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**Monitoring the Spread of *Magnolia kobus* within
the Royal Botanical Gardens'
Nature Sanctuaries**

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Magnolia kobus at RBG

Thousands of *Magnolia kobus* plants (also known as Northern Japanese Magnolia or Kobus magnolia) were recently discovered throughout RBG's natural lands, with most of the plants located in ravines.

The species was first introduced to North America in 1862, and was planted in the RBG collections in 1958. It has only recently begun to invade surrounding natural areas.





This presentation will cover information required for the development of a management strategy for *Magnolia kobus* in the RBG's natural lands.

- **Description of *M. kobus***
- **Native Range**
- **Identifying the Problem at RBG**
- **Identifying *M. kobus***
- **Is it a Problem Elsewhere?**
- **Theories for Invasion**
- **Management**
- **Going Forward**

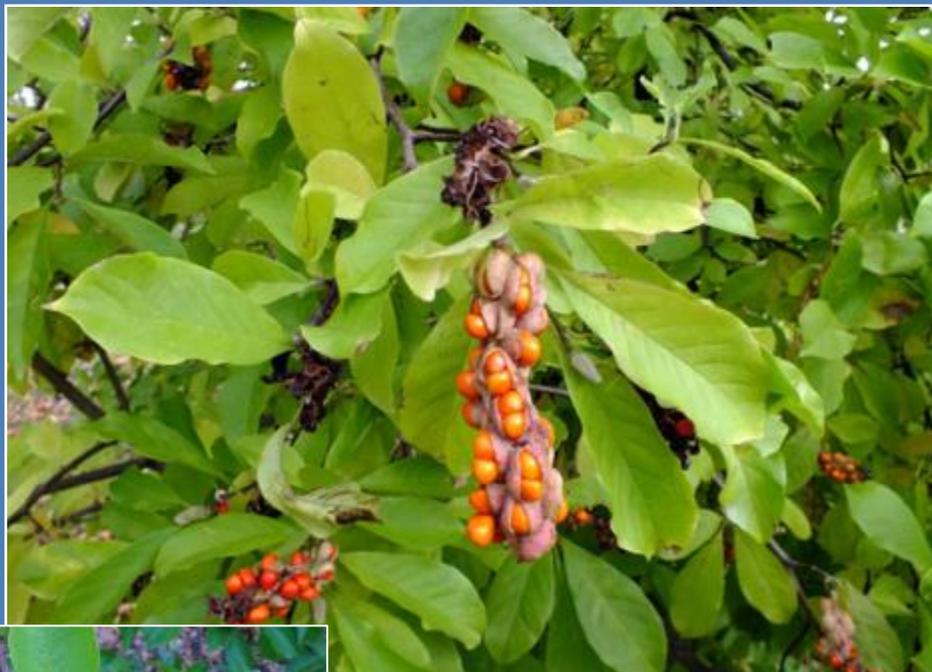
Description

- Deciduous, medium-sized tree
- Simple, deciduous leaves 3" to 6" long
- Obovate, abruptly acuminate
- Strong sweet smell when twig is broken
- Buds are covered in silky hair



Description

- White flowers 4" across bloom in early spring before leafing out
- Young trees don't flower- they take around 15 years to bloom for the first time
- Fruit is an aggregate of follicles
- Seeds are red; attract birds

