

Florida Torreya Relocation Project

Along the *Universe Story Walk*
and among the gardens at
Stovers' Sèjour
in Greensboro, North Carolina



Report Updated: January 3, 2019

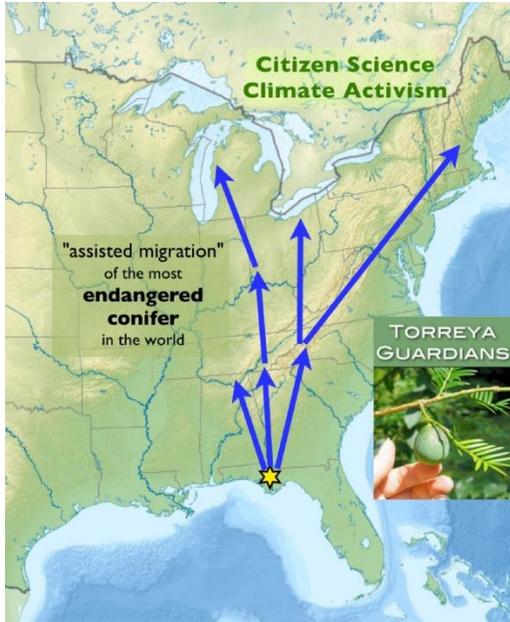
This tree relocation project is being conducted in conjunction with the Torreya Guardians, a self-organized group of naturalists, botanists, ecologists, and others with a deep concern for biodiversity protection, who have chosen to use the internet as a tool for discussing ideas, posting plans, and taking 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>.

The most recent version of the report on the relocation project at Stovers' Sèjour is also available at: www.EmergingEcology.org/Documents/FloridaTorreyaRelocation.pdf.

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Torreyia Guardians

(Information on this page has been taken from the Torreyia Guardians' website:
www.TorreyiaGuardians.org.)



"Based on fossil records, we can speculate that the geographical range of *Torreyia 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 "[Torreyia taxifolia \(Florida Torreyia\) 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 *Torreyia* 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."

Torreyia 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: *Torreyia taxifolia*.

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

Torreyia 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 Torreyia 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 Torreyia 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 Torreyia Guardians' relocation project by planting seeds in the upland wooded areas on their property. The Stovers received seeds from the main Torreyia 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 Torreyia Guardians harvest, an additional 20 seeds were sent to the Stovers. These were planted in the same general area. All seeds from the autumn 2013 and 2015 harvests by Torreyia 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 Torreyia 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 50 seeds planted during 2013 and 2015
- ✓ 25 seedlings visible by 2019 – 50% of seeds planted
- ✓ All seedlings ever spotted are still alive

In late 2015, an additional 20 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 of 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, and
January 2019 – **purple borders** showing 25 seedlings including ten from the second planting.
Thus, by January 2019, the overall germination rate has risen to 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 14¾ 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. The photos for three of these groupings appear near the end of this report after the numbered sign sequence.

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 with sitting area and a fire pit 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.

Marker 3

This seedling became visible by November 2016.

Left: Original planting

Below: Sprout in Nov. 2016



Right: Additional small branches appeared by May 2017

Lower left: Further growth developed during the summer of 2017

Lower right: Several branches in Jan. 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 Torrey 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



Center: Tree with sizing grid (May 2017)

