

USDA Forest Service State and Private Forestry

Forest health including identification and management of insects and diseases and impacts of natural disturbances

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Northeastern Area
State and Private Forestry

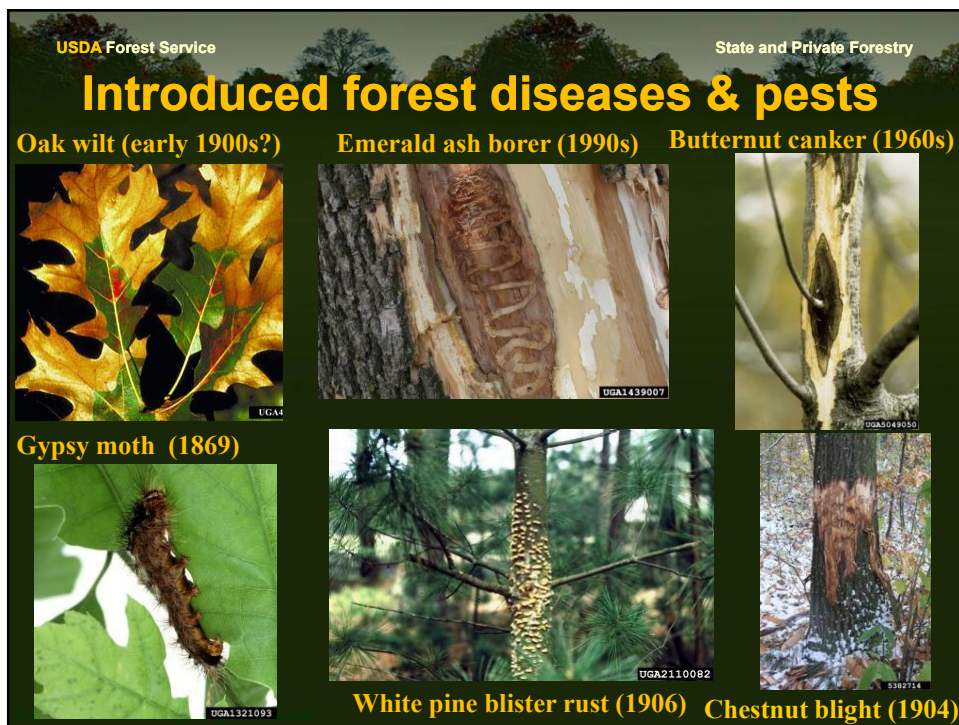
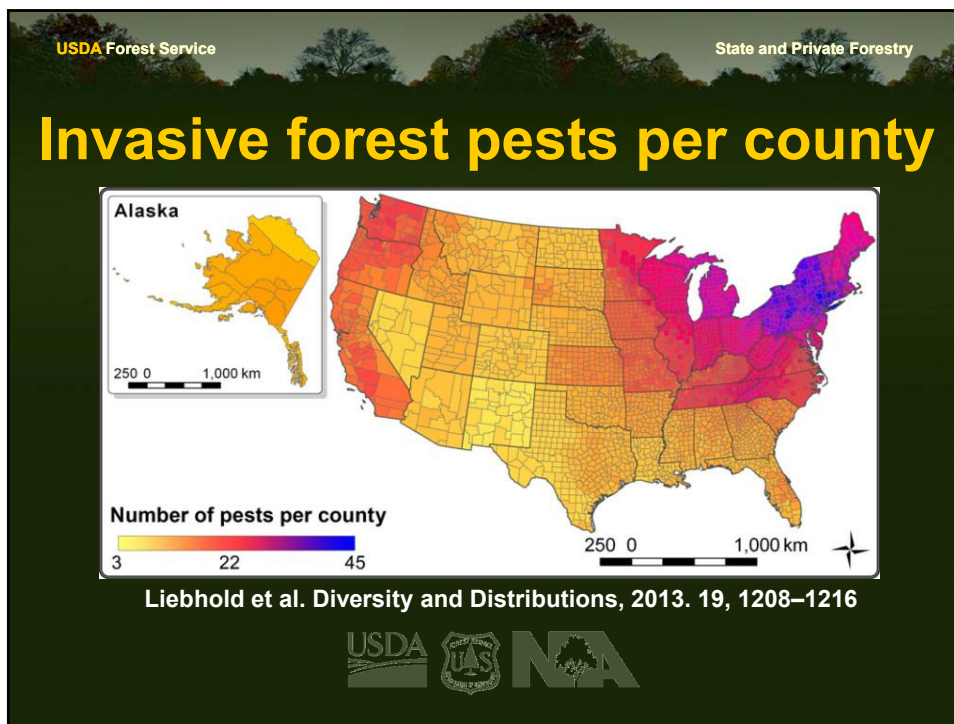
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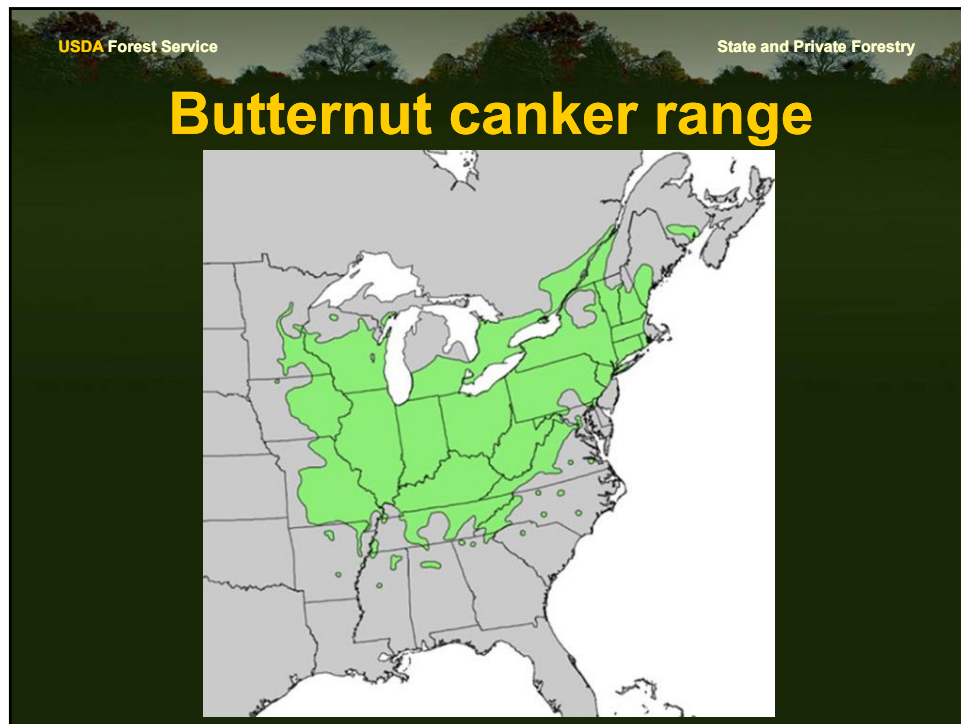
Outline

