

# **Florida Torreya Relocation Project**

## **Volume 1**

Along the ***Universe Story Walk***  
At Stovers' Sèjour  
in Greensboro, North Carolina



Report Updated: November 8, 2019

Cover Photo: Seedling at Universe Story Walk signpost 4, November 2019;  
seed planted November 2013.

This tree relocation project is being conducted in conjunction with the Torreya Guardians, a self-organized group of naturalists, botanists, ecologists, and others with a deep concern for biodiversity protection, who have chosen to use the internet as a tool for discussing ideas, posting plans, and taking a variety of actions on behalf of the Planet's most endangered conifer tree: *Torreya taxifolia*. For additional details about the work of the Torreya Guardians, visit their website at <http://www.torreyaguardians.org>. A special page for the Greensboro plantings has been created at: <http://www.torreyaguardians.org/nc-greensboro.html>.

In November 2019, the on-going report of the tree plantation in Greensboro was separated into two volumes. [Volume 1](#) deals with the initial planting of 30 seedlings along the Universe Story Walk trail. [Volume 2](#) documents subsequent plantings throughout the gardens and grounds of Stovers' Sèjour and includes appendices with information about planting and caring for Florida Torreya.

The most recent version of the report on the relocation project at Stovers' Sèjour is also available at: [www.EmergingEcology.org/Torreya](http://www.EmergingEcology.org/Torreya).

For further information about this Florida Torreya planting, contact Nelson Stover  
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## Torreya Guardians

(Information on this page has been taken from the Torreya Guardians' website:  
[www.TorreyaGuardians.org](http://www.TorreyaGuardians.org).)



"Based on fossil records, we can speculate that the geographical range of *Torreya taxifolia* included North Carolina and perhaps, it was forced south by glaciers, and when they retreated, it became isolated in small areas of the southeastern United States." — p. 12 of "[Torreya taxifolia \(Florida Torreya\) 5-Year Review: Summary and Evaluation](#)", 2010, U.S. Fish & Wildlife Service.

Rob Nicholson (of the Botanic Garden at Smith College, Massachusetts) wrote: "While the few remaining saplings may outlast the blight, not many people who have seen the trees would wager their homes on it. More likely, clusters of trees, propagated from specific ravines, will be grown in botanical gardens, universities, preserves, and state parks. This Florida native, as evidenced by the few healthy trees in cultivation, seems to thrive on the southern slopes of the Appalachian Mountains and is more cold tolerant than its present range would suggest."

Possibly an Apalachicola refugium can be re-created, an artificial *Torreya* forest where pollen can float, genes mingle, and the evolution of the past hundred million years can continue, even if it is in a pitifully discounted format."

**Torreya Guardians** is a self-organized group of naturalists, botanists, ecologists, and others with a deep concern for biodiversity protection, who have chosen to use the internet as a tool for discussing ideas, posting plans, and taking a variety of actions in behalf of our most endangered conifer tree: *Torreya taxifolia*.

There are no by-laws, officers, board, staff, overhead costs, dues, formal organizational structure, or physical location to this organization.

**Torreya Guardians** does not speak or take action as a group, but instead encourages subsets of those involved to post ideas and initiatives on this website and to help establish links with synergistic organizations and websites.

"The focus of the Torreya Guardians is an 'assisted migration' program that would introduce seedlings to forests across the Southern Appalachians and Cumberland Plateau. Their intent is to avert extinction by deliberately expanding the range of this endangered plant over 500 km northward. Because planting endangered plants in new environments is relatively simple as long as seeds are legally acquired and planted with landowner permission, the Torreya Guardians believe their efforts are justified. Introducing this species to regions where it has not existed for 65 million years is '[e]asy, legal, and cheap' (Barlow & Martin 2004)."

