Connie Barlow emails to Tyler Dreaden (USDA)
re *Fusarium torreyae* 2021 – 2023

From: Connie Barlow <conniebarlow52@gmail.com>
Sent: Wednesday, **February 17, 2021** 10:35 AM
To: Dreaden, Tyler - FS <tyler.j.dreaden@usda.gov>
Cc: Phillips, Catherine <catherine_phillips@fws.gov>
Subject: [CAUTION: Suspicious Link]USFS page on your "Detecting torreya pathogen" paper has wrong photo

Hello Tyler -

cc: Catherine Phillips, asst regional director USF&WS SE region, re her oversight of endangered Florida torreya

I already had posted your "Detection Method for Fusarium torreyae" 2020 paper onto this lengthy wepage on the Torreya Guardians website: "At the Brink of Extinction — Why?"

(Just do an internal "Find" for your last name in order to see where it is on that page.)

My google alert directed me this morning to the **USDA webpage** called:
"Detecting the pathogen that stalks the Florida torreya, a critically endangered tree"

That would be a good page for me to link to on our Torreya Guardians "Reports" webpage. But before I do, **please switch out the photo that is there now (which is NOT Torreya)** and put a real one in.

You can see lots of real photos of T. taxifolia on this page of ours "About Torreya taxifolia" plus learn more about its natural history.

I will attach below a photo I often use that I took, which shows a branchlet, with fruit and hand for scale, at Biltmore Gardens NC. I usually crop it to make it smaller and tall rather than wide.

ADDITIONAL REQUESTS:

1. Please let me know **whether the fusarium has ever been detected on or within seeds**, once the flesh is removed and the seeds washed. That is our usual method for assisting the migration of T. tax into northward states, so it would be nice to know if moving bare seeds is safe without using your detection method.

2. Please look at the section within the top-linked extinction page on our website that is titled:

2D. WHETHER THE FUSARIUM IS NATIVE OR EXOTIC, DO NORTHWARD PLANTINGS INDICATE DISEASE RESISTANCE?

And notice that I suggest there that somebody **test for the canker at the two near-century-old mature, seed-producing groves in North Carolina** (Biltmore Gardens and a private estate near Highlands, NC). Crucially, it is important to find just how far north one need plant in order for the canker to either be unable to live or be **unable to lethally attack a Torreya tree**. It is possible that Jason Smith already found canker at the Biltmore — but if it is nonlethal there, that would be an enormously useful finding that would help our efforts tremendously.

Do know that if you look around our website, you will see that **we ourselves successfully got seed production at an outdoor planting in Cleveland OH beginnining in 2018**. Accordingly, Sept 2019 I petitioned the USF&WS to downlist T. taxifolia from endangered to threatened. Given the disarray of govt operations during that time, I received one reply that said no and a later one that said my petition was officially under consideration (go to our "Reports" page and scroll down to Sept 2019 to see it). Since then, I have heard nothing. I would rather collaborate than combat. **Perhaps your paper on the pathogen can be put to use in ways that foster collaboration in behalf of this ancient species.**

Thank you for your assistance,
Connie Barlow, founder of Torreya Guardians

From: Connie Barlow <conniebarlow52@gmail.com>
Subject: syncing USDA forest pathology research with USDA climate hub
Date: **January 28, 2022** at 12:33:47 PM EST
To: tyler.j.dreaden@usda.gov
Cc: steve.mcnulty@usda.gov, "Swanston, Christopher -FS" <christopher.swanston@usda.gov>, thomas.m.schuler@usda.gov

cc: **Steve McNulty, Chris Swanston, and Thomas Schuler for their climate hub leadership in USDA**

RE the importance of **reviewing USDA pathology papers** from the standpoint of **climate adaptation tools** for responding to increased vulnerability of native trees to pathogens when stressed by increasing heat and drought.

Hello Tyler Dreaden-

I am **founder of** Torreya Guardians, and hence have read your 2020 paper:

"Detection method for *Fusarium torreyae* the canker pathogen of the critically endangered Florida Torreya, *Torreya taxifolia*"

Yours is the 5th peer-reviewed paper on the topic of *Fusarium torreyae,* and you are the second USDA pathologist to be listed as an author or co-author on the topic.

While the merits of the pathology science in all such papers is not something I can evaluate, I believe **it is crucial to begin placing all such forest disease papers in the context of ongoing climate change**. You may not be aware that Torreya Guardians is widely referenced in academic papers (and some media) for having used an "exception" for plants in the U.S. Endangered Species Act in order to begin "assisted migration" of this glacial relict tree to more northerly realms — and that we have achieved outdoor seed production as far north as Cleveland, Ohio.

