Aerial Privet Eradication

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Invasive Plants in Georgia…

Major invasive plants impacting forestry in Georgia…

Top 12 Species* and FIA occurrence data:

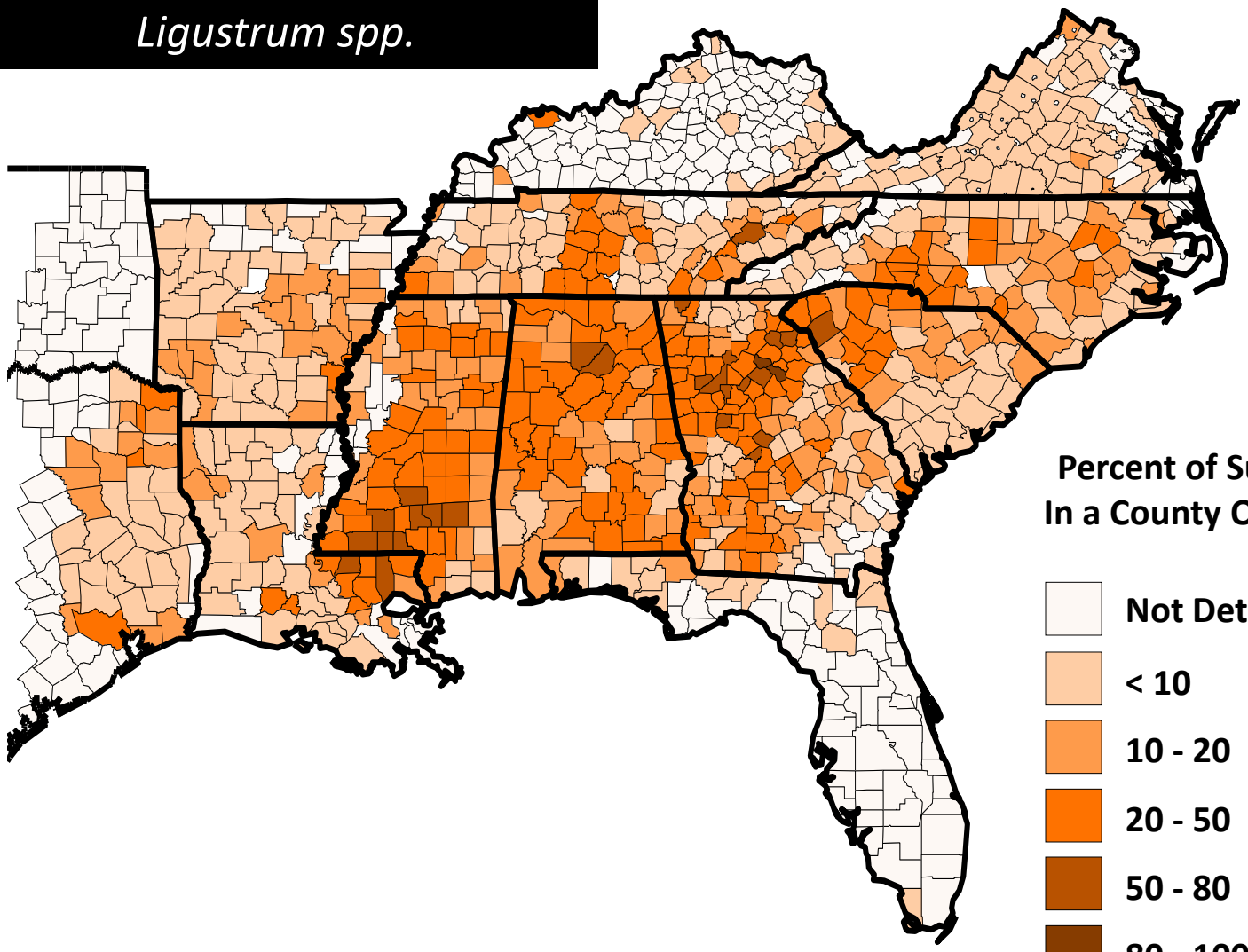
Rank	Species or Genera	Acres
1	non-native Privet	347,346
2	non-native Lespedeza	58,391
3	kudzu	26,669
4	Chinaberry	23,057
5	Japanese Climbing Fern	9,225
6	Tallowtree	7,204
7	non-native Roses	5,799
8	non-native Olives	5,158
9	chinese/japanese wisteria	5,045
10	napalese browntop	4,061
11	Mimosa	3,567
12	Cogongrass	200
		495,722

The Dirty Dozen

- Top 11 species removing honeysuckle and fescue
- Cogongrass is GFC estimate

All Invasive Privets

Ligustrum spp.



