Background Documents for Navigating Toward a Resolution of the Conflict between Atlanta Botanical Garden and Torreya Guardians

(attachment to 7 August 2018 email from C. Barlow to M. P. Matheson at ABG)

From: Connie Barlow <conniebarlow52@gmail.com>
Subject: **FOIA FWS-2018-00613 proposed win-win solution**
Date: August 3, 2018 at 6:39:52 AM EDT
To: Tiffany McClurkin <foiar4@fws.gov>

RE: **Proposed win-win solution and the larger ESA imperative**.

Ms McClurkin -

1. SEED DATA. On July 26, a new posting pertaining to ex-situ seed production appeared in the "Conservation Updates" section of the *Torreya taxifolia* page of The Center for Plant Conservation. Much of that I already knew; I simply wanted to seek that kind of report via the FOIA process. The data pertains only to ex situ plantings by the Atlanta Botanical Garden (ABG property plus Blairsville State Park). There is nothing yet published on the Smithgall Woods site, where Torreya Plantings are administered by the University of Georgia. **Both sites demonstrate very problematic inattention to seed production (which is necessary for "recovery"), as the management concern apparently has been limited to genetic "safeguarding."** Ergo, so long as the individual trees in the ex situ plantings remain alive, the Georgia institutions administering the Recovery Plan likely regard that there is no genetic gain or loss by doing anything in particular with the seeds. The seeds, thus, can be ignored, and possibly not even counted. In contrast, a citizen regard for ESA management, such as my own, would deem any management goal that simply seeks to "prevent extinction" and "safeguard plant materials" (rather than aim for "recovery") as far from adequate.

2. USF&WS CRITICIZED AT JULY 17 SENATE HEARING. The CNN video post of the **2-hour hearing on the "Recovering America's Wildlife Act"** includes strong criticism of federal implementation of the ESA during the first three minutes. The committe chairman charges that endangered species are being **"kept on life support."** *Torreya taxifolia* (listed in 1984) could easily be demonstrated as a case example of such — but it doesn't need to be.

3. TOWARD A WIN-WIN SOLUTION. **The USF&WS could encourage Atlanta Botanical Garden and University of Georgia to join hands with Torreya Guardians to present a stunningly successful example** of *what it could be like* for other endangered plants to be managed into the uncertain future. This would especially apply to listed plants in which seed dispersal impediments likely account for their current small geographic ranges and thus put them in the greatest danger with ongoing "weather disruptions." Note that both the 1986 and the 2010 recovery plans for Torreya point to its "glacial relict" status as the likely cause of its exeedling small and isolated range in n. Florida. Read the quotes at the top of this page. The seed-dispersal impediment for Torreya taxifolia is that, while the Chattahoochee River is an excellent delivery system for moving seeds southward from the southern Appalachians toward the Gulf Coast, vertebrate dispersers (squirrels) are the only modes of transporation for getting

seeds back north. (See my "Paleoecology and Assisted Migration Debate" post.) Measurements taken by Torreya Guardians at a 90-year-old private grove of Torreya taxifolia nearly Highlands NC indicates that it took the trees nearly a century to establish offspring (with the help of squirrels) out to a distance of 40 yards. As well, such data indicates that there should be no fear of Torreya taxifolia becoming invasive if assisted to migrate back up into the Appalachian Mountains.

4. FOCUS ON THE LEARNINGS. Because no other glacial relict species is being managed with a deep-time understanding, **it would be unfair to charge the creators and implementors of the 2010 recovery plan update for Florida Torreya as being negligent**. There was no precedent for utilzing assisted migration for an endangered plant. And because no other citizen group had made use of the intentional loophole (just for plants) in the 1973 Act **it would be wrong to focus on the conflicts that have arisen between the official plan implementers and the citizen volunteers** (over whom the officials have no jurisdiction). Instead, we should focus on the learnings.

I can easily report in hindsight the **mistakes that I made** in organizing and playing a leadership role in Torreya Guardians. While I do maintain a detailed account (private document) on all the seeds we distribute, year-by-year, numbers, where the seeds came from, and to whom we send them, and while many of the volunteers have eagerly reported results ongoingly, I have not been perfect in my record-keeping. As well, my encouragement to planters starting in 2013 to "freeplant" seeds into their regrowth forests experimentally to discern favored habitats and plant associations, largely resulted in significant seed predation by rodents — until volunteers began reporting successes by planting seeds 4+ inches deep (beyond the reach of rodents). Thus, **the official implementers of the recovery plan are not alone in "wasting" seeds.**

The **ABG recent effort to determine how to undertake long-term storage** confirmed that drying or freezing are not options for intact Torreya seeds. Hence simple storage of seeds for use at a later time is not possible without high-tech "somatic embryogenesis," necessarily performed seed-by-seed — and thus very expensively.

From the perspective of learnings, all pieces are in place for finally launching a combined institution-citizen effort to ensure that no seed goes to waste. We citizens *are* needed. The seeds surplus to ex-situ safeguarding or storage need not go to waste, and we Torreya Guardians do not need to be primary recipients. Crucially, very little, if any money needs to be allocated to USF&WS or the states in order to accomplish such partnerships.

5. ENLIST CONSERVATION ORGANIZATIONS AND GARDEN CLUBS **to create plans and to recruit private landowners for receiving seeds produced in ex situ orchards that are deemed surplus** to the official federal/state recovery projects. In effect, that is how ABG and Torreya Guardians inadvertently collaborated before 2016.

6. ACCOMPLISH THIS REVISION THROUGH ESA AMENDMENT. Several days ago I reached out to a Senator's office to suggest a specific provision for plants in the amendment process. (Notice the appeal to Libertarian legislators and the language of "weather disruptions" rather than "climate change.") I wrote:
PROPOSED AMENDMENT: For listed threatened or endangered plants that are encountering abnormal weather disruptions (notably, extreme droughts, intense and/or long-lasting heat stress, and/or unusually mild winters conducive to population increases or range expansions of diseases and/or

insect vectors of diseases), citizens may choose to volunteer their private lands for ex situ plantings in less stressful locations as specified by the USDA Plant Hardiness Zone Map. Citizens will engage via their regional land trusts, botanical garden clubs, conservation organizations, etc. Such organizations will submit to the USF&WS requests for seeds or other plant materials within the context of their own species-specific recovery plans. Such plans will include, at minimum, (1) scientific certification that the species is (or almost certainly is) non-invasive in the proposed recipient locales and ecosystems, (2) a preliminary statement of best practices for planting and nurturing the species in their particular region and for determining suitable habitats and micro-climates for experimental plantings, (3) a description of how the plantings will be monitored, (4) a commitment to report results ongoingly to the USF&WS, (5) potential alliances with regional educational or research institutions that could aid in developing scientifically robust "citizen science" experiments so that ex situ citizen plantings can advance not only the numbers of individuals "safe-guarded" but also improve management practices toward the goal of species recovery and resultant de-listing. Organizations submitting species-specific local or regional recovery plans will attest to their ability to proceed without need for funds from federal, state, or local governmental entities.

7. ... OR BY REGULATORY REVISION. This recruitment of citizens and supervising institutions could equally be accomplished within the regulatory revisions now under consideration. Note that this regulatory shift would encourage non-profit institutions to lead, thus replacing the conflictual binary of either the official recovery plan implementers or a lone or loose group of citizens paying their own way.

