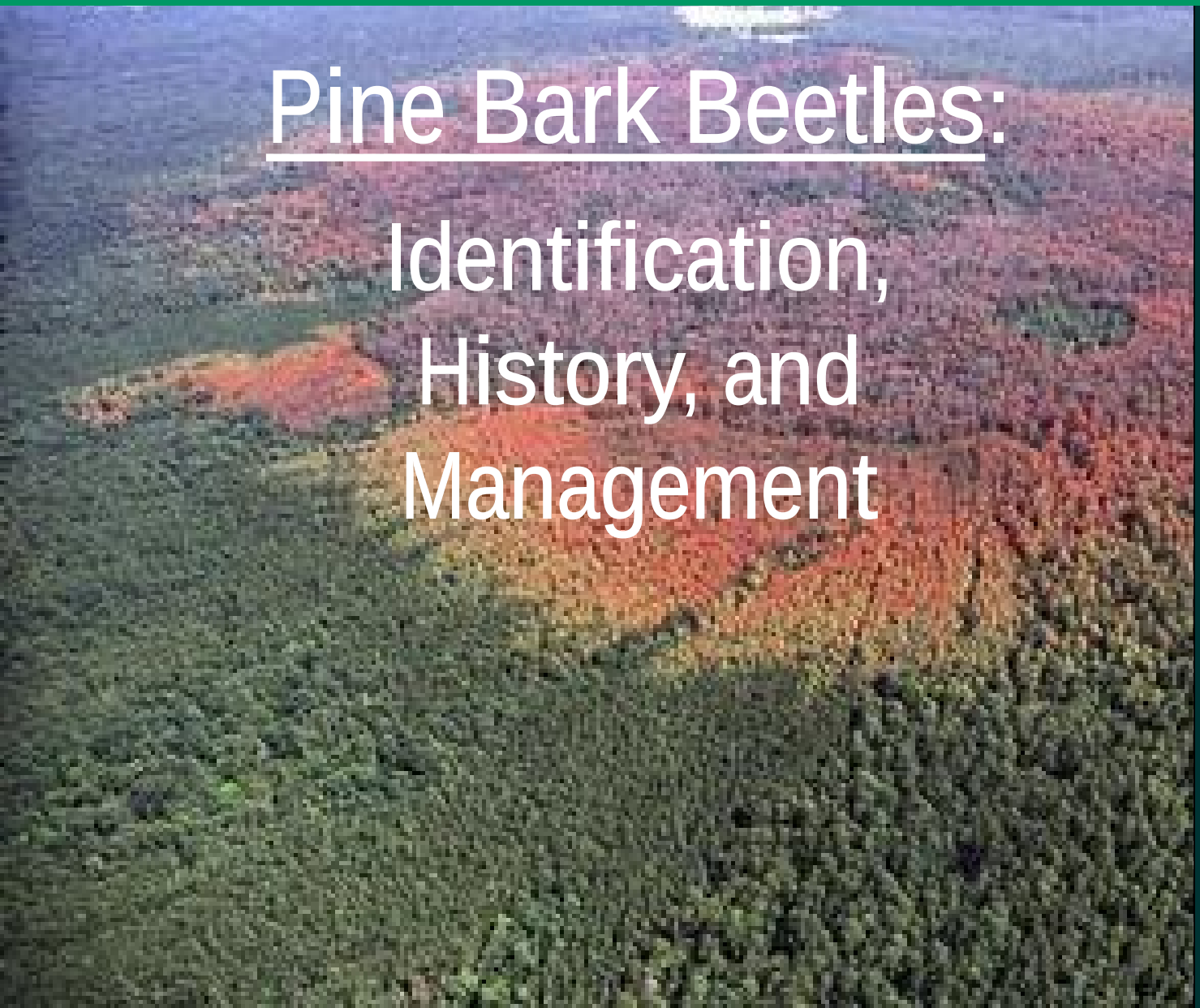


Pine Bark Beetles:

Identification, History, and Management

October 6, 2022

Lynne Womack

Forest Health Coordinator

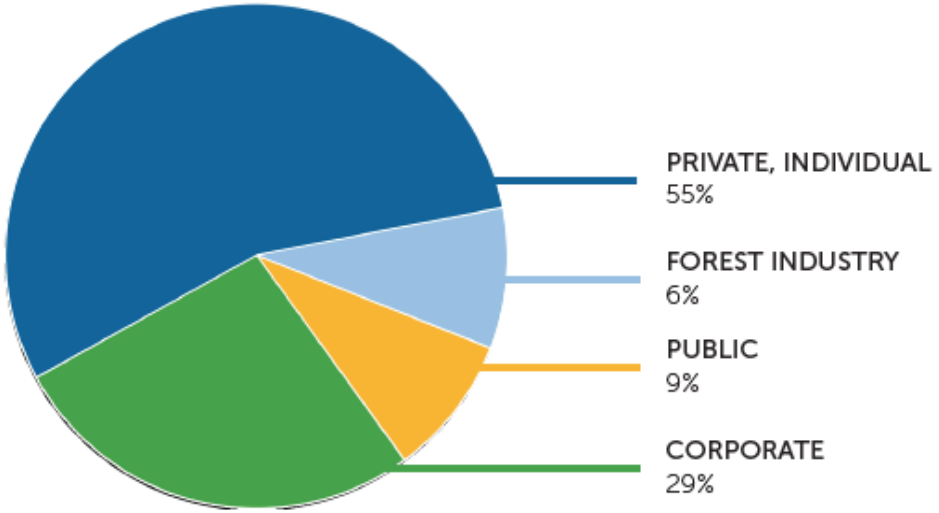
Georgia Forestry Commission

912-515-5180

Pine Bark Beetles

Georgia's Forest Statistics –

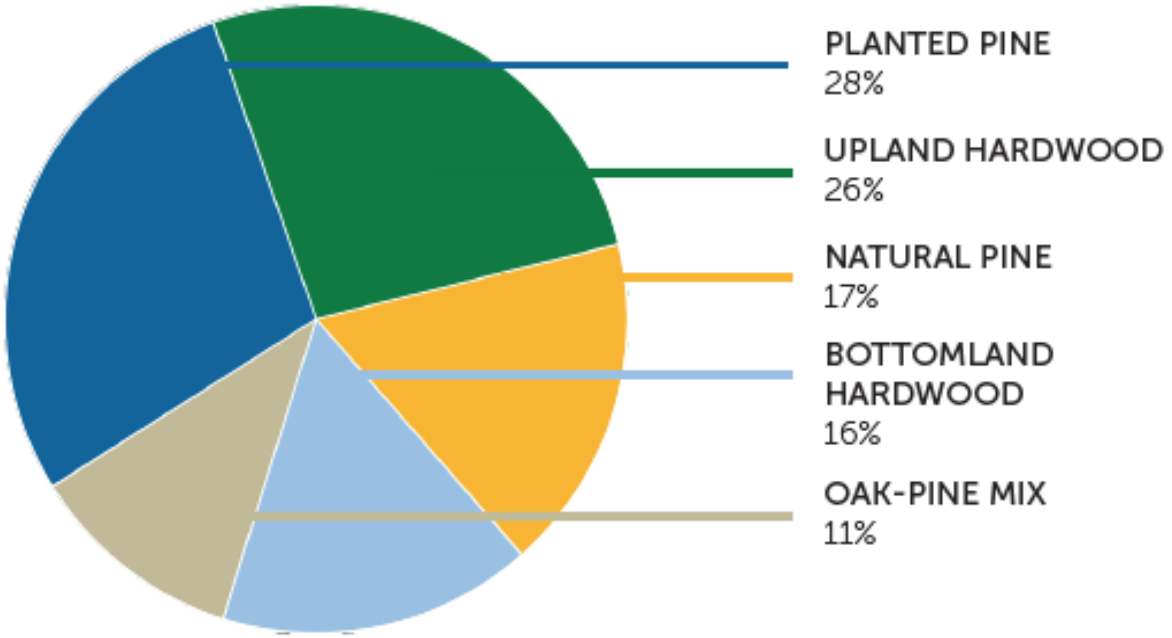
- 24 million acres of forestland
  - 2/3 of the state
  - Size of 4 Vermonts
- 91% of forestland is privately owned



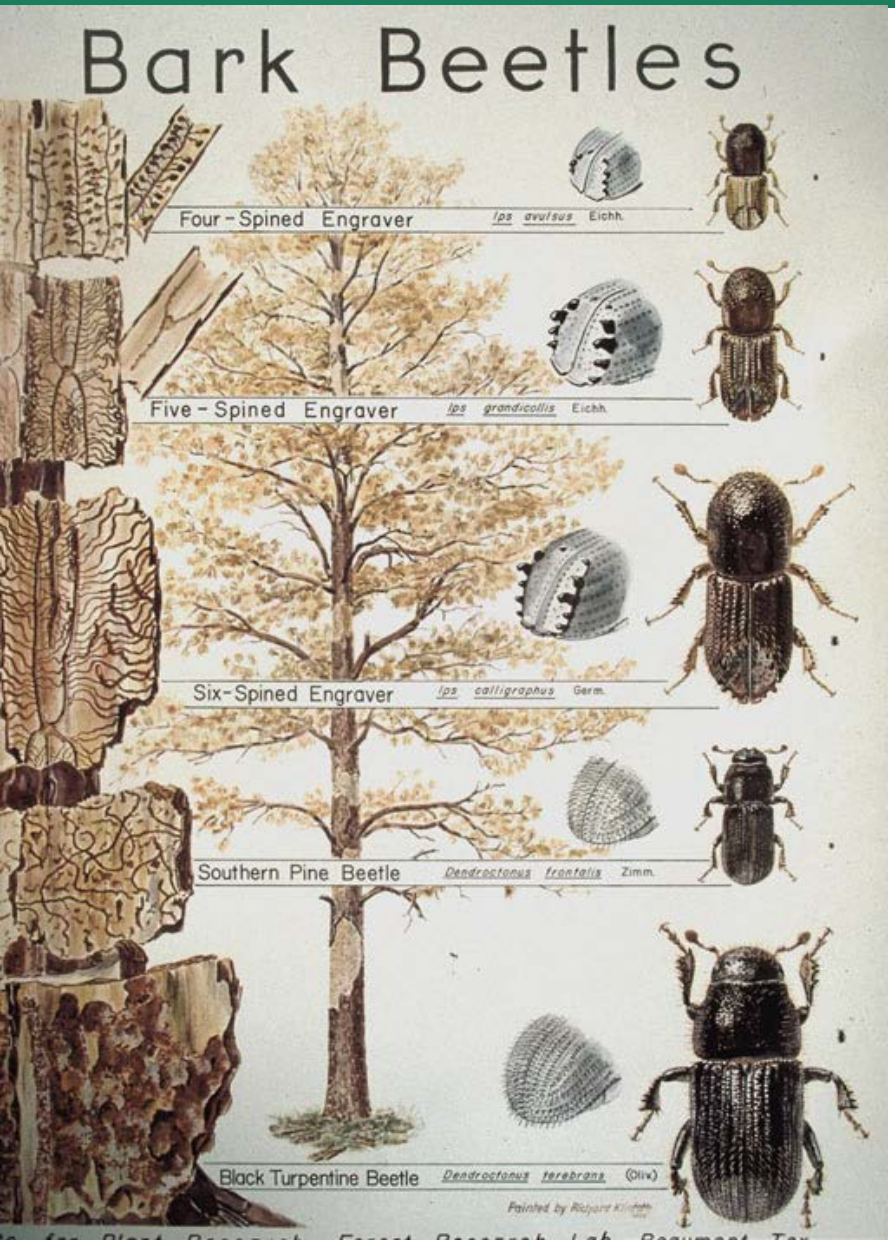
Pine Bark Beetles

FIG. B

GEORGIA FOREST TYPES BY GROUP[2]



Pine Bark Beetles



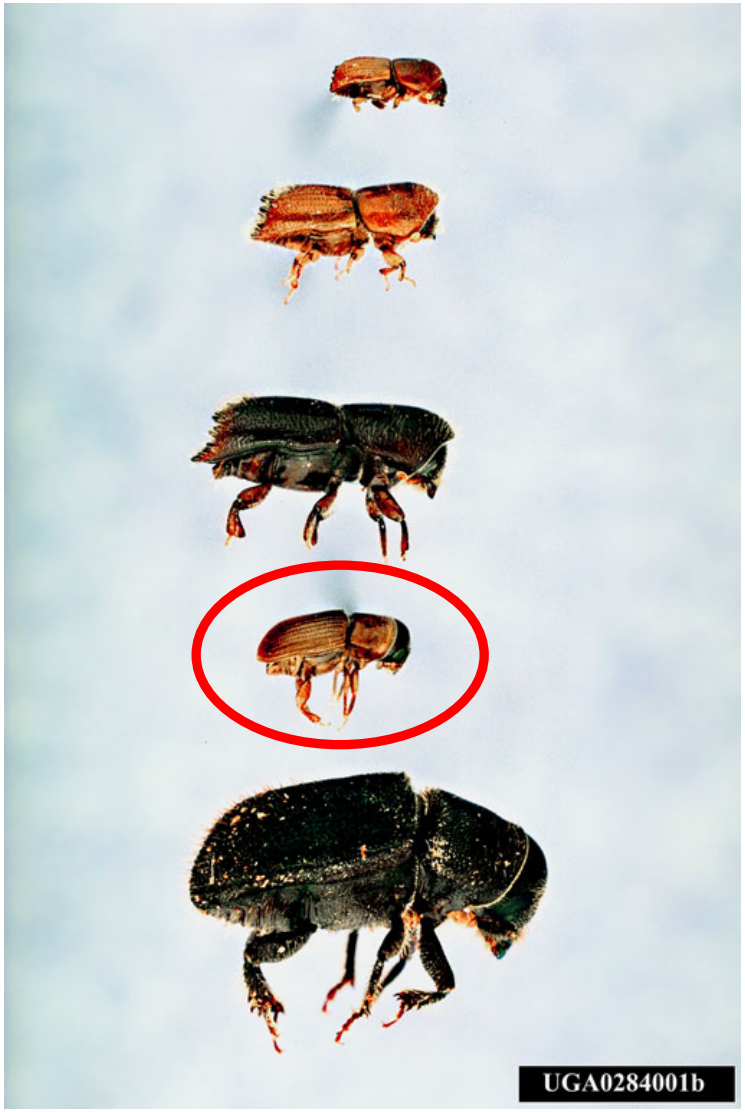
3 Main Types of Pine Bark Beetles

Ips species (3)