## The Greensboro Relocation Project

During her visit to Greensboro, North Carolina in 2013, Connie Barlow invited Elaine and Nelson Stover to join the Torreya Guardians' relocation project by planting seeds in the upland wooded areas on their property. The Stovers received seeds from the main Torreya Guardians harvest in the autumn 2013 plus some additional seeds from the small 2013 harvest from A. J. Bullard's property in Mt. Olive NC. From the autumn 2015 Torreya Guardians harvest, an additional 25 seeds were sent to the Stovers. These were planted in the same general area. All seeds from the autumn 2013 and 2015 harvests by Torreya Guardians were "free-planted" directly into the soil of their regrowth forest. The holes for the seeds were dug about 3" deep using a small trowel.

The initial planting of 30 Florida Torreya seeds was completed in mid-November 2013 along the ½-mile Universe Story Walk trail in 5 acres of upland woodland across I-73 from the FedEx Hub terminal at the Piedmont Triad International Airport in Greensboro, NC. At the time of the initial plantings, photographs were taken of each planting. These photos show the location of the seeds relative to the signposts along the trail through the woods.



After the original 2013 planting, the Stovers monitored the seed locations and documented the germination process on a semi-annual basis during May and November through 2017 and then shifted to an annual documentation. Cursory examinations during 2014 showed no indication that any seeds had germinated. During an inspection tour in November 2015, six plants were noted and reported by email to Connie Barlow.

### Germination Summary

- ✓ Total of 55 seeds planted during 2013 and 2015
- ✓ 26 seedlings visible by November 2019 – 47% of seeds planted
- ✓ All seedlings ever spotted are still alive – though 3 have stressed leaves

In late 2015, an additional 25 seeds were planted among the gardens and pathways on the same property. No photos were taken during the planting of these seeds. None of these seeds were seen to have sprouted during the May 2017 survey.

The report that follows shows the growth of the seedlings. Photos from the various monitoring sessions are indicated by the color of the borders on the photos as follows:

Original planting sites of the 30 seeds, November 2013 – **brown borders**,  
May 2016 – **light green borders** showing 6 seedlings,  
November 2016 – **yellow borders** showing 10 seedlings,  
May 2017 – **dark green borders** showing 11 seedlings, and  
November 2017 – **red borders** showing 22 seedlings including seven from the second planting along with five additional seedlings from the first planting,  
January 2019 – **purple borders** showing 25 seedlings including ten from the second planting and  
November 2019 – **light blue borders** showing 26 seedlings – 11 are documented in Volume 2.  
Thus, by November 2019, the overall germination rate has risen to nearly 50%.

In May 2016, Nelson Stover and Michael Dowd conducted an in-depth examination of all planting locations. Three documentable plants were photographed. The following day, in brighter sunlight, Nelson returned to the two sites in the valley. There he discovered the nubs of three additional plants. These are the ones found in November 2015 but not seen the previous day. It appears that the leaves of these three plants were eaten by deer or other small animals which are prevalent in the woods. Over the next year, each of these plants has appeared to recover.

Beginning with the survey in November 2016, a grid was placed behind each seedling to show its size. The boxes on the grid are 2" wide and 3" tall. During the May 2017 survey of the plantings, the same grid was used to photograph the trees. In addition, during this inspection, any vines and overhanging trees were removed. Wood chips and locally made leaf compost were put around each seedling. Finally, a green marking stake was installed near each tree to mark its exact location and to prevent accidental damage by people using the trail.

In each of the 2013 planting photos, Elaine Stover is holding a small trowel which shows the exact location of the planted seed. The Universe Story Walk at Stover's Sèjour consists of 20 markers spaced at 100' intervals through a wooded area. These represent the 14 billion-year history periods of the history of the Universe with additional signs in the final billion years and at the beginning. The Universe Story Walk is based on the book, *The Universe Story*, by Thomas Berry and Brian Swimme. Thomas Berry attended the dedication of the walk in April 1999. Although the original walk was marked to 15 billion years, based on more recent scientific calculations, the narrative for the Universe Story Walk was changed to use the more currently accepted span of a 14 billion-year history of the Universe. One signpost was removed but the numbering on the signs was not changed at that time. Hence, there is no signpost number 8 and the signs past this point have numbers one greater than the associated readings.

