


# Fire effects on insect populations in managed pines

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## Burn Study: Forest Health Co-op

- Management of insects using fire
- Five Treatments
  - 2 to 3 year burn
  - Symptomatic area not burned
  - Unmanaged control
  - Burned
  - Unburned
- Scotch Management
  - Clark and Marengo Counties, Alabama

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## Forest Health Cooperative Objectives

- Quantify the populations of root and lower stem colonizing beetles and other pine bark beetles across different burning regimes
- Compare populations among sites under various treatments
- Relate management methods to changes in insect populations

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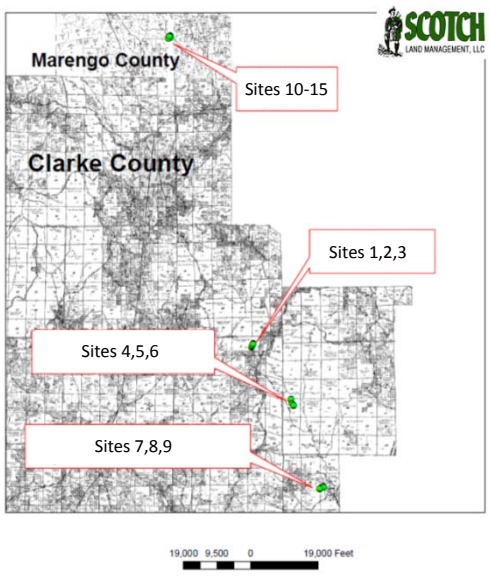
## Study Sites

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# Study Timeline


- Trap installation February 2014
- Insect collections began March 2014
- Burn treatment on April 2014
- Traps reinstalled on April 2014
- Traps removed March 2015
- Roots excavated September 2015

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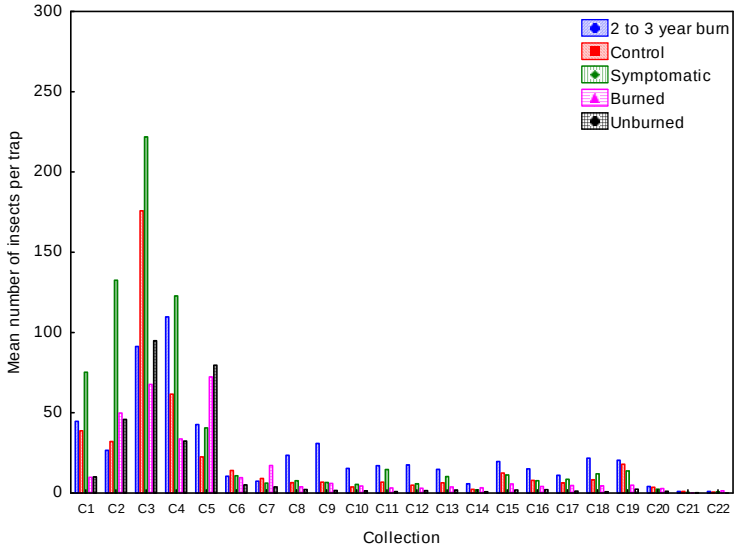
# Results

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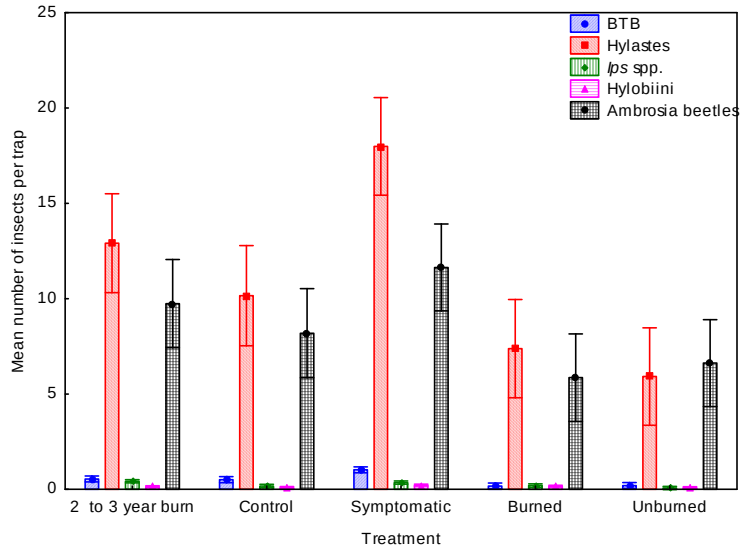
# Results