Southern Pine Beetle

Black Turpentine Beetle

Pine Bark Beetles



Ips species (3)

Ips avulsus

Ips grandicollis

Ips calligraphus

(Ips pini)

Southern Pine Beetle

Dendroctonus frontalis

Black Turpentine Beetle

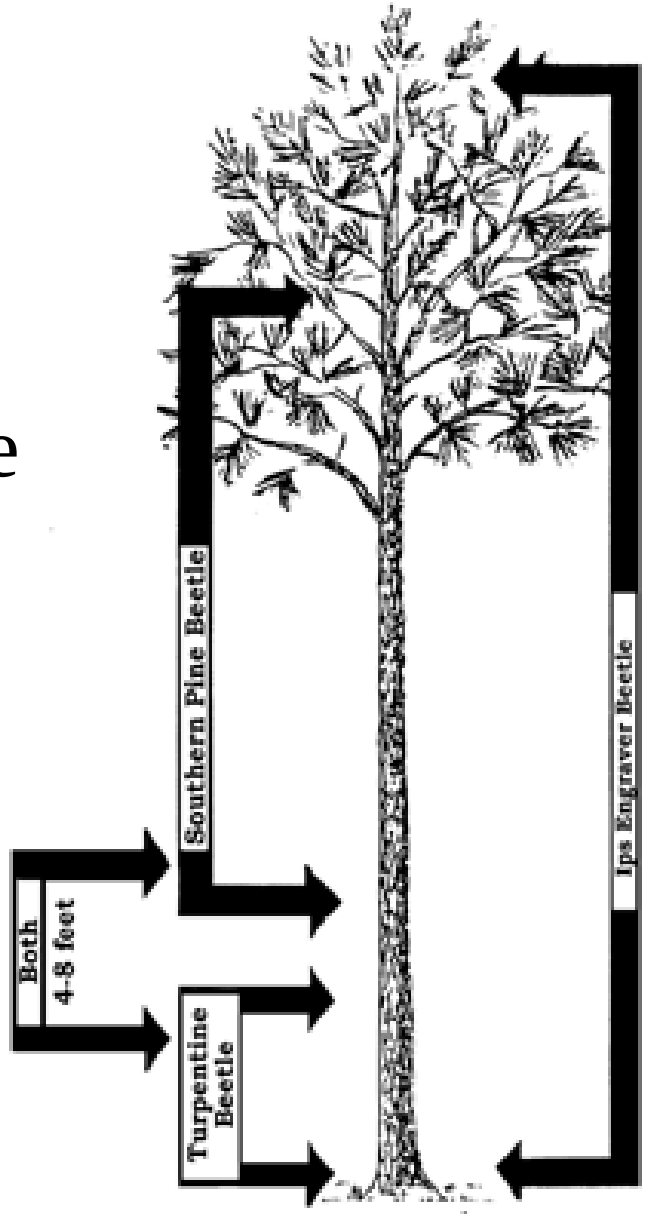
Dendroctonus terebrans

Black Turpentine Beetle

- Attracted to:
  - Stressed trees
    - Lightning strikes
    - Logging debris
    - Broken branches/ mechanical injury
    - Wildfire
    - Drought
    - Hurricane/Tornado

Black Turpentine Beetle

- Found in bottom 8-10 feet of tree
- Do not spread rapidly
- Infestations are not usually large (5-10 trees)
- Historically in areas that were heavily turpentined
- Can be controlled with insecticide – bark spray



Black Turpentine Beetle

Large Beetle

Large Pitch Tubes

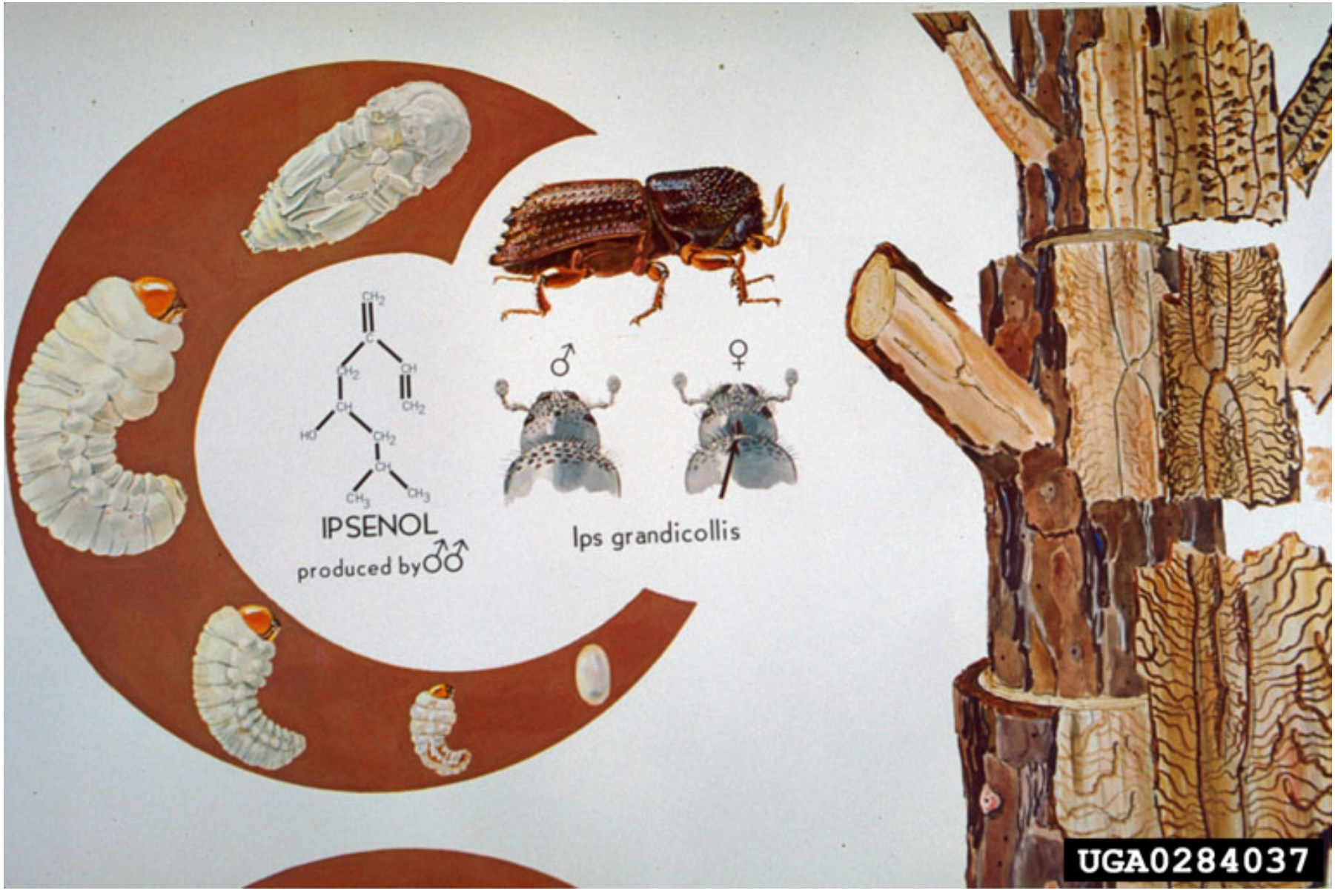
Large Pitch Tubes

Black Turpentine Beetle

Loblolly pine, Cherokee County, GA

GEORGIA FORESTRY COMMISSION

Ips Engraver Beetles

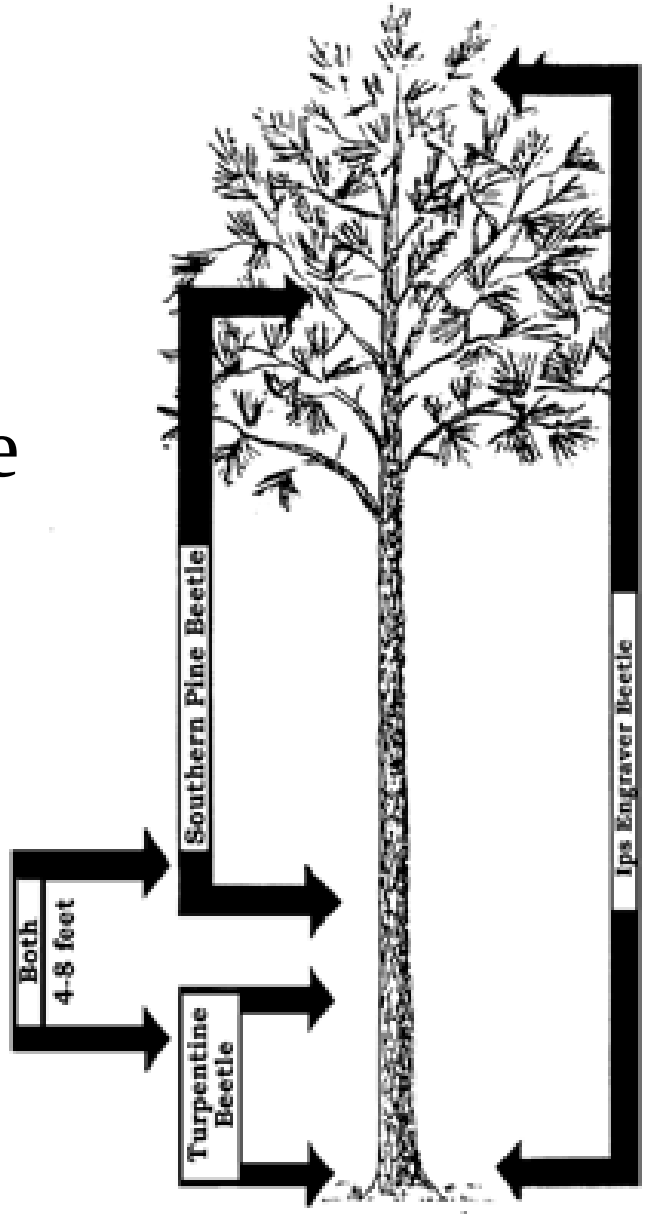


Ips Engraver Beetles

- Attracted to:
  - Stressed trees
    - Lightning strikes
    - Logging debris
    - Broken branches/ mechanical injury
    - Drought
    - Hurricane/Tornado damage

Ips Engraver Beetles

- Can invade trees from top to bottom
- Do not spread rapidly
- Infestations are not usually large (0.5 acre or less)
- Usually will accompany southern pine beetles, even across large infestations
- Cannot be controlled with insecticide