Because **Florida Torreya is listed by USF&WS as a critically endangered species**, and because the citizen-v.-government conflict in recovery of this species has yet to be reconciled (and because next year is the 50th anniversary of passage of the 1973 ESA), it is especially **important for USDA climate hub experts** to review papers pertaining to *Fusarium torreyae* that include USDA authorship. There are far bigger issues involved now. **USDA has been the earliest lead in U.S. government** for responding to ongoing climate change with actual adaptation tools. I co-authored a wikipedia page that highlights both the US and the Canadian forestry service

researchers who have contributed academic papers on "assisted migration" including climate-responses in seed transfer guidelines. Within DOI, only the NPS and the refuges arm of F&WS have demonstrated any climate awareness and need for climate adaptation. **F&WS endangered species management is still in the dark ages**, which means it is still only we citizens who are helping this glacial relict tree escape further climate warming.

Sadly, while common native canopy trees are getting the go-ahead to be helped in moving poleward, **the most endangered conifer in North America (an undisputed glacial relict) is still being prevented from obtaining such a simple and rational official action**. It is the un-peer-reviewed threat of potential spread to other tree species of *Fusarium torreyae* that is now the linchpin of the F&WS and GA botanical gardens refusal to begin poleward assisted migration experiments of their own. **Your 2020 paper strengthens their position.** Here is how:

Your paper is the first of the 5 peer-reviewed papers to **cite a master's thesis paper in the references**. The master's thesis (2012 by Aaron Trulock) is not peer-reviewed literature, and yet its within-lab research and speculations on **the possibility of *F. torreyae* being able to infect (lethally) other native conifers and hardwoods** have increasingly been used by staff of the two Georgia botanical gardens as reasons to disallow any northward botanical gardens from receiving seeds from n. GA ex situ mature plantings unless they are willing to sign MOU to use the seeds only for genetic safeguarding and none for assisted migration. I personally doubt that the lab-based inoculation results and speculative excesses of Trulock 2012 could have ever been able to pass through a peer-review process without significant editing — and removal of its final paragraph. Hence, I criticize your use of it in your 2020 *F. torreyae* paper. Notably, too, although no peer-reviewed paper has placed F. torreyae as being a non-native pathogen, the **initial fear-mongering** (March 2018 Torreya symposium) about northward movement of a possible non-native pathogen (coupled with recommendation of genetic engineering of Florida Torreya for Fusarium resistance) is still in the public arena — although, thankfully, absent from recent USF&WS statements.

Note: I have read all the *F. torreyae* papers and posted excerpts (along with my own comments) in this section of a lengthy page on the causes of endangerment on the Torreya Guardians website.

To reiterate: I do understand how it would have been easy for you to be unaware of the larger climate tools and ESA issues/politics pertaining to *Fusarium torreyae.* Therefore, I do want to **congratulate you on your 2016 first-author paper in which work on *Phytophthora* in Kentucky** makes clear how the pathogen is only dangerous to timber-value trees under management conditions that expose the area to drier, hotter

soils and recently cut stumps — and thus make it clear **how climate hub experts could use your pathology paper** to proceed with climate adaptation considerations for the most vulnerable trees in those regions of Kentucky.

Best wishes for your continuing climate-aware pathology work,
Connie Barlow, Researchgate page

From: Connie Barlow <conniebarlow52@gmail.com>
Subject: What Florida Native Plant Society is saying about Torreya pathology
Date: **February 7, 2022** at 1:26:25 PM EST
To: tyler.j.dreaden@usda.gov
Cc: executivedirector@fnps.org, torreyakeepers@fnps.org, communications@fnps.org, steve.mcnulty@usda.gov, thomas.m.schuler@usda.gov

RE: **Concern about the management implications of your forthcoming paper on *Fusarium torreyae*** inoculations of Appalachian native trees — and whether that work will **continue to prevent official actions from authorizing the use of climate adaptation tools** for helping an endangered glacial relict conifer move north.

Hello Tyler -

January 28, I sent you an email about **your 2020 paper**,

"Detection method for ***Fusarium torreyae*** the canker pathogen of the critically endangered Florida Torreya, *Torreya taxifolia*."

