

***Pyrus calleryana* Decne. – Callery Pear, Bradford Pear**

Synonyms: *Pyrus koehnel* C.K. Schneid., *Pyrus kawakamii* Hayata

**Taxonomy**

Family: Rosaceae



Figure 1. Callery Pear. Photo by K Frost

Callery Pear is a small, deciduous tree native to eastern Asia. It was brought to the United States in the early 1900s as a species resistant to fire blight that was affecting pear trees across America. Many cultivars have been developed from it; Bradford Pear is one of the best-known cultivars, but there are several. The tree blooms prolifically in the spring with white blossoms before the leaves emerge. The leaves are glossy green all summer and, depending on the variety, turn a glowing burgundy or yellow in the fall. The trees cannot self-pollinate, but if there is more than one cultivar in an area, they will produce copious small, hard, green fruit. It is well known for having nasty smelling flowers, that are variously described as rotting fish, perfume gone wrong, or dirty baby diapers.

**Native Region or Range**

This species is native to eastern Asia, including China, Japan, and Korea. In China, it was collected from a range of habitats. Its native range in China most closely matches the range from Illinois to Virginia and south to Louisiana and Florida (Culley and Hardiman 2007).

## History

The first record in the United States of Callery Pear were trees planted at Arnold Arboretum in Jamaica Plains, MA by E.H. Wilson in 1908 (Vincent 2005). *P. calleryana* was researched for its resistance to fire blight that attacks common pear (*Pyrus communis*). Fire blight, caused by a bacterium (*Erwinia amylovora*) and thought to be spread by pollinators in pear orchards, had affected over 80% of the annual pear crop in the early 1900s by killing the trees. A search for resistant pear species indicated that *Pyrus calleryana* was mostly resistant, but there were few plants available. Frank Reimer of the Southern Oregon Experiment Station requested USDA plant explorer Frank Meyer to collect 100 lbs. of seed in China for additional testing of resistance in different genotypes. (Culley and Hardiman, 2007; Vincent, 2005). Meyer noted the wide variation in habitats where the species occurred in China, including its tolerance for a wide range of environmental conditions. Following his travels in Yichang, China in 1918, he wrote:

*Pyrus calleryana* is simply a marvel. One finds it growing under all sorts of conditions; one time on dry, sterile mountain slopes; then again with its roots in standing water at the edge of a pond; sometimes in open pine forest, then again among scrub on blue-stone ledges in the burning sun; sometimes in low bamboo-jungle...and then again along the course of a fast-flowing mountain stream or on the occasionally burned-over slope of a pebbly hill. The tree is nowhere found in groves; always as scattered specimens, and but very few large trees were seen. (Culley and Hardiman, 2007, quoted Meyer's 1918 Typescript).

The seed collected from eastern Asia were planted over several hectares to test for the most fire blight resistant variety. These were planted in Oregon and in Maryland. In the 1950s, one particularly vigorous, thornless individual was recognized as a potential ornamental variety. Cuttings of it were grafted onto root stock of other *P. calleryana* seedlings and planted out to a treeless housing subdivision in Maryland. After 8 years, these were determined to be a success and the "Bradford" cultivar was named. It became commercially available in 1962. Other Callery Pear cultivars were also developed at both the Glenn Dale station in Maryland and in Oregon. Other cultivars continue to be developed by private efforts now. (Culley and Hardiman 2007; Vincent 2005)

## Biology

### *Life form:*

- perennial tree species that lives approximately 60 years, reaching a height of 30 to 60 feet (depending on the cultivar)
- Blooms with white petaled flowers in early spring before the leaves have fully expanded
- Has 2 to 3 styles and glabrous hypanthium (compared to 5 styles and a pubescent hypanthium in *Pyrus communis*)
- Pomes are 0.9 to 1.5 cm in diameter, dark in color
- Anthers are pink to red
- Some cultivars have thorns, some do not.
- Stemmed leaves are dark green, mostly glabrous, with low teeth, approximately 40-80 mm long by 35-60 mm wide
- leaves can be deltate or acuminate and might be confused with poplar

*Naturalized:* Yes

### *Dispersal:*

- Numerous small fruits attractive to birds and small mammals easily dispersed
- Hundreds of fruits produced on each tree, each with 2 to 10 seeds

- Self-incompatible – gametophytic self-compatibility, requires at least 2 cultivars (Bradford pear and another cultivar) or two related species (*P. calleryana* and *P. communis*) to cross-pollinate. Cultivars are clones of one tree.
- Seedlings take approximately 3 years of growth to start to flower and produce seeds.

