Incorporating lingering ash detection into ash/EAB management

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Made possible by Tree Species in Peril:

Monitoring and Managing Ash (MaMA)

Program of ERI that enables detection of lingering ash (LA) through:

- Data collection by natural resource professionals, community scientists
- Encouraging management practices that facilitate LA detection

Photos: R. Wildova, ERI

What are lingering ash (LA) and how are they used for resistance breeding?

- ***Lingering ash*** = mature (≥ 4" DBH), naturally occurring, chemically untreated trees that stay *healthy* ≥ 2 yrs. after ≥ 95% of nearby ash killed by EAB

  ➢Found for all three widespread NE ash spp. (white, green, black)

Lingering white ash. Photo: R. Wildova, ERI

- USFS EAB Resistance Breeding Project has shown that ***scion*** from LA can be used in selective breeding to yield highly EAB-resistant trees.

USFS EAB Resistance Breeding Project

- LA scion from OH, MI grafted onto rootstock → rapid clonal propagation; then repeated crossing (w/in sp.) of progeny that show highest resistance.

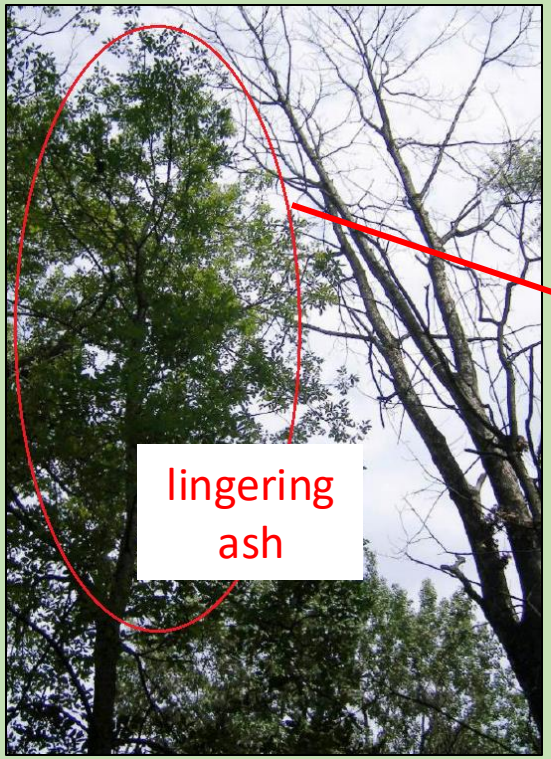
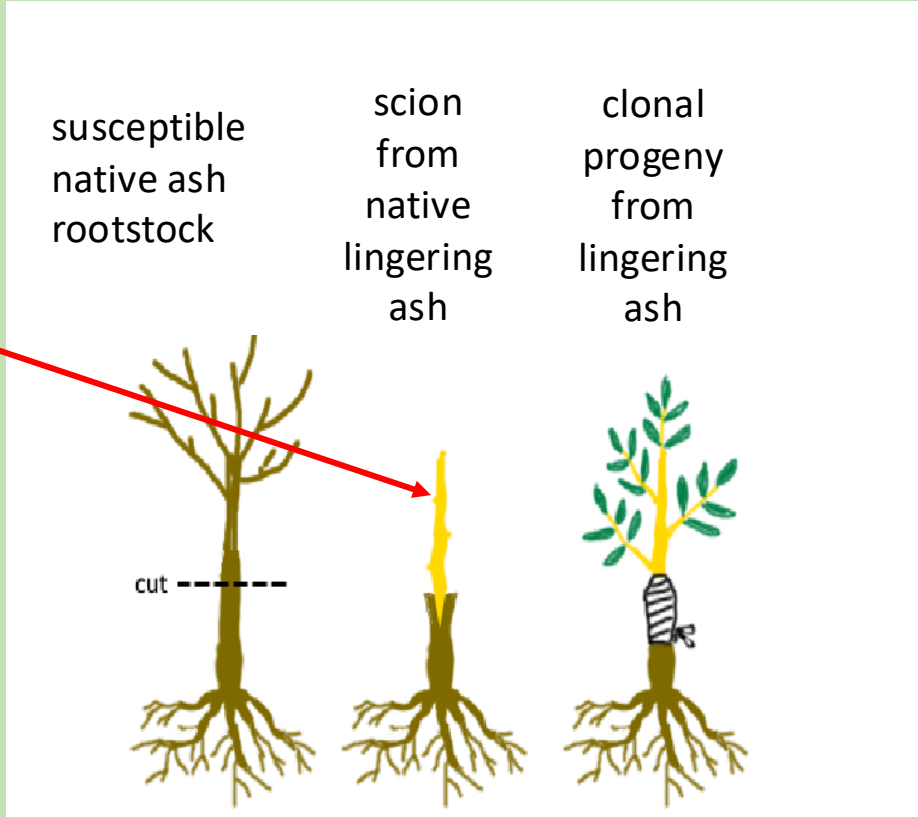