8. I WILL BE SUBMITTING COMMENTS BY SEPTEMBER 24 AS TO REGULATORY REVISIONS. I would dearly love to do so in a way that elevates **the Florida Torreya case as demonstrating that such partnerships can be viable** — and will surely work better when regional conservation groups and garden clubs step forward to play the intermediary role between citizen planters and those who implement the official recovery plan. The free labor of students and interns supervised by a regional university should be easy to engage. The opportunity for academics to create degreed projects (and publish papers) should be attractive to universities, not only in environmental studies programs but also in communications, horticulture, etc. **I wonder if Atlanta Botanical Garden might be inclined to submit recommendations** along these lines, too. I wonder if an informed, neutral party might play a role in our two groups being able to trade ideas, and hence converge somewhat on our recommendations. I wonder if we can be on the same team.

9. SUPPLEMENTAL POINTS ON USF&WS STAFF:

- **Vivian Negron-Ortiz** in the USF&WS Panama FL office has deftly tried to manage the tensions. Notably, she reached out to invite Torreya Guardians to participate (phone conference call) in the final meeting of scientific and stakeholder advisors toward the 2010 recovery plan update). Two of us participated. She expessly asked the group to vote on whether to include an assisted migration pilot project. The two of us Torreya Guardians were the only participants to vote yes. Note: Although "critical habitat" has never been designated for Torreya, the nearby landowners who had Torreya on their properties not only were eager to cooperate; they seemed to feel such pride of ownership that they, quite naturally, were not willing to say "goodbye" to Torreya by voting to have northward locations tested as possibly more suitable.

- **Donald W. Imm**, USF&WS State Supervisor (Georgia) was among the 6 signatories to a May 2016 memo of understanding titled "2016 Torreya Caution Statement to GPCA Botanical Guardians", which I received as an attachment from ABG Emily Coffey in her email to me February 2018. I was unaware of the accusations (and thus the hostility and unwillingness to communicate) prior to Coffey's email. I attach that pdf at bottom

10. BE AWARE OF THE UNIVERSITY OF FLORIDA'S ENTRY INTO PROMOTING GENETIC MODIFICATION OF FLORIDA TORREYA. This past March, the university hosted an invitation-only meeting that resulted in a glowing press report of the Forest Pathology program moving ahead with **using CRISPR technology to nudge a fusarium-resistant wheat gene into Torreya**. The press highlighted the participation of **E.O. Wilson** at the gathering. At first I was livid; then I realized that enviro groups will swarm in at recovery plan update time, protesting that the most endangered conifer in the world is being handled this way. So I don't need to worry about it. But USF&WS does. Learn more about this turn of events by going to this page and scrolling down to my March 2018 entry.

I look forward to working with your office to turn this FOIA problem into a win for the USF&WS in the ongoing "modernizing" of the Endangered Species Act and/or its regulations.

Sincerely,
Connie Barlow, Founder of Torreya Guardians

From: "FOIA, FWHQ" <fwhq_foia@fws.gov>
Subject: New Request; Fwd: [EXTERNAL] New FOIA request received for U.S. Fish and Wildlife Service
Date: March 29, 2018 at 11:35:40 AM EDT
To: <conniebarlow52@gmail.com>
Cc: FW4 FOIA R4 <foiar4@fws.gov>

Dear Connie Barlow,

The United States Fish and Wildlife Service (FWS) Headquarters FOIA Office received your FOIA request dated March 27, 2018. We have forwarded your request to our Region 4 Office for processing. You will receive a formal acknowledgement shortly.

If you have any questions regarding your FOIA request; please contact Tiffany McClurkin at foiar4@fws.gov or 404-679-4104.

Respectfully,

United States Fish and Wildlife Service
Headquarters Freedom of Information Act Office
MS: IRTM
5275 Leesburg Pike
Falls Church, VA 22041

Hello,

A new FOIA request was submitted to your agency component:

The following list contains the entire submission, and is formatted for ease of viewing and printing.
request_id
2971
confirmation_id
3726
address_city
Freeland
address_country
United States
address_line1
5246 Mutiny Bay Rd
address_state_province
WA
address_zip_postal_code
98249
company_organization
TorreyaGuardians.org
email
conniebarlow52@gmail.com
expedited_processing
yes
expedited_processing_explanation
Our group, Torreya Guardians, has been mentioned in many academic papers and some media reports as successfully pursuing the "assisted migration" northward of the USFWS endangered species, Florida Torreya. Yet, March 1-2 a USFWS staffer (Vivian Negron-Ortiz) in charge of this species attended a "Torreya Symposium" organized by a variety of institutions. Today, an article appeared by a journalist in an online environmental magazine that indicates that the "official" plans created by this institutional team exclude coordination with our group.

request_id	2971
confirmation_id	3726
address_city	Freeland
address_country	United States
address_line1	5246 Mutiny Bay Rd
address_state_province	WA
address_zip_postal_code	98249
company_organization	TorreyaGuardians.org
email	conniebarlow52@gmail.com
expedited_processing	yes

expedited_processing_explanation	Our group, Torreya Guardians, has been mentioned in many academic papers and some media reports as successfully pursuing the "assisted migration" northward of the USFWS endangered species, Florida Torreya. Yet, March 1-2 a USFWS staffer (Vivian Negron-Ortiz) in charge of this species attended a "Torreya Symposium" organized by a variety of institutions. Today, an article appeared by a journalist in an online environmental magazine that indicates that the "official" plans created by this institutional team exclude coordination with our group. Yet the 2010 recovery plan mentions in 3 places for institutions to coordinate their efforts with us. Our group is entirely engaged in moving seeds north, as and easy to implement and inexpensive solution to the species' ongoing decline (since its listing as an endangered species in 1984) in its small peak-glacial refuge in Florida. Yet the article indicates that the official institutions and scientists plan to engage in expensive and highly interventionist strategies of freezing embryos and also undertaking CRISPR genetic manipulation -- with no indication that they are considering the success we are achieving in simple and cheap actions of simply helping this large-seeded species move its seeds to cooler realms. You can access this journal article (March 27 in Yale Environment 360) via the newest

fee_waiver	yes
fee_waiver_explanation	I am the founder of Torreya Guardians, which is a group of citizen volunteers who legally access a loophole in the Endangered Species Act to help the glacial relict ancient conifer tree, Torreya taxifolia, escape a warming climate by legally accessing seeds for planting by botanical gardens and private landholders in states north of its historically native range in n. FL and s. GA. We receive no funding from anyone and we all volunteer our own time for helping this critically endangered tree. You can learn about the history of our actions via this webpage on our website, History of Torreya Guardians: http://www.torreyaguardians.org/guardians.html
name_first	Connie
name_last	Barlow
phone_number	850-420-8002
request_category	other

request_description	The Fish & Wildlife Service has not yet posted anything in its ongoing reports database as to the actual quantities of endangered Torreya taxifolia seeds produced year-by-year from ex situ plantings in Smithgall Woods and Blairsville GA, since those trees began producing seeds. It is important for the public to know the success of seed production, year by year, and especially the final destinations of those precious seeds, as produced under the terms of the 2010 update of the ESA recovery plan for this endangered species. My concern is that the seeds at Smithgall Woods may have been unharvested, and therefore "wasted" as food for local squirrels. I have already checked the online "Record of Actions" at this USFWS url: https://ecos.fws.gov/ecp0/reports/implementation-activity-status-ore-report?documentId=600127&entityId=1191 No information is available there for any year. However, the 2010 recovery plan, on p. 9, documented that the agency was already aware that at least the Smithgall Woods ex situ plantings were already producing seeds. It says, "The material planted at Smithgall Woods was propagated from all Georgia source population material (Army Corps. of Engineers, site at Woodruff Dam, Lake Seminole, in Georgia). The trees have grown quite large and are now

From: Tiffany McClurkin <foiar4@fws.gov>
Subject: FOIA FWS-2018-00613 1st Partial Response
Date: July 24, 2018 at 8:02:39 AM EDT
To: <conniebarlow52@gmail.com>
Cc: "'Lee, Larry'" <larry_lee@fws.gov>

Good Morning Ms. Barlow,

Attached is your signed 1st partial response letter and documents. As per our conversation, there is still one document that is currently being routed through the proper channels to be sent to the Solicitor's Office for review. Thanks!