*Habitats:*

- Extremely variable. See quote from Meyer above. Wetlands, old fields, dry slopes, acidic or alkaline soils.

*Disease and herbivory:*

- Callery pear is resistant to many diseases, including the fire blight. It is also resistant to Japanese beetles (*Popillia japonica*)
- White-tailed deer and other herbivores will browse on this species

**Reported Invasiveness**

Callery pear has been listed as invasive in several states, including ones that are south and north of Massachusetts.

- Listed as invasive in Ohio, April 2018 – no longer allowed to plant after Jan 1, 2023
- Listed as invasive in Pennsylvania, Nov 2021, no sales after Nov 2024
- Listed as invasive in South Carolina, banned October 1, 2024.
- Listed as invasive in Maine 2022, no sales after Jan 2024
- Listed as invasive in Delaware, March 17, 2021; no sales after July 1, 2022

**Distribution**

Callery Pear has been reported in 38 states in EDDMapS (see figure 2 on following page). As of August 2022 in Massachusetts, there were 15 confirmed reports in EDDMapS, with records in Essex, Middlesex, Worcester, Norfolk, and Plymouth counties. iNaturalist has over 200 observations in Massachusetts (Figure 3), but these are a mix of planted and escapees from cultivation into natural areas. For this species in iNaturalist, it is difficult to tell which are planted and which are escapees unless the observer has put a comment on the observation saying it is not planted. I have reviewed all the records in iNaturalist and marked ones that are clearly planted as such. The observations in iNaturalist span all but three counties in the state, Bristol, Franklin, and Berkshire indicating the species is growing across Massachusetts.

The Consortium of Northeastern Herbarium has 16 specimens of Callery Pear, with three from Arnold Arboretum in Suffolk County, two in Worcester County, three in Dukes County, two in Franklin County and four from Hampden County. The ones from Arnold Arboretum likely represent cultivated individuals while the other records all represent plants that have seeded into minimally managed lands, including roadsides.

**Spread and Impacts:**

Callery pear will grow in a variety of different habitat conditions. When mown, it forms dense stands completely shading the ground beneath it, thus preventing growth of herbaceous species and smaller shrubs. It will resprout after fire.

David Coyle, PhD., Assistant Professor at Clemson University in Extension in forest health and invasive species, describes the situation in South Carolina, “There is a lot of research that shows that where you have a diverse urban canopy, you have much more wildlife — more birds and more insects for the birds

to eat. It's just a much better, healthier ecosystem without those Bradford pears in there. Everywhere you've got a Bradford pear, it's like a food desert to a bird." South Carolina has programs providing native trees to landowners that bring documentation they removed Bradford pears (or other Callery pears) from their property.

