

An Assessment of Pumpkin Ash (*Fraxinus profunda* (Bush) Bush) at Cove Point, Calvert County, Maryland

By Brent Steury, October 1, 2020

The sex life of *Fraxinus* (ash) is exceedingly complex, not well studied in most species, and not entirely understood in those best known. Ash can be male, female, or hermaphroditic. The males can change to females, the females can change to males, and they can both change back again. The frequency with which this occurs and the factors that cause the changes are unknown. Opportunities to understand these complexities in North American species are dwindling as emerald ash borer (EAB), *Agilus planipennis* Fairmaire, a non-native buprestid beetle, spreads across eastern North America. It was first detected in Michigan in 2002 and has quickly spread north into Canada, south to North Carolina, and west to Colorado. Of the approximately 60 species of ash still extant in the world today, nearly half occur within the native home range of EAB including, eastern Russia, northern China, Japan, and Korea. North American ash species quickly succumb to EAB infestations and millions of ash trees have been killed across eastern North America since 2002.

Fraxinus profunda (Bush) Bush (pumpkin ash) was first documented from Cove Point, Calvert County, Maryland in 1996. Pumpkin ash is state listed in Maryland as an S2S3 species. Its nearest congener is *F. pennsylvanica* Marshall (green ash). It can be distinguished from that species by the following combination of characters: petiolules longer (8-15 mm), leaves more lanceolate and long acuminate, samaras wings wider (mostly 7-12 mm), and fall foliage deep burgundy-purple rather than yellow as in *F. pennsylvanica*. At least in Maryland and Virginia, *F. profunda* is a species of freshwater tidal swamps, whereas *F. pennsylvanica* is found in a variety of moist lowland habitats across the states. The pumpkin ash population along the southern shore Cove Point Marsh is the only population in Maryland known from a non-tidal habitat. In 2007, a breach of the barrier sand dune between Cove Point Marsh and the Chesapeake Bay resulted in an intrusion of brackish bay water into the freshwater marsh. This lasted until 2010 when an armor-stone breakwater was constructed in the bay, the breach was sealed, and the marsh began to revert back to a freshwater system. The brackish water intrusion killed many trees along the southern edge of Cove Point Marsh, including pumpkin ash, black gum (*Nyssa sylvatica* Marshall), and loblolly pine (*Pinus taeda* L.).

On September 9, 2015, a survey was conducted to determine how many pumpkin ash still exist along the southern shore of Cove Point Marsh and whether any surviving trees have been effected by EAB. All trees along the southern shore of Cove Point Marsh that occurred in standing water during the brackish water intrusion were observed to be dead in 2015. There were no survivors of any species. Some pumpkin ash did survive that were on higher ground along the upper edge of the wetland. A total of 32 pumpkin ash were located, 23 of these were in good

condition, 9 were in poor condition (defined by at least 30% of branches dead or tree with a broken trunk), and 11 trees were in fruit. Other tree species commonly associated with pumpkin ash included American elm (*Ulmus americana*), red maple (*Acer rubrum*), black gum, and loblolly pine. Pumpkin ash locations by area, using roads transecting Cove Point are as follows:

Barrier dune to Poplar Drive - 9 trees (7 good, 2 poor, 2 fruiting)

Poplar Drive to Elm Drive – 2 trees (1 good, 1 poor, none fruiting)

Elm Drive to Cedar Drive - 2 trees (1 good, 1 poor, none fruiting)

Cedar Drive to Holly Drive – 9 trees (7 good, 2 poor, 3 fruiting)

Holly Drive to Webster Drive – 7 trees (5 good, 2 poor, 4 fruiting)

Webster Drive to Chesapeake Drive – 3 trees (2 good, 1 poor, 2 fruiting)

Chesapeake Drive to Beach Drive – no pumpkin ash

Beach Drive to Park Drive – no pumpkin ash

The area from Chesapeake Dive to Park Drive contained more sweetgum (*Liquidambar styraciflua*) and is apparently at a slightly higher elevation.