Photo: K. Knight, USFS



Using scion for resistance breeding has advantages over using seed

- Scion from LA are genetically identical to it;
  - In contrast, seed from LA have only 50% of their genetic material from it

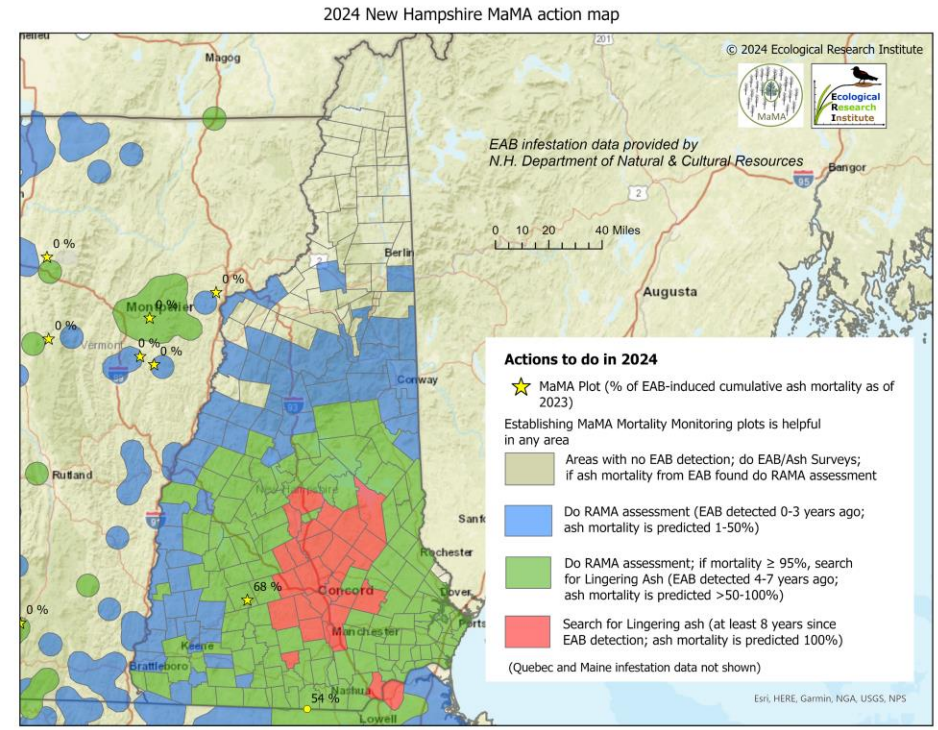
- Grafting of scion from mature LA rapidly produces mature trees ready for breeding.