USDA Forest Service SRS FIA database
March 2008 Miller and Chambliss, Auburn

Chinese Privet – invasion began long ago…

Winter Foliar Treatment – glyphosate 3-5%

Chinese Privet invades upland areas too…

Numerous low-growing small stems in pine stand = good choice for broadcast understory treatment

Burning may be good first step

Escort XP® (1 ounce per acre) – high volume

Chinese Privet control options

Foliar Treatments:

Escort XP® (1 oz per acre + 0.25% non-ionic surfactant) High Volume Broadcast. Good choice for pine stands but may damage hardwood overstory (Ash, Elm, Dogwood and Cherry are susceptible to root uptake from Escort). Growing season.

Glyphosate (2-5% solution with water) applied as a directed foliage spray *DURING THE DORMANT SEASON*. Good choice for hardwood stands with numerous sprouts or stands with desirable plants near privet. 41% active ingredient products.

Accord Concentrate® (up to 7 pints per acre) applied aerially *DURING THE DORMANT SEASON* (within piedmont region – GFC trial). 54% active ingredient product labeled for areas where standing water occurs.
http://www.gatrees.org/ForestManagement/documents/AerialGlyphosateApplicationtoControlPrivet2009.pdf

Chinese Privet control options

Cut Surface Treatments: as a cut surface or injected into the cambium. Safe around desirable trees where privet must be removed.

- **Krenite®** (mixed 50-50 with water plus surfactant)
- **Arsenal AC®** (5% solution with water plus surfactant)
- **Glyphosate** (mixed 50-50 with water) – 41% active ingredient products
- **Garlon 3A®** (20% solution with water plus surfactant)

Basal Bark Treatments: Safe around desirable trees where privet must be removed.

- **Garlon 4®** (20% plus crop oil) applied as a basal bark treatment. Good treatment option for large privet with single stems and bushy canopy.

Other Considerations:

- Privet eradication will take at least 2 treatments over 2 growing seasons
- Most privet seed will germinate within one year of maturing
- Re-sprouts should be at least 24” before treating

What is the First Step in Eradication?

Aerial Privet trial in Mature Hardwood Forests

Glyphosate treatment applied via helicopter
in the dormant season

Major Questions?

Will it damage the hardwood overstory?
Can it provide an initial control of privet?

Aerial Privet trial in Mature Hardwood Forests

http://www.gatrees.org/ForestManagement/ForestHealth.cfm

Aerial Glyphosate Application to Control Privet in Mature Hardwood Stands

By: James Johnson (GFC)[1], Scott Griffin (GFC)[2], & John Taylor (USFS)[3]

BACKGROUND:

Chinese Privet (*Ligustrum sinense*) is one of the most widespread non-native invasive plants within hardwood and pine forests throughout all ecoregions of Georgia (Harper 2009). It aggressively invades, spreads and eventually dominates many forested understories, completely displacing native flora. This field trial evaluated one technique (previously untested) for removing a privet-choked understory in a hardwood bottom within the piedmont region.

Dormant season applications of glyphosate herbicide applied as foliar treatments to Chinese privet have been shown to be an effective control option which may limit damage to non-target dormant plants (Evans 2008). Privet infestations beneath hardwood canopies are common along field borders, drains and streams. Often, treatment is difficult in stands growing beneath hardwood canopies because of access obstacles and minimal application methods that insure ample privet canopy coverage while limiting damage to the desirable overstory. In this project, glyphosate herbicide was applied aerially in an effort to control Chinese privet beneath dormant hardwood forests and to provide a basis for measuring both efficacy to privet and damage to the dormant hardwood stand.

METHODS:

On February 6-7, 2009, Glyphosate (Accord Concentrate®@ 54% active ingredient) was applied at two rates (3% and 6%), using a helicopter calibrated to deliver a spray volume of 15 gallons per acre (GPA). (Equipment used: Bell Jet Ranger helicopter equipped with Accu Flow 028® forestry nozzles coupled to an AutoCal® application calibration system.) These rates equate to (of Accord Concentrate® applied) 0.45 GPA and 0.9 GPA for the 3% and 6% treatment areas, respectively. Entry II® surfactant was used at 0.5% (0.075 GPA). Sites were selected at two state parks in the piedmont of Georgia for this trial (Hard Labor Creek and Fort Yargo State Parks -Figure 1 at left). "High" and "low" rates were applied to two areas at each park, creating four treatments areas. Treatment sites were separated by adequate buffers to insure plot integrity and minimize the potential for cross-treatment contamination.

