



# Great Lakes Basin Forest Health Collaborative

Highlights from the 2021-2023 Annual Partners Report

Rachel Kappler, Forest Health Coordinator, Holden Forests & Gardens  
September 2023

*Dear partners,*

*It is my great pleasure to share with you our first annual GLB FHC progress report. We have accomplished so much since our launch in September 2021! In this report, you'll find an overview of the Collaborative's mission and its progress to date. We hope this document will be something you can share with your own colleagues, superiors, and collaborators as we continue to build our network and strengthen our efforts toward our shared goal: Healthy forests for the future.*

*Thank you for all your hard work,*

*Rachel Kappler*

*Rachel Kappler  
Forest Health Coordinator  
Holden Forests & Gardens  
September 26, 2023*



## Our Mission

The Great Lakes Basin Forest Health Collaborative supports a network of partners in tree resistance breeding activities for forest species that are threatened by invasive insects and diseases. We serve as liaison between research facilities, agencies, organizations, and members of the public, providing training and resources to help these groups reach our common goal: sustainable forests.

Breeding trees takes time and space, but it's worth the effort to create pest-resistant trees that are locally adapted. To make this happen, our goal is to unite and facilitate efforts of anyone interested in:

- Monitoring ash, American beech, and eastern hemlock trees
- Monitoring the spread of insects and disease
- Locating potentially resistant individuals
- Collecting and storing seeds
- Germinating and/or grafting trees
- Planting trees for research

# Trees in Peril



**Eastern hemlock (*Tsuga canadensis*)**

The eastern hemlock is widespread across New England, Appalachia, and the upper Midwest. The trees are threatened by the hemlock woolly adelgid, a tiny aphid-like bug that sucks the sap, and elongate hemlock scale, a tiny scale insect that can kill needles. First found in Virginia in 1951, many areas have seen over 80% tree death due to HWA, but it can take anywhere from 2 to 20 years for an infected hemlock to die.



**Ash spp. (*Fraxinus* spp.)**

Ash trees were once widespread throughout the central and eastern United States. In 2002, the emerald ash borer was first discovered in southern Michigan, an Asian beetle whose larvae eat the inner bark of ash trees. Hundreds of millions of ash trees have been killed by the beetle since, decimating forests.



**American beech (*Fagus grandifolia*)**

American beech trees live across the eastern U.S., and are especially abundant in the beech-maple forests. The first documented case of beech bark disease in the U.S. was in Massachusetts in 1929. And in 2012, beech leaf disease was first discovered in Ohio, caused by a nematode that damages leaves.





The Great Lakes Basin is a watershed encompassing all the land that drains into Lake Superior, Michigan, Huron, Erie, or Ontario.

Our work spans these areas and into all neighboring states and provinces, including:

- Ohio
- Pennsylvania
- New York
- Ontario
- Minnesota
- Michigan
- Wisconsin
- Illinois
- Indiana

Map from Sea Grant Michigan



1.

Find  
Lingering  
Trees



2.

Test  
Lingering  
Trees



3.

Breed  
Resistant  
Trees



4.

Plant  
Resistant  
Orchards



5.

Collect  
Resistant  
Seeds



6.

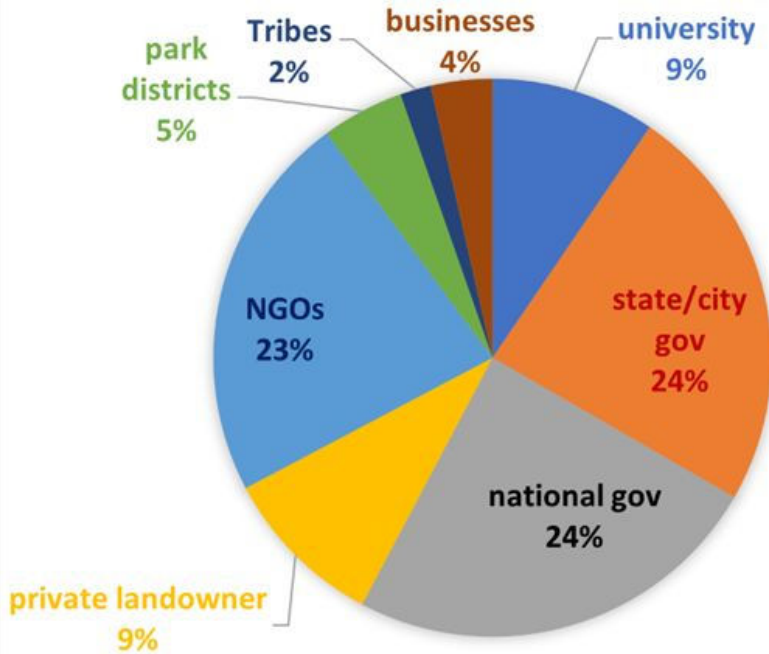
Restore  
the  
Forests



# A Forest Health Collaborative

160 total partners

## PARTNER REPRESENTATION



25 total in-person and online **presentations** given to share about the collaborative and species of concern