- Invasive pests
 1. Butternut canker
 2. Gypsy moth
 3. Oak wilt
- Native pests
 1. Anthracnose
 2. Phomopsis
 3. Hickory decline

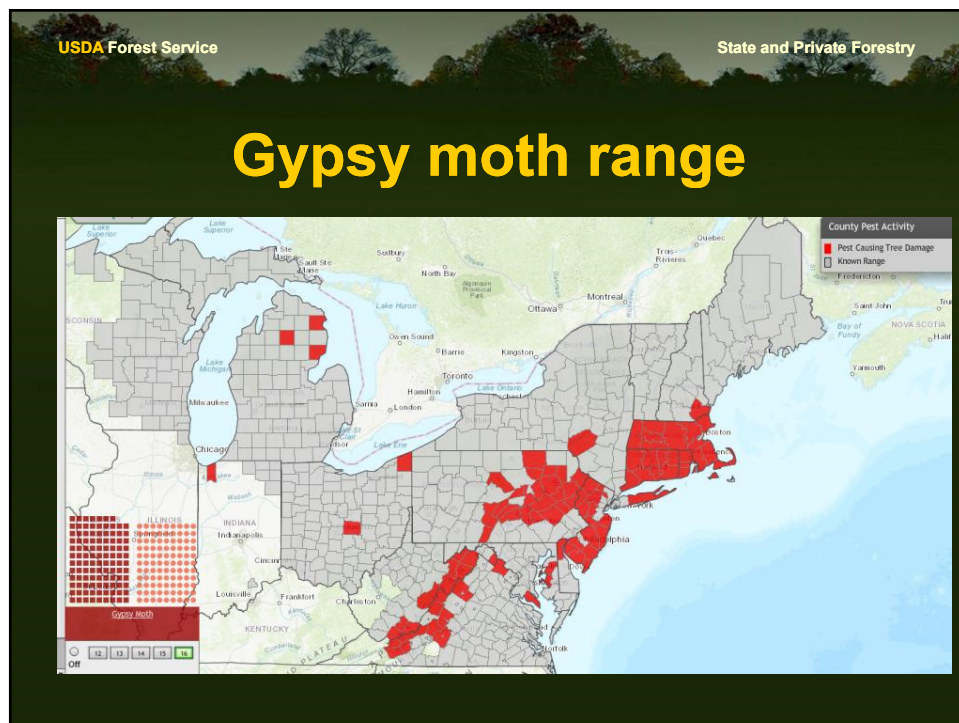
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Gypsy moth silviculture

1. Reduce density of favored species (oak) and increase the number of non-favored species (maple, birch, hickory)
2. Improve the growing conditions for residual trees with intermediate thinnings
3. Between gypsy moth outbreaks, salvage dead trees and thin live trees

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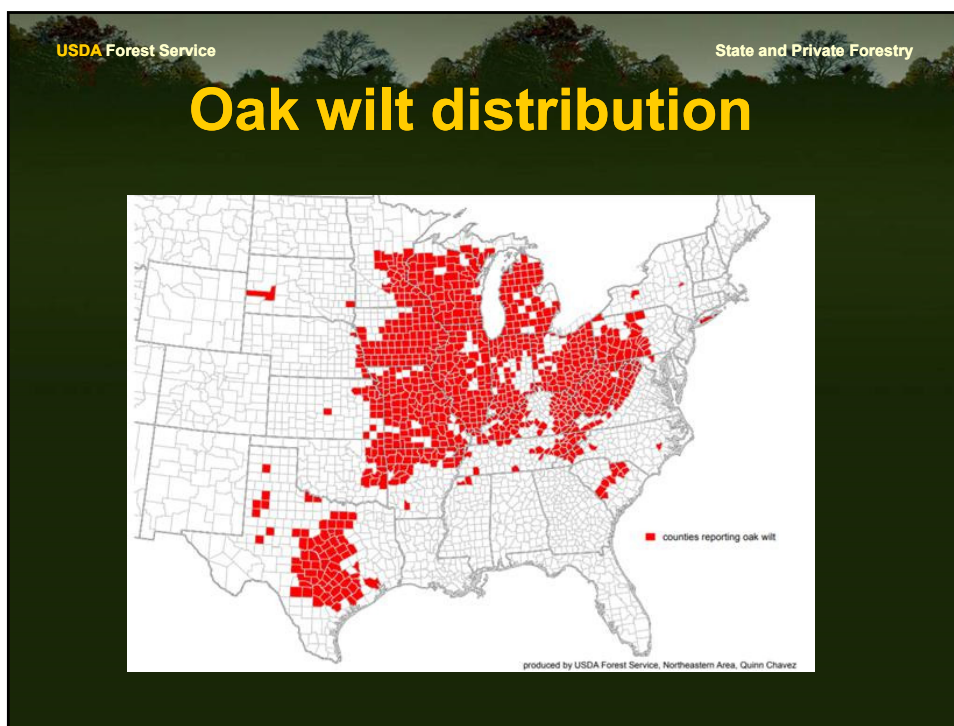
Oak wilt pathogen

