Potential ecological impacts of emerald ash borer in tidal swamps on Maryland’s eastern shore

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Tidal freshwater forested wetlands

- Also known as
  - tidal swamps
  - “cripples”

- Species
  - Green ash (*Fraxinus pennsylvanica*)
  - Pumpkin ash (*Fraxinus profunda*)

- Upper reaches of estuaries
  - Salinity usually fresh or slightly brackish

- Vegetation is more diverse than other tidal wetlands
Foreshadowing a massive impact: A western shore example

Patuxent River Watershed. Source: Maryland Department of the Environment and M-NCPCC Prince George's County
Completely defoliated green ash canopy
2015 – before canopy dieback

Leaf litter traps
2016: Ash canopy gone; scattered shorter red maple, black gum, poison ivy remain in canopy
Dramatic understory changes happened in 2016

- Bur-marinold, beggar’s ticks, tearthumbs, and other annual marsh plant species colonized the hollows via seeds from adjacent marsh
- Hummock species like ferns, sedges, and asters and other wildflowers still present but are shorter than the colonizing annuals
- Shrubs and small trees persist, including silky dogwood, viburnums, blueberry, winterberry holly, and fringetree
Dense basal sprouting by green ash - symptom due to canopy dieback
What does this mean for tidal swamps on the eastern shore?
Top 10 tree species in Nanticoke River tidal forests (Baldwin 2007)

- Fraxinus spp.
- Acer rubrum
- Nyssa biflora
- Rhododendron viscosum
- Magnolia virginiana
- Carpinus caroliniana
- Ilex verticillata
- Viburnum dentatum
- Chamaecyparis thyoides
- Myrica cerifera

Legend:
- Tidal Freshwater Forested Wetlands

Map of Nanticoke River tidal forests.
No major canopy dieback reported yet

Jonathan Kays

Diane Leason
Many sites contain red maple, Atlantic white cedar, and black gum as subcanopy trees (some have baldcypress). Post-impact natural regeneration or as restoration species?
Uncertainties

• Ash
  - Persistence via basal sprouts
  - “Lingering” ash – resistance?
  - Seed production and seedling recruitment

• Other species
  - Canopy reestablishment by current subcanopy trees
  - Loss of hummock species, increase in hollow species
  - Invasives – e.g. *Phragmites*, mutiflora rose, honeysuckles

• Ecosystem
  - Hummock-hollow microtopography
  - Elevation changes: Accretion and subsidence
  - Wetland conversion to marsh or open water
  - Ecosystem functions and services: Shoreline protection, water quality, fish and wildlife habitat
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Research is needed now to assess baseline conditions, understand the impact of EAB, and develop management and restoration strategies.
Take home message

• Vast areas of tidal freshwater forest Maryland’s eastern shore will experience a catastrophic disturbance

• Loss of ash, the dominant forest species, will have cascading effects on other plant and animal species and ecosystem functions and services

• There is much uncertainty concerning the future of these forests but research can provide insights into management and restoration options
Take home message

- Vast areas of tidal freshwater forest Maryland’s eastern shore will experience a catastrophic disturbance.
- Loss of ash, the dominant forest species, will have cascading effects on other plant and animal species and ecosystem functions and services.
- There is much uncertainty concerning the future of these forests but research can provide insights into management and restoration options.

Thank you!