The gist of my communication to you was:

> "**Yours is the 5th peer-reviewed paper on the topic of *Fusarium torreyae*,** and you are the second USDA pathologist to be listed as an author or co-author on the topic.... Your paper is the first of the 5 peer-reviewed papers to **cite a master's thesis paper in the references**. The master's thesis (2012 by Aaron Trulock) is not peer-reviewed literature, and yet its within-lab research and speculations on **the possibility of *F. torreyae* being able to infect (lethally) other native conifers and hardwoods** have increasingly been used by staff of the two Georgia botanical gardens as reasons to disallow any northward botanical gardens from receiving seeds from n. GA ex situ mature plantings unless they are willing to sign MOU to use the seeds only for genetic safeguarding and none for assisted migration. I personally doubt that the lab-based inoculation results and speculative excesses of Trulock 2012 could have ever been able to pass through a peer-review process without significant editing — and removal of its final paragraph. Hence, I criticize your use of it in your 2020 *F.*

torreyae paper. Notably, too, although no peer-reviewed paper has placed F. torreyae as being a non-native pathogen, the **initial fear-mongering** (March 2018 Torreya symposium) about northward movement of a possible non-native pathogen (coupled with recommendation of genetic engineering of Florida Torreya for Fusarium resistance) is still in the public arena — although, thankfully, absent from recent USF&WS statements."

UPDATE: **Last week a staff member of the FLORIDA NATIVE PLANT SOCIETY**, Lilly Anderson-Messec, presented an online webinar for the Tarflower chapter on the History and Management of Florida Torreya.

Two of us TORREYA GUARDIANS were among the online audience.

Much of the webinar was uncontroversial, informative, and well illustrated, as there is certainly **great value in TorreyaKeepers volunteers** documenting new specimens on private lands and thus adding genetic diversity to the ex situ safeguarding collections of the two botanical gardens in Georgia. **I was especially pleased that Ms. Anderson-Messec used moderate language for most of her talk**. My notes recall her as saying that the cause of the Torreya decline is "hotly debated." It was also good that she presented *Fusarium torreyae* as "the primary culprit" (instead of the singular cause). She also said that "Jason [Smith] suspects this fungus evolved in Asia." All this is factual reportage.

I was already aware that Atlanta Botanical Garden staff had reported the Fusarium as being present on "all plant material tested" of Florida Torreya, but **this webinar helpfully clarified that the Fusarium produces active canker pathology only on Torreya individual plants "when stressed"** — which apparently they all are in their peak-glacial refuge in n. Florida. That comports with my experience over the years with the **80-year-old Torreya Grove at the Biltmore Gardens near Asheville, NC**. Fusarium has, apparently, been there since first measured and reported in the original 1986 recovery plan (recently ID'd by Smith at the Biltmore as the torreyae species), and yet the trees look healthy to me — and squirrel-dispersed offspring are producing seeds there too. Hence, the sole reason for refusing new introductions of FL Torreya north of Georgia ex situ locales is for the express purpose of **preventing its spread into other native trees — and it is your collaborative research with Jason Smith on this point that represents the only peer-reviewed grounding for such immense concern**.

Anderson-Messec mentioned that **Jason Smith has another paper coming out "next month"**, which I presume you are on too, and that this paper documents new experiments (beyond Trulock 2012) that show the Fusarium can kill other native trees, including *Pinus pungens* of the Appalachian Mountains. I shall paste in below an image I captured during her presentation that shows (a) a photo of dying potted Pinus pungens in a lab setting and (b) a **shockingly hostile image she used in her program that criticizes the northward "assisted migration" actions of Torreya Guardians** since our founding (by me) in 2005.

During the **Q&A** part of the webinar, **the other Torreya Guardian (who has achieved seed production at his planted grove in Cleveland Ohio) asked, "I planted my torreyas in 2007 in Ohio. Are you saying I should tear them out?"**

Fortunately, Anderson-Messec responded that, so long as torreyas "do not express symptoms" of the disease, it does not pose a risk of spreading to surrounding trees. And therefore, the authorities are not recommending removing previous northward plantings.

BOTTOM LINE: As I expressed in my previous email to you about your 2020 paper, **I have great skepticism about the relevance of inoculations of Appalachian tree species in potted laboratory settings** — and presumably with no exposure to annual winter conditions of freezing, as occurs in the Appalachian region and northward. At minimum, I hope your forthcoming paper clarifies that **detection of the *Fusarium* on an outdoor northward-planted Torreya specimen that does not exhibit symptoms of the disease**, does not pose a risk to other tree species. Ideally, I hope your forthcoming paper also specifies the methodology of inoculation and the timing and conditions of the lab testing, so that the **ecological relevance of the results** can be evaluated by other pathologists and ecologists.