Figure 2. EDDMapS State Records of Callery Pear in the United States

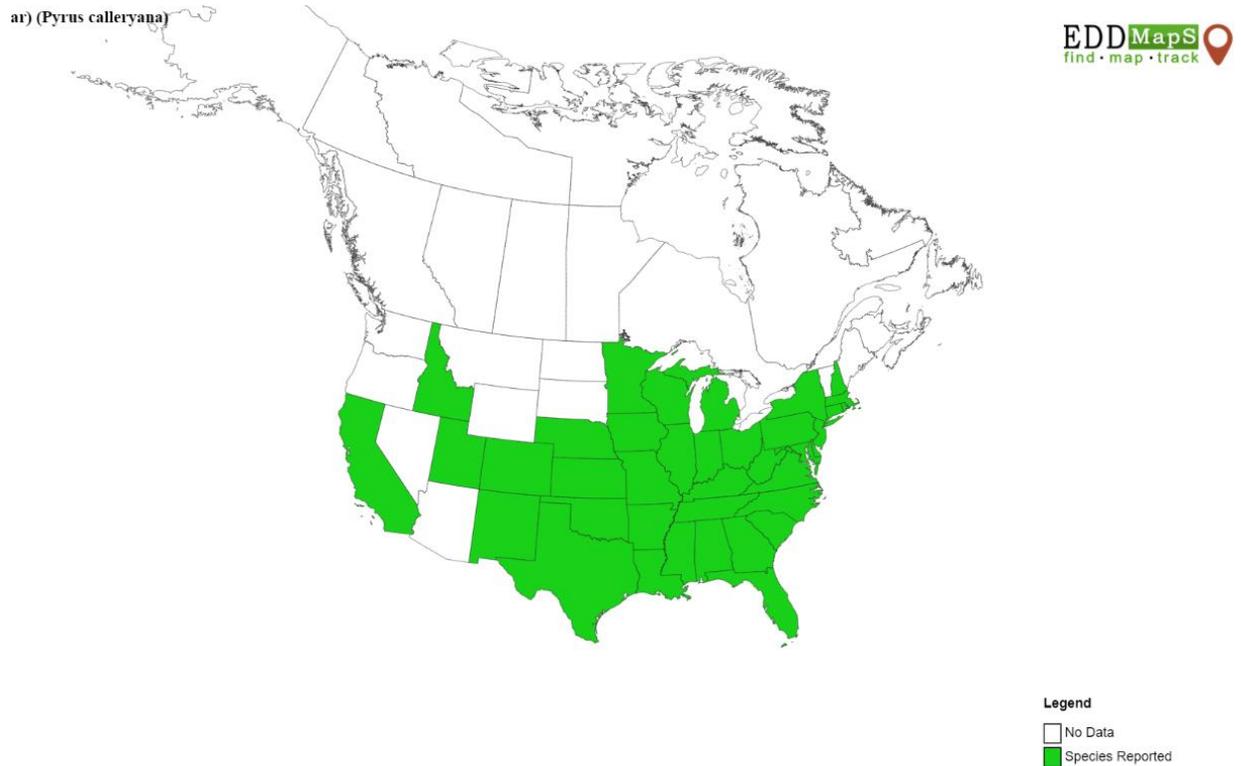
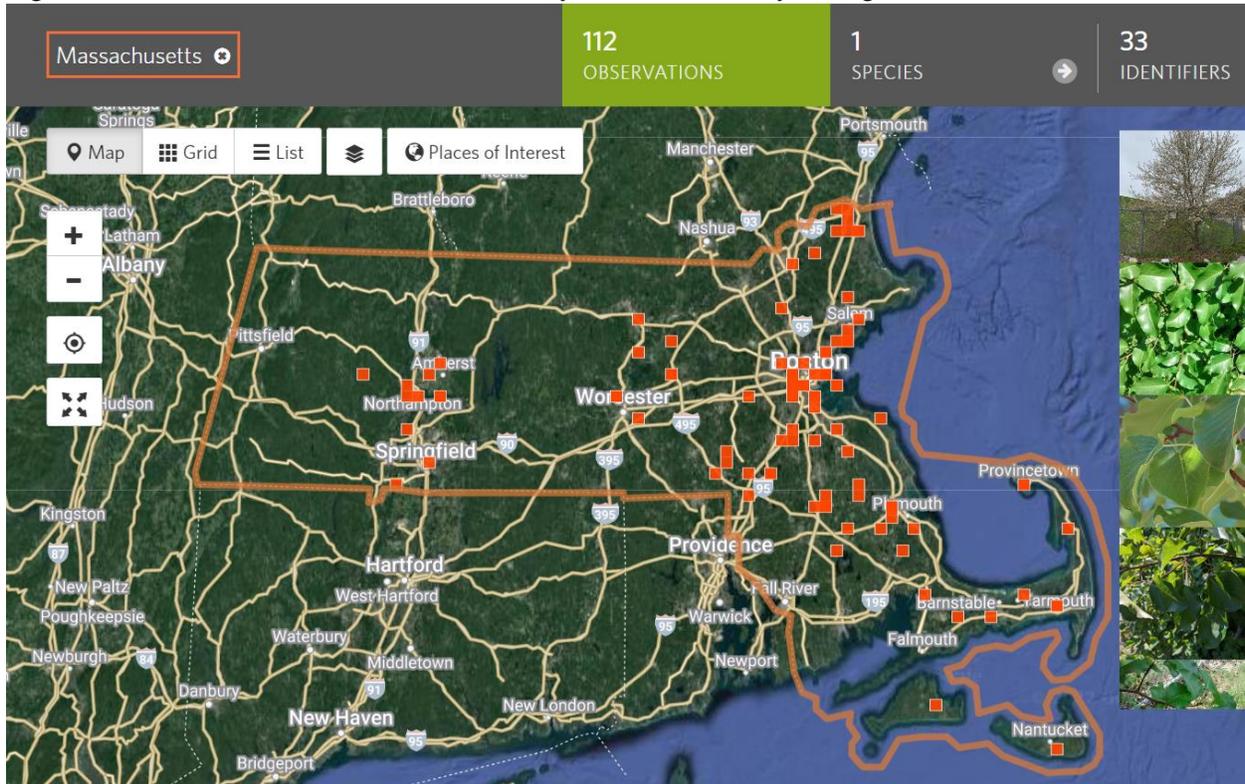


Figure 3. Verified iNaturalist Records of Callery Pear in minimally managed areas in Massachusetts



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