Bretziella fagacearum
Ceratocystis fagacearum



5505241 5492325

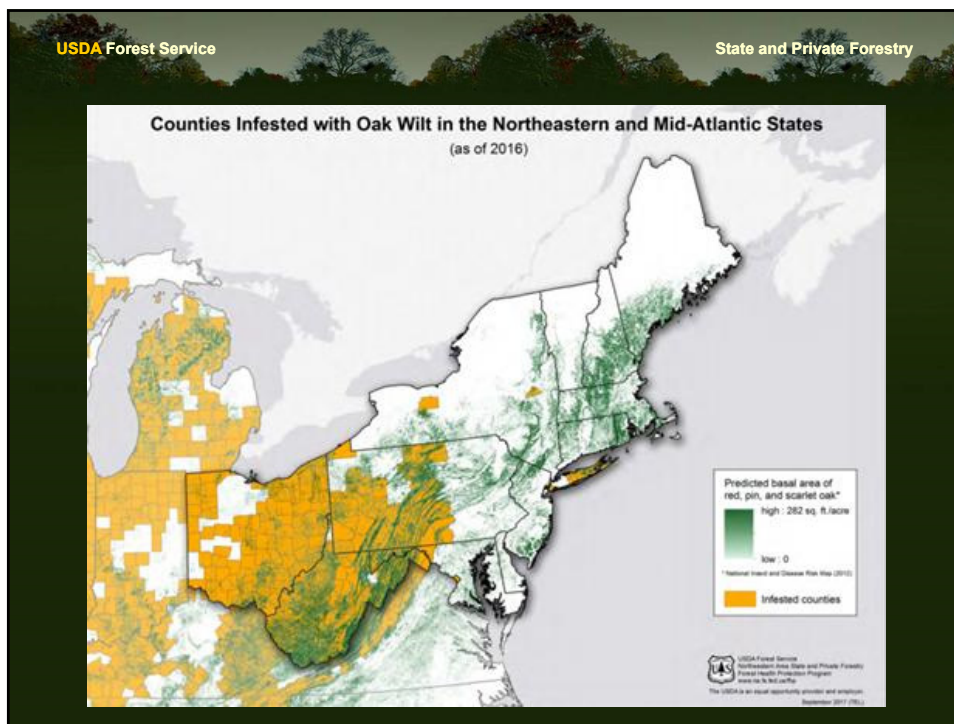
Sandra Jensen, Bugwood



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Hosts

<u>Red oaks:</u>	<u>White oaks:</u>
1. Northern red oak (<i>Quercus rubra</i>),	1. White oak (<i>Q. alba</i>)
2. Pin oak (<i>Q. palustris</i>)	2. Swamp white oak (<i>Q. bicolor</i>)
3. Scarlet oak (<i>Q. coccinea</i>)	3. Chestnut oak (<i>Q. montana</i>)
4. Black oak (<i>Q. velutina</i>)	4. Post oak (<i>Q. stellata</i>)
	5. Bur oak (<i>Q. macrocarpa</i>)

