

February 2015, Torreya Guardians founder, Connie Barlow responded to a statement made by the USF&WS ecologist in charge of the Florida Torreya recovery plan.

Here is the dialogue:



Sarah Dalrymple · 14.57
Liverpool John Moores University

Does anyone have any examples of assisted colonization, managed relocation or assisted migration in plants?

Collaborations may be forthcoming if I can find anyone working on plant assisted colonization. It can be anywhere in the world and any habitat. I want to try out a decision framework recently published on AC and the biogeographic approach.



V. Negrón-Ortiz · 19.11 · 28.78 · U.S. Fish and Wildlife Service

Sarah, this is a good paper: Vitt et al. Assisted migration of plants: Changes in latitudes, changes in attitudes. *Biological Conservation* 143 (2010) 18–27.

I am the Recovery lead for *Torreya taxifolia*, and this conifer has been re-allocated by a group called the Torreya Guardians. I'm trying to direct their efforts, since it has not been based on science.



Connie Barlow · 14.64 · 24.71 · The Great Story

Response re Negrón-Ortiz. comment. Our efforts at Torreya Guardians have been based on old-school natural history, practical horticulture, and greenhouse + field experimentation. Unlike what has been evidenced by the funded, sanctioned science, our volunteer citizen-scientist efforts are grounded in a rigorously paleoecological understanding that the small "historically native range" to which *T. taxifolia* is endemic was a peak glacial refuge, and that this northern hemisphere temperate disjunct genus surely had much larger populations in eastern North America during pre-Pleistocene times.

Barlow's comment continues on next page . . .

We Torreya Guardians are quite happy to modify our conservation actions and experiments based on any new scientific findings by Endangered Species Act scientists and others, and several years ago we were grateful that Dr. Negron-Ortiz invited us to participate via phone connection in the panel of advisors recommending changes in the ESA management plan for T. tax. But that advisory panel specifically voted down adding their own "assisted migration" experimentation to official species management, despite our own encouragement for the scientists to do so. Thus our northward experiments are still the only "science" happening in a field experimentation way.

Thus, in my view, the ESA-funded, official scientific findings have lagged far behind our own during the past 10 years in terms of providing practical assistance for determining (a) northward limits of the species physiological capacities and (b) specific soils, aspects, microclimates, plant associates, etc. for maximizing success in out-plantings in orchard as well as rewilding settings.

Ten years ago it may still have been reasonable to ignore climate change in cleaving to recovery efforts bounded by the "historically native" range; today it is anti-conservation and detrimental to this ancient genus to continue to operate with such blinders. Quite simply, *Torreya taxifolia* ought to be serving as the poster species for plants in eastern North America threatened by climate change. It should also be serving as the first instance of scientists and citizens working collaboratively, using the immense practical experience and volunteerism of we guardians to ensure that the science expands while the ESA management budgets contract. There is still time for that symbiotic collaboration to happen.

Specific problems: Besides lacking access to genotypic diversity, owing to our having legal access to seeds and branchlets only outside the critical habitat, we Torreya Guardians are especially frustrated that, thus far, our queries to the ESA scientists seeking help in learning which mycorrhizal fungi *Torreya taxifolia* has evolved to thrive with, and which other trees native to eastern North America typically have those symbionts in wild forest settings (and thus which would serve as helpful neighbors for out-planted seeds and seedlings) have yielded no assistance. It seems the emphasis is still on discerning fungal pathologies and experimenting with techniques for reintroducing this species into its tiny native range in Florida, where it has been languishing since wild seed production halted since the 1960s.

I visited that native range along the Apalachicola River a few months ago for the fourth time since 2000; sadly, the wild resprouts look even more pathetic. I did notice one caged new seedling planted in full-canopy forest, and the open-sun orchard plantings on the lawn by the parking lot look great (one seed still hanging from the tallest). But I challenge the professionals to find those accomplishments any more helpful than our own unfunded work -- which we always post online and emphasize photos and videos and expressly encourage all to help us "see" in those data, photos, and videos more than we ourselves might see.

Overall, we at Torreya Guardians are learning a great deal by our failures as well as our successes in experimenting on how best to propagate and plant this species northward (as far north as Ohio and Michigan recently; see those videos). See the Propagation, Reports, and "What We Are Learning" webpages on the vast Torreya Guardians website. Also, google my own "Climate, Trees, and Legacy" series to see how I encourage climate awareness to spread to more common trees, and how forestry research professionals are far ahead of academic conservation biologists in their preparing for a warmer future.

For any researchers new to "assisted migration", go to the Torreya Guardians website and click on the "Scholarly Papers" link on the homepage. It is there that I try to maintain a list (now quite lengthy) of annotated links to all important papers on this issue. Note that you can click directly on the "forestry" section -- where you will see how much farther along the forest researchers are. There is virtually no controversy among foresters that even common forest trees will need human help moving north this century. That *Torreya taxifolia* assisted migration is still controversial among conservation biologists is uncanny, in my view.

Note: I am the founder of Torreya Guardians; google my 2004 paper with the late Paul S. Martin, "Bring *Torreya taxifolia* North Now." I am also the author of the 2001 paleoecology book, "The Ghosts of Evolution."