Right: Tree from above showing branching and new growth



Below left: Tree with grid, Nov. 2017

Below right: Additional branches by Jan. 2019



Marker 5



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

Below left: Growth by May 2017
Below right: Growth by Jan. 2019





Marker 6

Left: Original planting location

Right: Seedling in Nov. 2016

Below right upper: Growth by May 2017

Below right lower: Nov. 2017



Below left: Jan. 2019

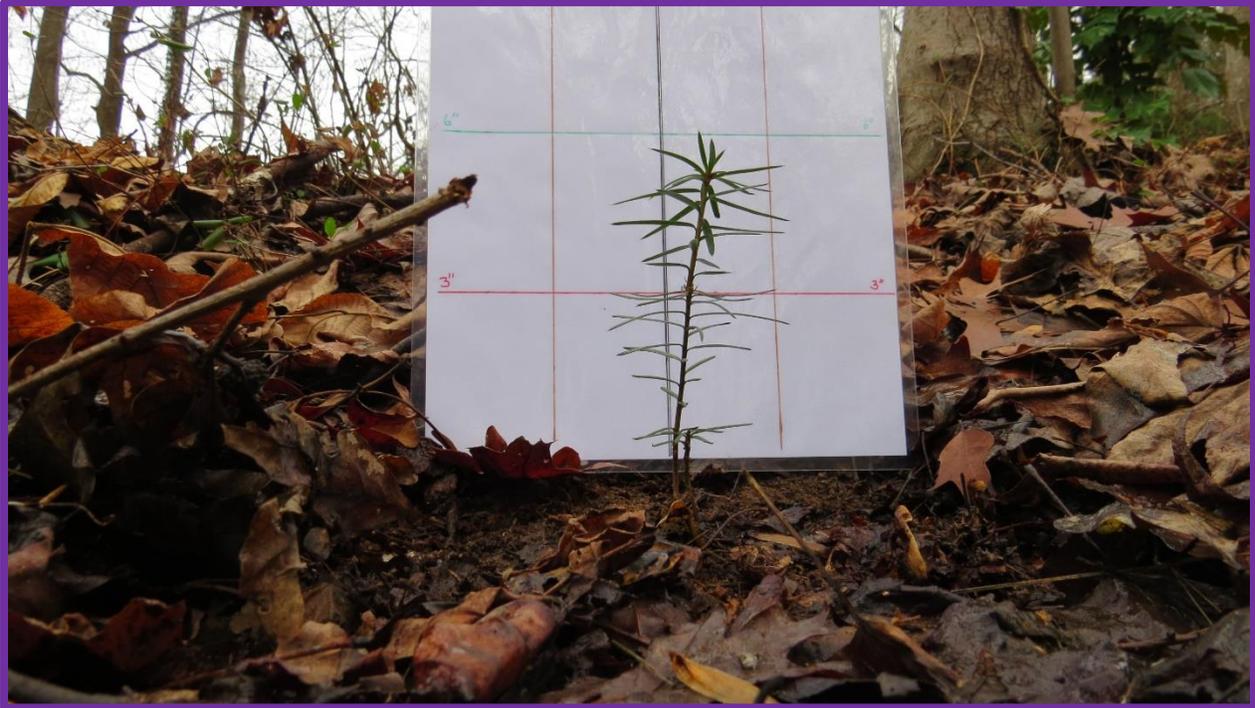


Marker 7

Left: Original planting
Below: Seedling, Nov. 2017



Bottom: Seedling, Jan. 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.



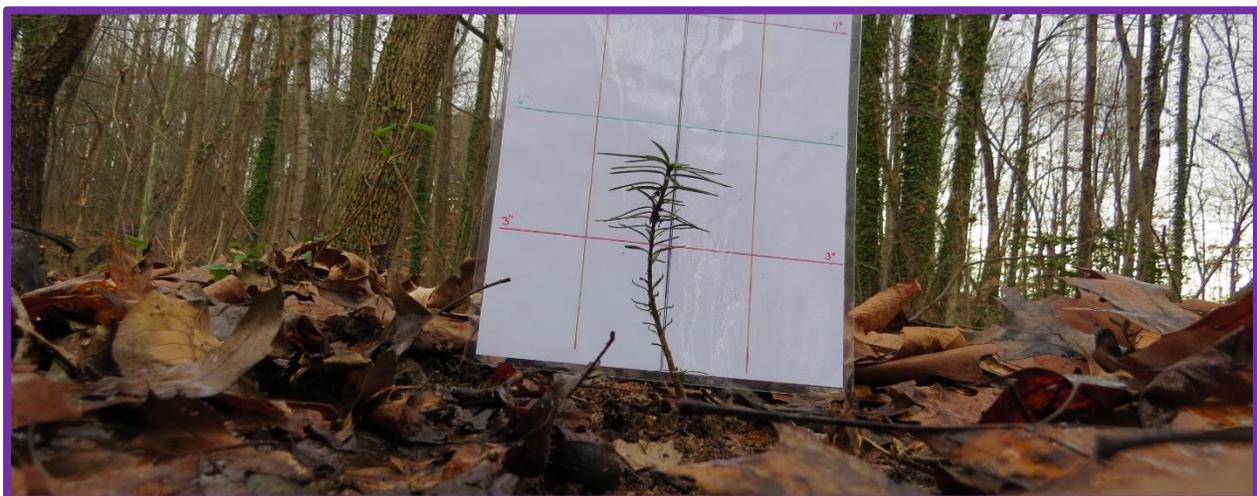
Marker 10



Left: Original planting
Right: Seedling Nov. 2017



Below: Growth as of Jan. 2019



Marker 11



Marker 12 – this seed was planted in what has become a major east-west deer thoroughfare.