Figure 1. Location of State Parks

Within each of the four treatment areas (which totaled 50 acres), three one-tenth acre (circular) plots were established for pre- and post-

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Aerial Privet trial - Methods

- ✓Sites selected at 2 state parks
  (Fort Yargo and Hard Labor Creek)

- ✓2 Treatment areas on each park established
  - ✓3% & 6% solutions of Accord Concentrate® (54% ai)
    - ✓3% (0.45 gpa) & 6% (0.9 gpa)
  - ✓0.5% Entry II® surfactant (0.075 gpa)
  - ✓15 gallons / acre applied February 6 & 7, 2009

Aerial Privet trial - Application

Aerial Privet trial - Application

Aerial Privet trial – plots…

3 plots established in each area

✓1/10th acre circular plots

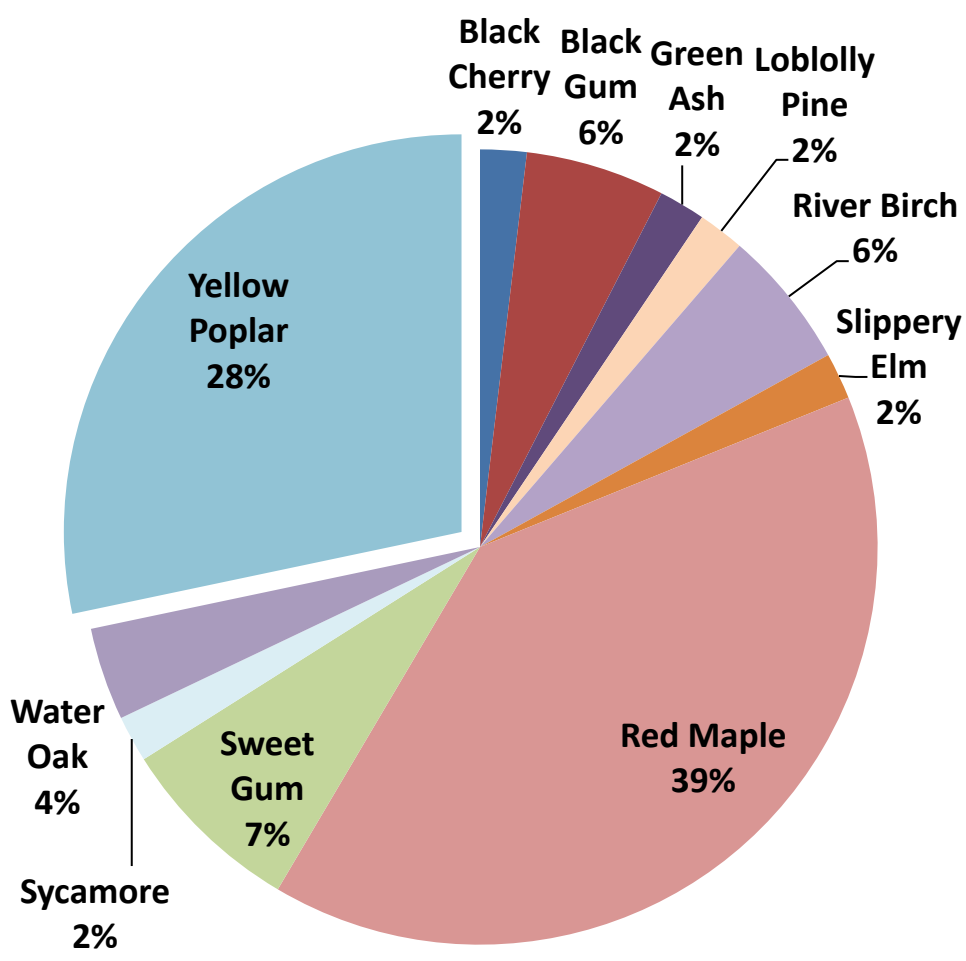
✓Plot location insure all major tree species would be represented