Ips Engraver Beetles

Pitch Tube

Boring Dust

Exit Hole

Ips Engraver Beetles

Ips grandicollis gallery

Ips avulsus gallery

Ips grandicollis

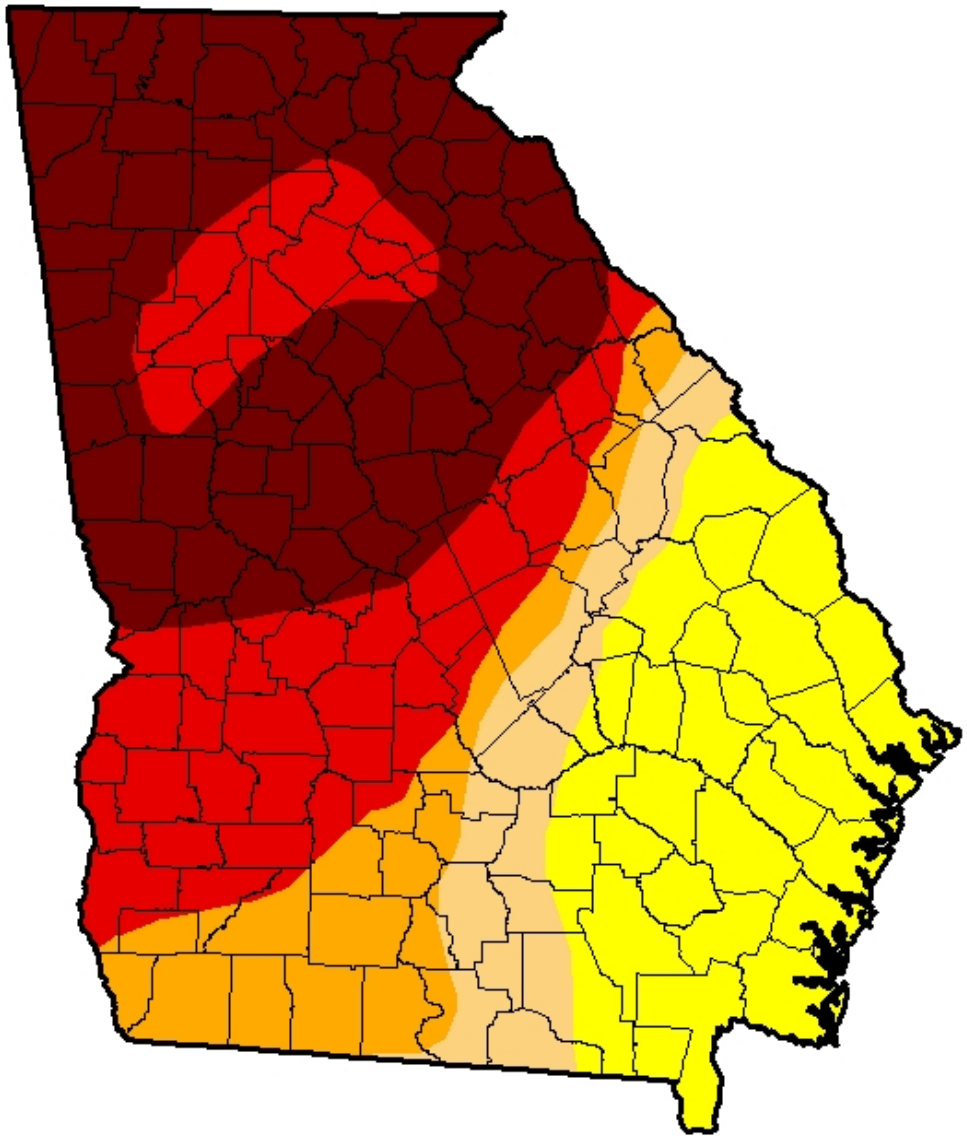
Ips Engraver Beetles

Ips Engraver Beetles

- What happened in 2016-2017?
  - Record number of above 90^{o} days
  - Historic drought
  - Above average winter temps

U.S. Drought Monitor

Georgia



November 22, 2016

(Released Wednesday, Nov. 23, 2016)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	76.64	67.76	56.60	33.78
Last Week *11/15/2016*	15.69	84.31	69.18	58.03	52.39	22.25
3 Months Ago *8/23/2016*	26.02	73.98	48.97	28.68	5.92	0.00
Start of Calendar Year *12/29/2015*	87.36	12.64	0.00	0.00	0.00	0.00
Start of Water Year *9/27/2016*	35.37	64.63	45.84	34.50	14.67	1.58
One Year Ago *11/24/2015*	88.41	11.59	0.00	0.00	0.00	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Richard Heim
NCEI/NOAA

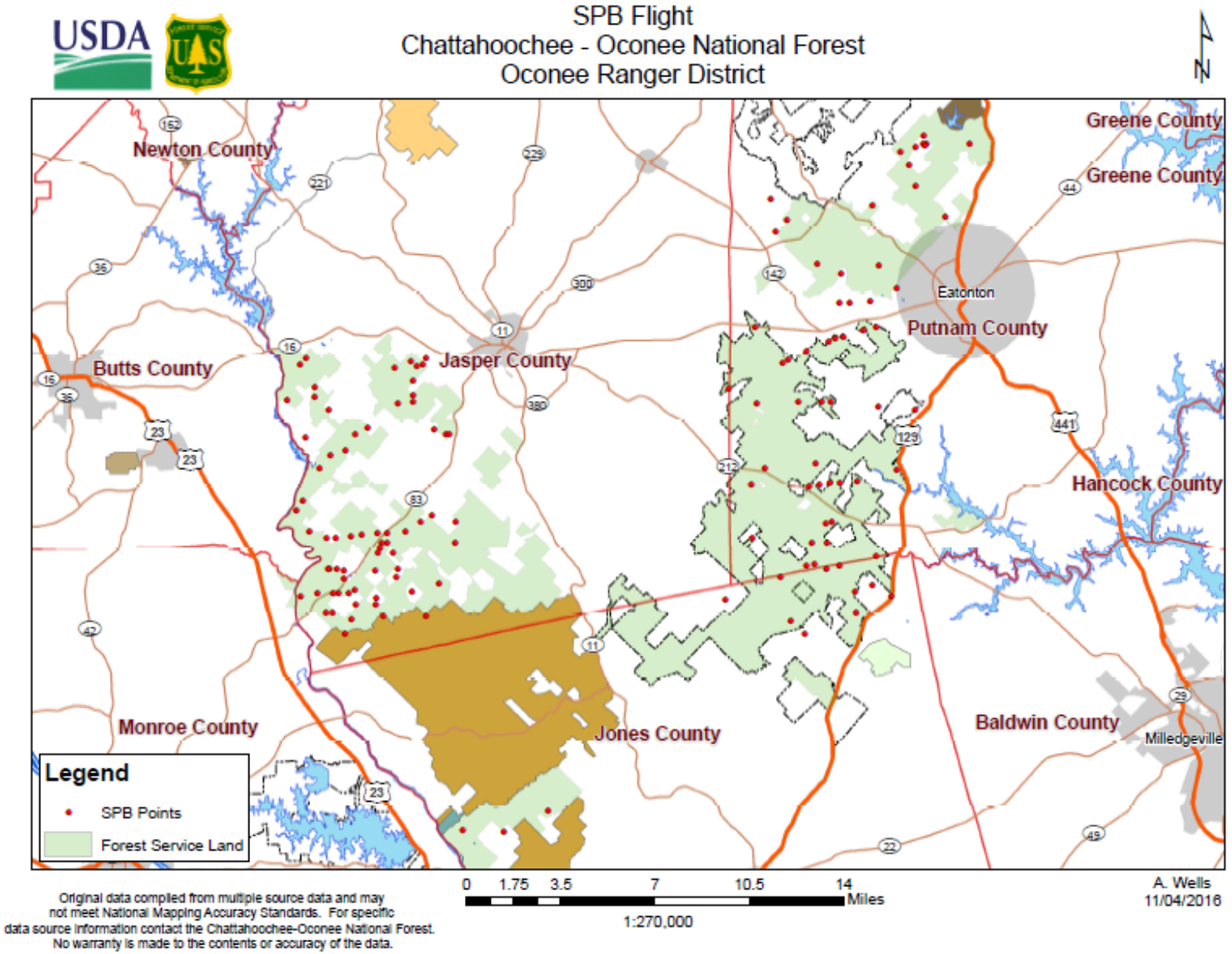
http://droughtmonitor.unl.edu/

Ips Engraver Beetles

Timeline

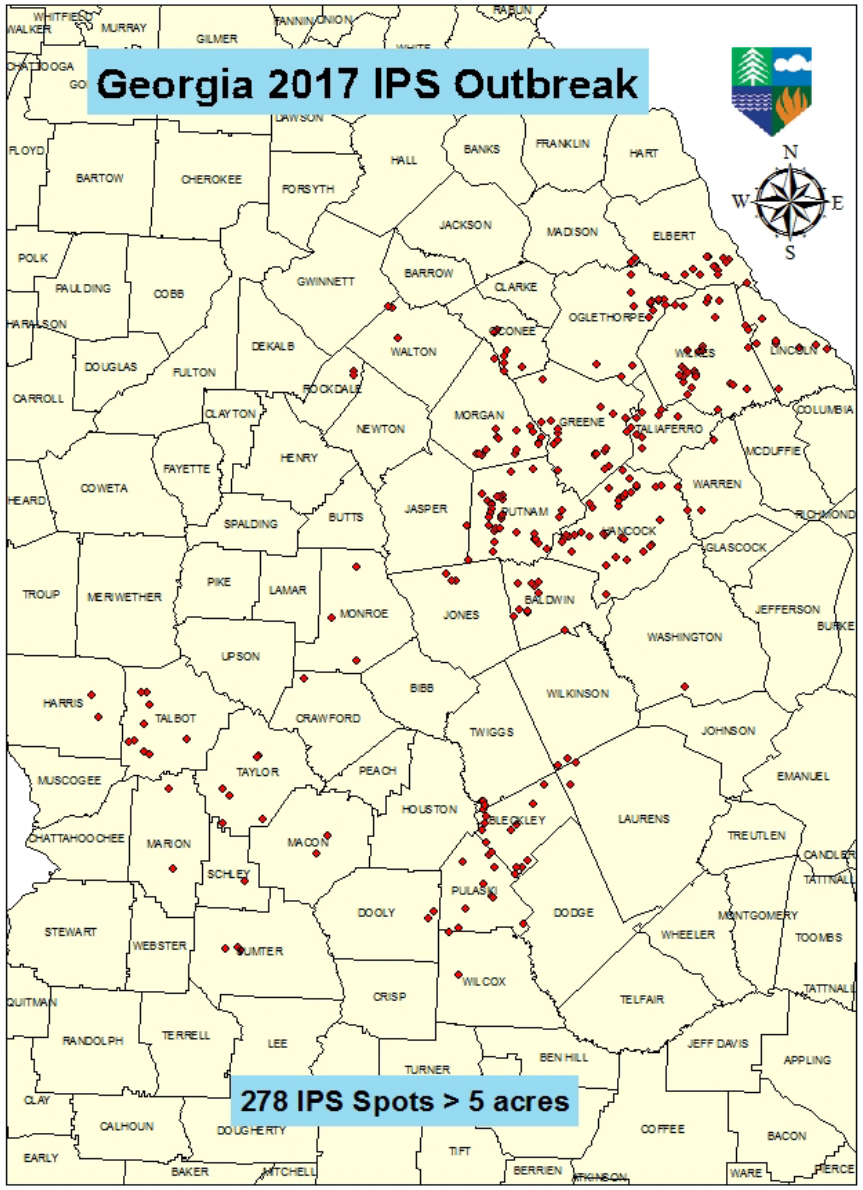
- August 2016 – few trees dying
- November 2016
  - USFS Oconee National Forest
  - 140 spots
- December 2016
  - GFC began aerial flights

Ips Engraver Beetles



Ips Engraver Beetles

- Estimated 6,500 acres lost
- Estimate over 6,000 small spots
  - 10-25 trees
  - Not mapped
- All age classes, species
  - 3 year old loblolly
  - young longleaf



Ips Control Methods

Reduce disturbance in stand:

1. Leave Alone

2. Clearcut and start over
   (Over 30-40% mortality)

Southern Pine Beetles

Dorsal view of southern pine beetles with female on the bottom and male on the top. Bar corresponds to 1.0 mm.
Credit: Demian Gomez, UF/IFAS

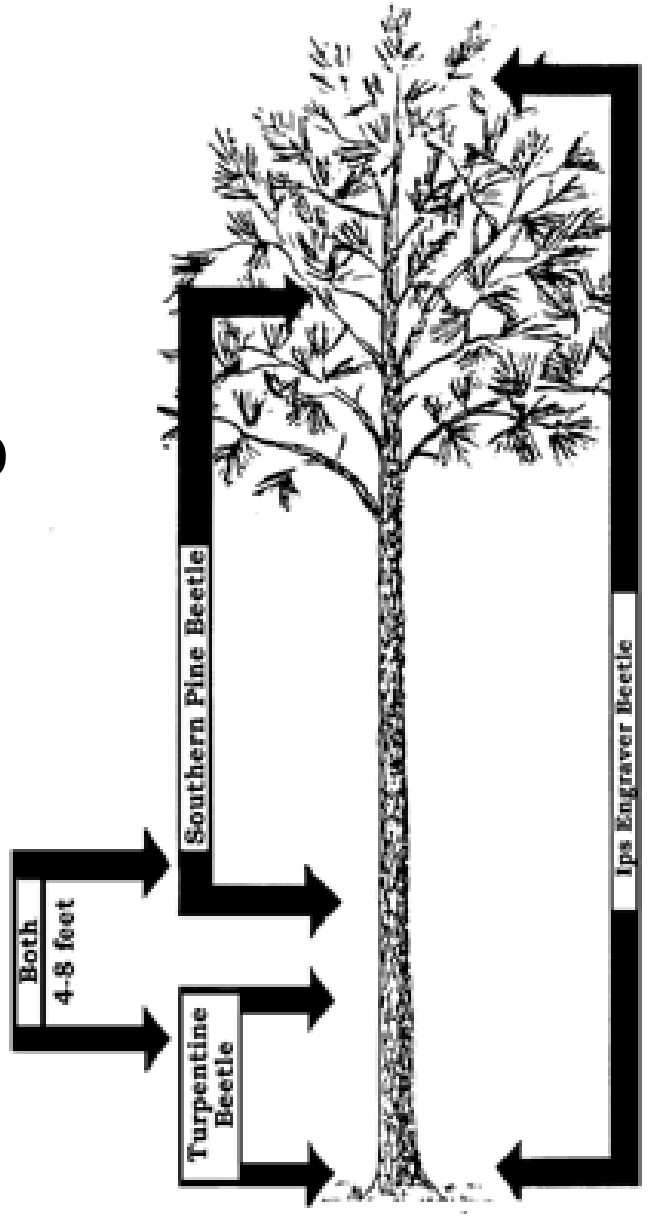
S-shaped or “wandering” galleries

Southern Pine Beetles

- Attracted to:
  - Overstocked pine stands
  - Over mature pine stands
  - Unmanaged stands
  - Stressed trees (Healthy during outbreak)