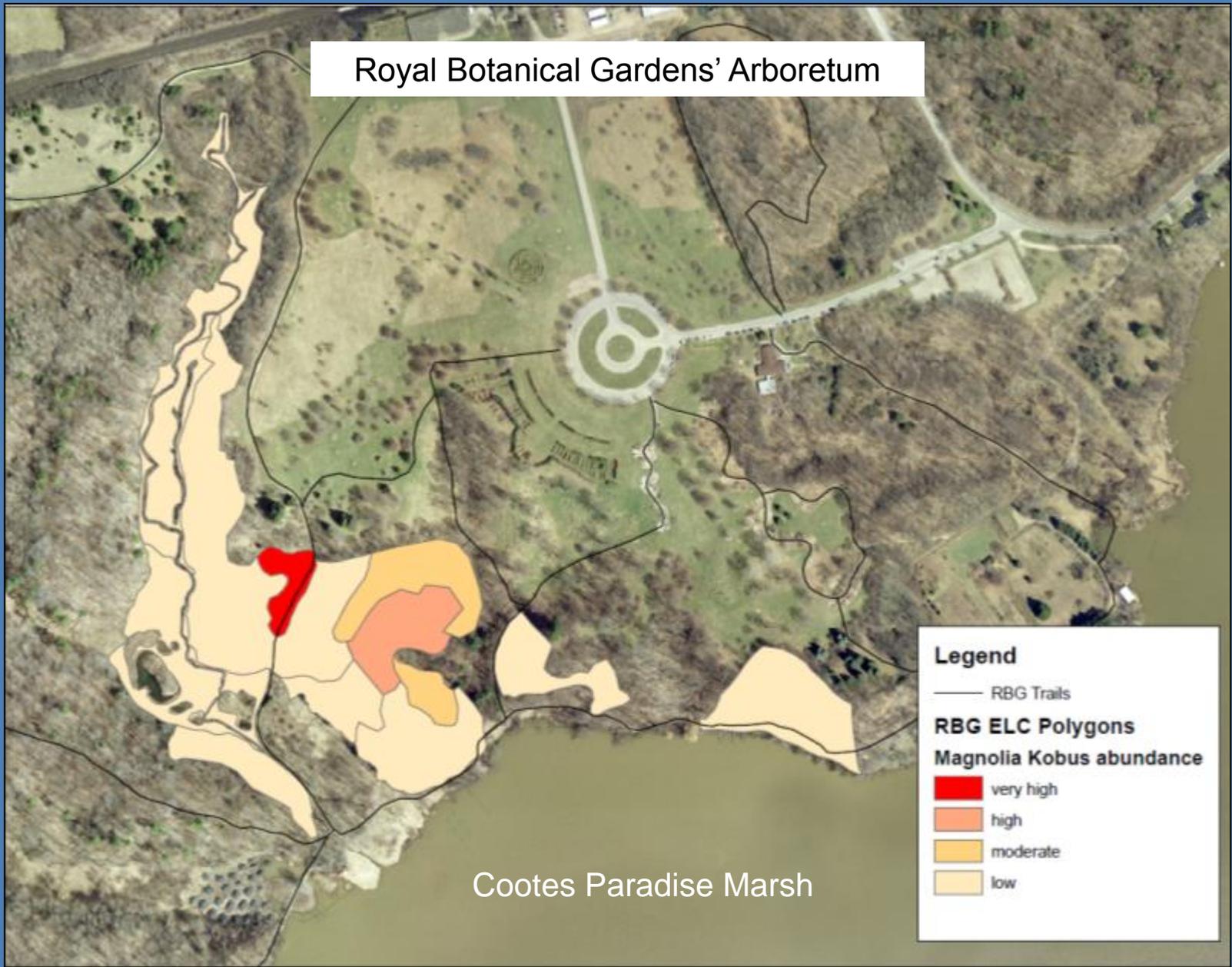


Where is it from?



Magnolia kobus inhabits forests in hilly areas and piedmont regions.
A piedmont is a gentle slope leading from the foot of mountains to a region of flat land.