V/R

Tiffany McClurkin
Government Information Specialist
Freedom of Information Act (FOIA) Coordinator
U.S. Fish & Wildlife Service
Southeast Region (Region 4)
1875 Century Blvd, Suite 214
Atlanta GA 30345
(E) foiar4@fws.gov

5-Part Email Correspondence with ABG & others, Feb 2018

chronological bt Connie Barlow, Emily Coffey, Carrie Radcliffe, and Jason Smith

From: **Connie Barlow** <conniebarlow52@gmail.com>
Subject: prep for ABG at Torreya Symposium March 1
Date: February 14, 2018 at 9:05:57 AM EST
To: CRadcliffe@AtlantaBG.org

Carrie -

Hello! I am the founder of Torreya Guardians and also the webmaster. Great to hear you are now fully working with ABG. (My records show that Jack Johnston donated 3 Torreya seedlings to you in 2015).

Two things:

1. TORREYA SYMPOSIUM - I see that ABG's new director of conservation is on the speaker list. I imagine that you and Ron Determann will be the staff members getting her up to speed on Torreya.

Torreya Guardians is not on the speaker list, but one of our volunteer planters (Clint Bancroft, TN) will attend — if his mother is not dying at that moment.

Know that I have been updating the top-level pages on our Torreya Guardians website. Especially, see that I have made major changes in the "Efforts to Save" page, where I try to list/link all the major urls for the official ESA program and plan — and I feature your new Smithgall Woods video: http://www.torreyaguardians.org/save.html Feel free to suggest edits and additions to the ABG part.

I am working behind the scenes contacting in advance some of the symposium speakers (or their staff), trying to ensure that they are aware of some basic information about Torreya Guardians. I have had several contacts with Jason Smith (and in years past, too). I had a phone conversation with the director of research at American Chestnut Foundation, Jared Westbroeck. I have had several emails with Gregory Payton at Morton Arboretum (I met him in November when I passed thru Chicago and personally donated a Florida Torreya potted seedling to them).

I plan to contact E. O. Wilson soon via email today and I hope to speak with him via phone. He knew me back in the 90s before I retired from science writing.

I have been thinking a lot about the distinctions in what we can do as volunteers and what the official team may be leaning toward doing re Florida Torreya. My thoughts keep growing, but these seem to be the main ones I'd like to convey to you, and encourage you to convey to Emily Coffey as you see fit:

• **Paleoecology v. Pathology Paradigm.** Although Florida Torreya has been recognized officially as a glacial relict ever since its designation as an endangered species in 1984, as I look carefully through the documents, I see no evidence that any document considered moving it northward until Barlow and Martin 2004 paper in Wild Earth. I, of course, have been advocating and acting on this "paleoecological" perspective ever since. This contrasts with Mark Schwartz's (and now Jason Smith's) focus on "pathology" as the cause to confront. I agree that disease is the proximate cause, but unlike the plant pathologists in charge, I see proximate cause as embedded within the ultimate cause of climate change: peak interglacial as the problem in the 50s and now exacerbated by anthropogenic climate change.

• **Analogue species.** Until evidence can be shown that Fusarium torreyana is indeed an exotic (or that, whether exotic or not, it is capable of spreading northward into the old Torreya groves at the Biltmore (Asheville) and Harbison House (Highlands) in North Carolina, I suggest that American Chestnut is not the best analogue for judging how to help Florida Torreya recover. Rather, any of the Rocky Mountain conifers (pines, spruces) suffering largescale deaths by native bark beetles (carrying native fungi) should be the analogues. There is no doubt among USFS researchers out west that, while native beetles/fungi are the proximate cause it is a changing climate that is the ultimate cause — and they are therefore reconciled to having to replant with seed populations or species drawn substantially from the south.

• **Importance of Natural History Observations:** When I learned that E. O. Wilson will be a speaker (his autobiography is called Naturalst), I determined to produce something that I could draw his attention to that would be a convincing demonstration of the value of natural history observations in recovery team deliberations. Already I knew that the video I made of Jack Johnston and me documenting the health and seed shadow of the 90 year old grove in Highlands NC is very helpful in that regard. But I knew the most convincing observations are those that I made in 2005 on site visits to Torreya californica in the wild. Therefore I spent the last week, many hours, converting the photos I took in 2005 into a 2-part narrated video. I am going to recommend to Wilson that he watch that video. You can access both parts via the first entry on this page: http://www.torreyaguardians.org/comments.html

2. POSSIBILITY FOR ABG + TORREYA GUARDIANS COLLABORATION. I imagine that one commitment we all share is to not let any precious seeds go to waste. As they cannot be stored long-term, that means they must be grown ex situ on an official site or somehow distributed to volunteer planters. For a variety of reasons, I am the most strenuous proponent for "free-planting" Torreya seeds directly into regrowth forests, skipping the potted stage. Obviously, that can only happen when seeds are abundant — which they used to be for us until 2016. Do know that we now have a big circuit of volunteers in northward states who would be happy to plant as many seeds as we give them. Obviously, some will be predated by rodents if free-planted, but we have recent evidence that planting seeds 6 inches deep may be even better protection than placing flat rocks over them. My experience at our 2008 Waynesville site, in contrast, is that the trees really struggle if they are rootbound, so I would encourage ABG to never let your seedlings stay too long in the pot before getting them, somehow, into the ground.

• OPPORTUNITY - I am staying at a friend's home in **Big Canoe GA** till March 10. This gated community has vast community forest lands, the coolest portions of which contain hemlock being treated against adelgids. These ravines would provide terrific slopes for exploring right here in north Georgia habitat differences based entirely on slope aspect and height above creek depth. The community already controls the deer population, so that would be another reason that torreya experiments — free planting seeds or outplanting potted seedlings right into forest plots — here could be ideal, and fully within the bounds of the existing recovery plan. **Would you like to come out here and explore the grounds** — and meet folks who could advocate for community agreement of an ABG experiment here?

Finally, I'll be speaking about Torreya Guardians to a biology class at Georgia College tomorrow and then returning to Big Canoe on Friday. Where do you live now?