Southern Pine Beetles

- Invade trees from top to bottom
- Can spread rapidly
- Infestations can be large – spread until a physical barrier to stop them
- Sometimes associated with Ips and Turpentine beetles
- Healthy stand management usually prevents outbreaks



Southern Pine Beetles

Pitch Tube

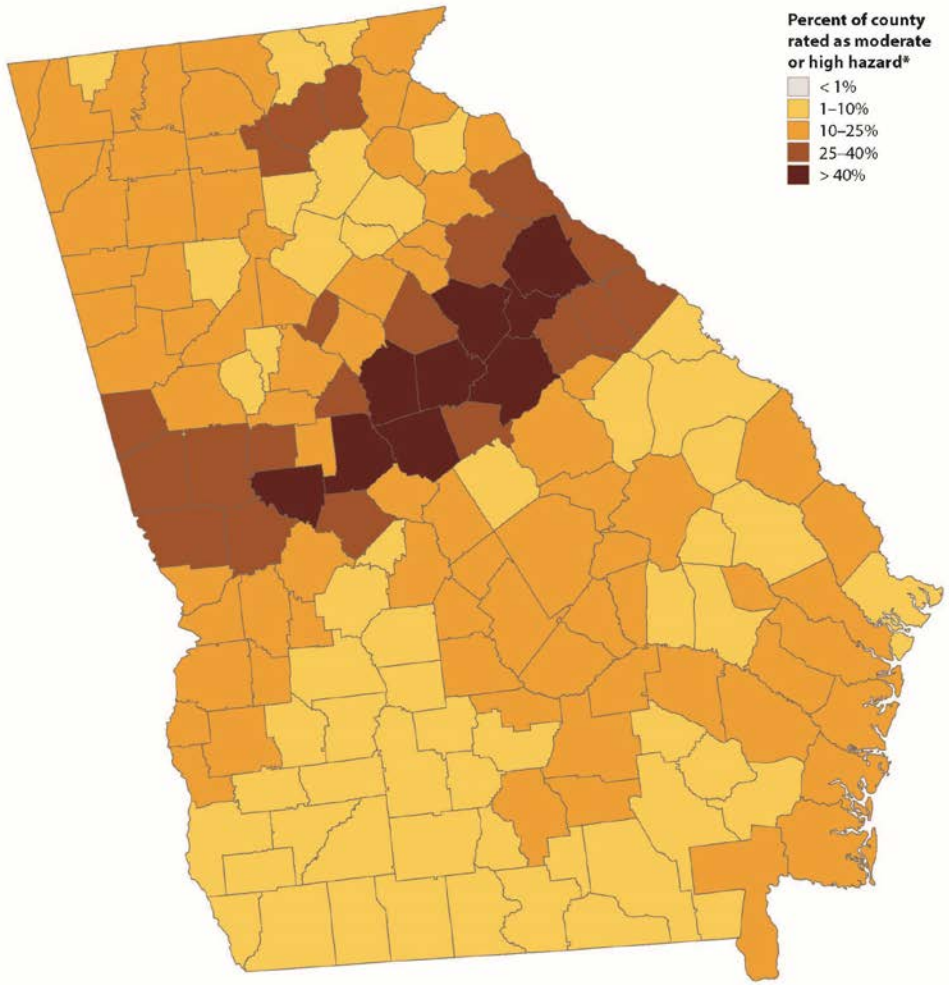
Exit Hole

Southern Pine Beetles

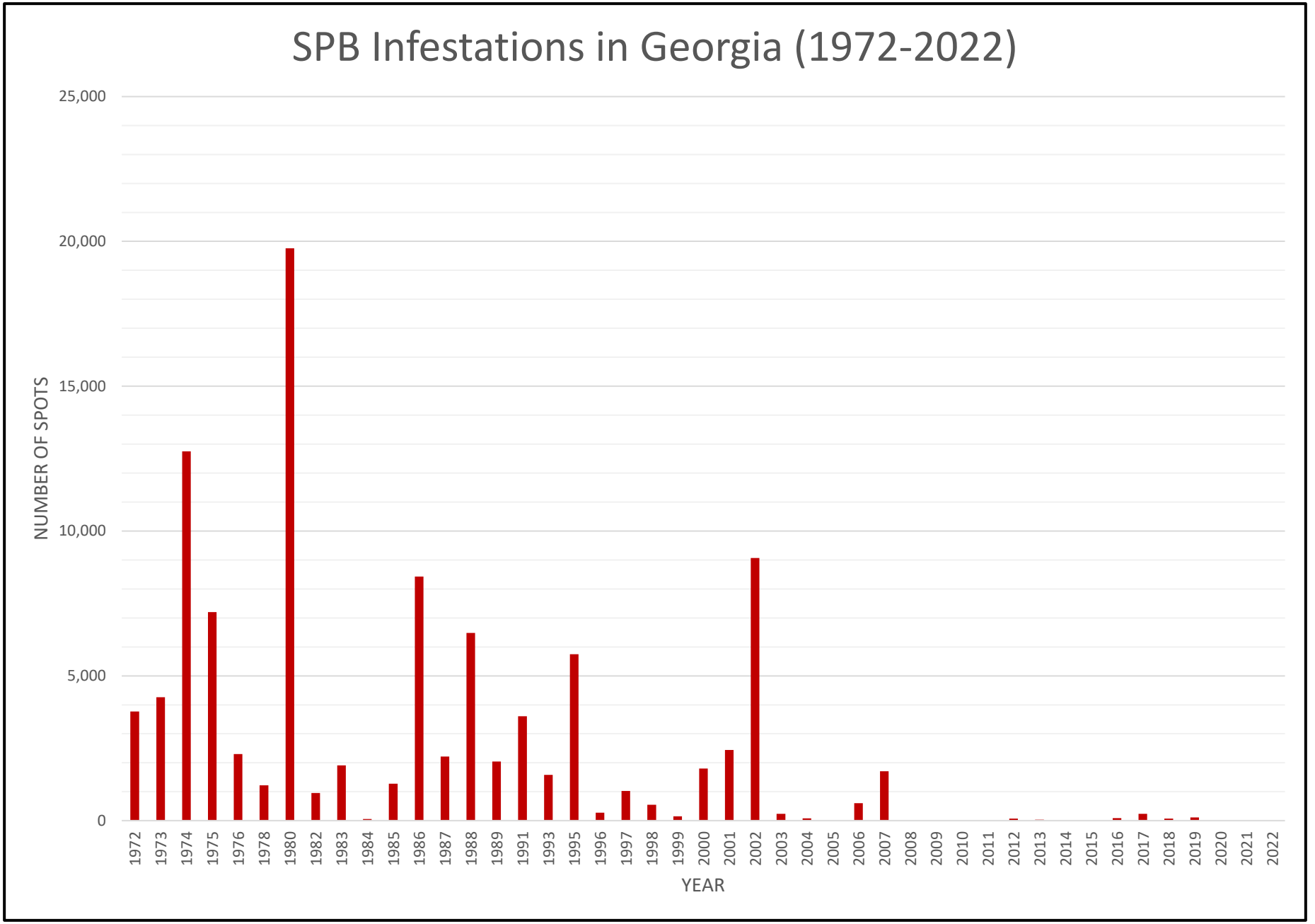
GEORGIA FORESTRY COMMISSION

Sou

SOUTHERN PINE BEETLE COUNTY HAZARD RATING FOR Georgia



*Hazard rating based on the US Forest Service 2012 National Insect and Disease Risk Map (NIDRM) over a 15 year period, 2013 – 2027.
-Moderate hazard = Areas projected to lose 11 to 24% of host basal area to SPB
-High hazard = Areas projected to lose 25% or more of host basal area to SPB


SPB Infestations in Georgia (1972-2022)
25,000
20,000
15,000
10,000
5,000
0
NUMBER OF SPOTS
1972
1973
1974
1975
1976
1978
1980
1982
1983
1984
1985
1986
1987
1988
1989
1991
1993
1995
1996
1997
1998
1999
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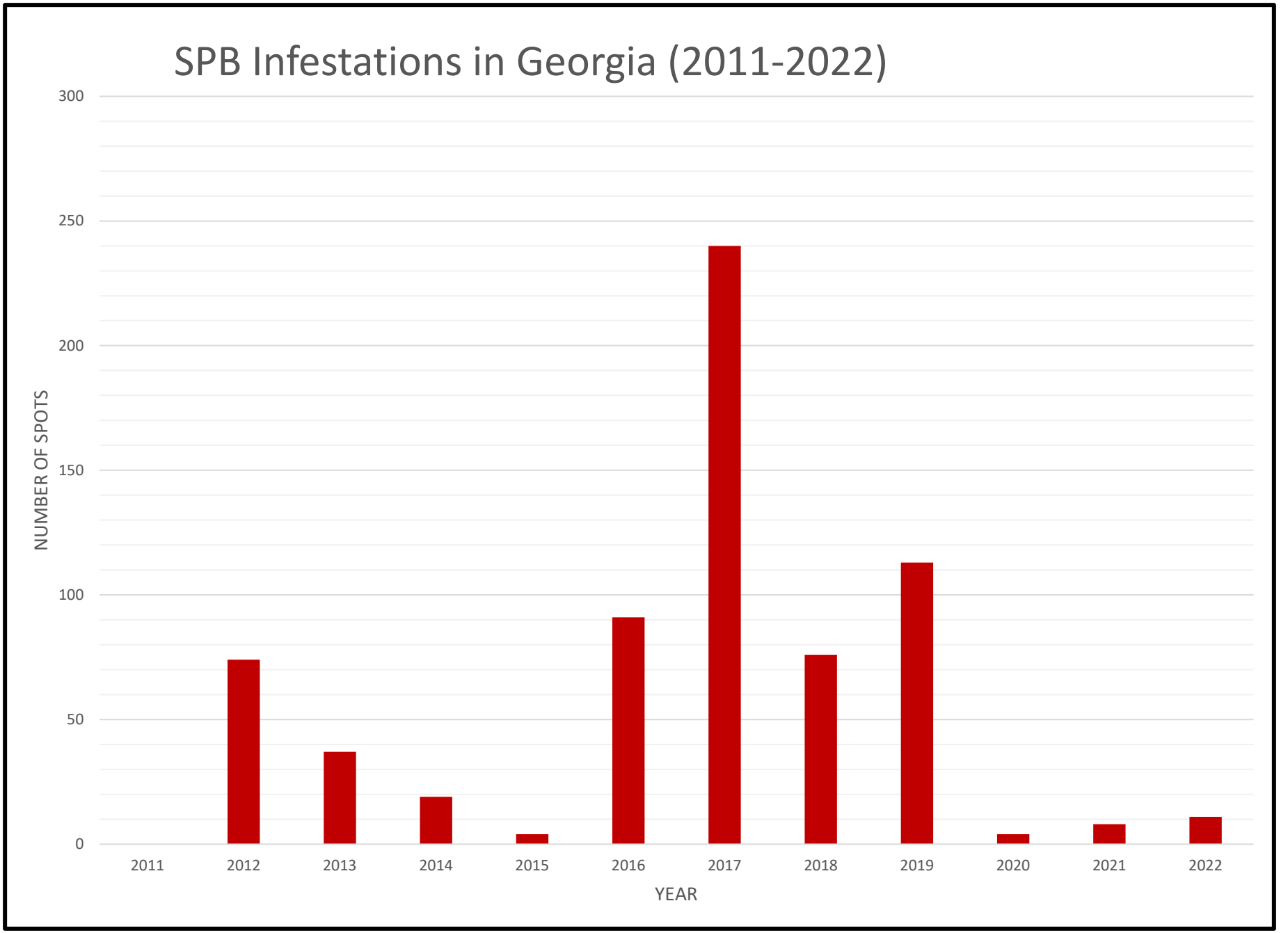
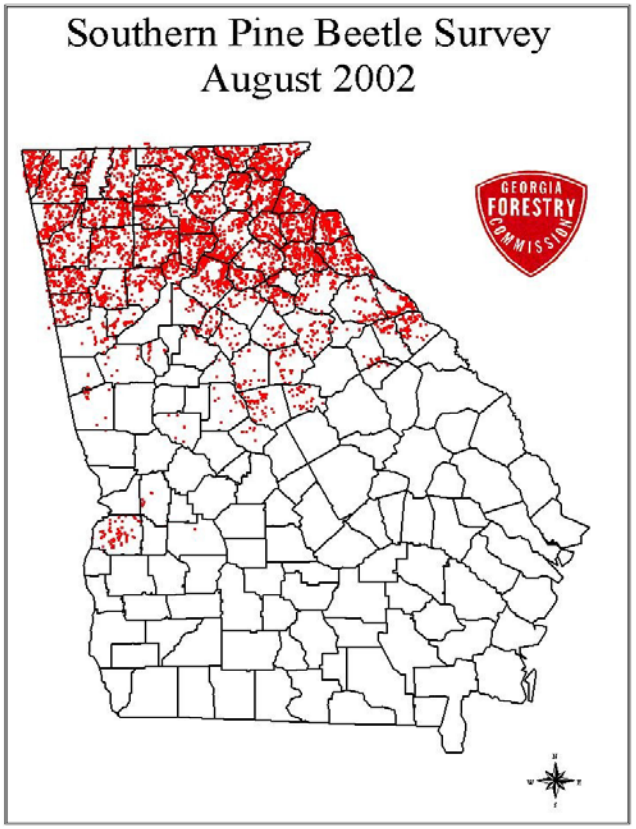
2016
2017
2018
2019
2020
2021
2022
YEAR


SPB Infestations in Georgia (2011-2022)
300
250
200
150
100
50
0
NUMBER OF SPOTS
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
YEAR

Perspective…

The largest fire in Georgia's history – Spring, 2007

Caused $65 million in damage to timber



2001-02 Southern Pine Beetle Epidemic caused $72 million in timber losses.