17 total **workshops** held for **174** participants

### Our workshops:

- **EAB Trap Training.** How to properly place emerald ash borer traps and lure traps, and how to assess them.
- **Lingering Ash Training.** How to identify ash and lingering ash, what data are needed for reports, and how to report lingering ash.
- **Hot Callus Grafting Workshop.** Hot callus grafting techniques for forest professionals.
- **Ash Monitoring Plot Training.** How to set up a long-term forest monitoring plot that focuses on ash health.
- **Hemlock Cone Collection and Cleaning.** How to collect hemlock seed for conservation purposes, including cone identification, collection procedures and proper drying and seed cleaning techniques.



# Getting the Word Out

## GLB FHC Webpage Completed

<https://holdenfg.org/great-lakes-basin-forest-health-collaborative>

## GLB FHC E-newsletter

**7** quarterly newsletters sent

**170** people on the email list

**32** new partners added through sharing of the newsletters

**Articles published with Holden Forests & Gardens: 8**

**Articles published with industry partners: 2**

**Articles published in local news outlets: 9**

We did a press campaign in fall 2022 to solicit lingering ash seeds from landowners across the region. We distributed a press release to 73 local news outlets, which resulted in six articles in local papers.

> [Sign up for the newsletter](#) <



Great Lakes Basin  
Forest Health Collaborative

HOLDEN ARBORETUM & CLEVELAND BOTANICAL GARDEN

Aug 2023



The lingering ash orchard at the Holden Arboretum this June. (Photo: Anna Funk/Holden Forests & Gardens)

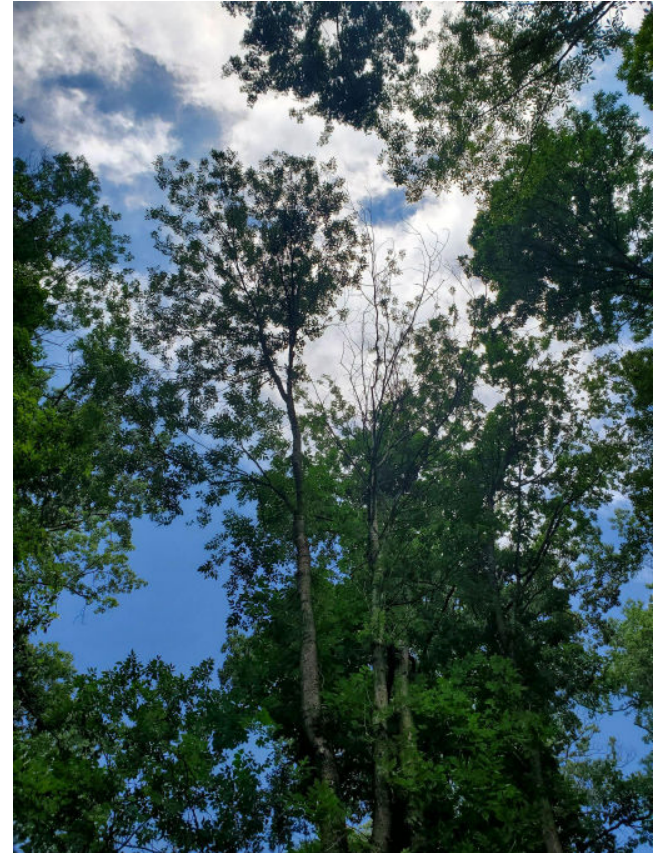
Hi all,

Hope you've had a great summer. How's the search for lingering ash going? Would your organization start a lingering ash orchard? Looking for updates on eastern hemlock management, or the latest tree and pest research? See below! Keep an eye out, it looks like it will be a good year for hemlock cones and beech nuts!!