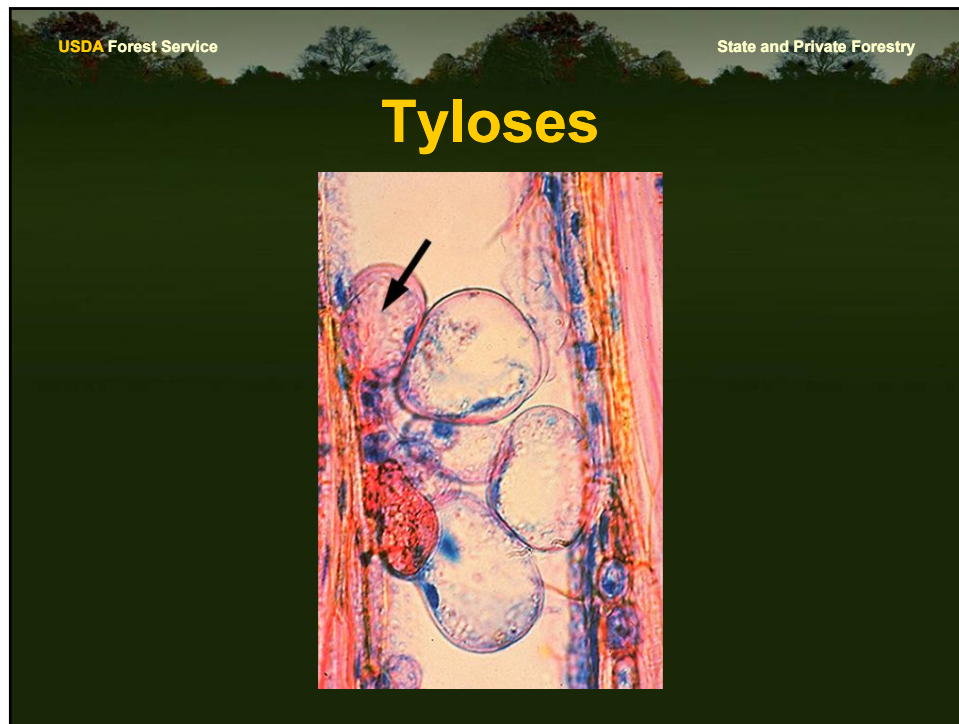


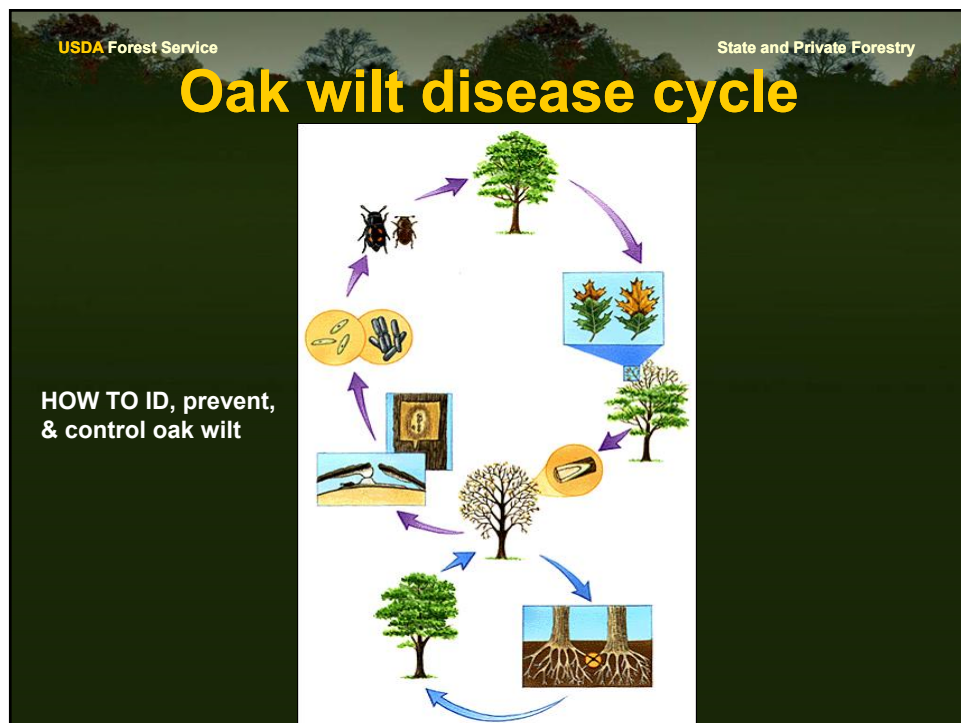
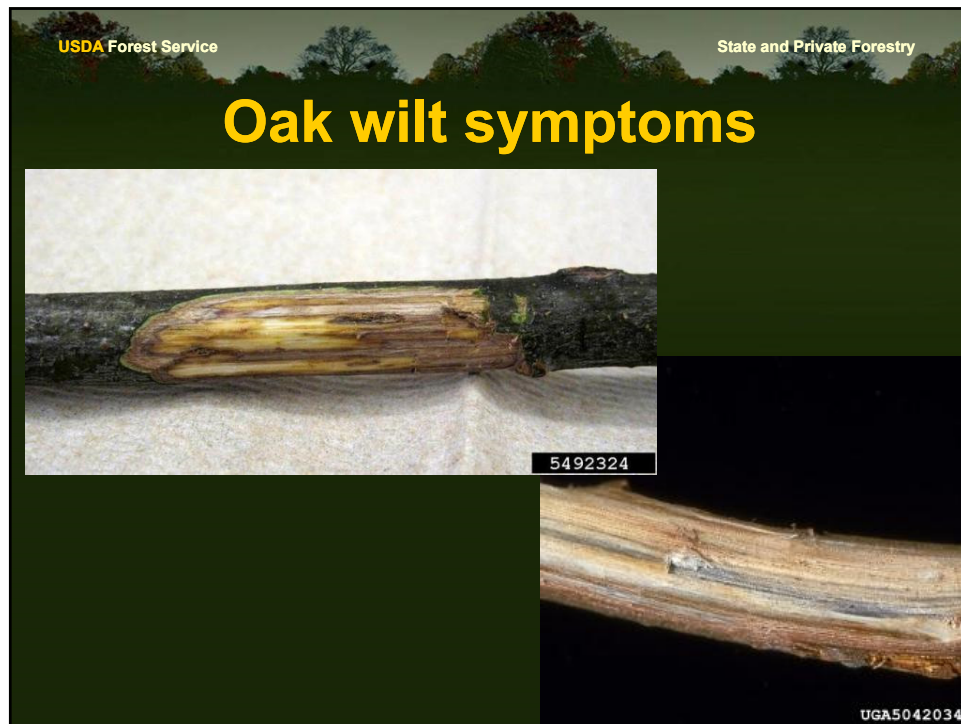
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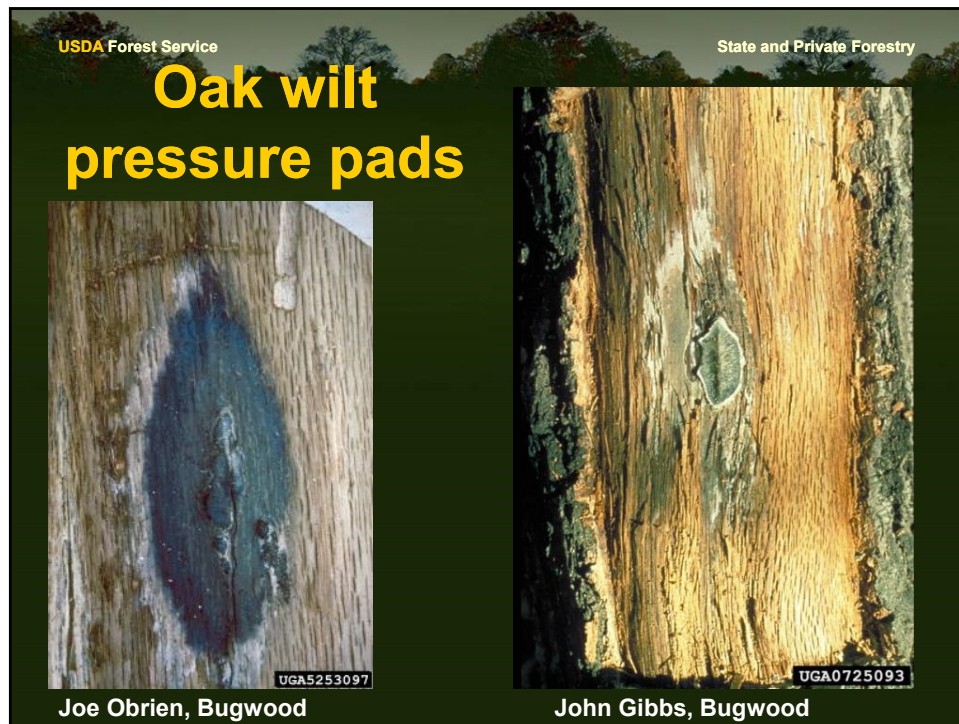
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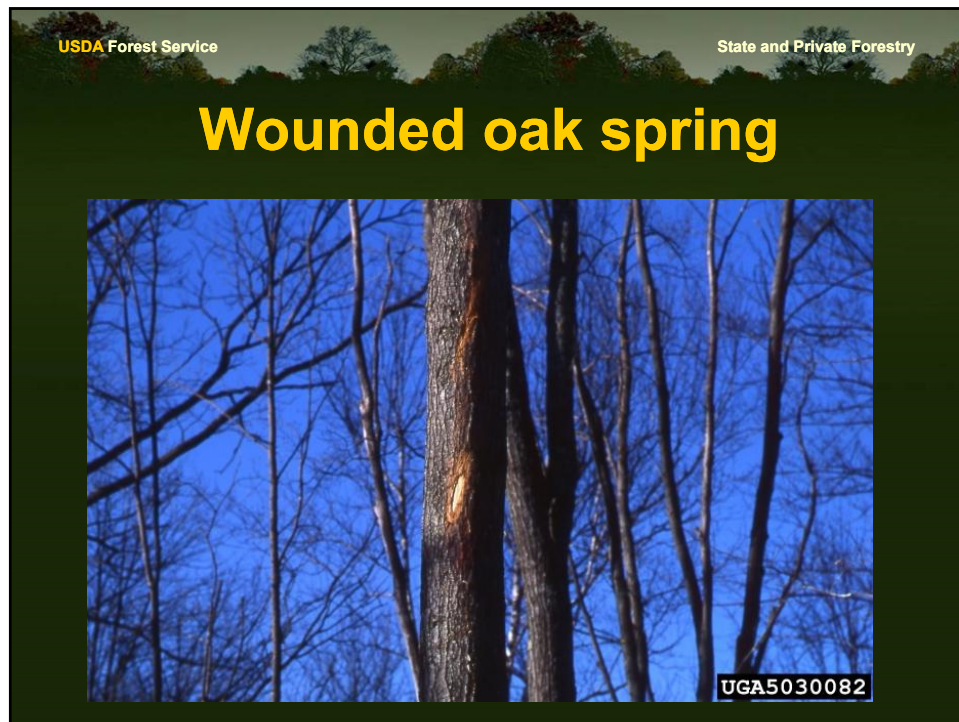
Vascular wilts