To find lingering ash, need to look at right places at right times

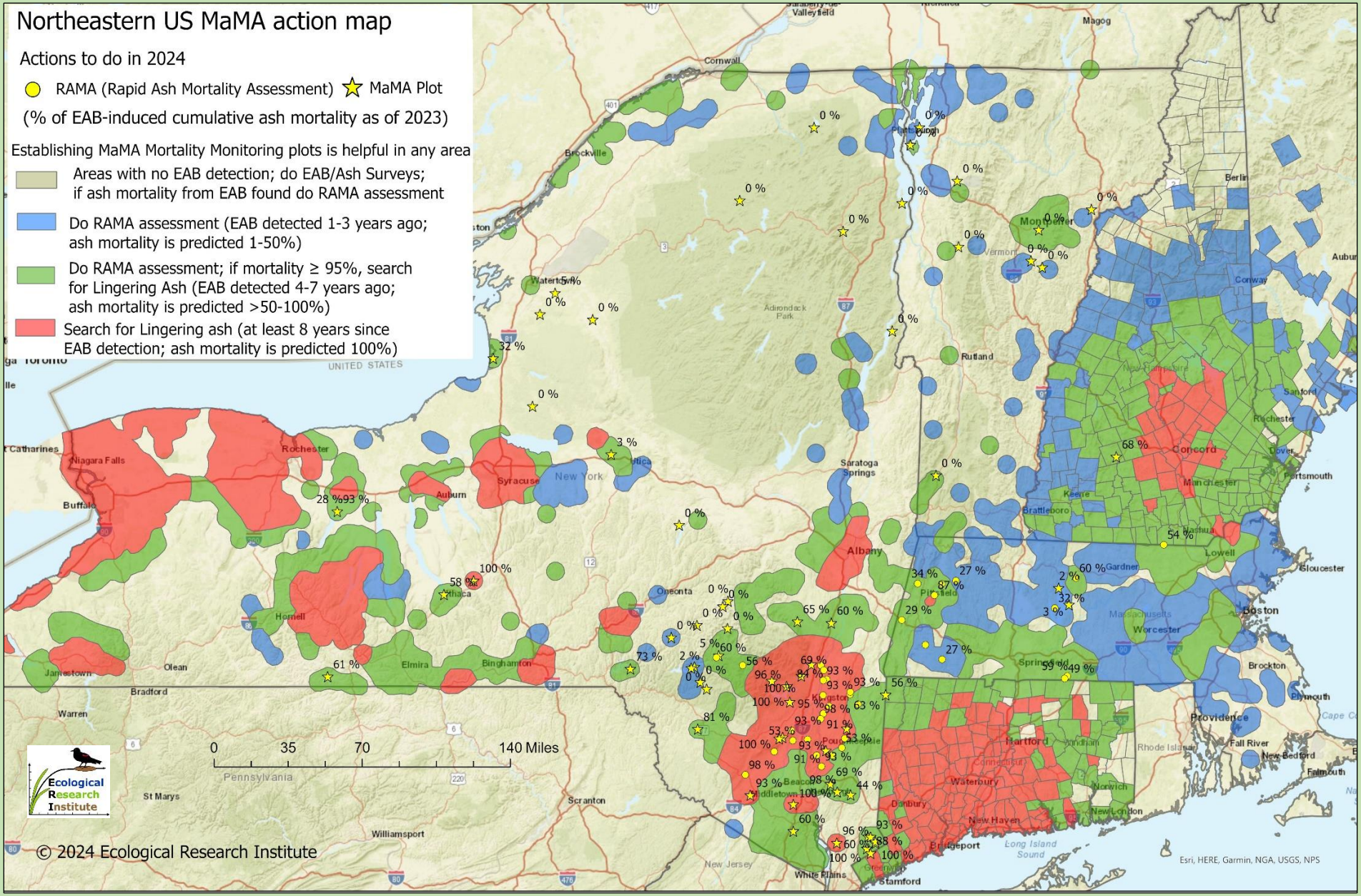
- Looking in area before mortality threshold reached yields spurious LA (not yet attacked enough by EAB)
- Waiting too long means:
  - → Lost opportunities
    - Trees likely to die from EAB (resistance only partial) or other causes
  - → Ingrowth confused with LA

MaMA action maps are crucial

- Created using EAB detection history plus data from MaMA projects
- Show areas that *should be* ready to search for LA based on ≥95% mortality + ≥2 years
- Show areas needing more data and which MaMA project to use to collect needed data.