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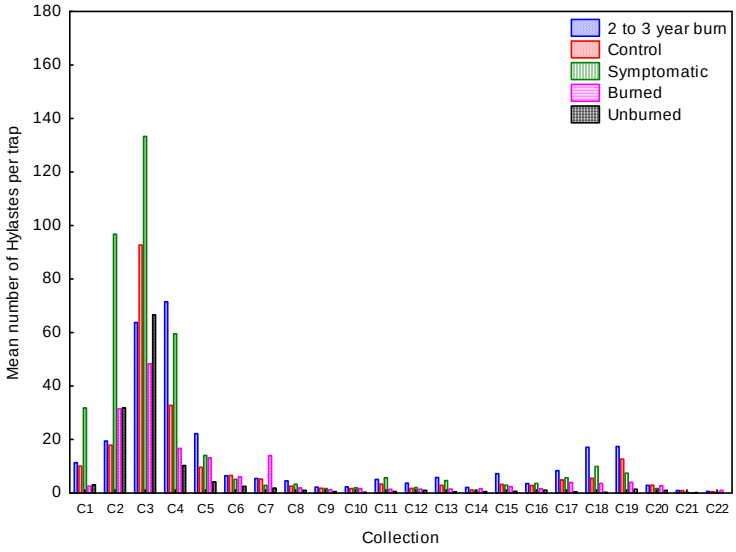
# Hylastes

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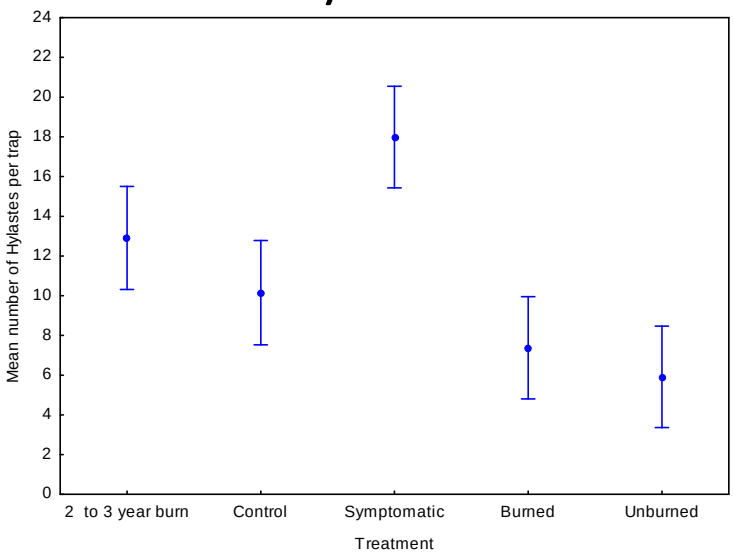
# Hylastes

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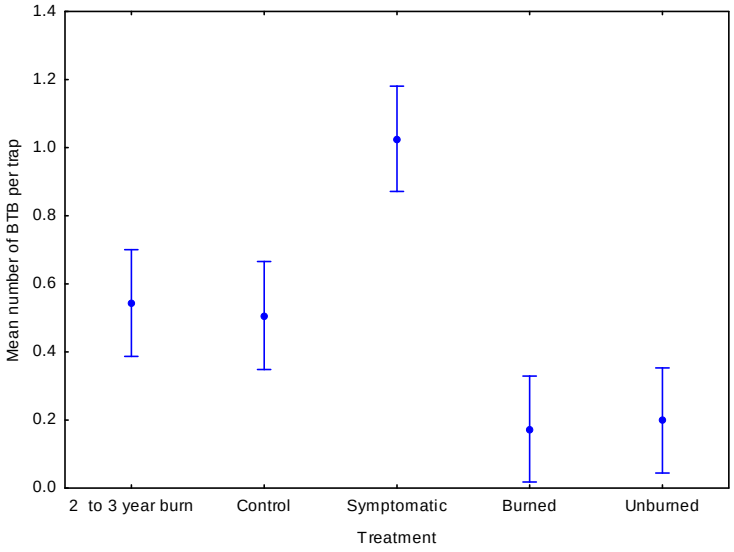
# BTB