Connie Barlow
850-420-8002

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From: Emily Coffey <ecoffey@atlantabg.org>
Subject: ABG Torreya taxifolia policy
Date: February 15, 2018 at 12:21:03 PM EST
To: conniebarlow52@gmail.com
Cc: Jennifer Ceska - State Botanical Gard <jceska@uga.edu>, Carrie Radcliffe <cradcliffe@atlantabg.org>, Rebecca Byrd <rbyrd@atlantabg.org>, Ron Determann <rdetermann@atlantabg.org>, "Negron-Ortiz, Vivian" <vivian_negronortiz@fws.gov>, "SMITH,JASON ANDREW" <jasons@ufl.edu>

Dear Connie,

I was forwarded your message by Carrie Radcliffe. I would like to take the opportunity to introduce myself and explain our work with Torreya. I am the new Vice President of Conservation and Research at ABG and took over the position in August. My team currently works with USFWS, Florida Park Service, University of Florida, and GPCA to conduct research and provide safeguarding for *Torreya taxifolia*.

We feel we need to clarify our stance and the work related to *Torreya taxifolia*. ABG and all of our GPCA partners work within strict scientifically driven conservation parameters. I am attaching a statement released by GPCA and the Botanical Guardians of Georgia from 2016 on Torreya as well as the GPCA *in situ* and *ex situ* policy. These documents summarize the collective viewpoint and policy of the GPCA, which resolutely opposes assisted migration of Torreya.

Regarding the paleoecological argument, as a conservation paleontologist by training (I went to University of Oxford, UK where I studied long-term ecology under Professor Kathy Willis), I have found no scientifically sound evidence that can support *Torreya taxifolia* as a northern species during the Pleistocene - no sedimentary evidence has been shown and based on the plants biology/physiology/ habitat requirement it is not suited for northern climates including the Appalachia Mountains. Non-sanctioned introduction of this species into a novel ecosystem, outside of its natural range, could have catastrophic consequences and is staunchly opposed by the USFWS.

The argument that outplanting action should be taken prior to rigorous scientific experimentation and conformation is truly shocking and reckless. We do not under any circumstances condone the assisted migration of *Torreya taxifolia* or the outplanting of a Federally listed species on public or private lands without proper permitting and approval from the USFWS. Furthermore if we find evidence of any individual removing propagules or any plant material from local, state, or federal lands in GA or elsewhere, without appropriate state and federal approvals we will involve the authorities. This includes you and your affiliates, additionally, the transportation of seed or seedlings across state lines without proper permissions would also involve the authorities.

GPCA is aware of previous trespassing to illegal harvest seed followed by illegal transporting and selling of Torreya across state lines. Further actions of this nature will not be ignored. ABG strongly opposes the sale of Federally Listed Endangered Species - this kind of activity can only hurt the native populations and careful work we and our collaborators are conducting. We encourage that these un-permitted activities cease, as they are harmful and undermine official research and safeguarding efforts. Please review the attached documents for additional information.

We take the conservation and long-term survival of this species very seriously as well as the health of all other conifers in the eastern US. ABG has spent over 17 years actively working on *in situ* and *ex situ* conservation of this species and we work within a stringent scientifically driven methodology taking into account the most recent and up to date research.

We hope you will seriously take into account the current scientific findings for this species and reconsider your position on assisted migration or 'free-planting' of *Torreya taxifolia*. Please feel free to read the most recent article published by Dr. Jason Smith. We all wish to save this important species however we must do so within the appropriate legal parameters and with the full weight of current scientific knowledge.

Sincerely,
Emily

Emily E.D. Coffey, Ph.D.
Vice President of Conservation and Research

Atlanta Botanical Garden
1345 Piedmont Ave NE
Atlanta, GA 30309

From: Connie Barlow <conniebarlow52@gmail.com>
Subject: Re: ABG Torreya taxifolia policy
Date: February 20, 2018 at 2:58:53 PM EST
To: Emily Coffey <ecoffey@atlantabg.org>
Cc: Jennifer Ceska - State Botanical Gard <jceska@uga.edu>, Carrie Radcliffe <cradcliffe@atlantabg.org>, Rebecca Byrd <rbyrd@atlantabg.org>, Ron Determann <rdetermann@atlantabg.org>, "Negron-Ortiz, Vivian" <vivian_negronortiz@fws.gov>, "SMITH,JASON ANDREW" <jasons@ufl.edu>

Dear Dr. Coffey,

Thank you for your quick response to my February 14 query (at bottom), and especially for attaching the May 2016 multi-agency memo, "Torreya caution statement to GPCA". The memo helps me understand why my attempts to communicate with ABG in recent years have gone unanswered. I now see that of course you were led to be "cautious" in communicating with us, as Torreya Guardians was regarded by GPCA institutions as the likely suspect for an apparent theft of seeds from the Smithgall Woods ex situ orchard.

Please know that seeds donated to us within Georgia have entirely come from the Experiment Station in Blairsville (not from Smithgall Woods), on a year-by-year basis, always subject to whether a bona fide institutional project would have a use for the seeds. Allowing Torreya Guardians access was regarded as a step up from just leaving unharvested seeds to the local squirrels, and we are grateful for that. My records show that we gained from the fall 2014 seed production at Blairsville about 4,000 seeds and from the fall 2015 production almost more seeds than we could responsibly distribute: 7,000. In July 2016, an email from the new superintendent at the Blairsville station informed us that our access to seeds had ended, which was not unexpected. I am heartened to know that ex situ safeguarding of this species by GPCA institutions (and affiliated botanical gardens) has finally reached the point that good homes/projects/experiments are now assured for the full production of seeds each year. None will be left behind.

I personally know how difficult it can be to find a sufficient number of good homes when the seeds we are responsible for number in the thousands. It is also a stretch for volunteers to maintain full documentation such that monitoring of results (especially those that can help ascertain habitat preferences, species interactions, and climate tolerances) can follow for many years to come. I know, too, how crucial it is to get seeds into the soil (natural or potted) in a timely fashion, as moisture conditions that are too dry or too wet will spell their demise. GPCA's own research confirms that long-term seed storage is not feasible for this species. Finally, our experience with planting potted seedlings in 2008 at Waynesville NC confirms that seedlings of this taprooted species that are left too long in the pot (hence, root-bound) will require either ideal conditions (planting near a waterfall) or will need to revert to regrowth from basals. Overall, serving well this unusual species requires a great deal of attention and openness to learnings.

We have been grateful not only to private landowners who accept seeds for planting and monitoring but also to local nurseries who are willing to accept seeds from us that we simply cannot find homes for. Thanks to Shirey et al. 2013 "Commercial Trade of Federally Listed Threatened and Endangered Plants in the United States," the terms are very clear by which nurseries can also participate, commercially and openly, in striving for all seeds to find a home, although they cannot document and monitor results in the fullness that our own group strives to achieve. My (albeit limited) understanding is that the nurseries we have donated seeds to have been complying well with the law. As you know, our historic assisted migration plantings of T. taxifolia in the area of Waynesville NC in 2008 were only possible because of the mutualistic role for nurseries established by the Endangered Species Act. We purchased potted seedlings from a nursery; their business benefited from that sale. Then we transported and donated the seedlings to private landowners.

Everything we do is by donation of our time and effort. We are dedicated volunteers. The result is that, however the science eventually unfolds in determining whether T. taxifolia's ultimate threat is an exotic pathogen or that it was merely left behind in its peak glacial refuge and needs some human assistance in moving north, my sense is that the ex-situ plantings we ourselves have made possible through the years are (a) clearly not endangering native plants in the recipient ecosystems, (b) will continue to offer

observational and possibly empirical insights into the species' preferred habitats and cold-adaptation limits, and (c) extend the documented ex-situ plantings that offer security, genetic preservation, and possibly ideal new habitat in this century of anthropogenic climate warming.