2007 - $14.5 million

Pine Bark Beetles

What does GFC do?

Spring Prediction Trapping

Aerial Survey

SPB Cost Share Program

SPB Prediction Trapping

- Based on USFS protocol – 3 lures: frontalin, alpha-pinene, endo-brevicomin
- 2019 first year working with Dartmouth University for Prediction Results
- New model for predictions:
  - # SPB per two-week period
  - # clerids per two-week period
  - Number of SPB spots previous year

50 traps statewide in 2022

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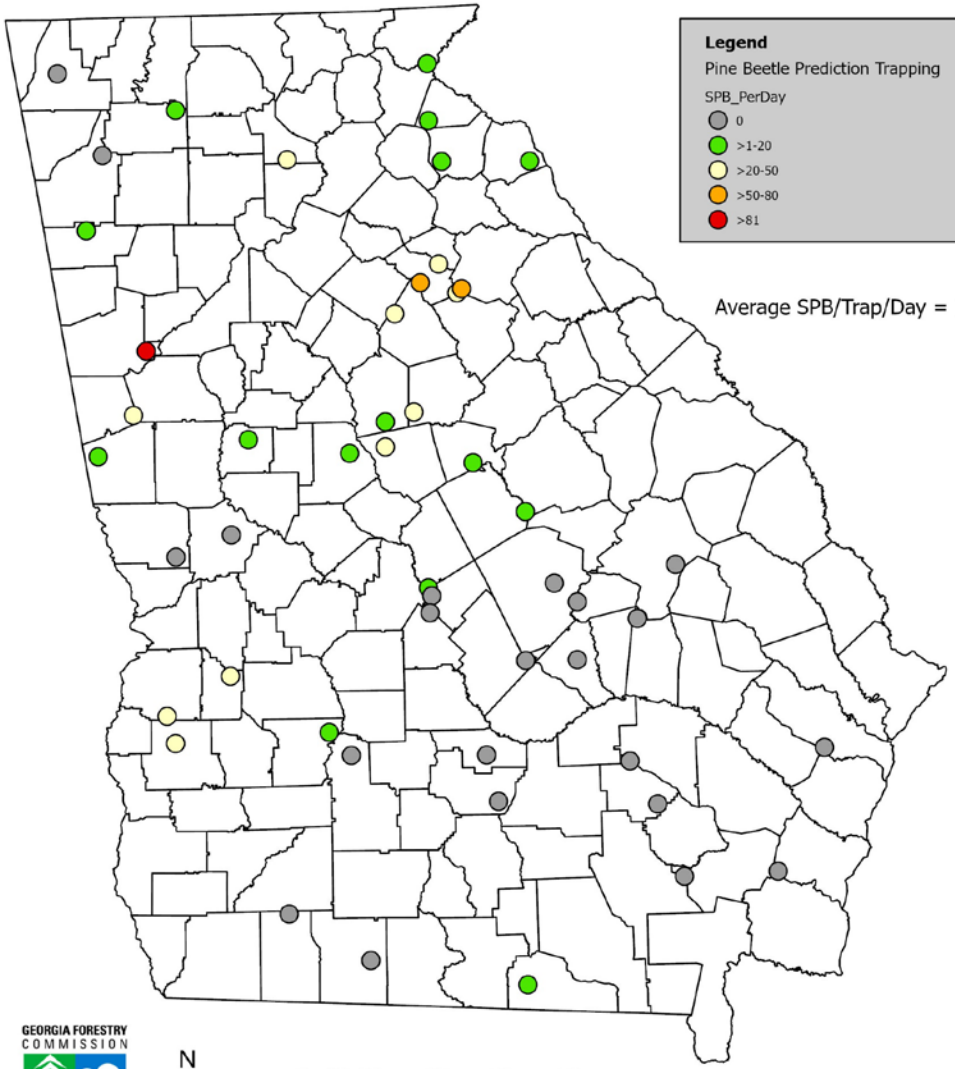
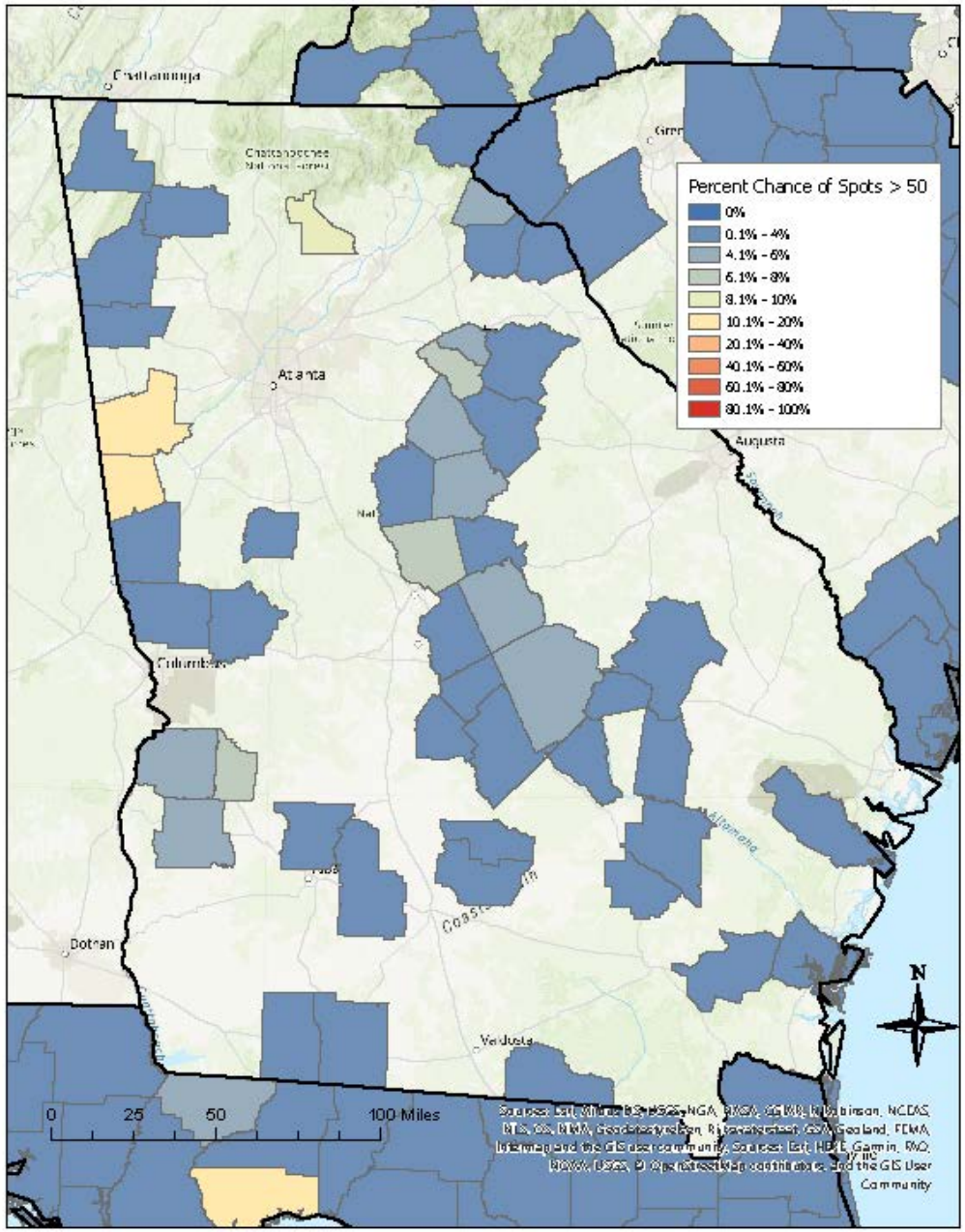
Southern Pine Beetle Trap Locations 2022
50 Traps



GEORGIA FORESTRY COMMISSION

GEORGIA FORESTRY COMMISSION



2022 Georgia Southern Pine Beetle Prediction Map

<u>Probability of Outbreak</u>:

Carroll and Heard – 10-20%
Dawson – 8-10%
Remaining Counties < 6%

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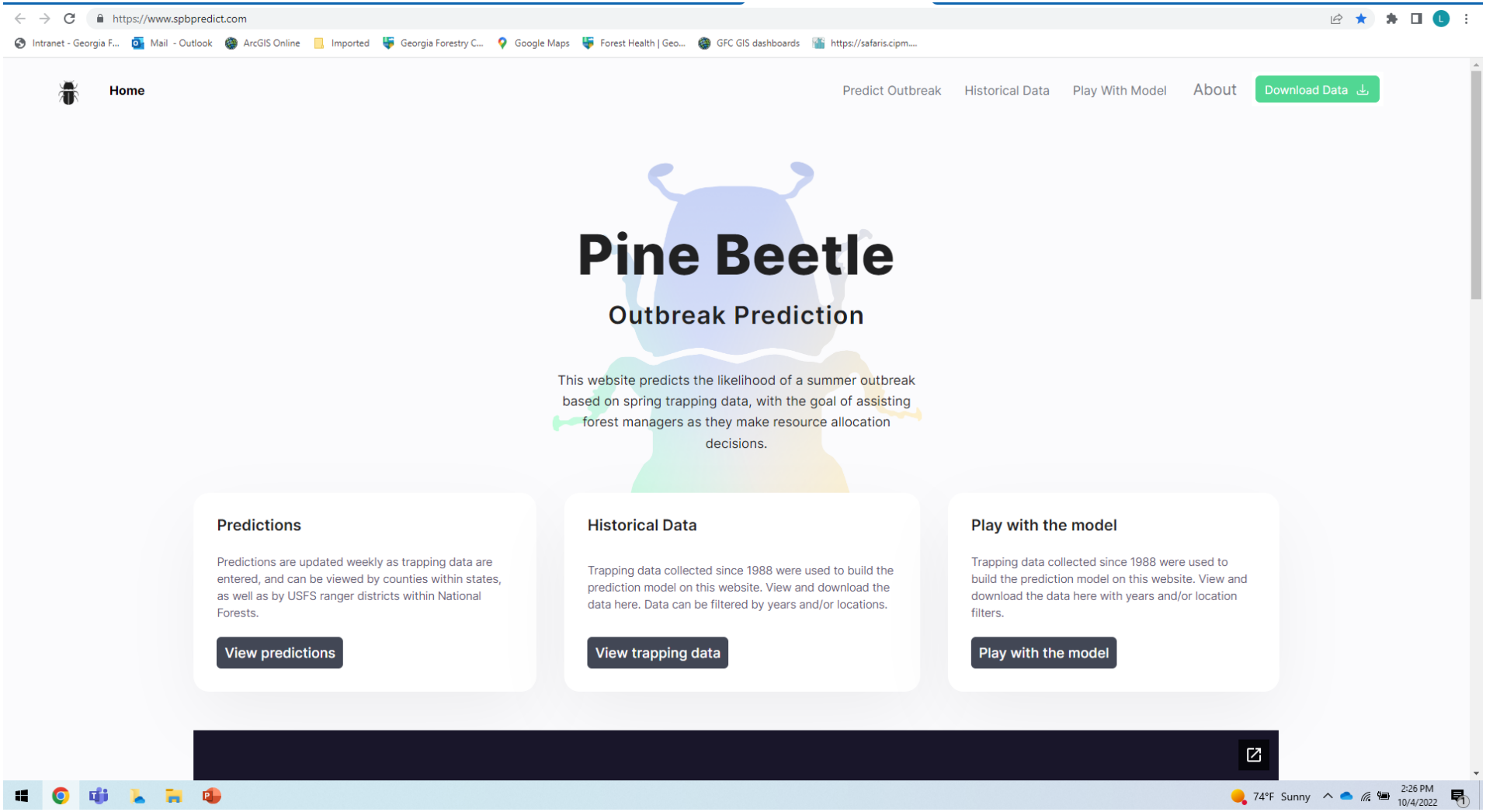
https://www.spbpredict.com/