Marker 13

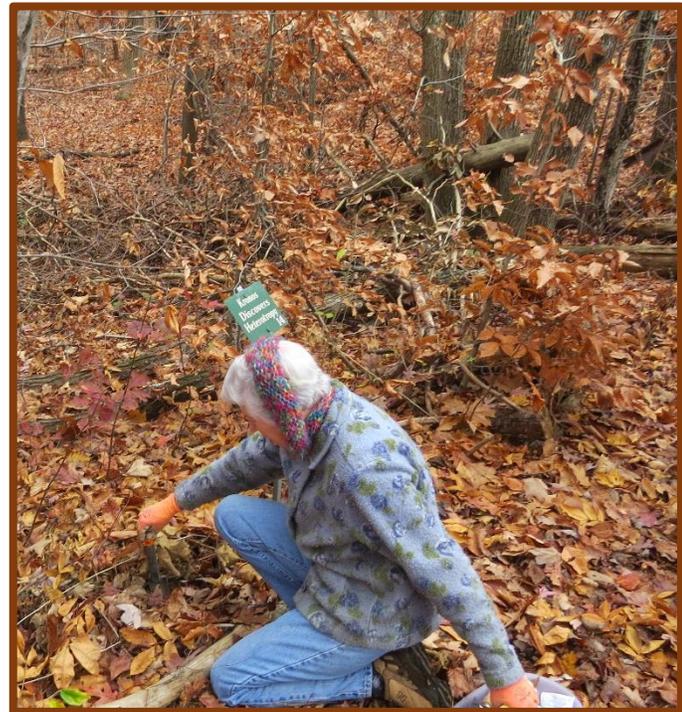


Left: Original planting
Below: Nov. 2017



Below: Seedling at Marker 13, Jan. 2019

Marker 14



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

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



Marker 14½



Note: Behind Elaine the ground slopes into the valley which was hit by a tornado in 2008. The “valley plantings” are down and to her left, along the trail 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.



Above: Planting area for 5 seedlings in 2013

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



Left: Michael Dowd with larger of two trees (A), May 2016

Right: Same tree in November 2016



Left: May 2017

Right: Jan. 2019



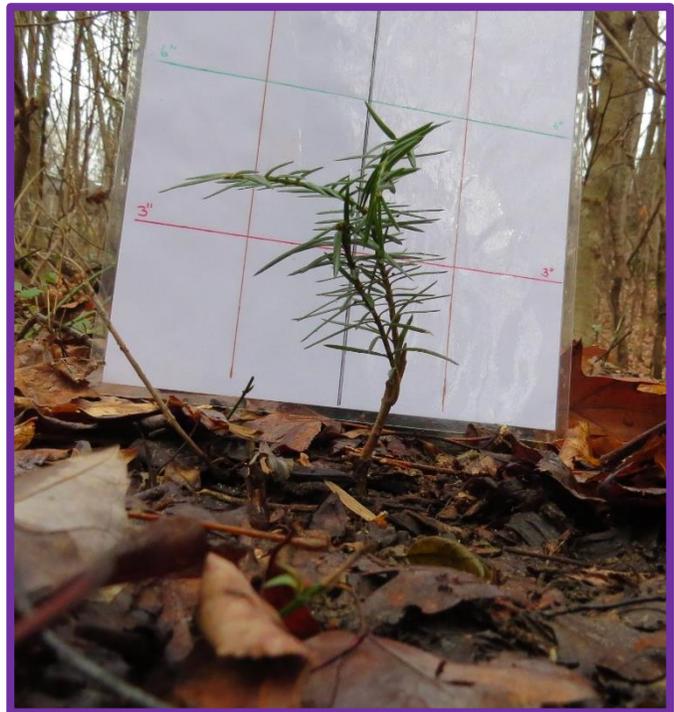
Left: Second tree (C) in this cluster, May 2016

Right: November 2016



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

Below right: Jan. 2019



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

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



Left below: Nov. 2017

Right below: Jan. 2019



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

Top: Nov. 2017

Bottom left: Nov. 2017 with measuring chart

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



Valley, South of Trail

Above: 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



Marker 14¾

Upper left: Original planting site.