Finally, the Torreya Guardians website is not meant to tie ourselves to the official recovery program (nor imply that official agencies approve of our actions and experiments). Rather, the site is largely a clearinghouse of Torreya information taken from public/government resources and open-source internet articles. We know that this knowledge is appreciated by our volunteer planters, and we hope that someday our documentation of results and learnings will also assist those working to fulfill the promise of the official recovery plan.

For Torreya and its future,
Connie Barlow, founder and volunteer with Torreya Guardians

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From: **"SMITH,JASON ANDREW"** <jasons@UFL.EDU>
Subject: Re: ABG Torreya taxifolia policy
Date: February 20, 2018 at 4:09:10 PM EST
To: Connie Barlow <conniebarlow52@gmail.com>, Emily Coffey <ecoffey@atlantabg.org>
Cc: Jennifer Ceska - State Botanical Gard <jceska@uga.edu>, Carrie Radcliffe <cradcliffe@atlantabg.org>, Rebecca Byrd <rbyrd@atlantabg.org>, Ron Determann <rdetermann@atlantabg.org>, "Negron-Ortiz, Vivian" <vivian_negronortiz@fws.gov>, "Nelson, Charles (Dana) -FS" <dananelson@fs.fed.us>

There is no doubt in my mind that the primary driver in the mortality of the trees is the pathogen. It is reasonable to assume that it is easily moved around. Furthermore, my M.S. Student, Aaron Trulock, completed a study that demonstrated that several conifer species native to the southern Appalachians are susceptible (http://eds.a.ebscohost.com/eds/detail/detail?vid=1&sid=cf6e73e9-f3f7-4642-a162-c10aa1db5243%40sessionmgr4008&bdata=JnNpdGU9ZWRzLWxpdmU%3d#AN=ufl.031447728&db=cat04364a), with a couple of species being highly susceptible (Fraser fir, hemlock)……This raise a flag of caution that any planted material there should come from disease-free trees and every effort should go into not introducing it. We did confirm that the trees at Biltmore Estate in Asheville already are infected, for example…

Assisted migration is not a simple strategy for a species that has a healthy base population, but for one that is affected by a pathogen (and one that appears to be of foreign origin) it is far more complicated and risky. As I'v always said, there are opportunities for the Guardians to collaborate with us to learn more about how best to cultivate the species etc., but it should be done carefully and in a way that allows for data collections and sharing of information.

Jason
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Jason A. Smith
ProForest – Proactive Forest Health and Resilience Team Member
College of Agriculture and Life Sciences Researcher and Educator
University of Florida
352-843-0843
jasons@ufl.edu

From: Carrie Radcliffe <cradcliffe@atlantabg.org>
Subject: Regarding Torreya fruit collection and our position on the activities of Torreya Guardians
Date: February 28, 2018 at 3:32:22 PM EST
To: conniebarlow52@gmail.com
Cc: Emily Coffey <ecoffey@atlantabg.org>, Rebecca Byrd <rbyrd@atlantabg.org>, Ron Determann <rdetermann@atlantabg.org>

Hello Connie,

I am glad that you got in touch with us and that Emily could clarify our work, as well as our opposition to the assisted migration of Torreya. I do know that members of our team have been in disagreement of activities of the Torreya Guardians all along. I was first exposed to this controversy when I was a student at UGA and an employee of the State Botanical Garden in the early- to mid-2000s. We have even had conservation professionals be wary of Atlanta Botanical Garden because they thought we were associated with TG. I am also aware that attempts have been made by ABG and our conservation partners over many years to advise TG about the necessity of adhering to best practices and scientific protocols in order to prevent the spread of disease and maintain the genetic integrity of material safeguarded *ex situ*.

I would prefer not to be featured on the Torreya Guardians website. The video was recorded to accompany the interpretive signage at Smithgall Woods State Park and is not intended to promote TG. I would like to let you know that many of our colleagues and research partners have been dismayed and even disgruntled by TG mentioning their work in the promotion of their own organization, because Torreya Guardians is not connected in any way to our/ their research, safeguarding work, or advances in conserving this species. It is not agreeable for the work of others to be promoted by TG in a way that claims affiliation with projects that they are not involved with.

Jack Johnston was once a valued volunteer of the Georgia Plant Conservation Alliance. I know him also as a local resident of the North Georgia Mountains, as well as a friend. I was advised to cease communication with him by my superiors a few years ago because his decisions to disregard standard practice for the handling of rare plant propagules became a threat to official conservation work and research. He used to help care for our Torreya safeguarding sites, but was also harvesting fruit without our knowledge or permission. That he felt entitled to do this and chose not to let us know about the fruiting plants at the UGA Experiment Station until very recently, are violations of the trust required to serve GPCA as a Botanical Guardian.

I know that Jack is very generous - his heart, like yours, is in the right place. However, this generosity has been problematic and has even been in violation of the law. Jack not only removed propagules of our plants without our knowledge and permission, but transported them across state lines - illegal for an endangered species. He gave seed to Highlands Nature Center and Georgia Forest Watch for them to sell for fundraising. If this were a safe or valid option to

raise money, we would have considered it ourselves, but we work very hard to raise the funds to support scientific research and permitted, viable conservation actions for Torreya.

I would like to take this opportunity to make it clear that the plants at the Georgia Mountain Research and Education Center (also known as the UGA Mountain Experiment Station) are the legal property of Atlanta Botanical Garden. Plant material was provided by Ron Determann, and a research contract was set up with the UGA Horticulture Department & GMREC to house and care for the trees. This was nearly 20 years ago, and it is unfortunate that we were not notified of the production of fruit before 2016. Luckily the new Superintendent immediately acknowledged that fruit had been illegally harvested without the knowledge of the project partners and put a stop to it. Only then did Jack inform us of the bounty that was available - because he was denied access. I was informed of his recent attempts to regain access to the plants, and that is not going to be allowed by GMREC or UGA.

While we are grateful to have found out that the trees not only survived all this time, but grew and became productive, it is very unfortunate that material was illegally taken and distributed. This not only allowed for un-permitted spread of propagules that now represent a pathogenic threat to the entire region, but it has impeded scientific research and official conservation of Torreya. This is difficult to accept, as we are now in an emergency planning stage with the U.S. Fish & Wildlife Service, Florida Department of Environmental Protection, and the University of Florida. We could have been further along in our research without the impediments outlined above.

We appreciate your cooperation and wish you the best.

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Carrie Radcliffe, M.S.

Restoration Coordinator
Safeguarding Database Manager
Department of Science & Conservation
Atlanta Botanical Garden
Mountain Bog Project Coordinator
Georgia Plant Conservation Alliance

5 May 2016
GPCA and Botanical Guardians:

As members of the GPCA and Botanical Guardians we can feel justifiably proud of our ethics, our teamwork, our mutual support and open sharing of information. But in light of a recent occurrence, we would like to remind the entire group of our official GPCA Safeguarding Policy Statement. It outlines basic best practices and our code of ethics.

None of us have permission to remove propagules or any plant material from state or federal lands for our own purposes or for projects that lie outside those sanctioned by GPCA at our project planning meetings.

