

What Are the Callery Pears Doing Now? An Update on Spread Into a New Habitat

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and Tziporah Serota

University of Cincinnati

Wild Callery Pear – *Pyrus calleryana*

- Spread noticed about 20 yrs ago
- Now listed as Invasive in IN, OH, PA, WV (but not IL)





© J. Boggs

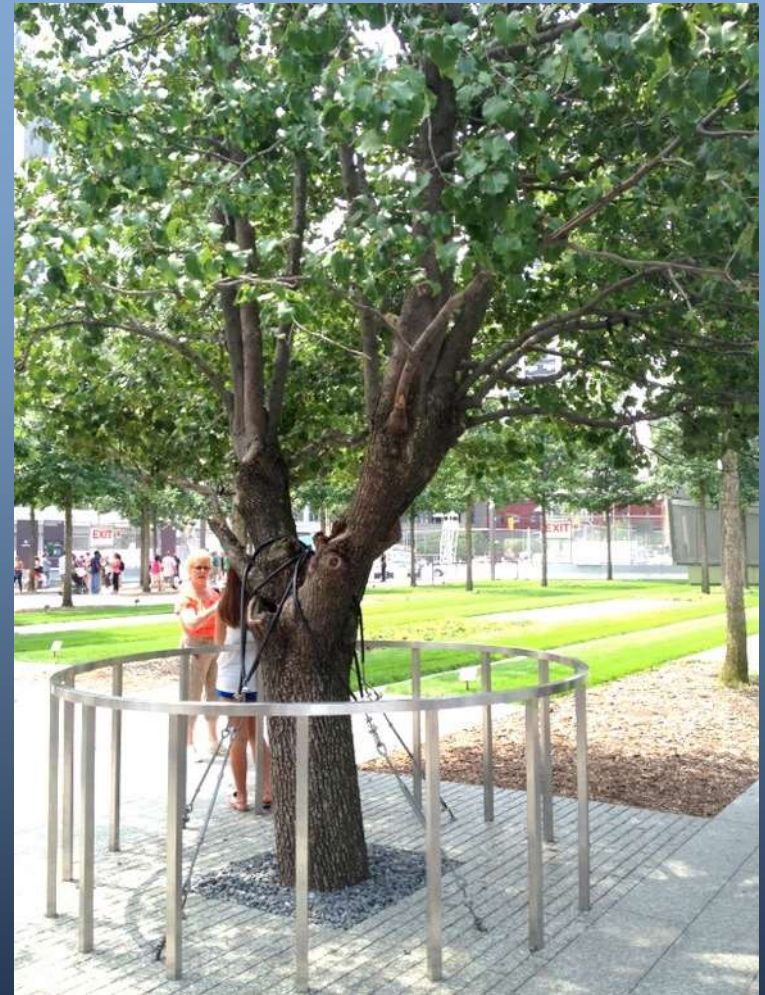


Typical Pattern of Spread in Butler County, OH



- Retrieved from Butler County Auditor's website 9/29/13

The Survivor Tree - Ground Zero, 9/11



So how did this....