All nine trees determined to be in poor condition were examined for the presence of EAB. Signs of EAB include 3–4 mm wide D-shaped exit holes on the trunk, and the presence of the beetle. None of the nine trees examined possessed D-shaped exits holes and loose bark removed from the trees did not reveal the presence of any EAB. Other factors causing poor health in these nine trees was often noticeable, including, apparent lightning strikes, broken trunks, and nearness to the marsh edge (making these trees more vulnerable to the brackish water intrusion of 2007 – 2010).

Although the Pumpkin Ash population at Cove Point was severely impacted by the brackish water intrusion of 2007 – 2010, a viable remnant population of at least 32 trees still remains. These include at least 11 samara producing females in 2015. The private property bordering Cove Point Marsh (not included in this survey) also contains some pumpkin ash and should help to insure the species survival until the arrival of EAB.

2016 Addendum to 2015 Pumpkin Ash Survey at Cove Point

On September 16, 2016, the pumpkin ash population at Cove Point was resurveyed (as described above) to monitor for potential EAB infestations at Cove Point. The results of this survey are below.

Barrier dune to Poplar Drive - 9 trees (7 good, 2 poor, 2 fruiting). Of the two trees in poor condition one is reduced to a single live branch and the second is exhibiting substantial crown dieback characteristic of an EAB infection. However no D-shaped exits holes were observed on this tree.

Poplar Drive to Elm Drive – 2 trees (1 good, 1 poor, none fruiting)

Elm Drive to Cedar Drive - 2 trees (1 good, 1 poor, none fruiting)

Cedar Drive to Holly Drive – 9 trees (7 good, 2 poor, 1 fruiting). In 2015, trees were observed in fruit.

Holly Drive to Webster Drive – 7 trees (5 good, 2 poor, 4 fruiting). Three of these trees, two female and a male are very close to the LNG property line and may not be on LNG property.

Webster Drive to Chesapeake Drive – 3 trees (2 good, 1 poor, 2 fruiting). All three trees are very near the LNG property line and may not be on LNG property.

Chesapeake Drive to Beach Drive – no pumpkin ash on LNG property. There are two healthy female Pumpkin Ash adjacent to LNG property.

Beach Drive to Park Drive – no pumpkin ash

2017 Addendum to 2015 Pumpkin Ash Survey at Cove Point

On September 18, 2017, the pumpkin ash population at Cove Point was resurveyed (as described above) to monitor for potential EAB infestations at Cove Point. The survey results are nearly identical to the results from 2016 and no EAB has been documented at Cove Point.

Barrier dune to Poplar Drive - 9 trees (7 good, 2 poor, 2 fruiting). Of the two trees in poor condition (one in fruit) one is reduced to a single live branch and the second is exhibiting substantial crown dieback.

Poplar Drive to Elm Drive – 2 trees (1 good, 1 poor, none fruiting)

Elm Drive to Cedar Drive - 2 trees (1 good, 1 poor, none fruiting)

Cedar Drive to Holly Drive – 9 trees (7 good, 2 poor, 1 fruiting). Some of these 9 trees may be Green Ash (*Fraxinus pennsylvanica*). One tree was starting to obtain fall color and was yellow instead of burgundy purple. Yellow fall color is characteristic of *F. pennsylvanica*.

Holly Drive to Webster Drive – 7 trees (5 good, 2 poor, 4 fruiting). Three of these trees, two female and a male are very close to the LNG property line and may not be on LNG property.

Webster Drive to Chesapeake Drive – 3 trees (2 good, 1 poor, 2 fruiting). All three trees are very near the LNG property line and may not be on LNG property.

Chesapeake Drive to Beach Drive – no pumpkin ash on LNG property. There are two healthy female Pumpkin Ash adjacent to LNG property.

Beach Drive to Park Drive – no pumpkin ash

2018 Addendum to 2015 Pumpkin Ash Survey at Cove Point

On September 14, 2018, the pumpkin ash population at Cove Point was resurveyed (as described above) to monitor for potential EAB infestations at Cove Point. The survey results are nearly identical to the results from 2017 and no EAB has been documented at Cove Point.