We mention this because in the last several months, someone removed all of the fruits from the *Torreya* safeguarding collections at Smithgall Woods State Park. All of the fruits had been bagged for a GPCA seed-collecting project. Nevertheless, every fruit was methodically removed at some time after the park was closed. This would have required a great deal of time and planning.

We have no information about where these fruits went, but we press upon all of you to take seriously any stories you hear about taking from public lands. And, if you have a chance, please correct anyone you hear even joking about taking plant material. This is serious and can slow or even halt our careful and planned work with imperiled plant species.

While we have no knowledge of who was responsible for the above action, we would like to point out that the Torreya Guardians and their volunteers are not members of the GPCA. They have been linking their work to ours but they are not partners of the GPCA. The GPCA does not sanction assisted migration of *Torreya* outside its range, and we do not support the movement of *Torreya* outside the state of Georgia. Furthermore, we have grave concerns about the fusarium disease present within all *Torreya* tissues and its potential for spread.

The assisted migration and the outplanting of plant material with no plans, monitoring, reporting methods, or permission from public landowners is counter to the GPCA's methods and philosophy. Our safeguarding plans for *Torreya taxifolia* have been very specific, carefully monitored, planned with iterative feedback from colleagues outside our organization, and are currently being revisited as our knowledge grows regarding the fungal pathogen.

GPCA members and Botanical Guardian volunteers are advised to be cautious when speaking to any members of Torreya Guardians. They have taken advantage of professional courtesies, making broad claims from simple correspondence, and linking their work with members of the GPCA. GPCA is publicly distancing itself from Torreya Guardians and their methods of rewilding an endangered species outside its range.

Our thanks go out to you all for your hard work and support in safeguarding and advocating for threatened and endangered Georgia species. The above incidence has been extremely troubling, but with your help we hope it is an isolated one. For questions or comments, please send an email to GPCA Coordinator, Jennifer Ceska (jceska@uga.edu).

Sincerely,

Donald W. Imm, Ph.D.
State Supervisor/Project Leader
U.S.Fish & Wildlife Services

Matt Elliott
Program Manager, Georgia DNR
Nongame Conservation Section

Jennifer Cruse-Sanders, Ph.D.
VP for Science and Conservation
Atlanta Botanical Garden

Henning Von Schmeling
Senior Director of Operations
Chattahoochee Nature Center

Jennifer Ceska
GPCA Conservation Coordinator
State Botanical Garden of Georgia, UGA

Heather Alley
GPCA Botanical Guardians Coordinator
State Botanical Garden of Georgia, UGA

Policy Statement Regarding in situ and ex situ Plant Conservation Between Members of the Georgia Plant Conservation Alliance - April 2008

Purpose:

This policy statement between members of the Georgia Plant Conservation Alliance establishes protocols for an integrated plant conservation strategy combining in situ and ex situ projects and including habitat restoration and plant population safeguarding. It is intended to expand the scope and accelerate the process for determining and approving ex situ conservation projects in order to protect plant population integrity and genetic diversity in Georgia.

The Mission of the Georgia Plant Conservation Alliance is to study and preserve Georgia's flora through multi-disciplinary research, education, and advocacy; facilitate the recovery of rare, threatened, and endangered plants of Georgia and the southeastern US through collaborative efforts in our state; and communicate the importance of preserving biodiversity worldwide.

Background:

In July of 1995 a statewide network for plant conservation was established C the Georgia Plant Conservation Alliance (GPCA). For the first time in Georgia, botanical gardens, state agencies, universities, and non-profit environmental organizations joined forces to coordinate research, education, and conservation programs focused on threatened and endangered plants. From rigorous scientific research to hands-on projects with elementary schools, the combined resources, expertise and outreach strategies of GPCA members provide powerful tools for plant conservation in Georgia. Charter members of GPCA include three botanical gardens (Atlanta Botanical Garden, Callaway Gardens, and The State Botanical Garden of Georgia), the Nongame Conservation Section of the Georgia DNR, United States Forest Service, The Nature Conservancy of Georgia, and the University of Georgia. This Alliance, one of the first of its kind

in the United States, has been studied by neighboring states and national conservation organizations as a model for their own programs. GPCA initiates and coordinates efforts to protect natural habitats and endangered species through biodiversity management and public education.

Rare plants and endangered plant communities almost always receive less publicity, less protection, and lower levels of funding than do animals, although the threat to their survival is

even greater. Extinction rates for plant species are seven times greater than for animals. Seventeen vascular plants are presumed extinct in the United States, 164 are possibly extinct, 2,530 are imperiled or critically imperiled, and an additional 2,556 are vulnerable. Plants constitute more than half of the 1,290 plant and animal species on the federal endangered or threatened list, yet animals receive 97 percent of the available funding, according to the 2003 U.S. Fish and Wildlife Service expenditure report, which includes money spent by all federal and state agencies. This disproportionate emphasis ignores the essential role that plants play in the structure and function of ecosystems or in our daily lives.

The southeastern U.S. supports 33% of the total number of plant species in the United States on just 17% of the land mass. Species richness reaches a maximum in the region which includes such hot spots of biological rarity and diversity as rock outcrops, pitcherplant bogs, sandhills, cove hardwoods, boulderfields, relict prairies, canyons, and remnants of the Longleaf Pine ecosystem. Georgia ranks seventh in the nation in the number of extant plant species behind other high biodiversity states, such as Hawaii and California. This richness of plant species results in part from the diversity of physiographic provinces (from the Blue Ridge, Cumberland Plateau, and Ridge and Valley in the north through the Piedmont and south to the Coastal Plains and Barrier Island complex.) Unfortunately, however, Georgia is also experiencing tremendous threats to its biodiversity. These include not only habitat destruction, reflecting rates of population growth and development among the highest in the nation, but also include the degradation caused by invasive species and exotic pathogens.

The GPCA is committed to protecting natural habitats in Georgia by developing innovative strategies for biodiversity management and mobilizing the public through educational programs. Collectively, GPCA members own or manage extensive research facilities and nature reserves throughout the state. Their professional expertise embraces the entire field of plant conservation, from laboratory research to natural areas management and conservation education. Participation of the largest botanical gardens in the state, as well as the University of Georgia, enables GPCA to take advantage of an extensive, pre-existing network for public education. The GPCA member gardens alone attract 1,360,000 visitors annually. Finally, GPCA's interdisciplinary structure is well suited to addressing the scientific, social, and regulatory complexities of conservation issues.

One aspect of GPCA distinguishing it from other networks is the commitment to keep the alliance simple, decentralized, and project driven. Projects are steered by committee chairs that discuss projects with team members, set priorities for each field season with calendar deadlines, and provide project status reports to the GPCA body at each of our three annual meetings. Normally, GPCA projects are suggested by Georgia Natural Heritage Program botanists who identify conservation needs. The GPCA Coordinator facilitates and expedites the project by using the GPCA network to establish a project team and secure contributions from various member organizations towards its successful completion. Contributions among members vary with each project, given a particular organization's resources, expertise, constraints of time and budget, and other project demands, etc. The project team then selects a chairperson who is responsible for communicating regularly and pro-actively with the GPCA Coordinator. Current projects include restoration and management of pitcherplant bogs; propagation, genetics, and management of a Georgia endemic tree, Elliottia racemosa (Georgia plume); safeguarding Torreya taxifolia (stinking cedar), Tsuga caroliniana (Carolina hemlock), and Gentianopsis crinita (fringed gentian); and the creation of a network of volunteers called the Botanical Guardians who conduct searches for rare species, and monitor rare species' populations and habitat. There is also an in- school conservation project titled the Georgia Endangered Plant Stewardship Network (GEPSN) where children become active stewards of the environment by propagating and caring for rare plants. To increase communication around the state, a GPCA newsletter is periodically produced; and in an effort to better support teachers and students within the stewardship network, several products were created such as a GEPSN newsletter, the Green Plant Blues News, and a web site with background information on plant projects and plant conservation in Georgia. GPCA maintains a website describing its projects and listing member contact information. We also produce and publish posters and brochures about our conservation projects and issues effecting plants in Georgia such as invasive species.