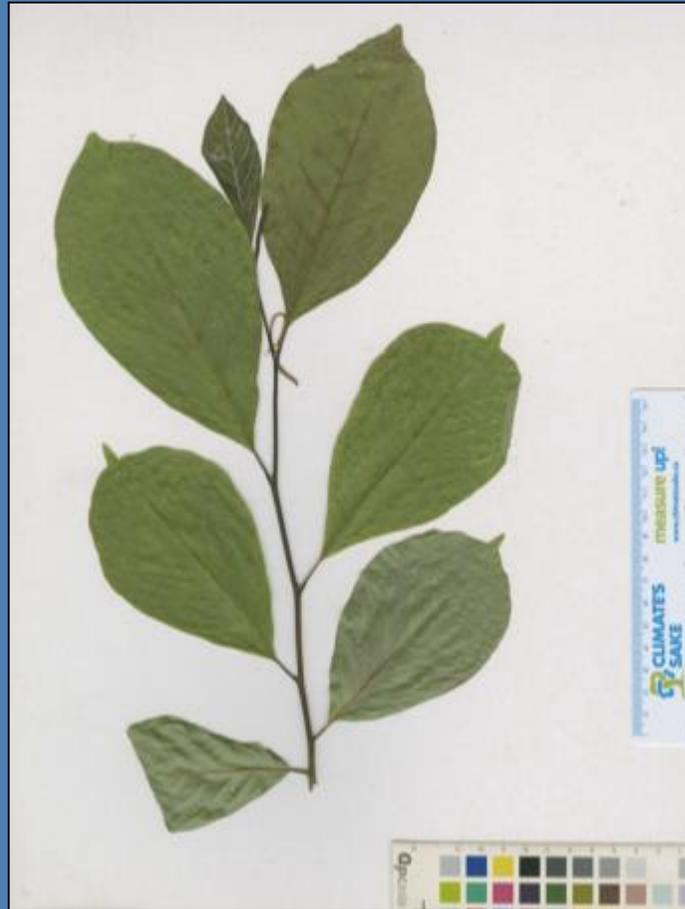
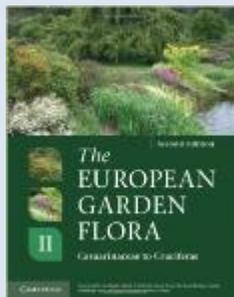
Native Range



Identifying the problem

Identifying *Magnolia kobus*

- RBG's herbarium staff collected and pressed samples of the magnolia
- The leaves and flowers were identified using a dichotomous key and consultation with RBG plant taxonomist, horticulture staff, and other experts



Different magnolias may share common features. The herbarium specimens had to be inspected closely...

...Very closely!

One of the key identifying features of *M. kobus* is the presence of long hairs scattered along the edge of the veins and/or in the axils of the major lateral veins



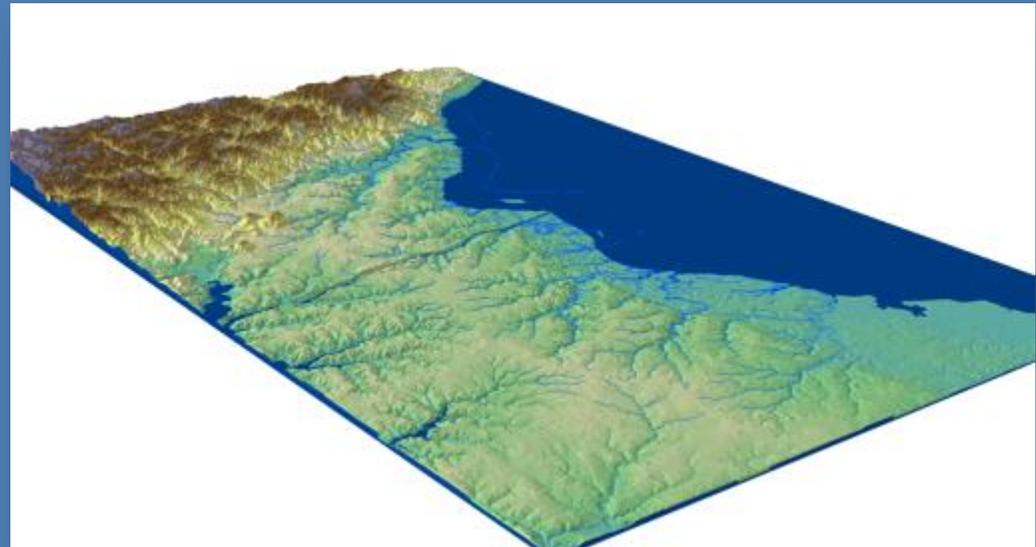
Identifying the plant

Invading Delaware

According to the Delaware Department of Natural Resources and Environmental Control, *M. kobus* was identified as an invasive species in 2001 in the northern **piedmont** region of New Castle County, Delaware

Becomes established in:

- Young woods
- Thickets
- Forest edges
- Moist soils rich in organic material
- **Ravines?**



Elevation model of New Castle County

Where else is it a problem?