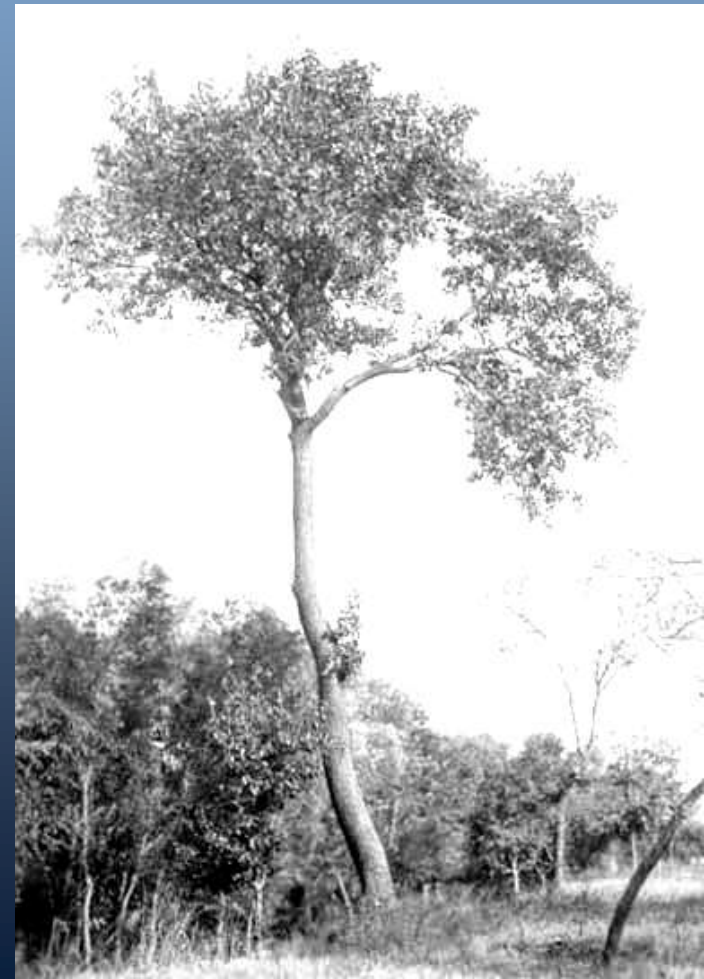
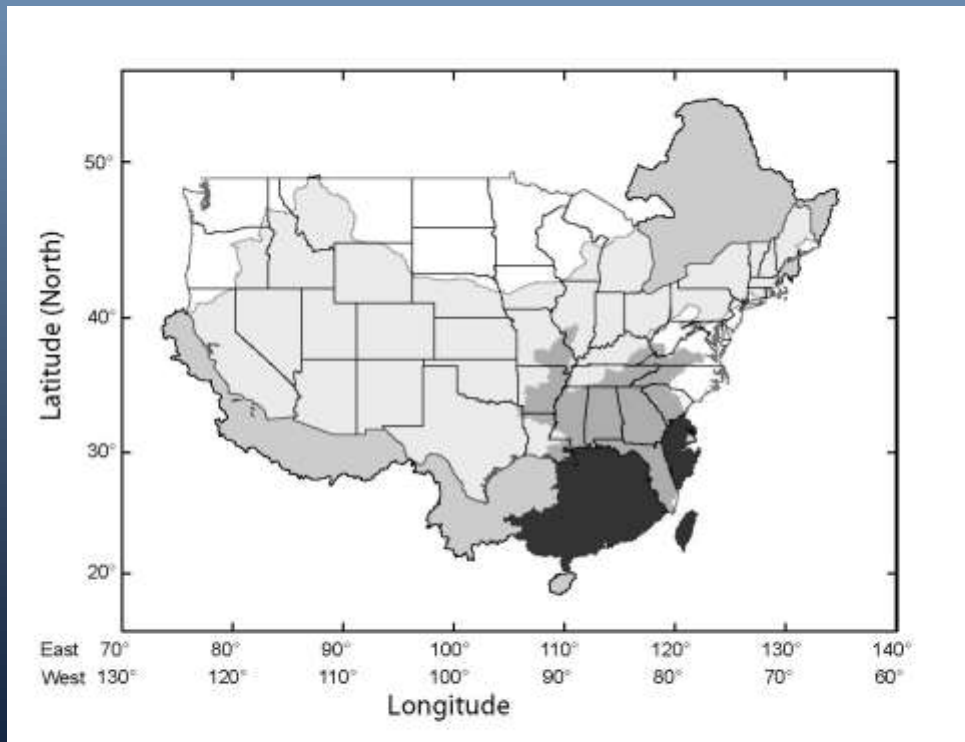
So how did this....become this?



Butler Co., OH

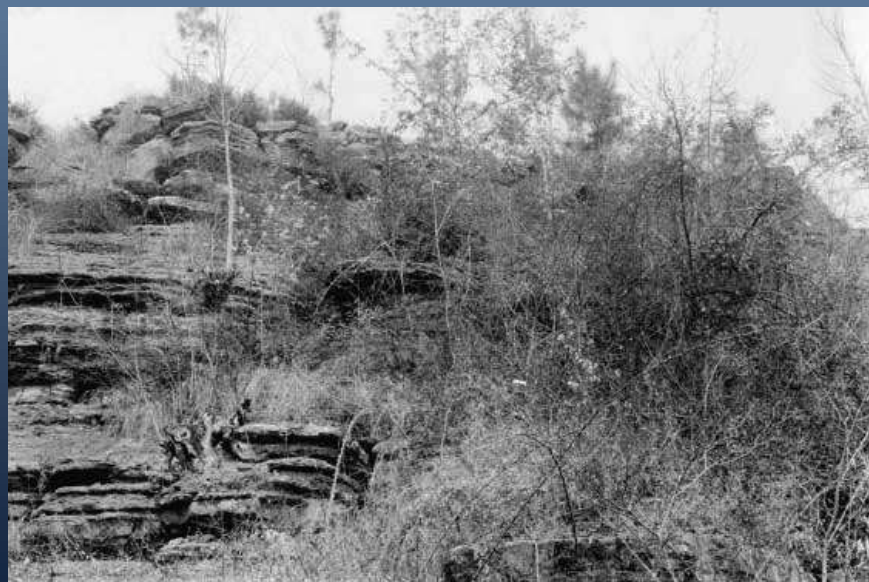
History of the Callery Pear

- Originally from China
- Used as rootstock, to breed fireblight resistance in edible pear



“*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....”

Frank Meyer (1917)



'Bradford'











Cultivated Varieties:

"Cultivars"



Bradford



Aristocrat



Cleveland
Select



Autumn Blaze



Capital



Redspire

Trinity
Princess
New Bradford
Valzam
Whitehouse
Pzazz
Paradise
etc.

Pyrus calleryana



H. C. Steadman
11-21-'21.

No. 100496
Pyrus calleryana, from
Arnold Arboretum.