With concern,
Connie Barlow (my Researchgate page)

One of the images from Ms. Anderson-Messec's slide program:

From: Connie Barlow <conniebarlow52@gmail.com>
Subject: need peer-reviewed science to break impasse on Torreya taxifolia seeds prohibition
Date: June 8, 2023 at 10:08:34 AM EDT
To: tyler.j.dreaden@usda.gov, eric.gustafson@usda.gov
Cc: Louis -FS Iverson <louis.iverson@usda.gov>, publicaffairs@fws.gov

TO: Tyler Dreaden and Eric Gustafson, USDA forest pathologists familiar with the *Fusarium torreyae* issue and with how climate can limit northward pathogenicity of tree diseases (notably, *Phytophthora* root rot).

CC: Louis Iverson (climate range shift forestry expert); and media contact at USFWS

Hello to all. I hope this **outline format** will help each of you read through quickly and thus assess possibilities. Thank you, in advance!

PROBLEMS:

1. **Citizens and staff in Torreya Keepers are maligning citizens in Torreya Guardians for continuing to distribute seeds of Florida Torreya produced in horticultural plantings in central North Carolina and (our own) in Cleveland, Ohio**. (I, Connie Barlow, am founder of Torreya Guardians and webmaster of our extensive website.)

2. **Tens of thousands of seeds produced in the official ex situ Torreya groves ("genetic safeguarding") in northern Georgia are apparently still prohibited from distribution** (which is why botanical gardens in northward states now regularly query Torreya Guardians to access seeds for their own plantings).

3. This year is the **50th anniversary of the Endangered Species Act**, and as founder of Torreya Guardians I have already been contacted by Associated Press, CBS 60 Minutes, NYT Magazine, and was filmed last month for a 2025 documentary feature film. I personally value the ESA, but I cannot speak positively about the act when recounting my own nearly 2 decades of experience in **our citizen efforts to assist Florida's *Torreya taxfiolia* in moving north**.

REQUEST: **Could a group of USDA scientists evaluate and publish what is known and unknown about the science** concerning:

(a) **native v. non-native origin** of the newly identified *Fusarium torreyae*

(b) whether **"glacial relict"** history accounts for the small "historical native" range

(c) possibilities for successful reintroduction of Torreya into Florida, absent **genetic engineering**

(d) whether **unpublished lab experiments in Florida** that injected the fusarium into clippings or potted specimens of spruce, fir, and pine species native to high altitudes of the southern Appalachian mountains offer **reliable evidence for halting seed distribution** from the ex situ groves and perhaps also from mature horticultural plantings in North Carolina and Ohio.

(e) **scientifically credible next steps for producing peer-reviewable and thus publishable results** on the actual disease risks of continuing Torreya seed distribution northward of Florida and Georgia.

I am writing to USDA staff in the hopes that **your scientific understanding** of this topic and concern could **help USF&WS staff** in facilitating science-based, respectful, and publicly documented communicatiions with and between the interested publics and professionals.

EXAMPLE OF HOSTILITY: Fred Bess, our Cleveland OH planter (and distributor of seeds his Ohio grove produces) recently brought to my attention a Facebook thread that began with a 30 January 2023 post by **Adam Black, a former staff member of the U. Florida lab** that was involved in Fusarium injection experiments. Black wrote:

"... Sadly there is a group called the Torreya Guardians who still subscribe to the outdated theory that these trees were going extinct due to not having shifted north to cooler, higher elevations/latitudes after the last ice age. The group's "assisted migration" efforts (planting Torreyas all over the Appalachian region and beyond) has garnered a lot of well-meaning support, but we now know they are simply moving the pathogen into naive habitats with no knowledge of what other trees may be succeptible...perhaps causing a broader ecological disaster. Initial lab inoculation studies have produced some shocking symptoms in other eastern US native conifers...and this research continues in order to yield some solid data. Too energized by the attention and funding, the Torreya Guardians refuse to believe there is a problem and continue spreading the pathogen far and wide across the eastern US...."

On 14 May 2023, **Torreya Guardian Fred Bess, contributed a scientifically informed rebuttal** of Black's accusation. I excerpted Fred's rebuttal as a June 2023 entry on the Reports page of Torreya Guardians. His full, 6-part rebuttal appears at this linked section of the Torreya Guardians "Endangerment (causes of)" lengthy webpage. Fred concludes:

"... Finally, as I write this my male Torreya taxifolia trees are shedding pollen and that is being received by the female trees. **I suspect I'll have another banner seed crop.**

Last year it was close to **200 seeds from 3 female trees**. When they ripen, **I will freely offer them to anyone (east of the Mississippi river) for only the cost of postage.**

I fail to understand why the scientific community and citizen groups cannot work together for the good of this species. There truly does not need to be this complete refusal for scientists to work with other groups. Neither group is going anywhere, we should work together and stop trying to put up road blocks."

Sincerely,
Connie Barlow, bio