- Wilts are caused by bacterial or fungal colonization of xylem vessels
- Disrupt water movement-wilt
- Tyloses are produced by the plant that plug up the xylem vessels
- Fungal spores, hyphae, and polysaccharides plug up vessels
- Fungi produce enzymes and toxins that degrade plant cells walls and kill parenchyma cells









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Control

- Prevention is most effective
- In areas with oak wilt:

Do NOT prune trees between April and July when sap beetles are active! If necessary, paint over wounds

HOW TO ID, prevent, & control oak wilt

Spread through root grafts



UGA3226028

Ronald Billings, Bugwood

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Site factors affecting oak wilt

- Topography
- Soil
- Tree species composition

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Trenching-vibratory plow

1. Trench
2. Cut Trees-chip, debark, burry
3. Herbicide



The diagram illustrates the trenching-vibratory plow method for controlling oak wilt. It shows a central yellow circle labeled 'Infected Tree' surrounded by several green circles representing healthy trees. A dashed line, labeled 'Trench Line', forms a diamond shape around the infected tree. A legend indicates that green circles represent 'Treat trees within trench with fungicide'. Below the diagram, text states: 'Fungicide and a vibratory plow can be used together to control oak wilt.'



A photograph shows a man operating a yellow vibratory plow in a forest. The machine has large, treaded tires and a long, curved blade. A small label in the bottom right corner of the photo reads 'UGA5034061'.

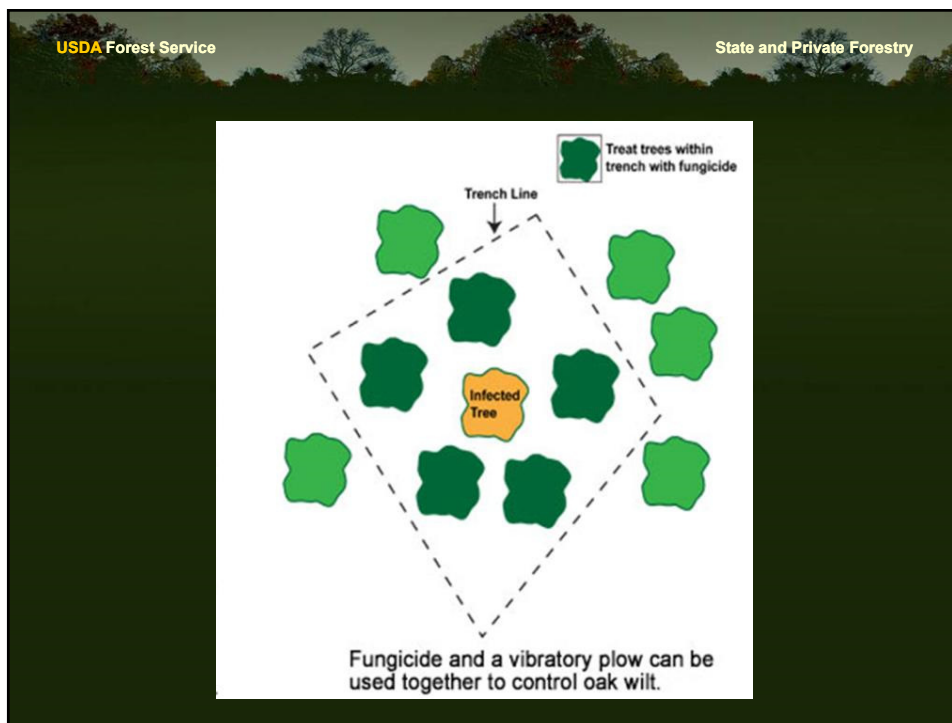
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Bruhn Method of Root Graft Barrier Line Placement

	Intertree Distance (feet)			Intertree Distance (feet)		
Combined d.b.h. (inches) ¹	Loamy sand	Sandy		Combined d.b.h. (inches) ¹	Loamy sand	Sandy
2	3.1	3.9		18	27.8	34.9
4	6.2	7.8		20	30.9	38.8
6	9.3	11.6		22	34.0	42.7
8	12.4	15.5		24	37.1	46.6
10	15.4	19.4		26	40.2	50.4
12	18.5	23.3		28	43.2	54.3
14	21.6	27.2		30	46.3	58.2
16	24.7	31.0		32	49.4	62.1



Combined diameters = diameter of diseased tree at 4.5 feet from the ground, added to the diameter of the tree in question.