✓All trees measured – species, dbh, health condition

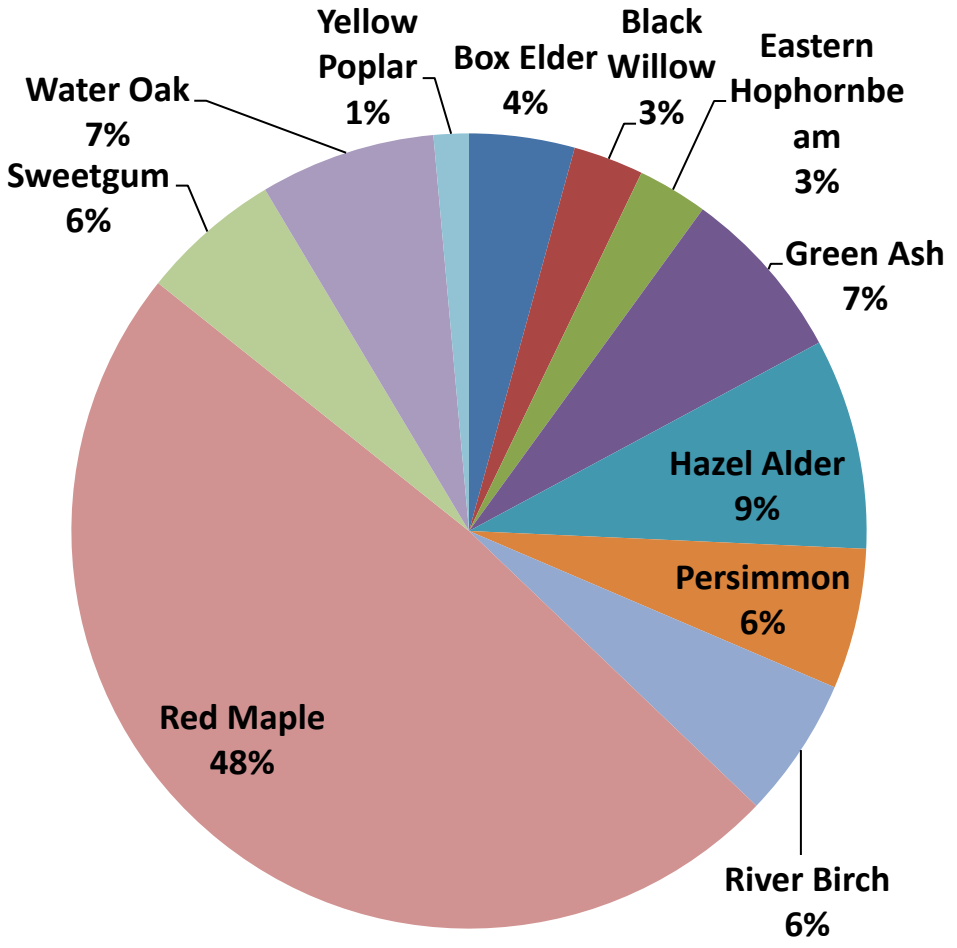
✓5 or more 1” dbh privet measured and tagged / plot

✓Privet regeneration measured within 3’ radius of plot center

Aerial Privet trial – Tree Composition



Tree Species within plots at Fort Yargo State Park
Average - 88 trees per acre / 14.8" dbh



Tree Species within plots at Hard Labor Creek State Park
Average - 120 trees per acre / 8.4" dbh

Aerial Privet trial – Fort Yargo plots (Trees)

Tree common names	Scientific Names
Black Cherry	*Prunus serotina*
Black Gum	*Nyssa sylvatica*
Black Willow	*Salix nigra*
Box Elder	*Acer negundo*
Eastern Hophornbean	*Ostyra virginiana*
Green Ash	*Fraxinus pennsylvanica*
Hazel Alder	*Alnus serrulata*
Loblolly Pine	*Pinus Taeda*
Persimmon	*Diospyros virginiana*
Red Maple	*Acer rubrum*
River Birch	*Betula nigra*
Slippery Elm	*Ulmus rubra*
Sweetgum	*Liquidambar styraciflua*
Sycamore	*Platanus occidentalis*
Water Oak	*Quercus nigra*
Winged Elm	*Ulmus alata*
Yellow Poplar	*Liriodendron tulipifera*