Increases in certain bird populations

- Reintroduction of Wild Turkeys
- More reports of Red-bellied Woodpeckers



Local weather patterns

- Recent winters have been frigid with an abundance of snow



Filling a niche

- Similarities between *M. kobus* and *M. acuminata*

Theories for recent invasion



Delaware

- 34 wild turkeys were released in 1984
- Reintroduction continued through the 1990s
- Current population estimate is 6,000 birds statewide

Ontario

- Between 1984 – 1987, 4,400 wild turkeys were released throughout Ontario
- In 2014 the population estimate was 75,000 birds
- Most of Ontario's wild turkeys are found in the southern regions

A wildlife camera will be set up near a mature *Kobus magnolia*

Remember when...

- The past 2 winters broke records throughout Ontario
- The 2013/14 winter was the season of the “Polar Vortex”



- A study in Japan concluded that snow accumulation directly affected the survival of *Fagus crenata*. The snow protected seeds against predation and winter desiccation
- Most of the *Kobus magnolia* seedlings are 1-2 years old. Could their germination be partially attributed to the harsh winter conditions?

Historical weather data for the Hamilton region will be collected from local weather stations



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Harsh winters

Species Similarities

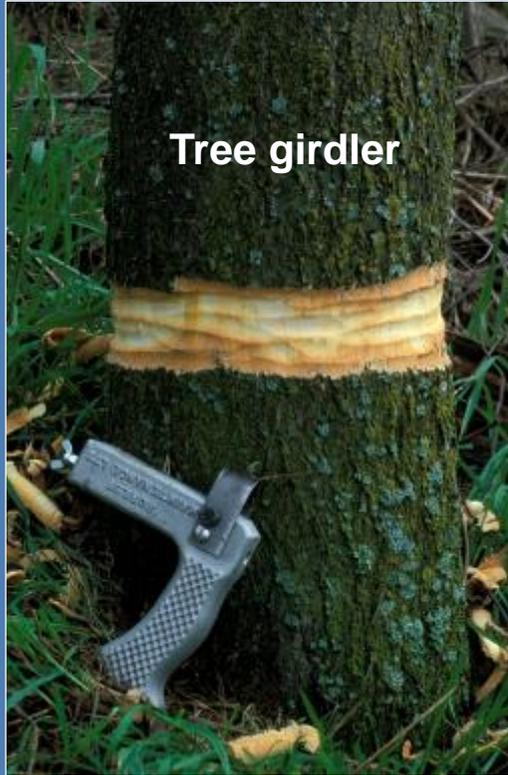
- *Magnolia acuminata* (Cucumber magnolia) prefers rich soils of bottomland and slopes
- *M. acuminata* is most abundant in mountains and hilly regions
- Wildlife that use it as a food source may turn to *Magnolia kobus*
- **As *M. acuminata* disappears from the landscape, *Magnolia kobus* may be taking advantage of the void left behind**



Filling a niche

Monitor & Control

- Mechanical control methods are used to remove the plants at RBG
- Small seedlings are hand-pulled; larger trees are girdled
- Hand-pulling seems to be the most effective method, as girdling fails to completely kill the trees



Extractigator



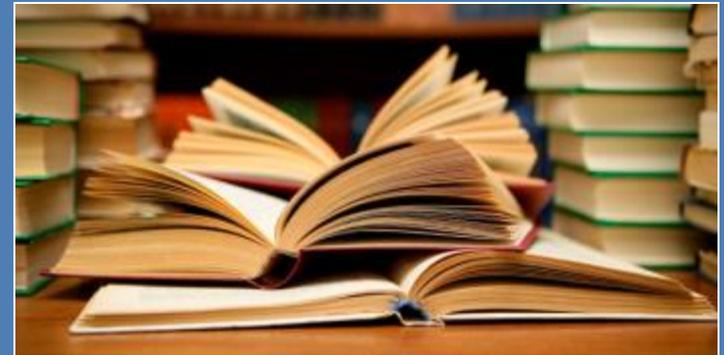
Hand-pulling

Next Steps

Using a combination of field observations and published research, information will be gathered on the species'

- Growth rate
- Aggressiveness
- Lifespan
- Ecological niche
- Pollinators and pests

In order to develop effective management strategies for *Magnolia kobus*, further research will be conducted regarding its potential impacts on local ecosystems.



Going forward



Thank you!

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