MaMA Action Maps



MaMA data projects

- **MaMA Ash EAB Surveys** – reporting EAB evidence
- **MaMA Monitoring Plots Network** – monitoring ash mortality using tagged trees
- **MaMA Rapid Ash Mortality Assessments** – quick evaluations of sites w/ some mortality.
- **MaMA Lingering Ash Search** – reporting of LA in high mortality areas.

MaMA data collection projects

- All on Anecdata platform, with printable forms also available
- Can submit data using smartphone, tablet, PC or via email or even snail mail!

Paper forms: https://www.monitoringash.org/data-forms-for-mama-projects/

MaMA has already enabled detection of 180 lingering ash in NY/CT

Lingering white ash

Lingering black ash

Lingering green ash

Photos: R. Wildova, ERI

Scion collected from all 3 species

Photos: R. Wildova & J. Rosenthal, ERI

Scion grafted!

Scion grafted at the Coldwater Pond Nursery by Ted Hildebrant

Photo: Todd Bittner, Cornell Botanic Gardens

How can managers enable LA detection?

- Establishing mortality monitoring plot(s);
  - 40 mature (≥4" dbh) ash on 0.5-10 acres.
  - Can't chemically treat the trees.
  - Can't cut them until after they die.
  - Data recorded once/year until the trees die.
- Why do it?
  - When mortality sufficiently high, triggers search for LA
  - Gives better sense of what's happening w/ ash, yielding better-informed management

How can managers enable LA detection?

- Other data collection (MaMA RAMA, Ash/EAB Surveys, Lingering Ash Search) could be appropriate, depending upon circumstances, capabilities.

How can managers enable LA detection?

- Leaving enough standing healthy ash (instead of proactively cutting) for possibility of some turning out to be LA. Trees not in plot can be cut as soon as they begin to decline.
- When most ash at site are dead or in severe decline, protecting from cutting those trees still healthy – these are potential LA, and some could turn out to be actual LA.

What to do if you find lingering ash

- Once LA found, report them (via MaMA Lingering Ash Search)
- Protect from cutting at least until after scion collected.
- Once reported and verified, can treat w/ emamectin benzoate to prolong health.
- Can also target LA for seed collection.

Harmonizing lingering ash detection with other management practices

- Cutting
- Chemical treatment
- Parasitoid release
- Seed collection

Other considerations?