Upper right: Seedling in Nov. 2016



Bottom left: May 2017

Bottom right: Nov. 2017



Below: Seedling at 14¼, Jan. 2019



Marker 14.9



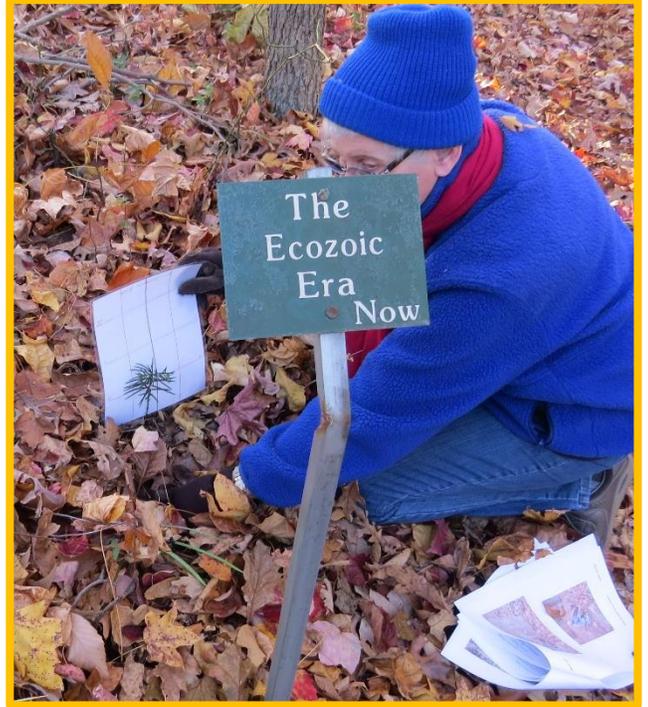
Marker 14.99



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



Second Planting

Eastern Woods, Welcome Garden and Valley Short Cut

In late 2015, 20 additional seeds were planted in several additional places around Stovers' Sèjour. The first seven seedlings were discovered in the summer of 2017. Three more seedlings were discovered during the documentation in January 2019.

In the **eastern woods**, two sets of seeds were planted. One was planted near the northeast corner of the dog fence at the meditation bench. The Universe Story trail passes the fence on the left side of this picture. Marker #1 stands near the upper right corner of the photo. Two were planted in the pet cemetery located near the south fence of the property in the eastern woods; one was visible by Nov. 2017; a second was found a year later.



Left: Seedling, in circle
Below: Measurement, Nov. 2017
Bottom: Jan. 2019



In early 2013, sentimental remains from our dog, Perdu, was buried under the square marker stone in this area of the pet cemetery. My sister's cat was buried in the same vicinity which is located on the south side of the property near the interstate. The *Torreya* seeds were planted near each animal's headstone. Red circles locate the two plantings in the photo below – taken facing south, east is on the left.



Below left: Measurement of eastern seedling, Nov. 2017
Right: Eastern seedling, Jan. 2019



Below: Western seedling in the pet cemetery, Jan. 2019 – yellow circle highlights seedling



Four seeds were planted in the **Welcome Garden** between the dog fence and the parking pad. This area is immediately north of the Anniversary Garden that was built in 2015 (in upper center of photo, near dog). The four red circles indicate the locations of the seedlings – numbering from left to right, these will be referred to as WG1, WG2, WG3 and WG4 in the following documentation. WG2 was not seen until January 2019.



The photos below and on the following page show the seedlings from in the same left to right sequence as the photo above.

WG1

Left: Nov. 2017

Right: Jan. 2019

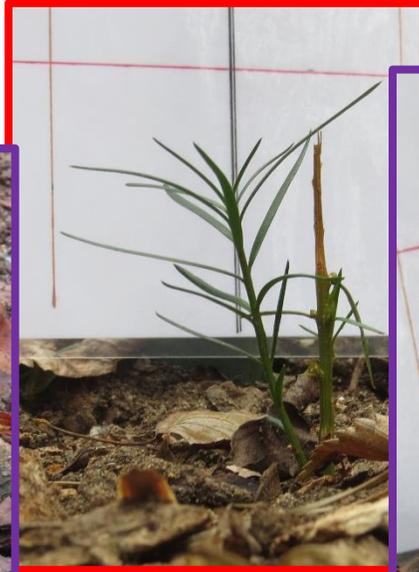


WG2 & WG3: The WG3 seedling may have been damaged in the summer lightening storm or affected by an overabundance of direct sunlight during the heat of July and August.

Left: WG2, Jan. 2019

Center: WG3, Nov. 2017

Right: WG3, Jan. 2019



WG4

Left: WG4, Nov. 2017

Right: WG4, Jan. 2019



From an opening in the valley, near the Valley North and Valley South plantings, a **Shortcut Trail** follows the old creek bed north toward Marker 9. Many of the large trees in this area were knocked down by the tornado which came through the valley in 2008. The fallen trees in the background came down during that storm. During November 2015, several seeds were planted along the western side of this trail. Two seedlings were seen during the late summer of 2017 and first documented in November 2017.



Above: Two seedlings along the shortcut trail

Below left: Leftmost planting, Nov. 2017

Below right: During a walk through the woods in late summer, we noticed that the top of this seedling had been broken/eaten off. The plant survived into January.



Below left: Seedling on the right in valley picture, Nov. 2017

Below right: Seedling, Jan. 2019



Just north of the **Shortcut Trail**, the Universe Walk Trail comes into the valley. Marker 9 is on the west side (right in photo). During the second planting several seeds were planted on the east side of the trail.



Below: Seedling Jan. 2019, artificially resting on oak stick





A tree (Valley North d) in the valley January 2019