Aerial Privet trial – Fort Yargo plots

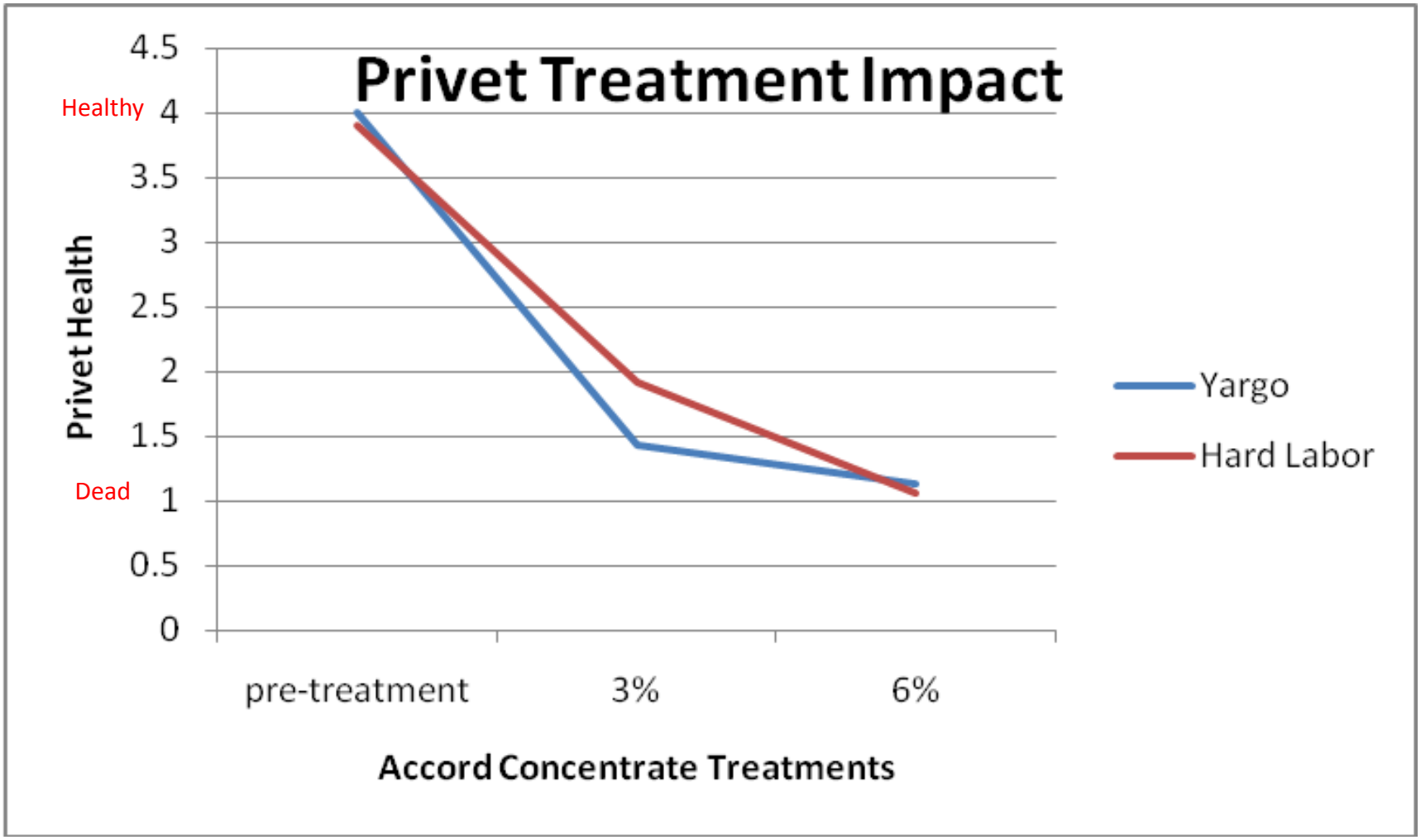
	Condition 12-08		Condition 5-09	
	3%	*6%*	*3%*	*6%*
All Trees				
Fort Yargo	3.94	4		
Hard Labor	3.87	3.83		
Privet (greater than 1" dbh)				
Fort Yargo	4	4		
Hard Labor	4	4		

Condition Scores:

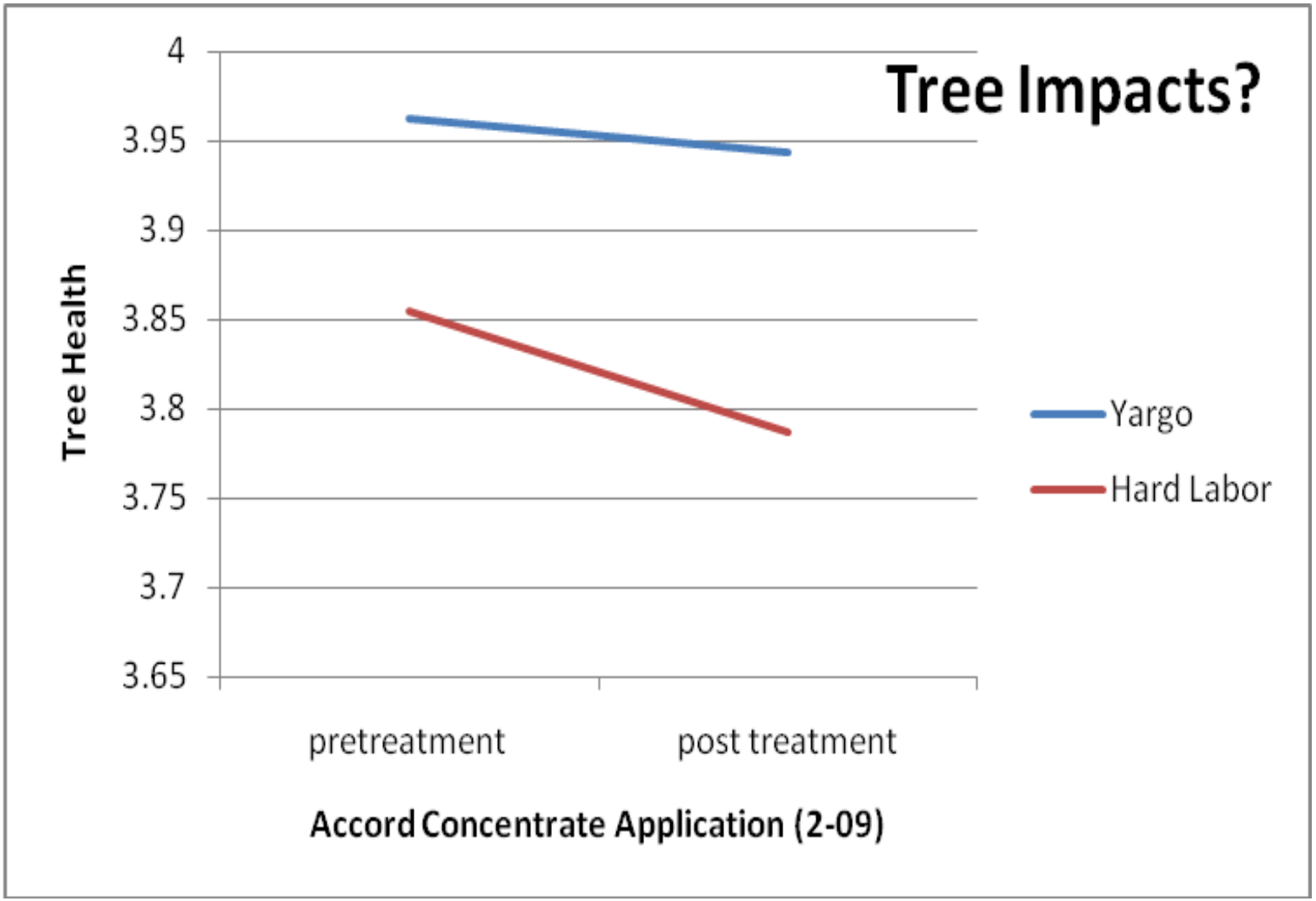
1	dead more than 50% canopy
2	dieback
3	less than 50% canopy dieback
4	healthy