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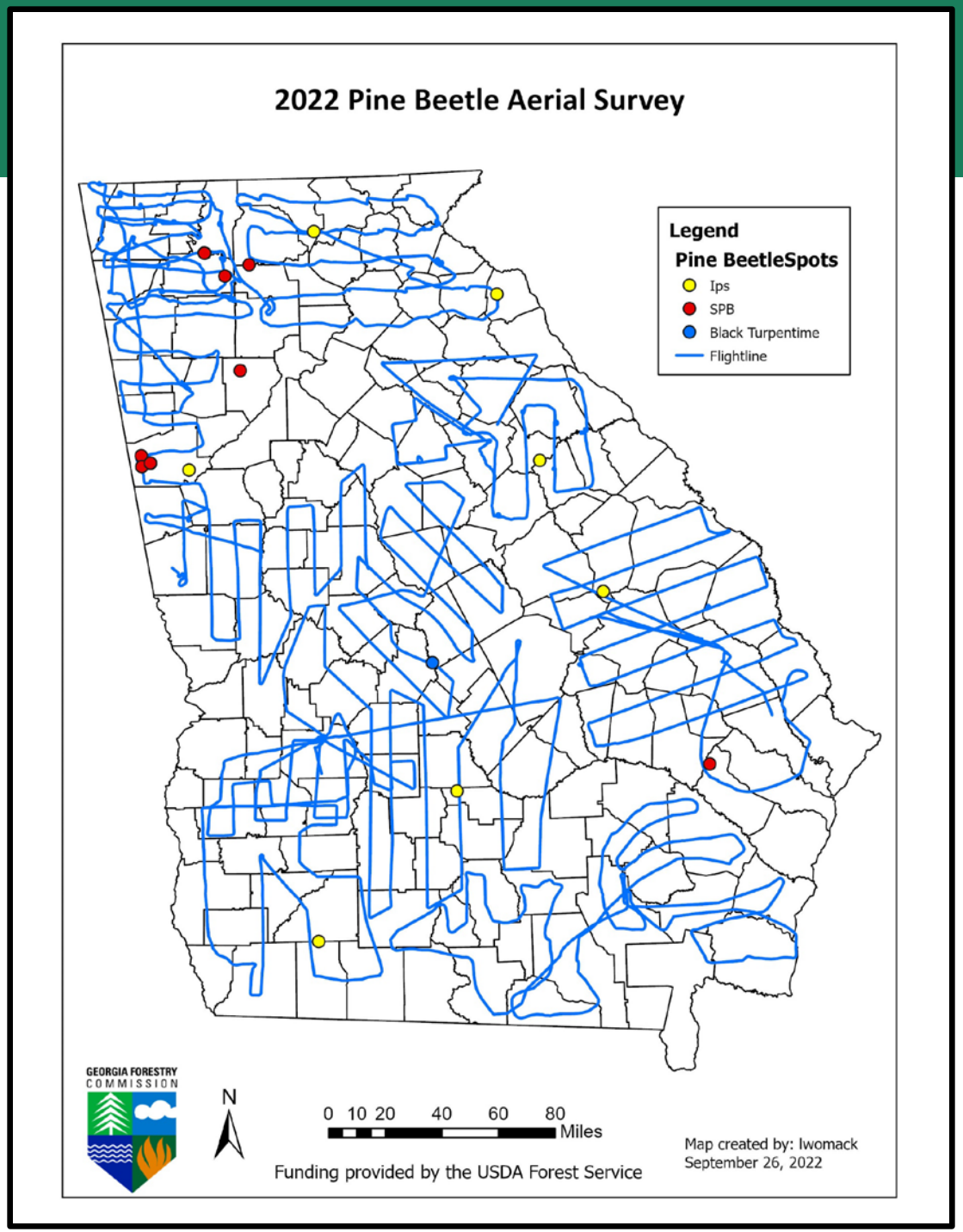
SPB Aerial Survey



2022 SPB Aerial Survey

6,351 miles flown
13,614,358 acres

11 SPB spots

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https://spb.clemson.edu/

https://spb.clemson.edu

Intranet - Georgia F... | Mail - Outlook | ArcGIS Online | Imported | Georgia Forestry C... | Google Maps | Forest Health | Geo... | GFC GIS dashboards | https://safaris.cipm....

Current Status | Around the Globe | Data | Publications | Contacts

Southern Pine Beetle Information Center

SOUTHERN PINE BEETLE INFORMATION CENTER

Welcome to the Southern Pine Beetle Information Center. The southern pine beetle (SPB) is a pest of pine trees most commonly associated with the southern United States. More information about this insect's native range, biology, and preferred hosts can be found in the Publications section.

Latest Publications

Biosystematics of the Dendroctonus frontalis (Coleoptera: Scolytidae) Complex

Jun 17, 2022

Abstract The validity of Dendroctonus frontalis Zimmerman, D. brevicomis Leconte, D. mexicanus Hopkins, D. vitei Wood, D. approximatus Dietz, and D. adjunctus Blandford as distinct species is supported by breeding experiments, karyology, male genitalia, and external...

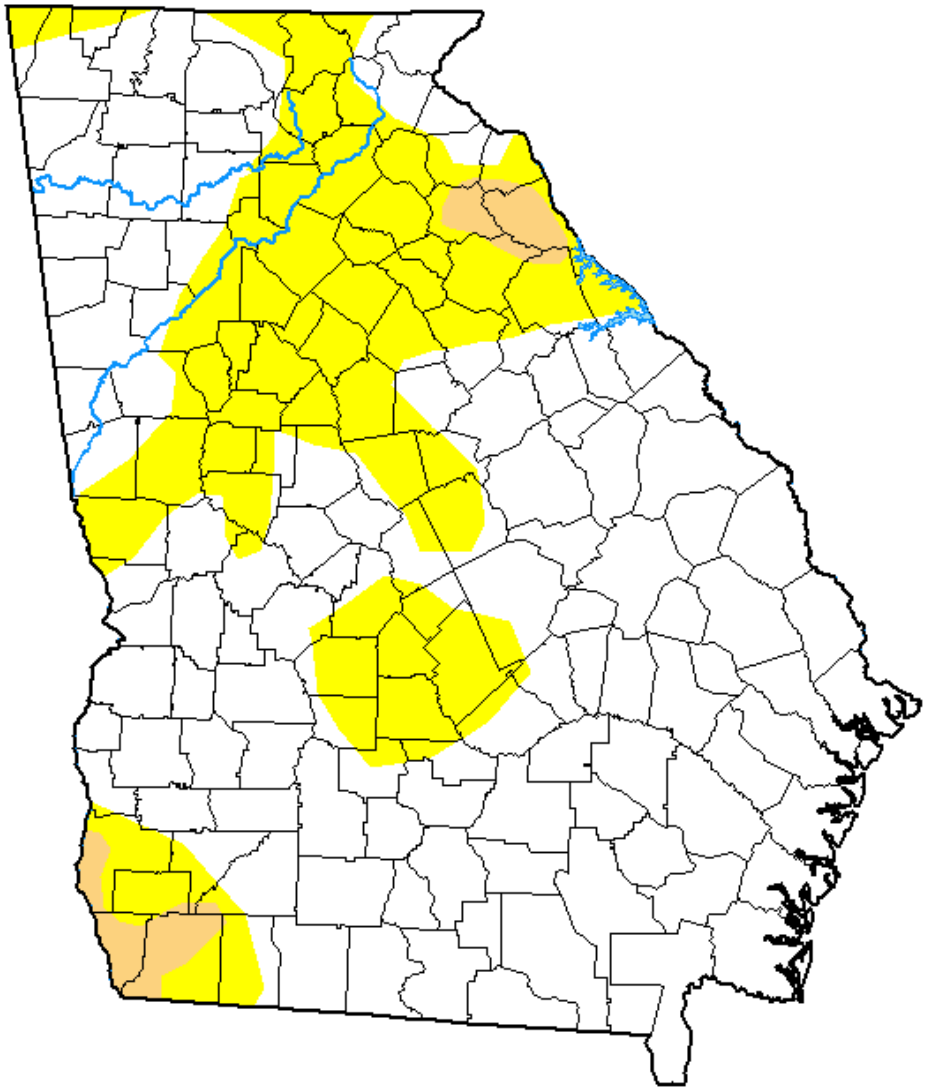
2733006-PPT.jpg

Show all

Russell 2000 +2.85%

1:48 PM
9/28/2022

U.S. Drought Monitor
Georgia



October 4, 2022
(Released Thursday, Oct. 6, 2022)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	70.82	29.18	2.48	0.00	0.00	0.00
Last Week *09-27-2022*	76.20	23.80	0.00	0.00	0.00	0.00
3 Months Ago *07-05-2022*	10.16	89.84	49.62	6.55	0.00	0.00
Start of Calendar Year *01-04-2022*	97.01	2.99	0.00	0.00	0.00	0.00
Start of Water Year *09-27-2022*	76.20	23.80	0.00	0.00	0.00	0.00
One Year Ago *10-05-2021*	100.00	0.00	0.00	0.00	0.00	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:
Brad Pugh
CPC/NOAA

droughtmonitor.unl.edu

SPB Cost Share

Southern Pine Beetle Cost Share Program

Landowner assistance for:

<u>Prevention</u>

- Non-commercial thinning ($70/acre)
- Pine release ($40/acre)
- Prescribed burning ($5/acre)

<u>Reforestation</u>

- Loblolly, slash, shortleaf, longleaf, white pines and hardwood ($100/acre)

Contact your local GFC forester for more information.