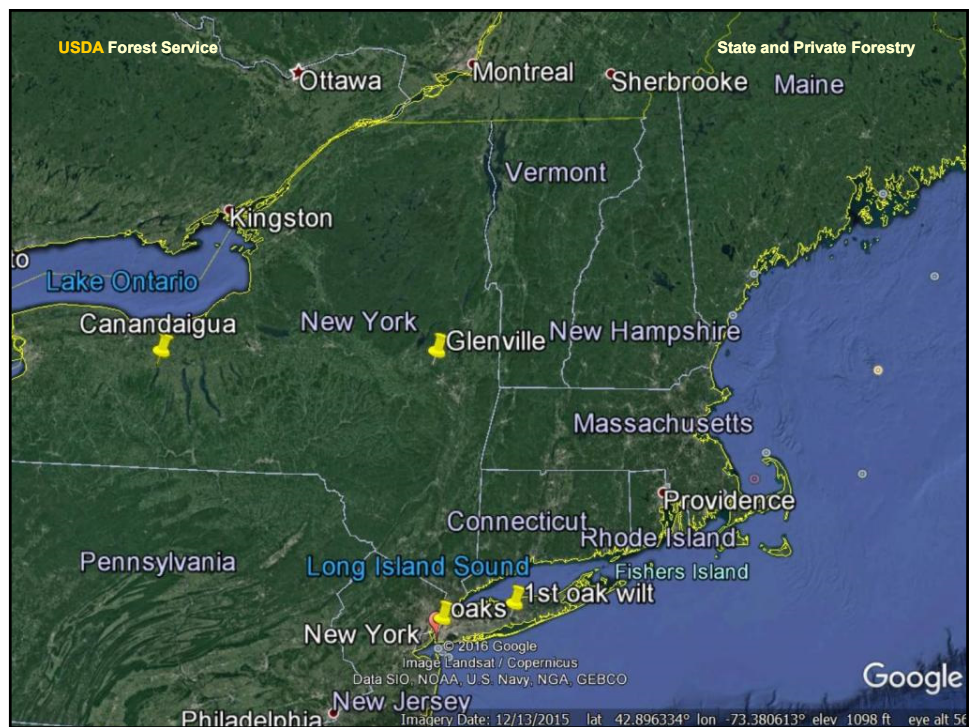
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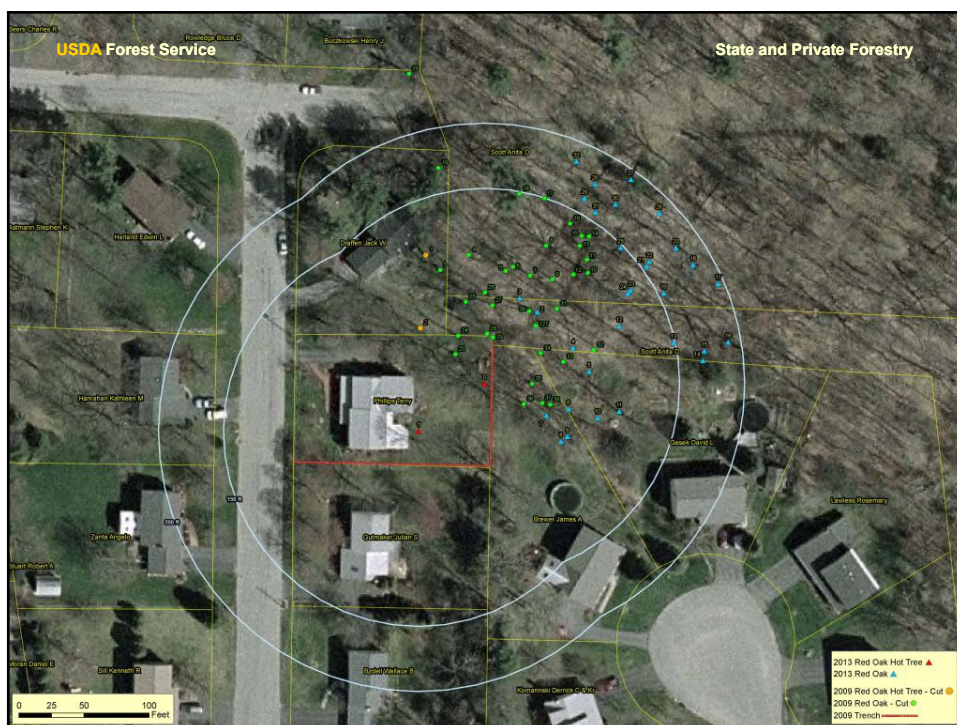
Root rupture

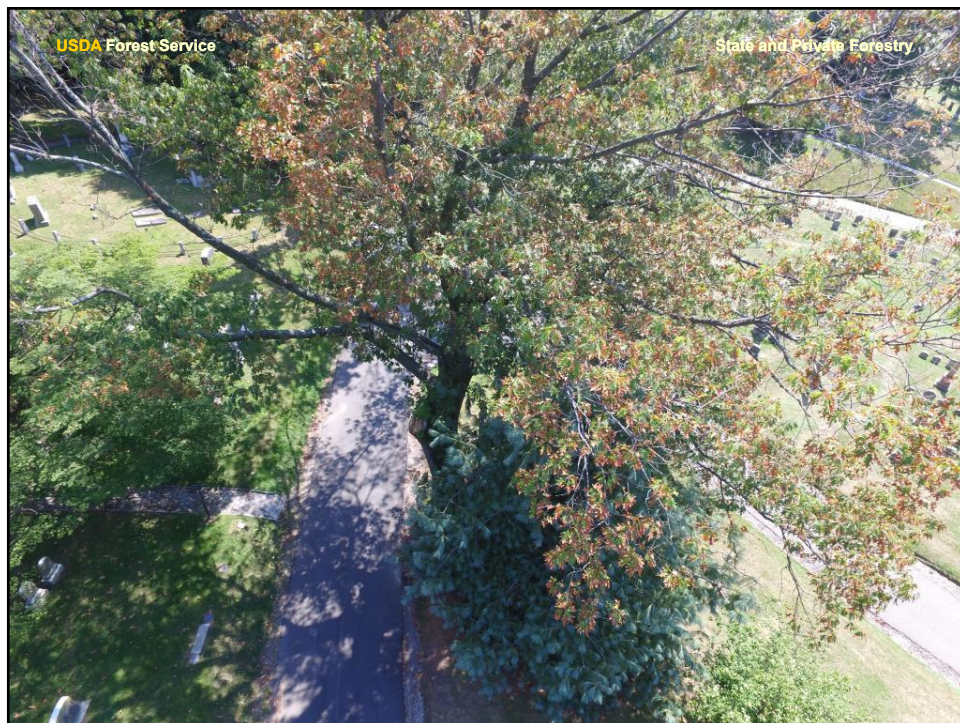
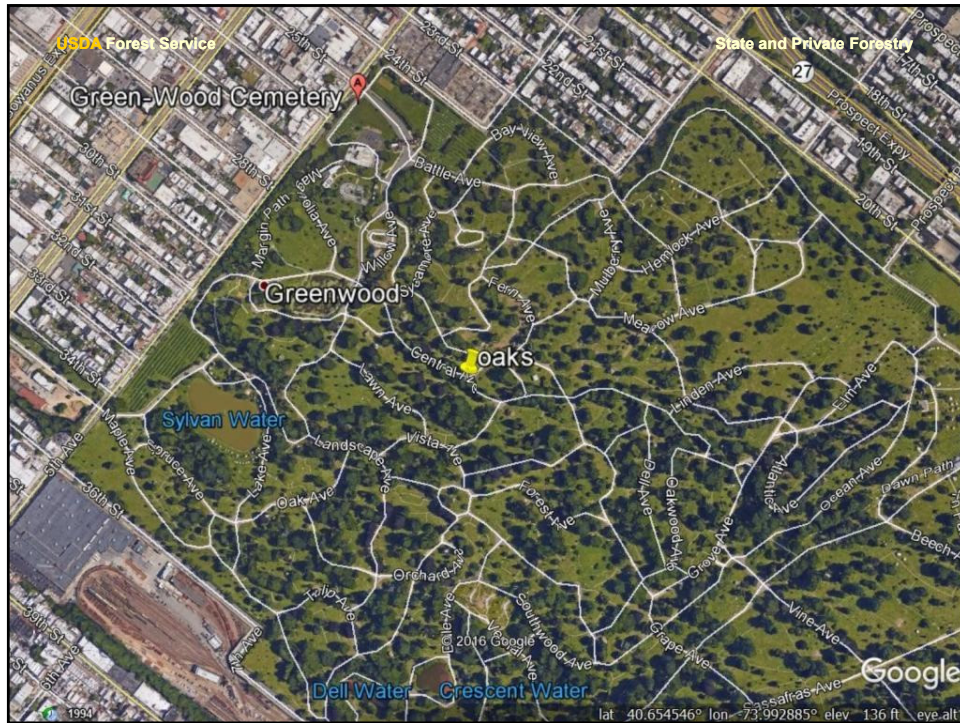
1. Cut trees-chip, debark, burry
2. Severe stumps