The marker numbered 14½ lies at the bottom of a small valley. The tree canopy covering this valley was decimated by a tornado in 2008. The photo at the right shows a trunk of an oak tree that was twisted apart by the tornado and the opening in the overall canopy. This scene is at about where the Valley South of the Trail seeds were planted. The stream which had its headwaters at a spring south of the marker has been dry since the cut was made for the nearby highway (I-73) in 1994. However, the fertile ground in the valley does collect water from the surrounding higher ground. In this area, two clusters of 5 Torreya seeds each were planted. The photos of these areas are shown in the following pages after the 14½ marker and are labeled "Valley South of the Trail" and "Valley North of the Trail".

The second planting of seeds was done at various places around the Stover Sèjour. Documentation of the growth and development of these seeds is contained in [Volume 2](#) of this report.



**Marker 0** – originally located near the front of the Stover's house. This signpost has been relocated to the eastern edge of the parking pad. No Torreya seed is located near this new marker space.

Three large pine trees just to the left of this original planting became infected with pine bark beetles in the fall of 2015. The trees had to be cut down. The area was repurposed as an Anniversary Garden commemorating the Stovers' 50 Wedding Anniversary. A sitting area and a fire pit were added after the trees were removed and the yard was fenced in for the dog. The exact location where the Torreya seed was planted is still visible (see photo below right) but is not well protected.



Photo left: original planting, Nov. 2013.

Photo below: repurposed area, May 2016 (note, 6"x6" off-cuts at right are the center of the original planting photo).



Below: May 2017 photo showing fully planted "Anniversary Garden". Torreya seed is in the approximate center of the photo under about 8" of dirt.



## Marker 1



Note: Due to a realignment of the trail, this marker was moved 10' south; the tree seed was not adjusted.

## Marker 2



No seedling has been discovered near this marker.



This seedling became visible by November 2016.

Left: Original planting  
Right: Sprout in Nov. 2016

### Marker 3



Left: Additional small branches appeared by May 2017

Right: Further growth developed during the summer of 2017

Lower left: Several branches in Jan. 2019

Lower left: About 4" wide by Nov. 2019



## Marker 4



Left: Nov. 2013

Below: Sprouting, Nov. 2015,  
hands of Elaine Stover



Note: This marker is located just to the west of the driveway into the Stover Sèjour. Thus, this is the most visible of the original plantings. This site sits at the lower end of a south-sloping property with trees to the south and a more open area to the east and north.



Photo left: Michael Dowd with tree at Marker 4, May 2016.



Photo below: Tree enlarged, hands of Michael Dowd.

The Torreya Guardians website added the following comments to these pictures:

Notice that in November, the **leafy growth is all fully mature and dark green**. In May the **light green color signifies new growth**. So, the first horizontal branches appeared right after the first winter following germination.

But by November 2016, one of those branches had been **nibbled off halfway**. That photo at far right (following page) does indicate a short vertical growth emanating from the top of the 3 branches that has fully greened since emerging, presumably during the summer. This **pattern of growth** is consistent with what we have documented elsewhere: by its second year, the plant seems to have **2 growth spurts annually** if it is not too shady. There is a spurt in the spring and another in the summer. The growth alternates between sending up a vertical stem v. sprouting 3 (and later, 4 to 6) branches laterally out of its top (terminal bud).



Left: Tree at Marker 4 stands about 6" tall by Nov. 2016



Right: Tree from above showing branching and new growth

Below left: Tree with grid, Nov. 2017



Bottom left: Additional branches by Jan. 2019

Bottom right: All branches spreading out and dividing during the 2019 growing season



## Marker 5



Left: Original  
planting  
Above: Visible  
seedling, Nov. 2016

Right: Growth by May  
2017



Below left: Growth by Jan. 2019

Below right: Spreading during 2019 growing season (boards in photo  
are 1" x 1" deck rail pieces)





## Marker 6

Left: Original planting location (photo shows Elaine and the family dog, Tony, in the background)

Right: Seedling in Nov. 2016

Center right upper: Growth by May 2017

Lower right lower: Nov. 2017



Left: Jan. 2019

Lower left: Nov. 2019 (note upward growth during the year)



## Marker 7



Upper left: Original planting  
Upper right: Seedling, Nov. 2017  
Lower left: Seedling, Jan. 2019  
Lower right: Seedling Nov. 2019



## Marker 8-9

Note: When the trail was reimaged from 15 billion years to 14 billion years, the marker number 8 was removed. The numbers were not changed on subsequent signs.