Privet (regeneration/acre)	Stems Per Acre
Fort Yargo	52,086
Hard Labor	14,331

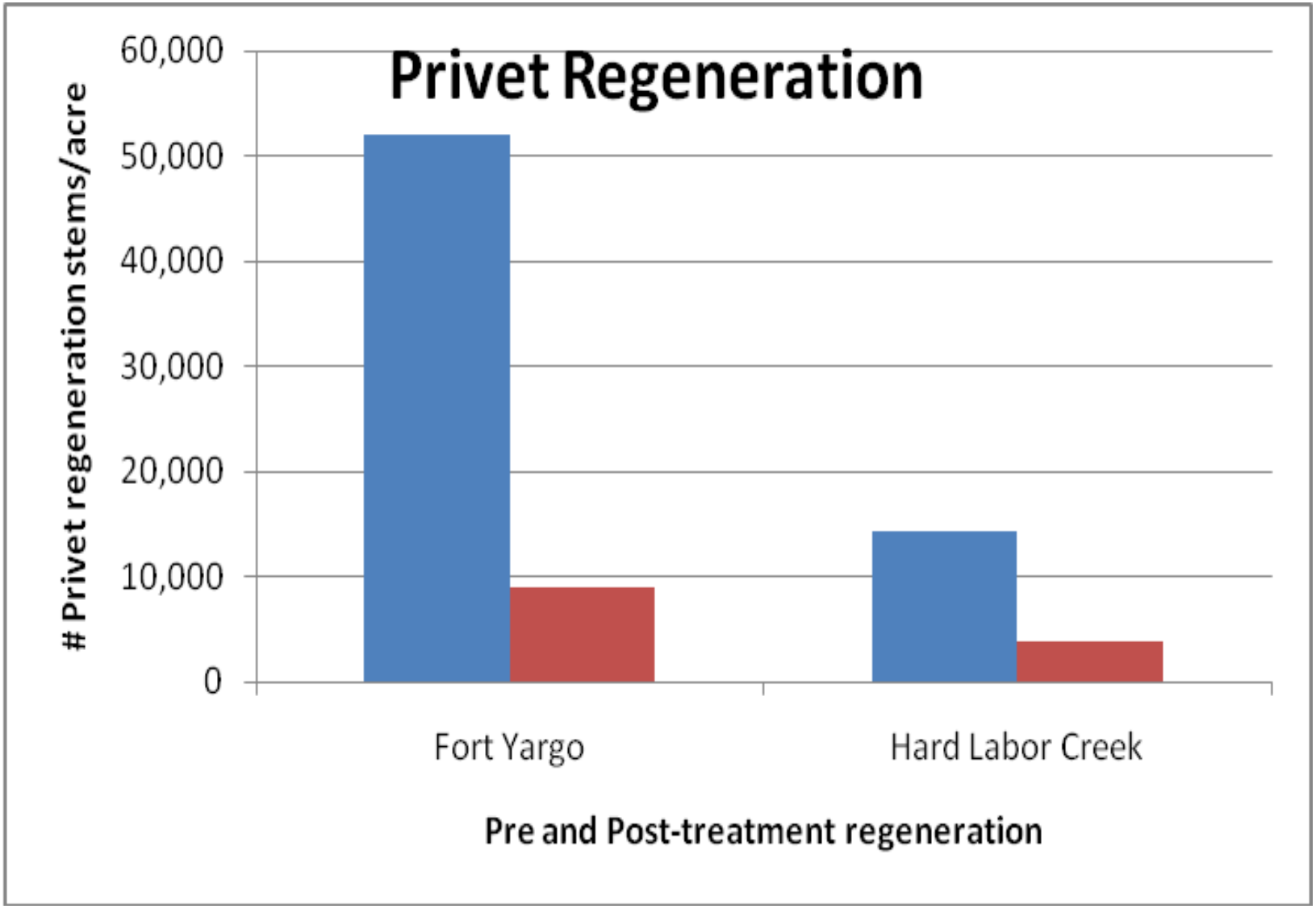
Aerial Privet trial – privet impact



Aerial Privet trial – tree impact



Aerial Privet trial – privet regeneration impact



Aerial Privet trial – final thoughts

- ✓Treatments at both concentrations had significant impact on the privet
- ✓Privet regeneration was also impacted
- ✓Neither concentration impacted tree canopy (except Persimmon)
- ✓Privet is not eradicated…must follow-up with ground treatments
  - ✓Seed remain viable for 1 growing season
- ✓Aerial cost is similar (or cheaper) than ground applications
  - $170 / acre - 6%
  - $150 / acre - 3% (GFC costs 2010 - $65/acre)
- ✓Treatment window may vary each year – overstory dormancy is critical
- ✓Avoid below freezing applications
- ✓Coastal plain trial – winter 2009 – 2010 (magnolia, sweetbay, switch cane)

Partnerships & Thanks!

Dow AgroSciences

Aerial Privet trial

Aerial Privet trial – marking treatment areas….

Trials still on-going….