Pyrus communis



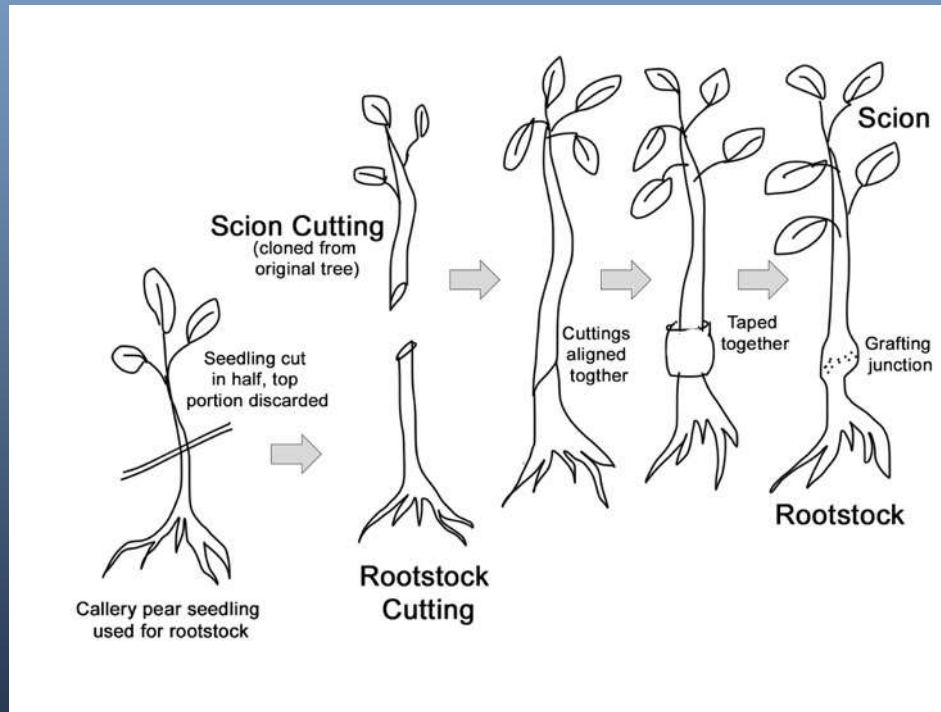
26055
"Select" Bartlett
J. H. Fulton
Barker & Company Co. Ill.

D. P. Patterson

"Select" Bartlett - as shipped from Barker N. Y.
to London, Sept. 13, from New York

Cultivars are propagated by grafting:

- Cloned from a single individual
- Typically grafted onto Chinese *P. calleryana* roots



So...the top parts of all trees of each **cultivar** are genetically identical!

Callery pear is self-incompatible

- Individual trees cannot produce fruits on their own

Need a different individual for pollination



- Initially, Callery Pear trees rarely produced fruit
Mostly consisted of the Bradford cultivar

But abundant fruit set is now common!



Why???

Cultivated Varieties:

"Cultivars"



Bradford



Aristocrat



Cleveland
Select



Autumn Blaze



Capital



Redspire

Trinity
Princess
New Bradford
Valzam
Whitehouse
Pzazz
Paradise
etc.

Testing with Genetic Markers:

Compare DNA of wild trees to DNA of known cultivars to identify their parents.

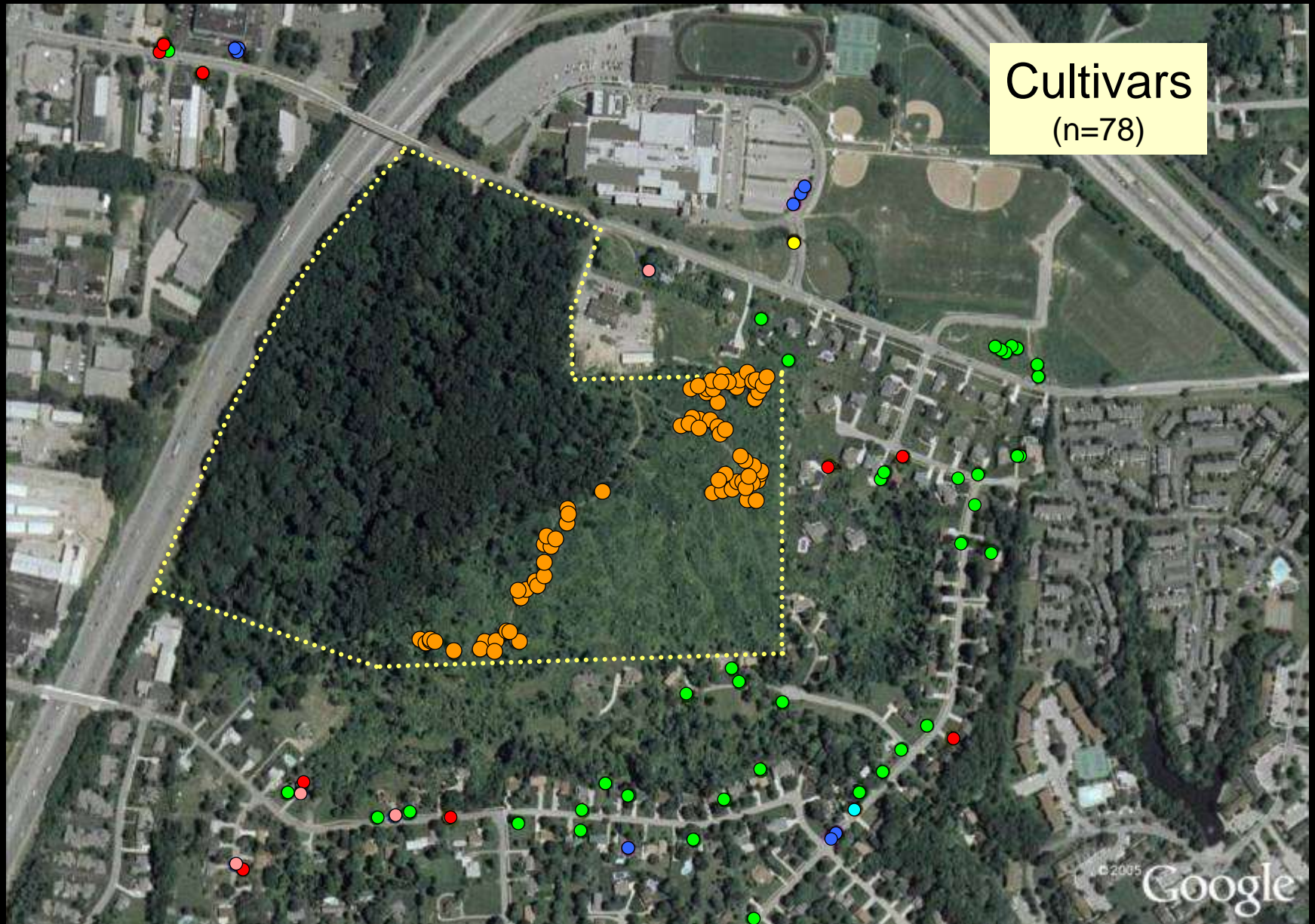
- 1) Collect leaf
- 2) Extract DNA
- 3) Amplify only specific part of DNA