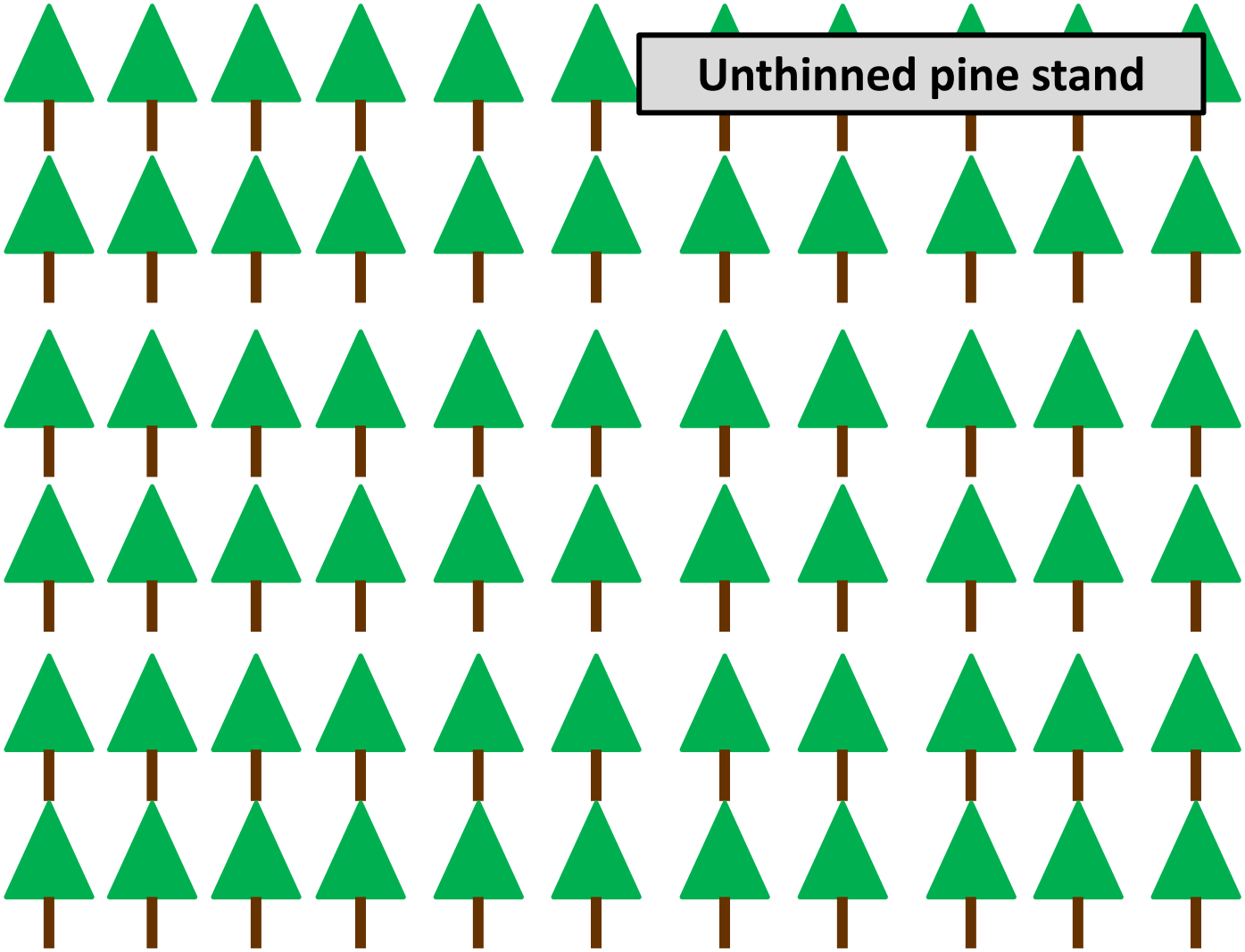
Pine Bark Beetles

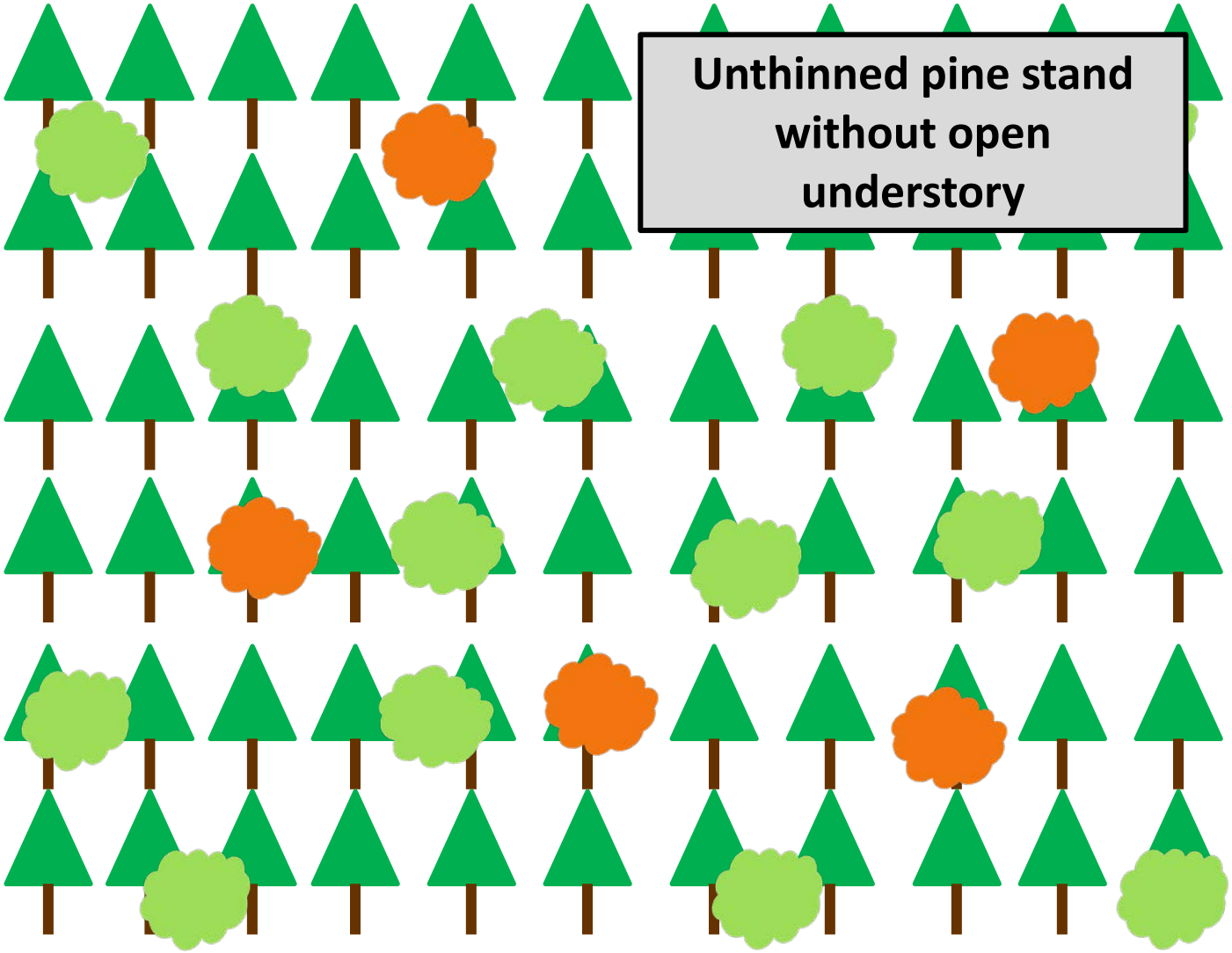
What can you do?

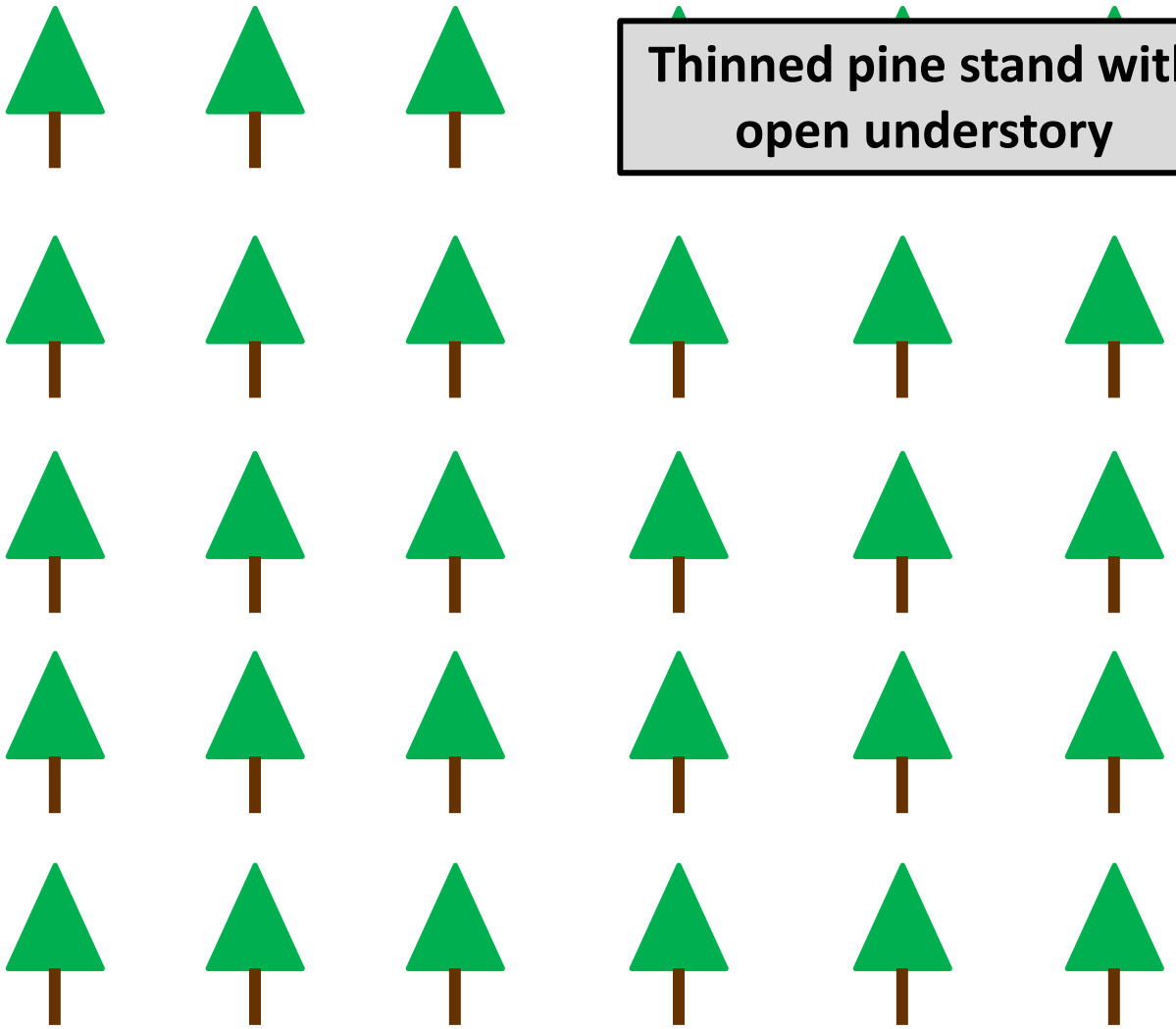
Manage for Healthy Forests

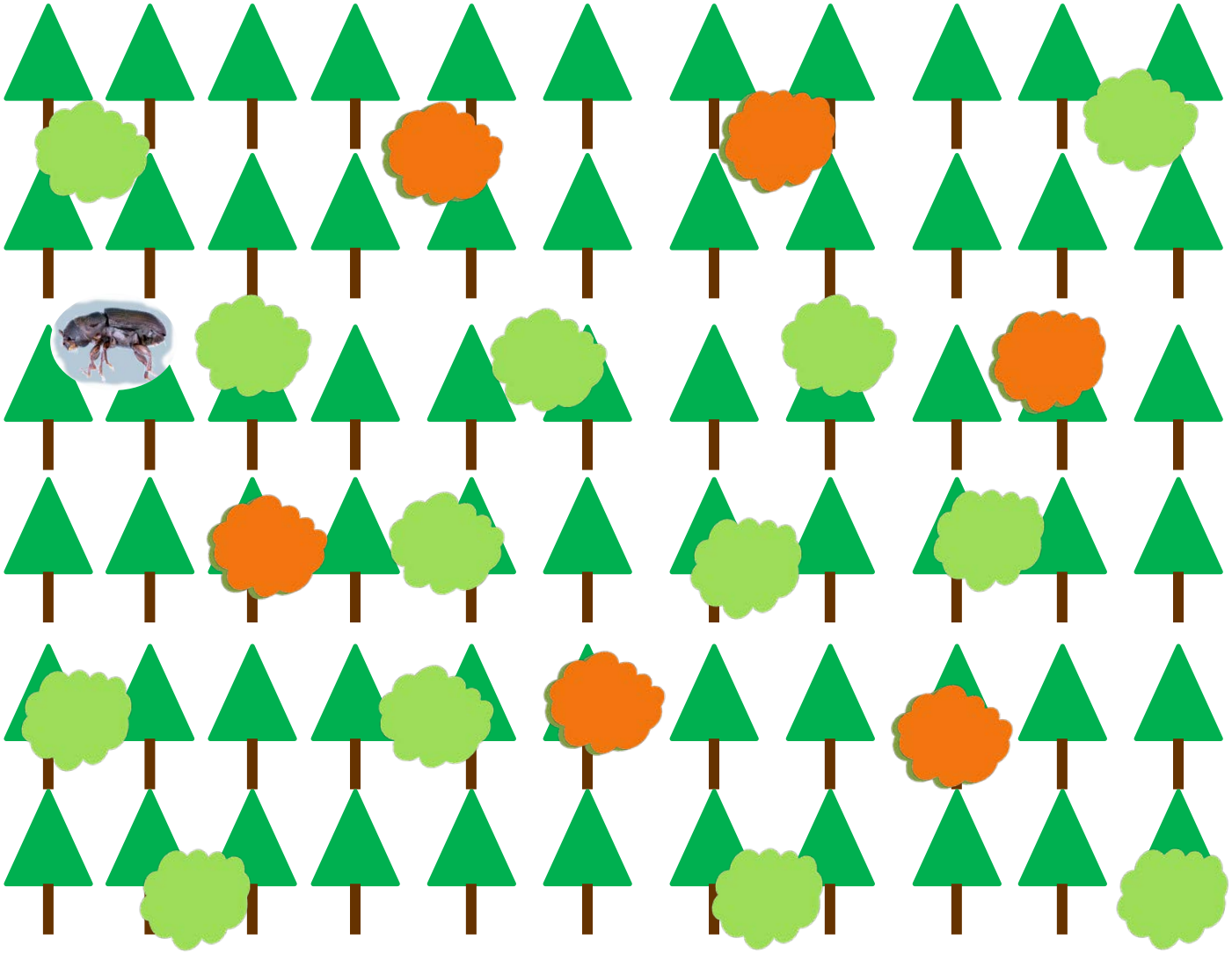
- Proper thinning (less than 90 ft^2 BA)
- Prescribed Fire
- Hardwood/Invasive Species Control
- Always monitor stands
- Mark areas of active infestation to be able to monitor spread

