	12
16	Amelanchier laevis	Allegheny serviceberry	16
4	Aronia melanocarpa	Black chokeberry	4
6	Betula populifolia	Gray birch	6
6	Cercis canadensis	Redbud	6
6	Corylus americana	Hazel	6
4	Euonymous atropurpurea	Eastern wahoo	4
16	Liriodendron tulipifera	Tulip-poplar	16
12	Nyssa sylvatica	Sour gum	12
16	Platanus occidentalis	American sycamore	16
8	Populus tremuloides	Quaking aspen	8
8	Quercus bicolor	White oak	8
16	Quercus macrocarpa	Bur oak	16
16	Quercus rubra	Red oak	16
4	Symphoricarpos orbiculatus	Coralberry	4
16	Tilia americana	Basswood	16
4	Viburnum prunifolium	Blackhaw	4
<b>170</b>			<b>170</b>
<b>TOTAL TREES PURCHASED</b>			<b>TOTAL PLANTED AT ECG IN FALL</b>

**Table 2: Bareroot seedling species used in spring plantings at Eagle Creek Greenway and Tinkers Creek Greenway**

TOTAL QUANTITY	SPECIES	COMMON NAME	TINKERS CREEK GREENWAY	EAGLE CREEK GREENWAY
600	Acer rubrum	Red maple	120	480
580	Acer saccharum	Sugar maple	80	500
100	Amelanchier canadensis	Shadblow serviceberry	20	80
145	Aronia melanocarpa	Black chokeberry	29	116
185	Betula allegheniensis	Yellow birch	85	100
600	Betula nigra	River birch	120	480
200	Betula populifolia	Gray birch	40	160
280	Carya glabra	Pignut hickory	56	224
30	Carya illinoensis	Northern pecan	0	30
880	Carya ovata	Shagbark hickory	176	704
400	Cornus amomum	Silky dogwood	80	320
600	Cornus florida	Flowering dogwood	120	480
400	Cornus racemosa	Gray dogwood	80	320
95	Corylus americana	American hazelnut	19	76
600	Diospyros virginiana	Persimmon	120	480
600	Gleditsia tricanthos	Honey locust	120	480
95	Hammamelis virginiana	Witchhazel	19	76
300	Juglans nigra	Black walnut	60	240
45	Juniperus virginiana	Red cedar	15	30
600	Liquidambar styraciflua	Sweetgum	120	480
500	Liriodendron tulipifera	Tulip-poplar	100	400
190	Nyssa sylvatica	Sour gum	65	125
1005	Pinus strobus	White pine	213	792
1000	Platanus occidentalis	American sycamore	200	800
90	Prunus americana	American plum	18	72
600	Prunus virginiana	Chokecherry	120	480
700	Quercus alba	White oak	140	560
135	Quercus muehlenbergii	Chinkapin oak	27	108
1000	Quercus rubra	Red oak	200	800
600	Quercus shumardii	Shumard oak	120	480
1700	Quercus velutina	Black oak	500	1200
65	Rhus glabra	Smooth sumac	13	52
140	Salix amygdaloides	Peachleaf willow	28	112
75	Salix nigra	Black willow	75	0
30	Sambucus canadensis	Black elderberry	6	24
65	Sassafras albidum	Sassafras	13	52
70	Tilia americana	Basswood	14	56
300	Ulmus americana	American elm	60	240
15600			3391	12209
TOTAL TREES PURCHASED			TOTAL PLANTED AT TCG IN SPRING	TOTAL PLANTED AT ECG IN SPRING

SPENDING SUMMARY FOR 2021 REFORESTATION					
SEASON	VENDOR	QUANTITY	SIZE/TYPE	TOTAL	
Spring	Alpha Nurseries	700	Seedling/Bareroot	840.08	
Spring	Cold Stream Farm	1125	Seedling/Bareroot	1157.47	
Spring	Lake County SWCD	1455	Seedling/Bareroot	2027.6	
Spring	Portage County SWCD	245	Seedling/Bareroot	193.3	
Spring	Musser Forests	12200	Seedling/Bareroot	6732.2	
Fall	Riverside Native Trees	170	Sapling/3 gallon pots	3737	
	<b>TOTAL TREES PURCHASED</b>	<b>15895</b>	<b>TOTAL COST FOR TREES</b>	<b>\$14,687.65</b>	
MATERIALS AND SUPPLIES FOR TREE PROTECTION					
	VENDOR	QUANTITY	PRODUCT	TOTAL	
	Auburn Pipe	3700'	1/2" PVC	750	
	Blue -X Enterprises	10000	30" Grow Tubes	11875	
	Lowe's	1000	1/2" PVC	314	
	The Home Depot	3900'	1/2" PVC	1224.6	
	Tractor Supply Company	1200'	5' tall 2"x2" Welded Wire Fence	839.88	
	ULINE	21000	Black UV Stabilized Cable Ties	798	
			<b>TOTAL COST FOR PROTECTION</b>	<b>\$15,801.48</b>	
<b>TOTAL COST</b>				<b>\$30,489.13</b>	