## Marker 10



Left: Original planting  
Right: Seedling Nov. 2017



Below left: Growth as of Jan. 2019

Below right: Nov. 2019



## Marker 11



**Marker 12** – this seed was planted in what has become a major east-west deer thoroughfare across the 5-acre property.





## Marker 13



Left: Original planting

Upper right: Nov. 2017

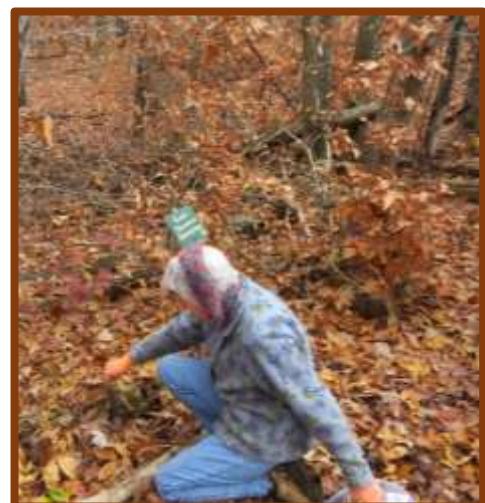
Lower right:  
Seedling at Marker  
13, Jan. 2019

Bottom left:  
Growth by Nov.  
2019



Note: Relative to the other markers, numbers 10 – 14½ are on the highest ground, these seeds are mostly among hardwoods.

## Marker 14



## Marker 14¼

Right: Original planting  
Below: Seedling in Nov. 2016



Below left: May 2017  
Below right: Nov. 2017



Below: Two views of seedling at 14 ½, Jan. 2019



Below: Nov. 2019

**Marker 14½**



Note: Behind Elaine (photo right above) the ground slopes into the valley which was hit by a tornado in 2008. The “valley plantings” are down and to her left, just beyond the right edge of this picture.

## Valley, North of Trail



Two trees (A & C) were found in May 2016. During the survey of November 2016, three trees (A, B & C) were found in the cluster of seeds planted north of the trail. All three trees had grown further by May 2017, as shown in photos groups that follow. The fourth tree (D) was found during the summer of 2017 among trees and ferns; it may have been overlooked previously. The fifth seed has not sprouted.

Above: Planting area for 5 seedlings in 2013

Below: Same location in November 2017; the yellow line connects the pole at the center of the five plantings in both photos, four green stakes indicate seedling locations



Upper left: Michael Dowd with larger of two trees (A),  
May 2016  
Upper right: Same tree in November 2016



Center right: May 2017  
Lower right: Jan. 2019  
Lower left: Nov. 2019





Left: Second tree (C) in this cluster, May 2016

Right: November 2016



Center right: Nov. 2017 –  
this seedling (C) is at the  
back of the group photo

Below right: Jan. 2019

Lower left: Nov. 2019



Below left: Third tree (B) growing north of the trail in the valley

Center below: Same tree in May 2017, this tree is on the side of the cluster shown in group photo

Right below: Nov. 2019



Left below: Jan. 2019

Right: Nov. 2019



The fourth tree (D) in this cluster. Some of the surrounding ferns and low branches from other trees were removed to increase sunlight.