Harris Benedict Nature Preserve – Cincinnati, OH

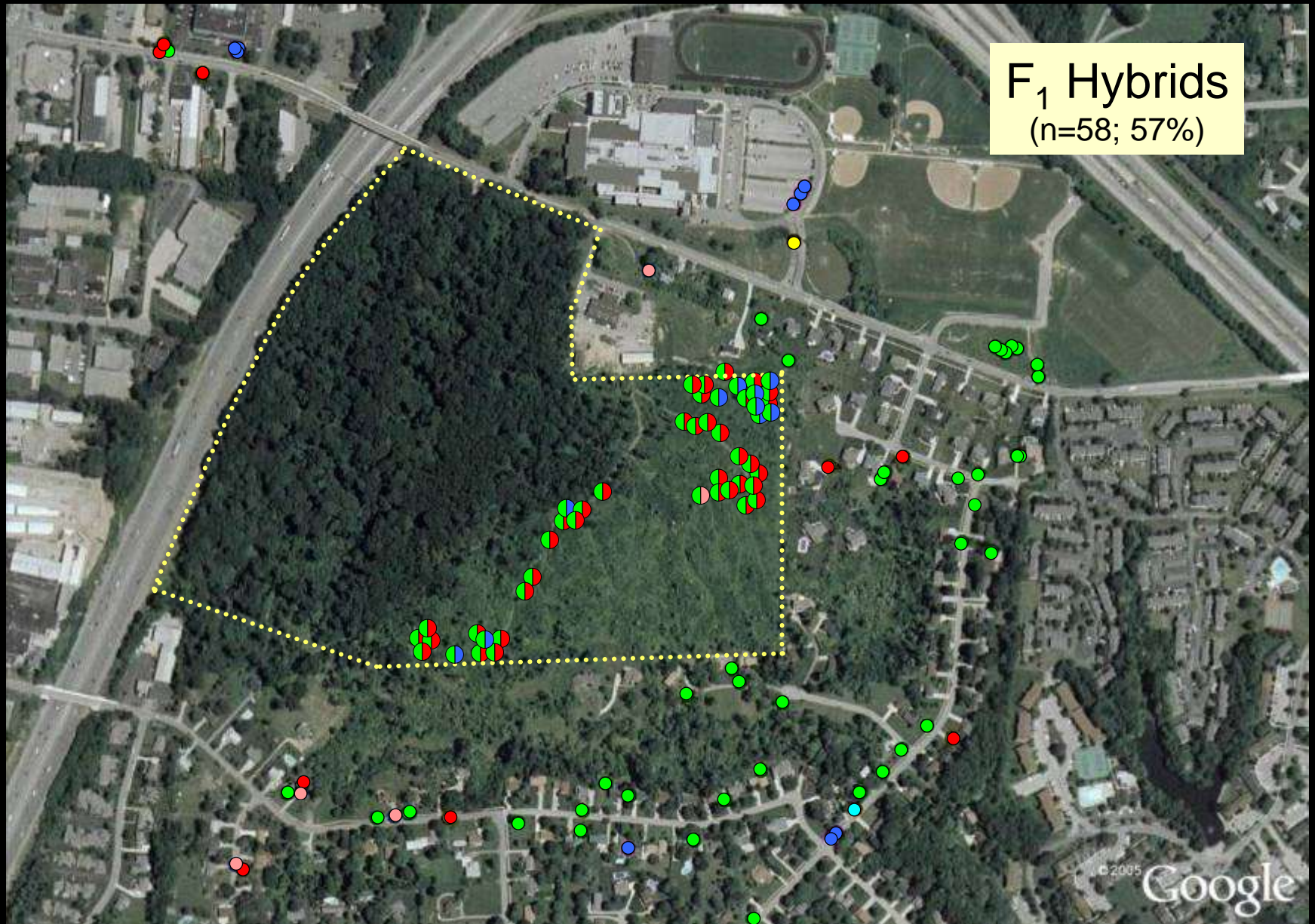


Harris Benedict Nature Preserve – Cincinnati, OH



● = Aristocrat ● = Bradford ● = Redspire ● = Capital ● = Chanticleer ● = Faurie