The Georgia Plant Conservation Alliance is adopting a new, aggressive plant conservation initiative targeting a prioritized list of critically endangered plant species. The list was assembled by a technical team of knowledgeable botanists, ecologists, and conservation professionals from throughout Georgia, and was coordinated by the Georgia DNR as part of the State Wildlife Action Plan (formerly Comprehensive Wildlife Conservation Strategy). Specially trained volunteers from the Botanical Guardians network will be working with GPCA scientists to help locate populations of these rare plants to assess their sites and collect seeds for propagation at GPCA botanical gardens. Plants will be propagated for safeguarding at the botanical gardens (ex situ) and at specially selected and secured safeguarding sites in the wild (in situ). Plants will also be propagated for restoration of parent populations in the wild, to be reintroduced back to their source populations.

GPCA Participating Organizations and Research Collaborators

Atlanta Botanical Garden
Atlanta History Center

Callaway Gardens
Chattahoochee Nature Center
Coastal Plain Research Arboretum
Fort Valley State University
Georgia Botanical Society
Georgia Department of Natural Resources Georgia Department of Transportation Georgia Native Plant Society

Georgia Power
Georgia Southern Botanical Garden Georgia Wildlife Federation
Joseph W. Jones Ecological Research Station The Nature Conservancy of Georgia
North Georgia College and State University

The State Botanical Garden of Georgia The University of Georgia
USDA Forest Service
US Fish and Wildlife Service

Valdosta State University Herbarium Zoo Atlanta

Existing Technical and Ethical Guidelines for Conservation Horticulture:

With regard to integrated plant conservation techniques in situ and ex situ, GPCA has been operating under the guidelines of our own institutions and those set by governing plant conservation organizations such as Botanic Gardens Conservation International, the Center for Plant Conservation, the World Conservation Union (IUCN) Re-introduction Specialist Group of the Species Survival Commission, the Convention on Biological Diversity, The Nature Conservancy, and the Society for Ecological Restoration International; and publications including, but not limited to, the Global Strategy for Plant Conservation (CBD and IUCN, 1992), A Handbook for Botanic Gardens on the Reintroduction of Plants to the Wild (BGCI, 1995), the New England Plant Conservation Program (Brumback, 1992), Ex Situ Plant Conservation, Supporting Species Survival in the Wild (Guerrant, Haven, and Maunder, 2004), Genetics and Conservation of Rare Plants (Falk and Holsinger, 1991), Principles and Practices of Plant Conservation (Given, 1994), and Restoring Diversity: Strategies for Reintroduction of Endangered Plants (Falk, Miller, Olwell, 1996).

Plant conservation literature is quite consistent in its ethical guidelines internationally and nationally. The following is a summary of these guidelines as they relate to collaborative projects developed by GPCA for restoration and safeguarding activities involving plant reintroduction, introduction, augmentation, seed banking, and rescue.

Definitions:

Safeguarding refers to all types of propagation and/or outplanting activities that constitute a conservation strategy of last resort. Specifically, safeguarding refers to various propagation and outplanting activities as they relate to ex situ or in situ efforts, including re-introductions, augmentations/enhancements, and introductions. I. Ex situ safeguarding collections - indexed collections of plants, seed banks, and germplasm of known provenance at botanical gardens, arboreta, nature museums, etc.

II. In situ safeguarding outplantings:

A. **Introduction** (a.k.a. establishment, experimental) - controlled placement of plants into an area where the plant is currently absent and historically unknown.
B. **Augmentation** (a.k.a. enhancement, reinforcing) - the addition of plants to an existing population, with the aim of increasing population size or diversity, and thereby improving its viability.

C. **Reintroduction** - the process of placing plants back into formerly occupied habitat or into suitable habitat within the plants' natural range.

Guiding Principles:

Plant conservation projects emphasizing safeguarding (in situ and ex situ) and restoration are planned and determined on a case-by-case basis with consensus from the GPCA body. There are exceptions to every rule when working with biological systems, and all decisions for restoration and safeguarding projects are deliberated and documented in writing. The following principles guide GPCA's restoration and safeguarding projects.

1. The GPCA recognizes habitat protection as the preferred method for preserving species. Maintaining viable populations in their natural habitat is the best way to conserve rare and endangered plants. However, protection for all plant species in the wild is not feasible as populations decline or are destroyed. GPCA opposes any activities that harm plant populations in situ. GPCA endorses habitat restoration; population augmentation, introduction, and reintroduction; and safeguarding ex situ: when it is necessary to 1) increase the viability of a population (especially in cases of dwindling and non-reproductive populations) or 2) safeguard genetic diversity (creating indexed populations to guard against extinction). Under the right circumstances, such responses as reintroduction, introduction, augmentation, safeguarding ex situ, and rescue may be suitable to prevent the decline of existing populations or restore lost populations to suitable habitats within their historical range.

2. A top priority for GPCA is the protection and safeguarding of individual plant populations, maintaining their genetic integrity in order to protect the full range of genetic diversity within a species. For all of our horticulture conservation projects for restoration and safeguarding, indexed plant material of documented origin is maintained. Plant provenance is fundamental and

strictly maintained. GPCA uses voucher specimens, formal plant records and accessioning systems, and special plant labeling to track indexed plant material. Plant material is not mixed between populations unless a highly unusual project specifies a dramatic need for such an aggressive practice, and then only with the consent of the GPCA body and appropriate state and federal organizations. Plant material is not reintroduced to a population unless it comes from that original population or unless a special breeding project is necessary for the survival of a species. A species may be in serious decline requiring crosses between populations to try to encourage reproduction and increased genetic diversity (possible examples include Torreya taxifolia and Rhus michauxii). Plant introductions in situ for safeguarding are created within the historical range of the species but not within breeding range of other viable populations of that same species. Plants without proper provenance documentation are suitable for education and display. Plant material from educational displays is valuable for safeguarding in the extreme situation that all other surviving plant material in situ and ex situ has been lost.

3. Reintroduced and introduced populations in situ are deemed experimental with no long-term guarantee of survival. Careful documentation of these sites is maintained by GPCA and Georgia

DNR. Until a population is self-sustaining (actively reproducing with evidence of seedling recruitment) it is not deemed successful and contributing to the survival of the species as a whole. However, it is important to note that properly planned, documented, and monitored projects, even when they fail, add to the body of scientific knowledge.

4. GPCA obtains all required permits for collecting, reintroduction, introduction, augmentation, and rescue, and will obey all state and federal guidelines while working with rare and endangered plant species. GPCA does not advocate destructive collection methods or collection that may impede the progress of natural populations.