UGA5030077





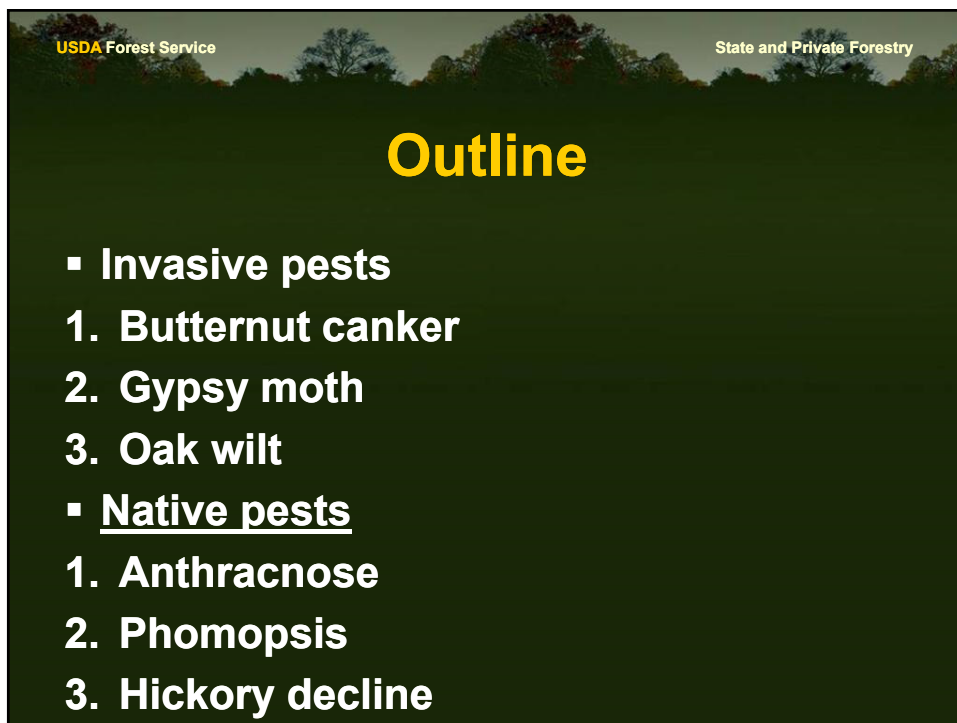




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Oak wilt management

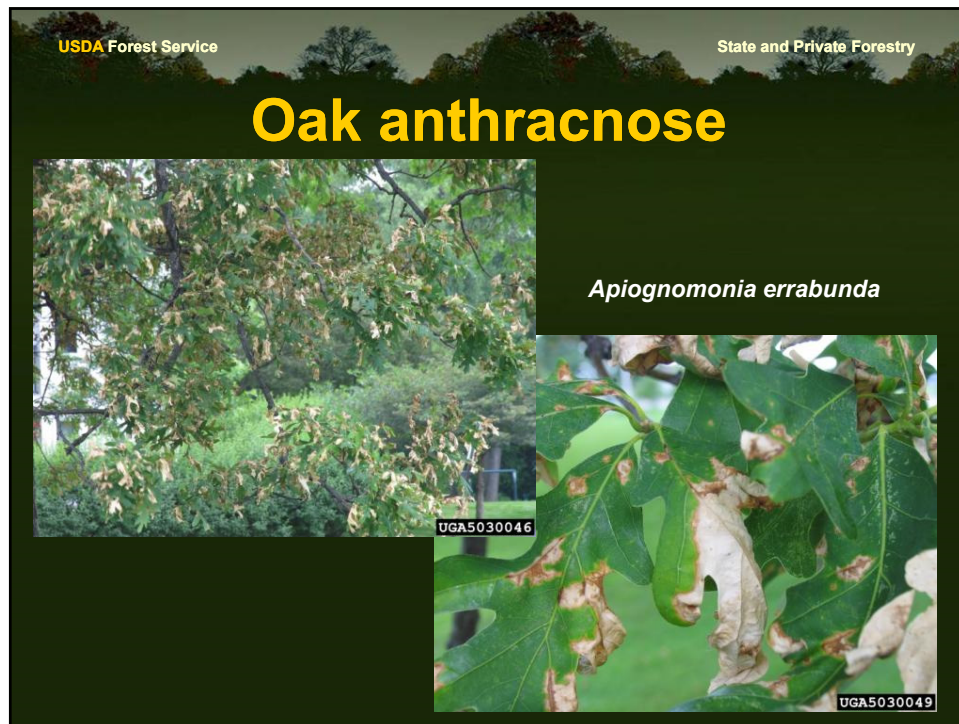
- Remove infected trees and debark, chip, or dry and cover wood
- In affected areas, avoid injury to oak during spring and summer
- In infected areas, limit disease spread by disrupting root grafts
- Do not move infected wood