Harris Benedict Nature Preserve – Cincinnati, OH



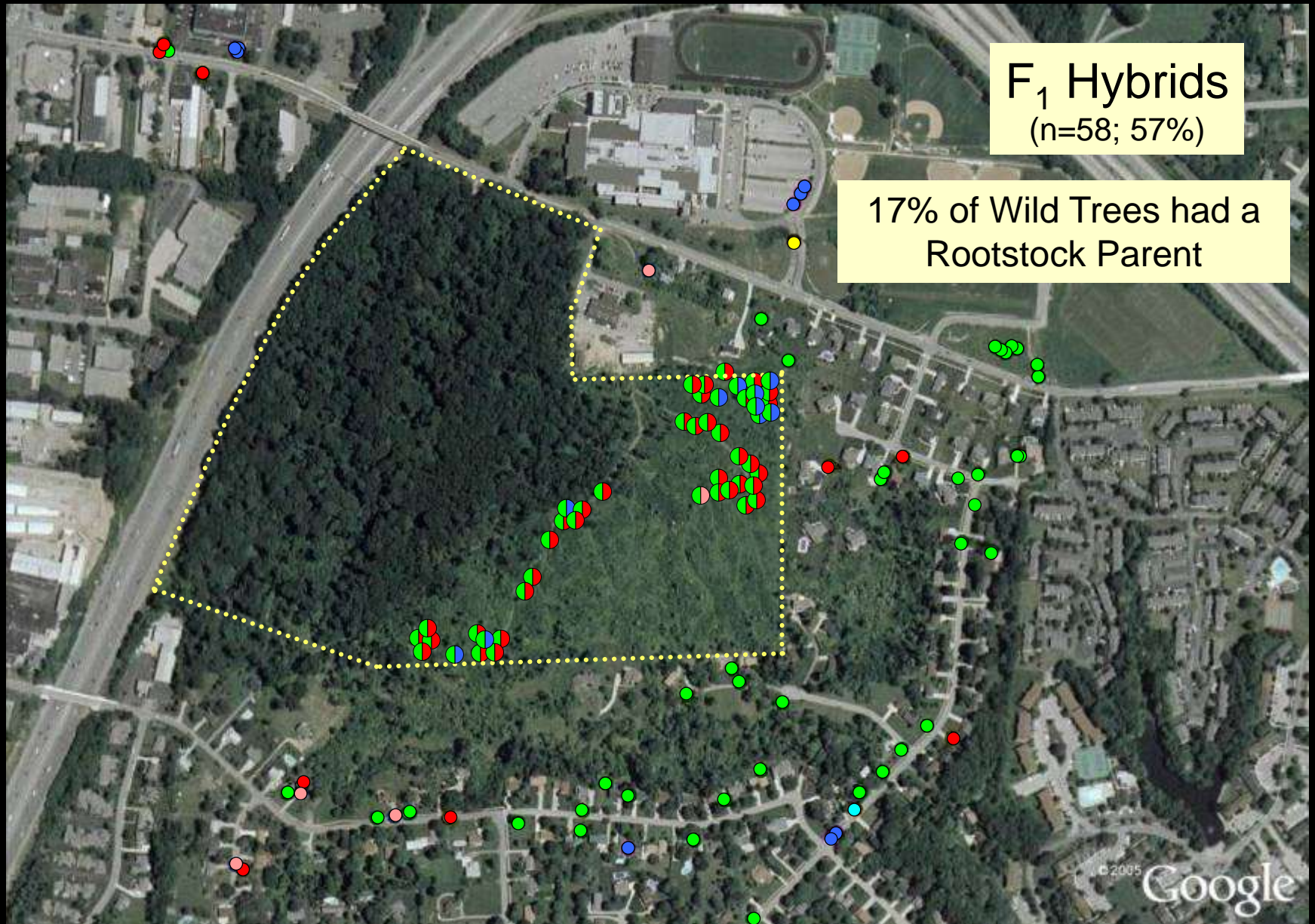
● = Aristocrat ● = Bradford ● = Redspire ● = Capital ● = Chanticleer ● = Faurie