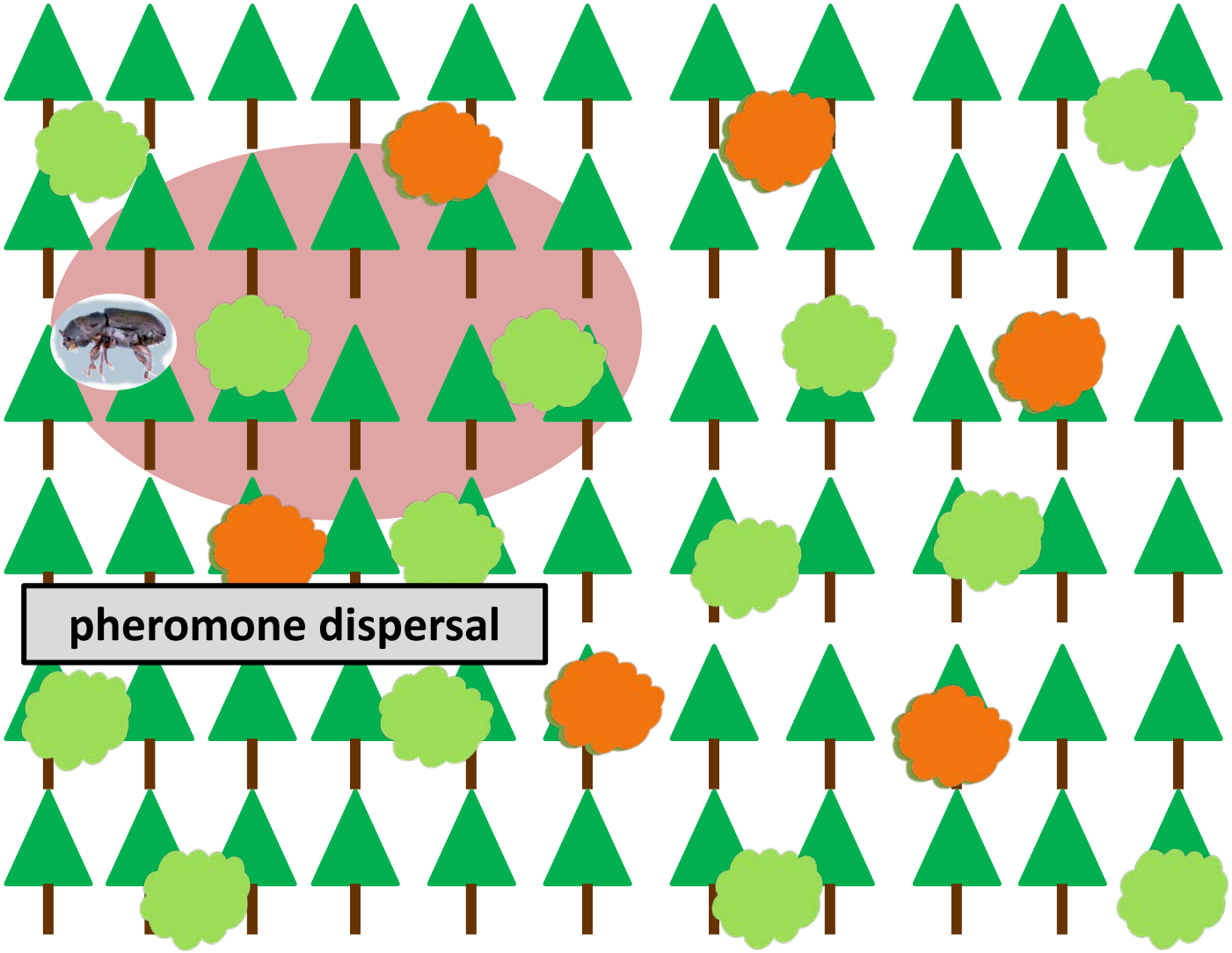
Contact local GFC Forester:
http://www.gatrees.org/about-us/contact-us/

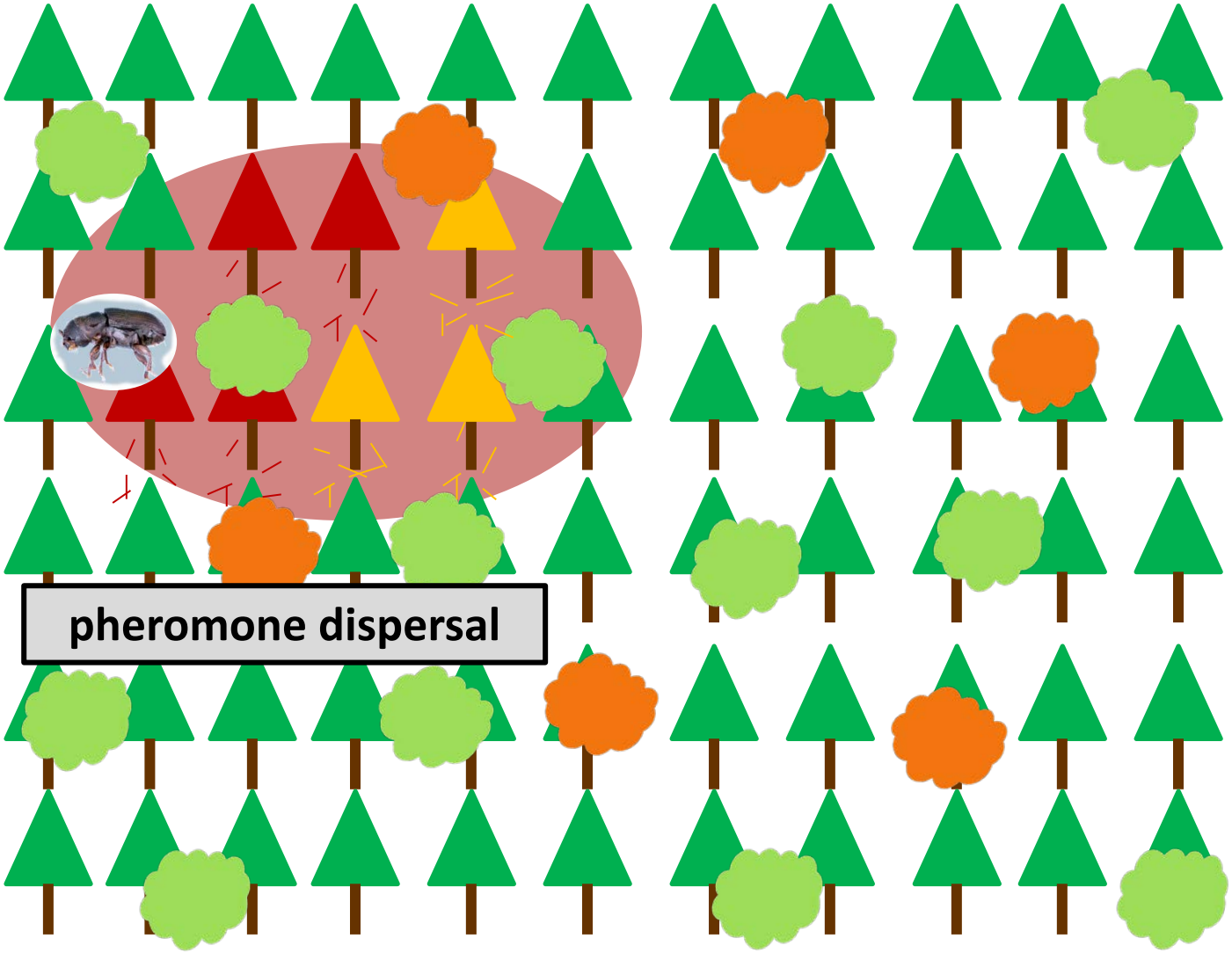

Unthinned pine stand


Unthinned pine stand without open understory

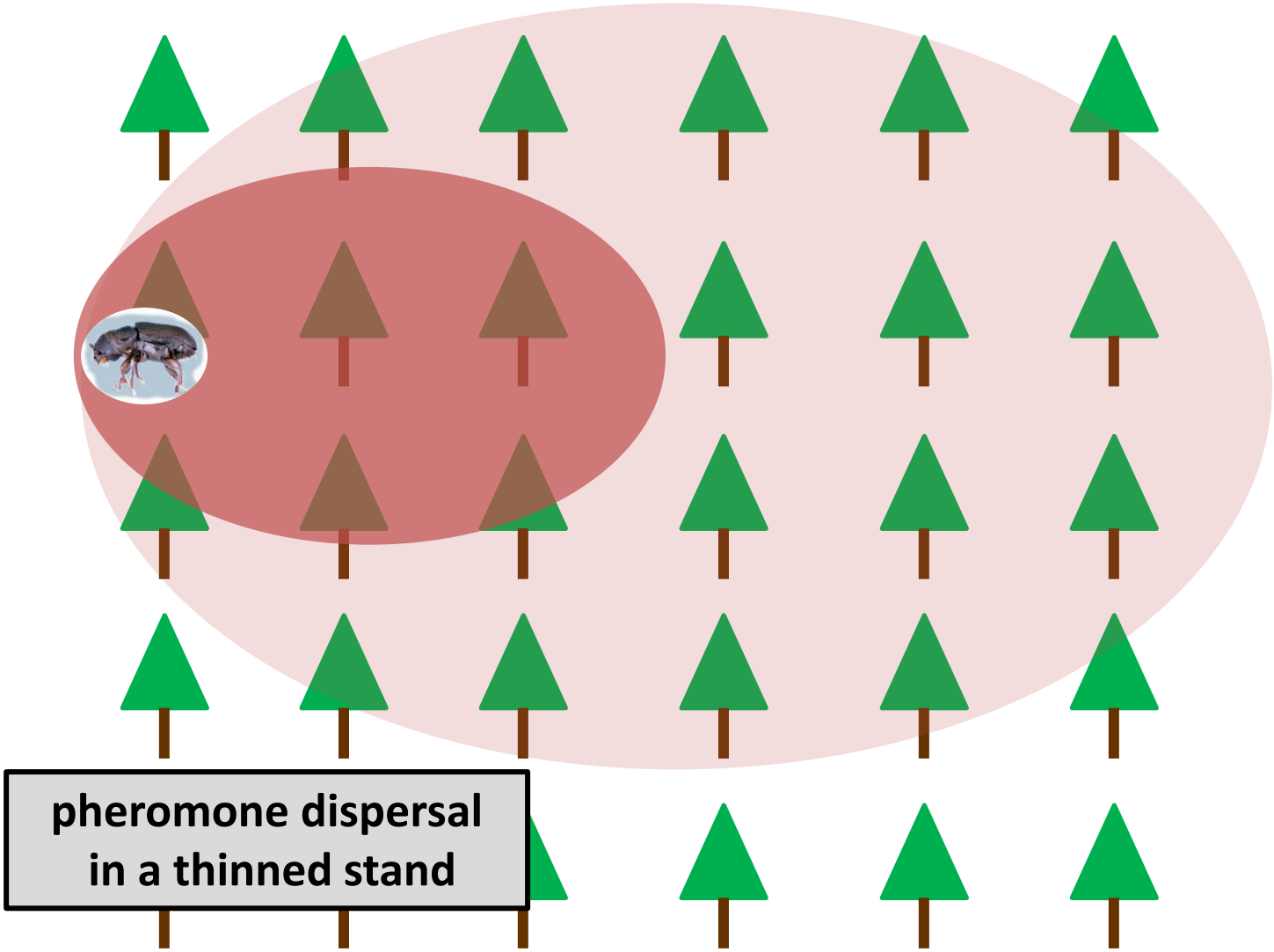

Thinned pine stand with
open understory




pheromone dispersal


pheromone dispersal

Thin pine stands



pheromone dispersal
in a thinned stand

Direct Control Methods

1. Cut and Remove
2. Cut and Leave

Both require a buffer

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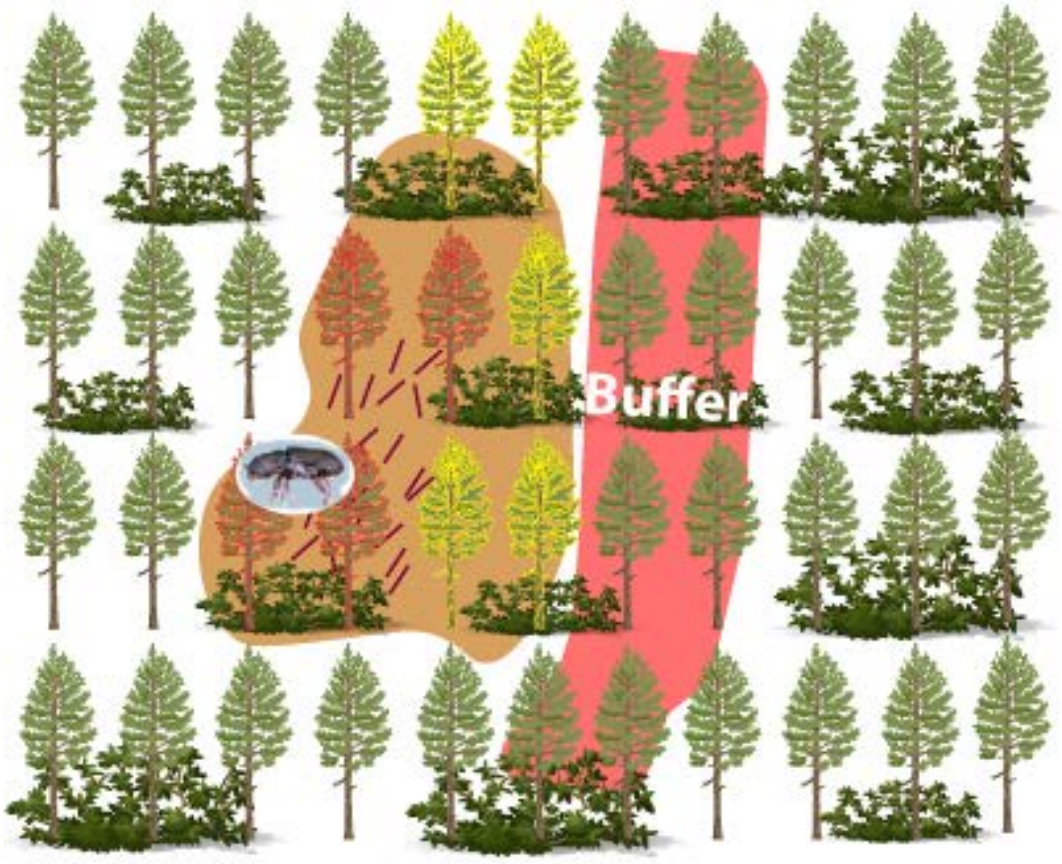
Cut and Remove (with a Buffer)



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Cut and Remove (with a Buffer)

Cut and Remove

Blue Stain and Bark Slipping may decrease Value

GEORGIA FORESTRY COMMISSION

Cut and Leave

QUESTIONS ?

Lynne Womack
Forest Health Coordinator

www.gatrees.org

Cell: 912-515-5180

E-mail: lwomack@gfc.state.ga.us