— Rachel Kappler

# Ash

- Collected **115 new lingering ash** reports and an estimated **451,000 seeds** from **94 lingering ash trees**, especially during the 2022 mast year (**Cleveland Metroparks and Toledo Metroparks**).
- Trained **Holden Forests & Gardens** employees in grafting, identifying lingering ash, and collecting tree seeds.
- **Expanded Holden's 2-acre research orchard** in Kirtland, Ohio, to make room for new clones from northeastern Ohio.
- Confirmed lingering ash sightings and facilitated scion collection with the **USFS Northern Research Station**, for their ash breeding program.
- Completed the **Roots of Rock** project to plant EAB-resistant ash into two urban spaces in the Detroit metro area (**American Forests, USFS, Greening of Detroit**, and others).
- Began work to launch a **lingering ash program at the Morton Arboretum**.





# Ash, cont.

- Launched new searches for lingering ash, with assistance on tree identification, reporting, and location identification (**Ohio DNR Division of Forest Health**).
- Engaged members of the community in identifying lingering ash through citizen science, including in Michigan's upper peninsula (**Michigan DNR Division of Forest Health and Natural Areas and Preserves**).
- Completely filled the state lingering ash orchard in Brighton, Michigan.
- **Sleeping Bear Dunes National Lakeshore** secured funding and technology to begin breeding on-site ash populations.
- Used systemic walking surveys in **Allegheny National Forest** to identify lingering ash, then prioritized and retrieved scions (with **USFS** and **Washington & Jefferson College**).
- Created and distributed a lingering ash identification and reporting document for the **Allegheny National Forest** neighboring woodland owners' group.
- Wrote a letter to Wisconsin landowners to inform them about lingering ash and to encourage reporting (with **Wisconsin DNR**).
- New research launched to investigate the use of hyperspectral imaging to survey the landscape for lingering ash (**Wisconsin DNR, USFS, University of Wisconsin-Madison**).
- Engaged **private landowners**, 24 of whom have reported lingering ash trees on their property. One mailed in lingering ash seed, and one is interested in setting up an ash clone orchard.

# Beech



- Added new BBD-resistant beeches to the research orchard and trained staff in grafting at the Holden Arboretum (**Holden Forests & Gardens & USFS**).
- Collected data on BBD-resistant trees planted in 2017 (**USFS Northern Research Station & Ludington State Park, Michigan**).
- Started grafting the healthiest beech identified by **Cleveland Metroparks** for resistance to Beech Leaf Disease (BLD) for research.
- Added American Beech to **TreeSnap**, an app for members of the public to record tree observations (**University of Kentucky & University of Tennessee**).
- Convened with the **Beech Leaf Disease Research Group**, whose work will lay groundwork for development of an integrated pest management system.



# Hemlock

- Launched a new research program investigating HWA resistance, beginning with stratification and germination of seeds (**Holden Forests & Gardens, USFS Northern Research Station, New Jersey Forest Service**).
- Collected germplasm from strategic locations across the region for the National Seed Laboratory and partner collections (**Wayne National Forest, Ohio DNR, Cleveland Metroparks, Summit County Ohio Metroparks, Lorain County Ohio Metroparks, Holden Forests & Gardens, Wisconsin DNR, Pennsylvania DNR, Catskill Mountain-keepers New York, New Jersey Forest Service**).
- Created new partnerships for knowledge transfer of prior HWA-resistance research (**Forest Restoration Alliance, North Carolina State University, Holden Forests & Gardens**).



# Hemlock, cont.

## Lingering Hemlock Workshop

April 18, 2023

Organized by Rachel Kappler, **TNC Trees in Peril** project leaders, and the **Hemlock Restoration Initiative**. The hybrid workshop's purpose was to review past and future HWA resistance research, as well as to review the lingering hemlock monitoring protocol. This allowed the working group to get important feedback from professionals that will be using the protocol.

A recording of the presentations is available on the GLB FHC website ([watch the recording](#)).





The GLB FHC is sponsored by **Holden Forests & Gardens** and the **USDA Forest Service** with funding support from the **Great Lakes Restoration Initiative**.

**Rachel Kappler, PhD**, is the Forest Health Coordinator for the GLB FHC. The liaison between partners of the Collaborative, she hosts workshops, webinars, and trainings for partners to help achieve their forest health goals. If you have any **questions or would like to get involved**, please email her at [rkappler@holdenfg.org](mailto:rkappler@holdenfg.org).