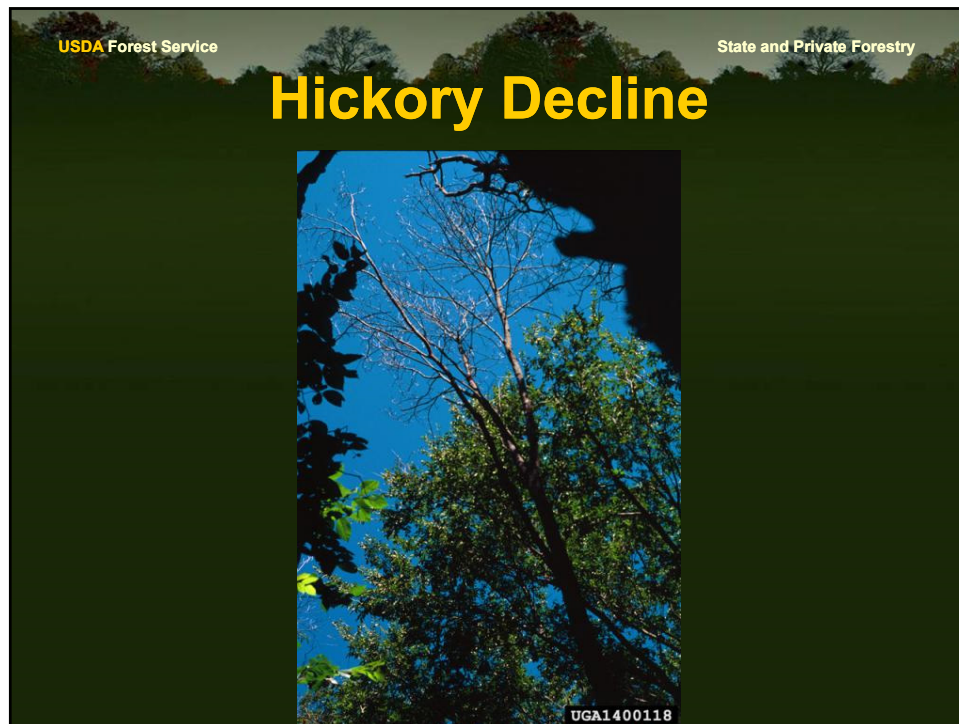


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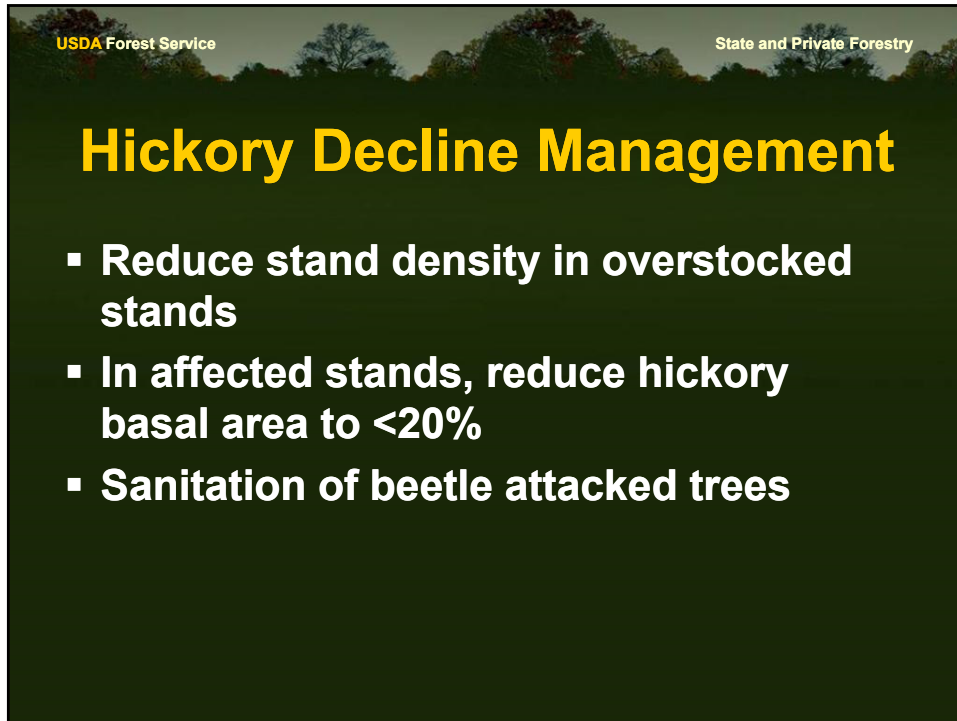
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A slide titled "Hickory Decline" with a dark green background. At the top left is the "USDA Forest Service" logo and at the top right is the text "State and Private Forestry". The title "Hickory Decline" is in large yellow font. Below the title, the following states are listed in white text: Iowa, Maryland, Missouri, New York, Pennsylvania, West Virginia, and Wisconsin. Below the list of states, there are three bullet points in white text: "Drought, flooding, overtopping", "Hickory back beetle (*Scolytus quadrispinosus*)", and "Canker fungus (*Ceratocystis smalleyi*)".



A presentation slide with a dark green background and a forest image at the top. The slide is titled "Hickory Decline Management" in large yellow letters. Below the title is a bulleted list of three management strategies. The text "USDA Forest Service" is in the top left and "State and Private Forestry" is in the top right.

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Hickory Decline Management

- Reduce stand density in overstocked stands
- In affected stands, reduce hickory basal area to <20%
- Sanitation of beetle attacked trees

A presentation slide with a background image of a forest floor covered in green grass and fallen brown leaves. The feet of three people wearing hiking boots are visible at the top. The slide contains a "Thank you" message and an invitation for questions. The text "USDA Forest Service" is in the top left and "State and Private Forestry" is in the top right.

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Thank you for your attention!!

Questions????

USDA NCA



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