Barrier dune to Poplar Drive - 9 trees (7 good, 2 poor, 2 fruiting). Of the two trees in poor condition the one reduced to a single live branch is still living and sending out stump sprouts. The second has crown dieback but continues to survive.

Poplar Drive to Elm Drive – 2 trees (1 good, 1 poor, none fruiting)

Elm Drive to Cedar Drive - 2 trees (1 good, 1 poor, none fruiting)

Cedar Drive to Holly Drive – 9 trees (7 good, 2 poor, 1 fruiting).

Holly Drive to Webster Drive – 7 trees (5 good, 2 poor, 4 fruiting).

Webster Drive to Chesapeake Drive – 3 trees (2 good, 1 poor, 2 fruiting).

Chesapeake Drive to Beach Drive – no pumpkin ash on LNG property. There are two healthy female Pumpkin Ash adjacent to LNG property.

Beach Drive to Park Drive – no pumpkin ash observed.

2019 Addendum to 2015 Pumpkin Ash Survey at Cove Point

On September 18, 2019, the pumpkin ash population at Cove Point was resurveyed (as described above) to monitor for potential EAB infestations at Cove Point. The survey results are similar to the results from 2018. No evidence of EAB was recorded at Cove Point in 2019.

Barrier dune to Poplar Drive - 9 trees (7 good, 2 poor, 3 fruiting). Of the two trees in poor condition the one reduced to a single live branch is still living, sending out stump sprouts, and this year produce a few fruits. The second has crown dieback but continues to survive. The area at the end of Poplar Drive is a good site to observe pumpkin ash and green ash growing side by side

Poplar Drive to Elm Drive – 2 trees (1 good, 1 poor, none fruiting)

Elm Drive to Cedar Drive - 2 trees (1 good, 1 poor, none fruiting)

Cedar Drive to Holly Drive – 9 trees (7 good, 2 poor, 1 fruiting). Some of these are green ash.

Holly Drive to Webster Drive – 7 trees (5 good, 2 poor, 4 fruiting).

Webster Drive to Chesapeake Drive – 3 trees (2 good, 1 poor, 2 fruiting).

Chesapeake Drive to Beach Drive – no pumpkin ash on LNG property. There are two healthy female Pumpkin Ash adjacent to LNG property.

Beach Drive to Park Drive – no pumpkin ash observed.

2020 Addendum to 2015 Pumpkin Ash Survey at Cove Point

On September 17, 2020, the pumpkin ash population at Cove Point was resurveyed (as described above) to monitor for potential EAB infestations at Cove Point. The 2020 surveys revealed a high probability that EAB has reached Cove Point. All mature ash trees surveyed had 30%-50% crown die-back with the exception of one green ash. Young ash trees, generally less than 6 inches DBH were also unaffected. EAB targets mature trees with a thick cambium layer, thus it is to be expected that young trees will survive until they reach an age when they are favored by EAB.

Barrier dune to Poplar Drive - 9 trees in 2015 (in 2020; 7 poor, 2 dead, 2 fruiting). This area contains a mixture of green and pumpkin ash.

Poplar Drive to Elm Drive – 2 trees in 2015 (in 2020; 1 good, 1 dead, none fruiting). The tree in good condition is a green ash and is probably not on LNG property.

Elm Drive to Cedar Drive - 2 trees in 2015 (in 2020; 1 poor, 1 dead, none fruiting)

Cedar Drive to Holly Drive – 9 trees in 2015 (in 2020; 2 good, 5 poor, 2 dead, none fruiting). Some of these are green ash. The 2 trees in good condition are young trees under 6 inches DBH.

Holly Drive to Webster Drive – 7 trees in 2015 (in 2020; 5 poor, 2 dead, 2 fruiting).

Webster Drive to Chesapeake Drive – 3 trees in 2015 (in 2020; 1 poor, 2 dead, none fruiting).

Chesapeake Drive to Beach Drive – no pumpkin ash on LNG property.

Beach Drive to Park Drive – no pumpkin ash observed.