Upper left: Nov. 2017 with measuring chart

Upper right: Jan. 2019 (also see back cover – this is now the largest of the seedlings)



Below: Nov. 2019



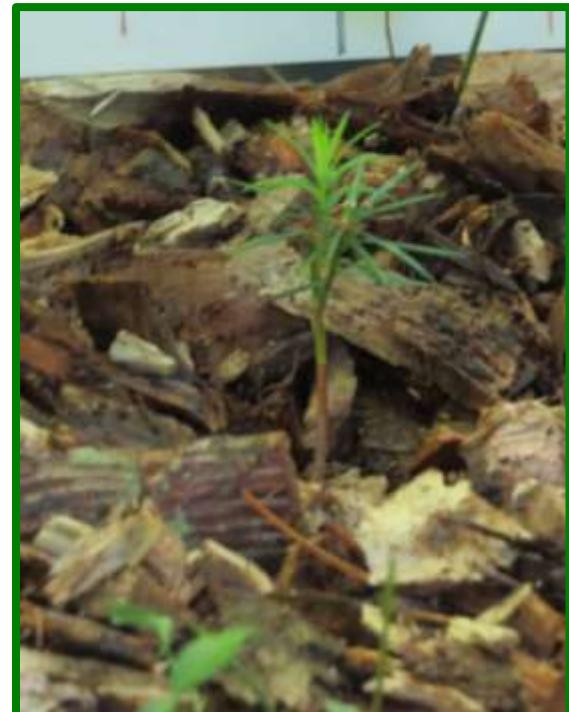
## Valley, South of Trail

Below: Planting area for cluster of 5 seeds south of main trail in the valley. Rocks were placed near each seed location around a central pole (which has subsequently disappeared).



Below left: Possible nub of tree, apparently eaten between November 2015 and May 2016. No signs of these trees were observed in Nov. 2016 (this may be a favorite deer sleeping place)

Below right: Revitalized seedling May 2017



Below: Nov. 2017



Below: Jan. 2019



Below: Nov. 2019 – note recovery over recent years



### Marker 14¾

Upper left: Original planting site.  
Upper right: Seedling in Nov. 2016



Bottom left: May 2017  
Bottom right: Nov. 2017



Below: Seedling at 14¾, Jan. 2019

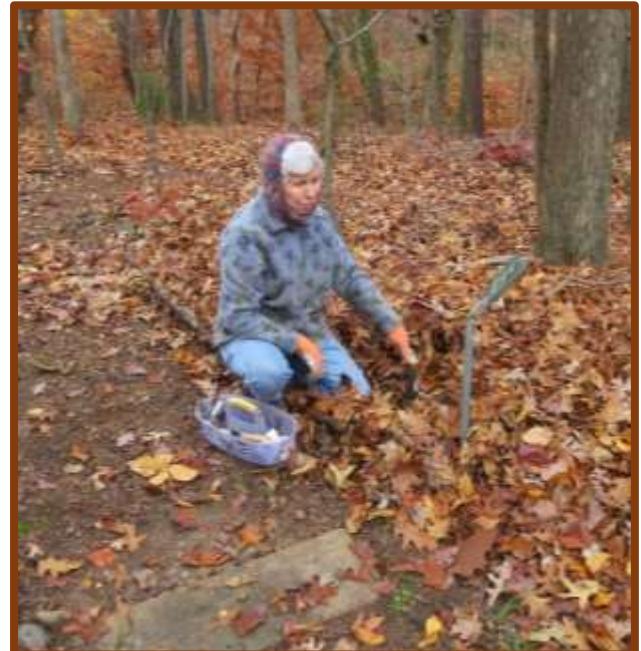
Right: Nov. 2019



**Marker 14.9**



**Marker 14.99**



## Final Marker

Upper left: Original planting – The Stover's house is 20' in front of Elaine at this point in the trail  
Upper right: Seedling during November 2016



Bottom left: Nov. 2017 with template – tree stands 9" tall and each of the two branches reach out over 4" from the trunk

Bottom right: Jan. 2019, with an additional tier of branches



Back cover shows tree in Nov. 2019

Florida Torreya growing at the end of the Universe Story Walk

At Stover's Sèjour, November 2019

Planted from seed, November 2013



(Note: Post behind tree is a 1" x 1" deck pole.)