5. GPCA will obtain landowner permission before collecting material or implementing any horticulture conservation projects on private land. Landowners are seen as partners and their participation and support for a project is vital for its success. Respect for landowners is a GPCA priority.

6. GPCA will consider participation in the rescue of plant populations, only when the population is legitimately doomed to destruction and we have the landowner's permission. GPCA follows plant rescue guidelines set by the Georgia Native Plant Society. GPCA offers suggestions to landowners to help protect populations in situ. We prefer to remove propagules only (seeds, cuttings, and divisions) rather than whole plants. GPCA is cautious in its involvement in mitigation and participates only as a last resort and only with approval from the GPCA body.

7. When removing plant material from an original population, GPCA uses the 10% standard, collecting no more than 10% of the seeds or removing divisions or other propagules from no more than 10% of the parent plants on site. Research has shown that collecting, on average, a

minimum of 30 propagules from a population is recommended to give a 95% chance that at least one individual will survive (Guerrant, 1992). Collection at this level can only be done if it does not jeopardize the viability of the original population. If seed production is low, seed collection may be spread over a series of years to reduce any negative impacts to the parent population. In this situation, if a population is declining quickly and no safeguarding material exists, a larger percentage of the existing seed or other propagules may be collected. These collection guidelines may be modified depending on a species' type of breeding system and the distribution of genetic diversity within and among populations. For example, if a species is primarily a selfing species (crossing genetically within an individual plant) or if the species maintains most of its genetic diversity within populations (each population holds alleles unique to that population and different from all others), then more plant material will need to be collected in order to capture that genetic diversity. As is often the case with rare plant species, this genetic and breeding system information is not known and a best guess based on experience and the scientific literature must be used.

8. Site location and landowner information is kept confidential by all members of GPCA to protect wild populations of rare plants. GPCA reserves the right to deny someone location information to protect sensitive rare species as specified in Section 50-18-72 of the Open Records Act (below). All volunteers working with GPCA agree to maintain confidentiality regarding all site location and project specifics.

THE OPEN RECORDS ACT (O.C.G.A. 50-18-70 through 76). Section 50-18-72. When public disclosure not required.
(a) Public disclosure shall not be required for records that are:

(11) Records that contain site specific information regarding the occurrence of rare species of plants or animals or the location of sensitive natural habitats on public or private property if the Department of Natural Resources determines that disclosure will create a substantial risk of harm, theft, or destruction to the species or habitats or the area or place where the species or habitats are located; provided, however, that the owner or owners of private property upon which rare species of plants or animals occur or upon which sensitive natural habitats are located shall be entitled to such information pursuant to this article.

Criteria for Release of Plant Material In Situ:

A successful restoration or safeguarding project requires detailed knowledge of a species' survival criteria. Growing plants successfully ex situ provides a significant amount of information on the life history and growing requirements of that species. GPCA brings a special talent to in situ conservation projects in Georgia because of the horticultural expertise of its member botanical gardens and the life history knowledge and ecological understandings of GPCA land managers. Coupled with the research knowledge of GPCA ecologists, botanists, and geneticists, this makes for an effective integrated plant conservation team.

1. Site selection

Using the GPCA network and expertise of the Georgia DNR, Nongame Conservation Section staff, sites for in situ recovery projects are chosen based on the following set of criteria and considerations.

Conservation Status - Is the site protected by state or federal categories of ownership, land trust, or conservation easements? Do we have landowner permission to easily access the site when needed? Is there a long-term commitment from the landowner to secure the site and the project?

Accessibility - Is the site accessible to GPCA for work? In addition to landowner permission, will the site reasonably accommodate equipment and plant material transport, and return visits for monitoring and management? Conversely, will the site be readily accessible to people who might tamper, tramp, or take plants from the site?

Appropriateness - Does the site meet the needs of the species? While sites can be managed, do the basic characteristics of the site match the needs of the species to be conserved (soils, hydrology, light, aspect)? GPCA will often test the survival and success of a few individual plants at an in situ introduction (safeguarding) site for at least one growing season prior to planting an entire indexed safeguarding collection. Are there other factors (land for purchase, invasive species, effluent or erosion, feral animals, dual land use) that are concerns limiting the use of a site?

2. Plant material health and preparation

When placing plant material in situ, GPCA takes great care not to introduce any pests or pathogens. Roots are washed clean of potting soil before plants are transported to the field to prevent greenhouse weeds or soil pathogens from being introduced in situ. Only healthy plants free of any signs of disease, fungal infections, or pests are allowed in situ.

3. Establishment

GPCA uses a variety of techniques to help plants establish in situ.

Water - Members will hand water plants weekly or more frequently when plants are first placed in the field, although plantings are usually performed in the dormant seasons, in order that newly placed plants are not unduly stressed by heat or drought. Plants placed in wetlands generally require no additional water. Species established in other habitats may require watering initially until their roots become established. If the source of the water is a concern, GPCA can take steps to use distilled water or natural water from a nearby source.

Cages - GPCA also uses exclusion devices, such as cages, and in some cases simple fencing, to exclude animals that might pull or root-up the plants before they are established. These can be removed from the site when it is determined they are no longer necessary.

Erosion controls - It is unlikely GPCA would place plants into a site with an existing erosion problem. However if necessary, GPCA will use silt fencing to protect plants from washing away before they are established. It is often preferable to use natural materials selected from the site such as logs, branches, and rocks to help slow and spread water that may wash severely over newly planted material.

Labels - GPCA will often discretely mark a planting site with flagging tape and may mark planting sites for individuals with some sort of plant label to help relocate the plants when monitoring. Stainless steel photo stakes to mark photo-points for establishing long term photo monitoring of a site have also been employed.

Chemicals – Depending on the project, the use of chemicals in situ may be required, with permission from the landowner. GPCA has used herbicides when removing Chinese Privet. Other research projects in situ have involved the uses of various fungicide applications and fertilizer regimes. These are only used for very specific projects and are not applied on a broad scale.

4. Management

GPCA members are often directly involved in the management of their in situ projects, but GPCA will transfer responsibility to another party as long as active management in perpetuity is guaranteed. Many sites require restoration before safeguarding material can be introduced. Depending on the condition of the site, this may take several growing seasons. Once the plant material is in place, active management will continue, often with multiple work party visits during the first few years. After a site appears self-sustaining, management may only be required once a year or less.

5. Monitoring

GPCA has utilized a variety of monitoring techniques as appropriate for the project, including photo monitoring, mapping, vegetation sampling (species richness, percent woody cover), and population surveys (from formal counts to a variety of sampling methods). GPCA monitors all in situ projects annually, or more frequently when projects are newly established. Monitoring reports are kept on file at GPCA member gardens. Copies of monitoring reports are sent to the Georgia DNR Nongame Conservation Section as well. GPCA also utilizes a network of specially trained volunteers who are selected to participate in our Botanical Guardians project. Volunteers living near an in situ project are able to perform regular site visits, especially during such critical times as flowering, fruiting, or during periods of drought or other management concerns.

This **Policy Statement between members of the Georgia Plant Conservation Alliance** formalizes the ethics and guidelines to be used by all GPCA members when engaged in GPCA sponsored plant conservation (in situ and ex situ) activities, including safeguarding and restoration.

Bibliography ...