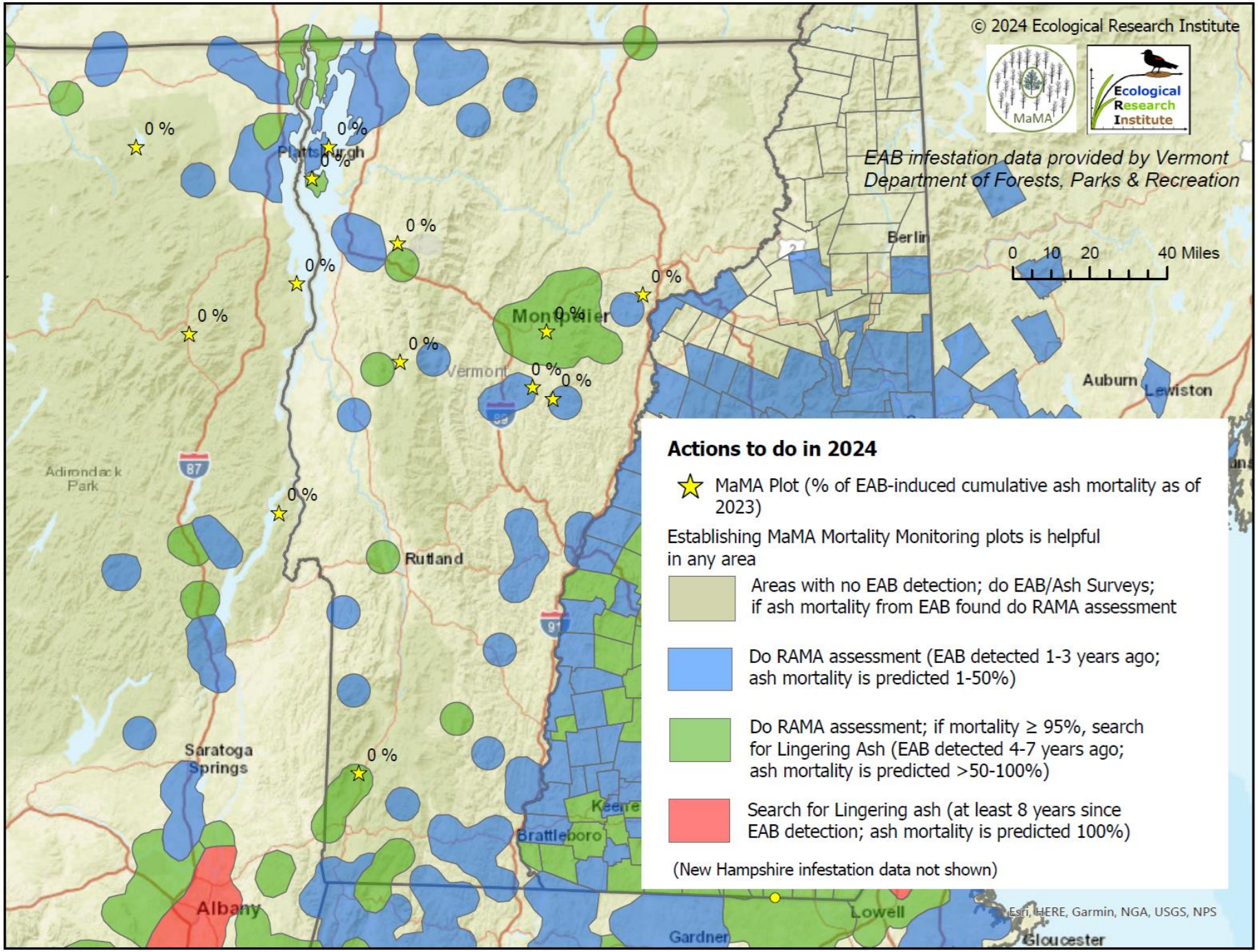
For more info. on MaMA

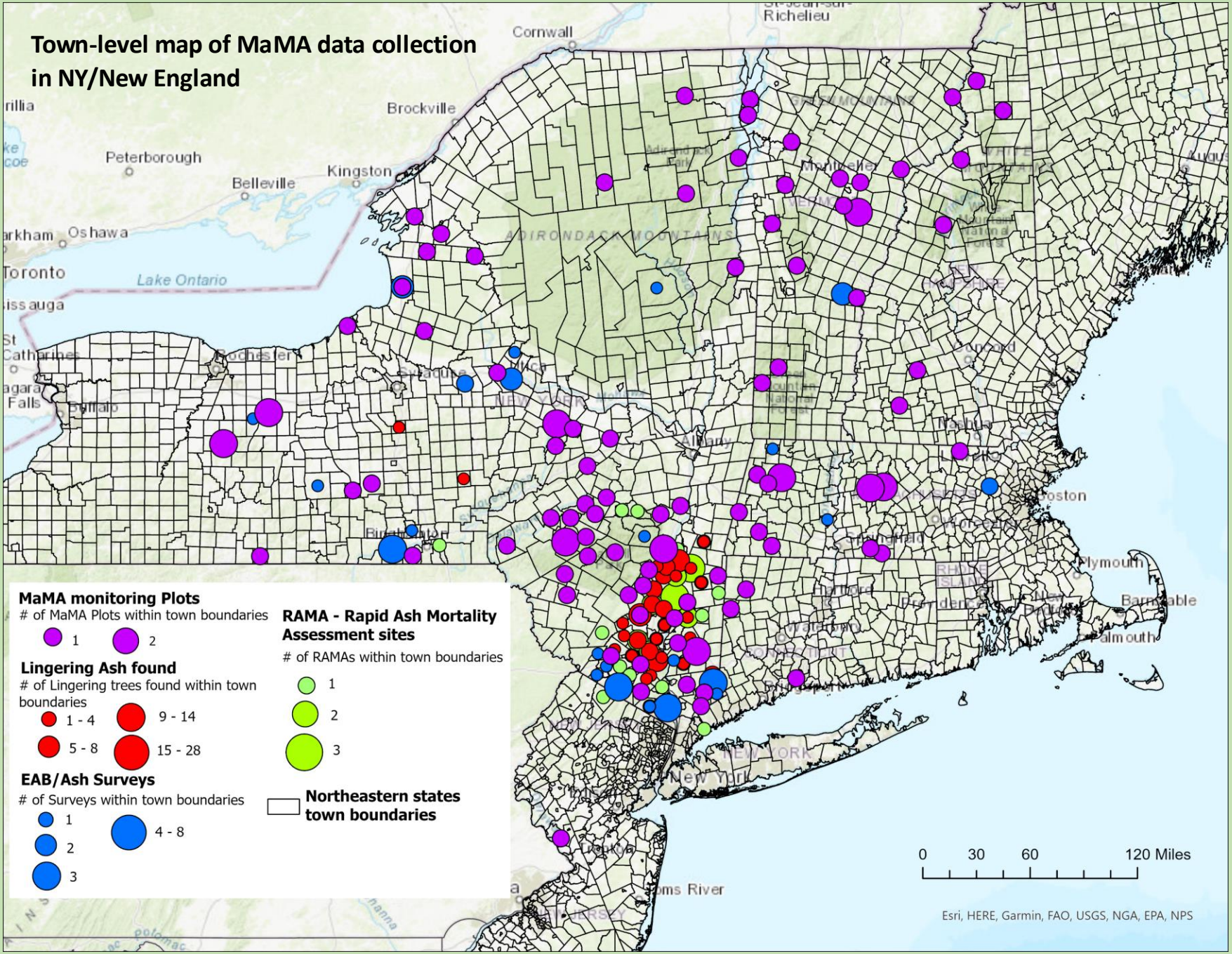
- Visit MaMA website, www.MonitoringAsh.org (now being updated)
- Email the coordinators of the MaMA program:
  - Jonathan Rosenthal (JROSENTHAL@ecoresearchinstitute.com)
  - Radka Wildova (RWILDOVA@ecoresearchinstitute.com)

Ecological Research Institute

MaMA

2024 Vermont MaMA action map




Town-level map of MaMA data collection in NY/New England
Cornwall
Richelieu
Brockville
Peterborough
Belleville
Kingston
Oshawa
Toronto
Lake Ontario
Rochester
Buffalo
Albany
Boston
Plymouth
Barnstable
New York
Toms River
MaMA monitoring Plots
# of MaMA Plots within town boundaries
1
2
Lingering Ash found
# of Lingering trees found within town boundaries
1 - 4
5 - 8
9 - 14
15 - 28
EAB/Ash Surveys
# of Surveys within town boundaries
1
2
3
4 - 8
RAMA - Rapid Ash Mortality Assessment sites
# of RAMAs within town boundaries
1
2
3
Northeastern states town boundaries
0
30
60
120 Miles
Esri, HERE, Garmin, FAO, USGS, NGA, EPA, NPS