But.... Crossing can occur between rootstock and upper scion of cultivated trees

- Common in abandoned or neglected trees

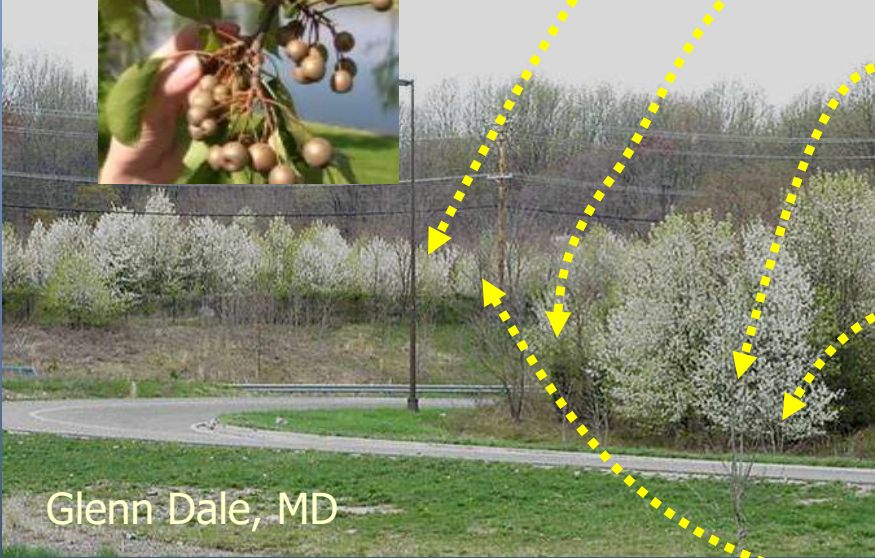
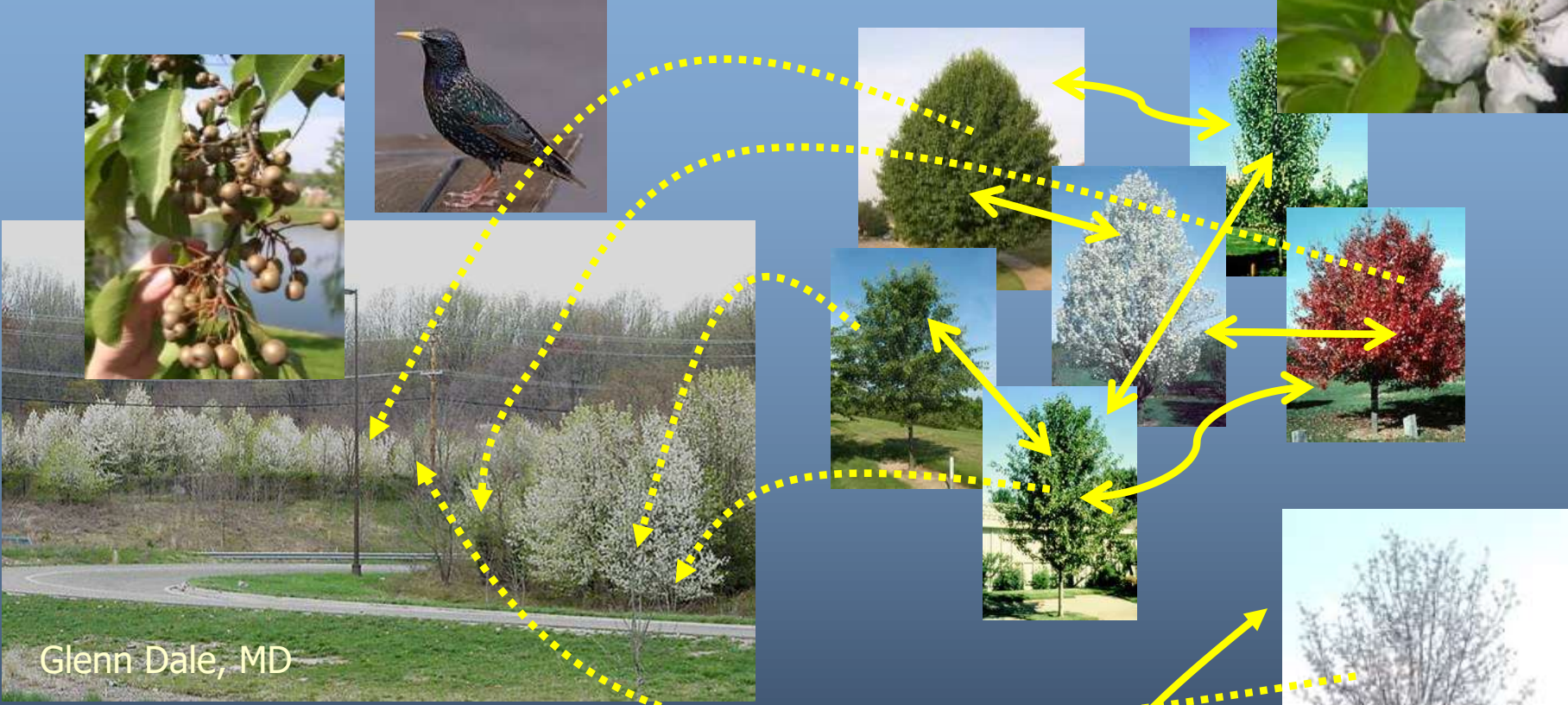


Harris Benedict Nature Preserve – Cincinnati, OH



● = Aristocrat ● = Bradford ● = Redspire ● = Capital ● = Chanticleer ● = Faurie

Formation of Wild Populations



Wild populations originate from cross-pollinations (1) between genetically distinct cultivars and (2) between scion and rootstock.



But recently Callery pears have begun to appear in forest interiors.

Why???

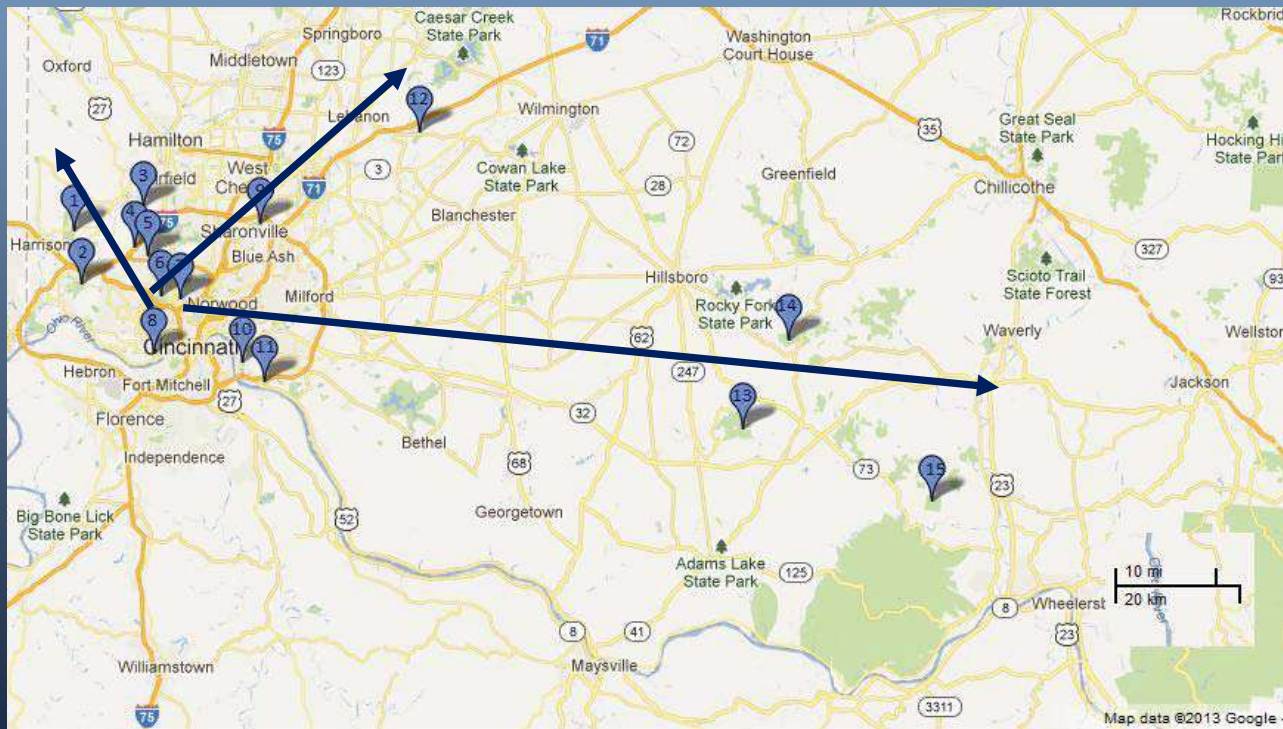
Forest Invasion in Martin County, IN



Spread of Wild Pear

- Vegetation survey in 15 forests along an urban-to-rural gradient in SW Ohio:

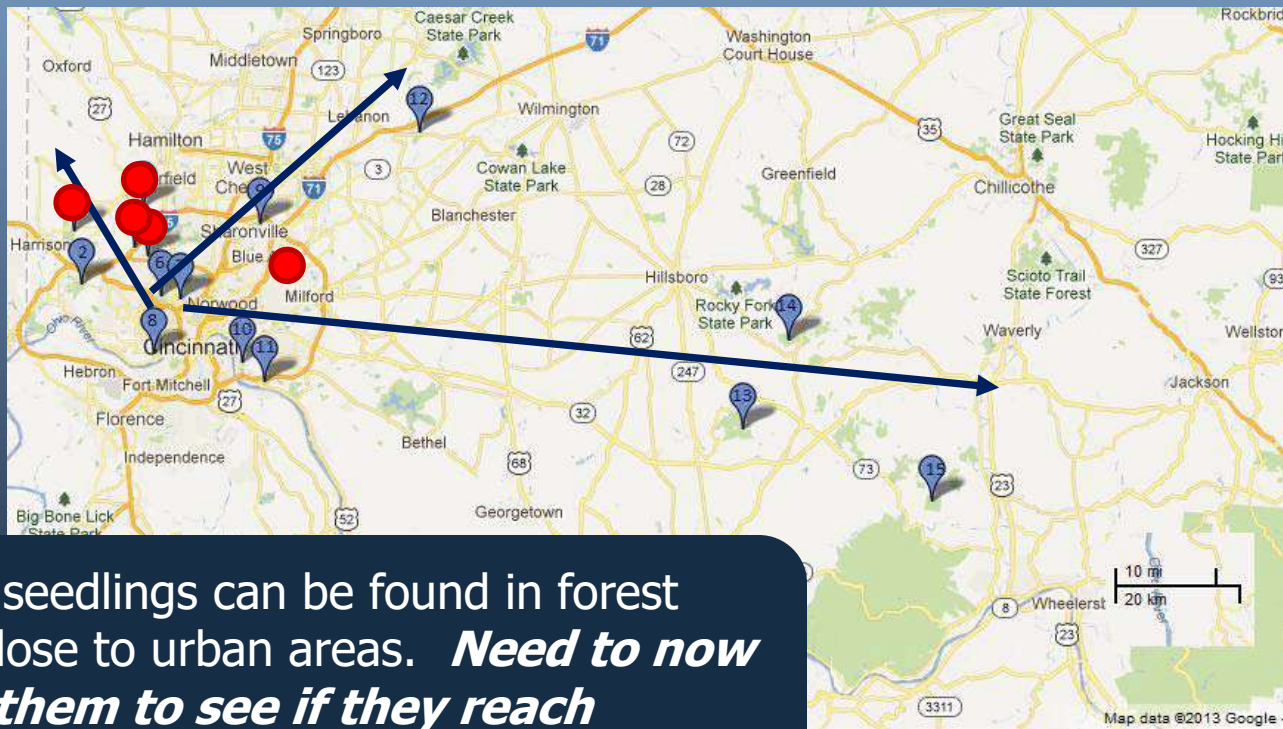
Focus was on non-native species of ornamental origin.



Mastalerz & Culley, unpubl. data

Spread of Wild Pear

- Found in nearly a third (4/15) of all surveyed forest interiors
- All small seedlings
- Average percent cover of <math><1\%</math> within plots



Wild pear seedlings can be found in forest interiors close to urban areas. ***Need to now monitor them to see if they reach reproductive maturity.***

UC Harris Benedict Nature Preserve (Hazelwood)



Are these a certain type of F₁ hybrid adapted to the forest understory?



NO

- Collected DNA for analysis
- Measured abiotic conditions

But recently Callery pears have begun to appear in forest interiors.

Why???





US 75 South
Cincinnati

Dispersed by European Starlings



But what about the interior forests?



Work by Julie Craves

Summary



- Wild pears originate from crossing between commercially available cultivars and rootstock
- Problem compounded by horticultural use
 - Only a single new cultivar tree needed in group of an established cultivar to trigger fruit production
- Species starting to appear on state invasive lists
- Land managers now need to watch for wild pears in interior forests as problem is likely to continue

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- [Flowering Pear 'Bradford'](#)
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Flowering Pear Combination



Testimonials:

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Acknowledgements

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National Clonal Germplasm Repository

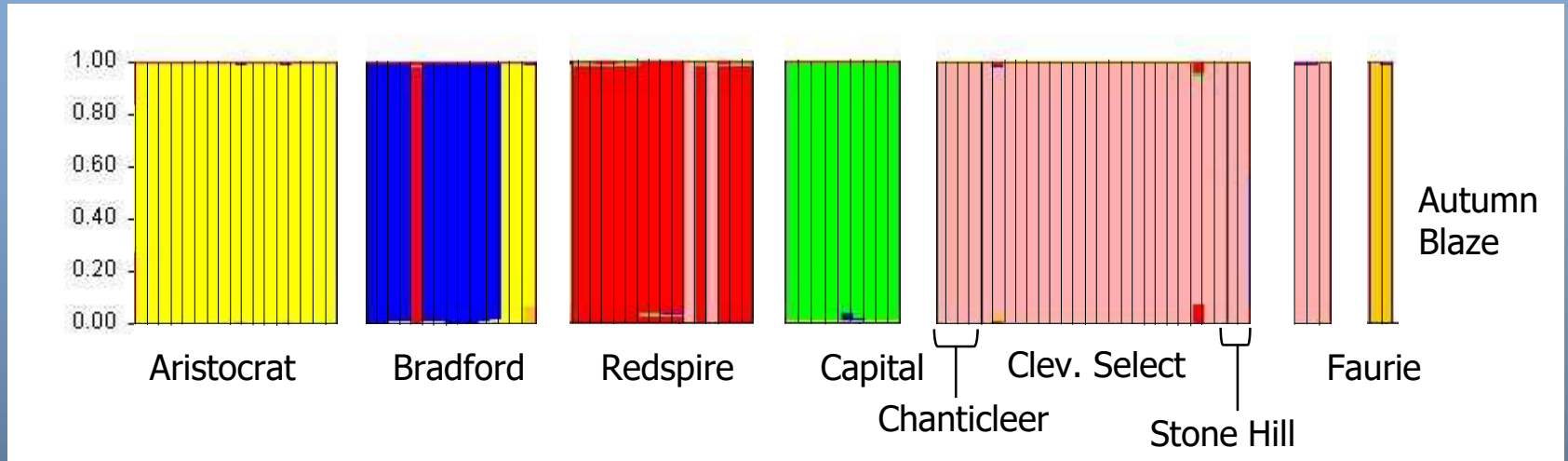


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Cultivar Database Results

Structure Output



- 1) Individuals within a cultivar are genetically identical
- 2) Cultivars are sometimes sold mislabeled (11.5% of trees)
- 3) Some cultivars are genetically identical

Chanticleer
Cleveland Select
Stone Hill

} Cloned from same tree

(Santamour and McArdle 1983)



April 15, 2014



Yarn Bombing or Knit Graffiti



And....Fruits Are Dispersed by Introduced European Starlings