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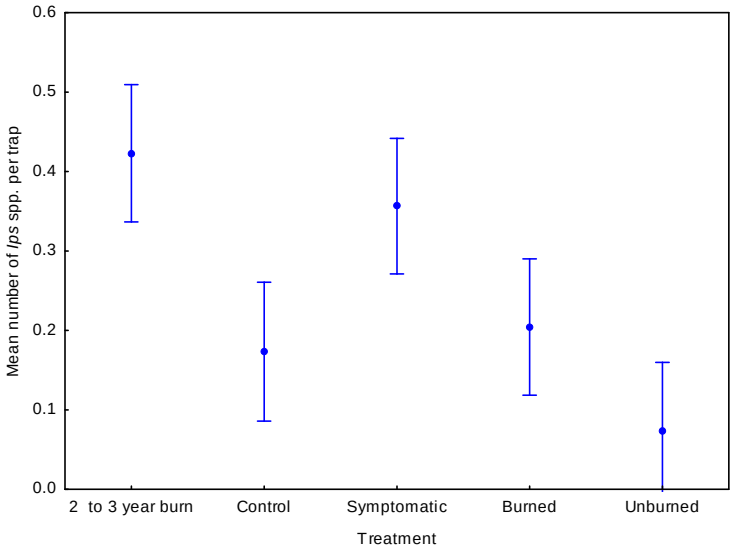
# *Ips* spp.

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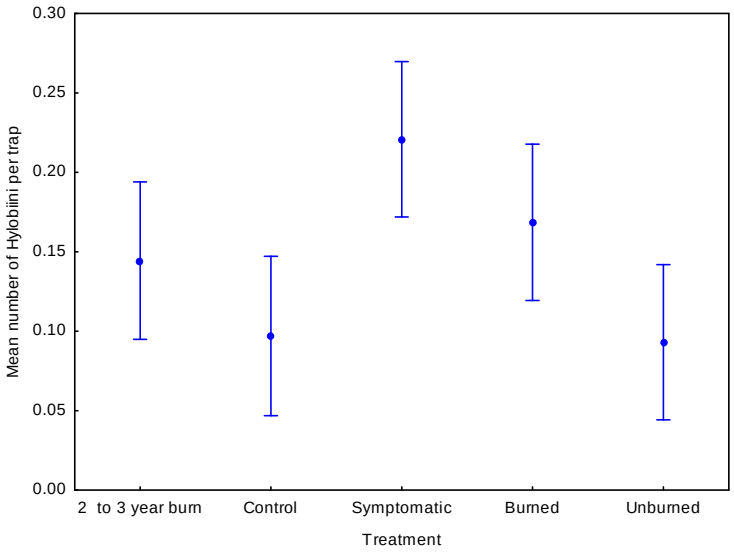
# Weevils

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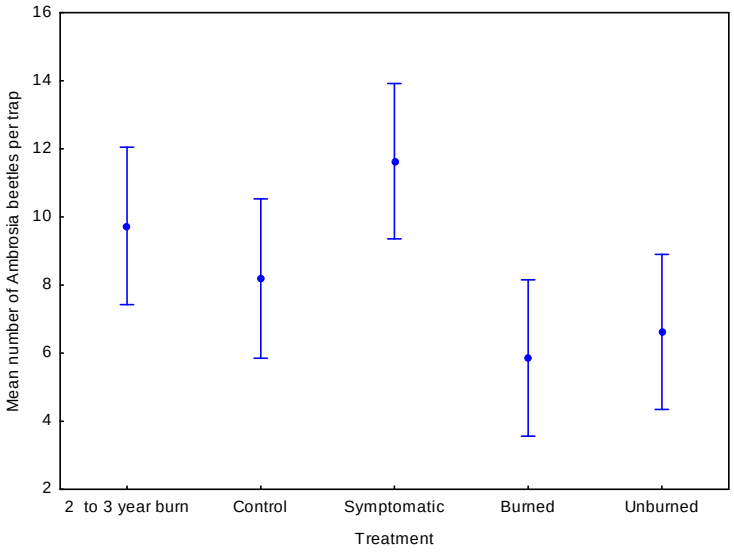
# Ambrosia beetles

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# Insect Conclusions

- Pest insect numbers were highest in the symptomatic and burned areas
- Pest insect numbers were lowest in the unburned area



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# Fungal Isolation

Roots from three trees on each site were extracted from the ground, brought to the lab, and tested for the presence of fungal pathogens

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# Fungal Species

- Non-native
  - *Grosmannia huntii*
  - *Grosmannia alacris*
- Native, capable of genetic recombination
  - *Ophiostoma minus* –like sp.
  - *O. ips*
- Native
  - *Leptographium procerum*
  - *L. terebrantis*
- Non- pathogenic, potentially beneficial
  - *Graphium* sp.

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| Plot | Treatment | Fungal Species |
|---|---|---|
| 1 | Asymptomatic 2-3 year burn rotation | *Grosmannia huntii*, *Ophiostoma minus* –like sp., *O. ips*, *Leptographium procerum*, *L. terebrantis*, *Graphium* sp. |
| 2 | Asymptomatic 2-3 year burn rotation | *G. alacris*, *O. minus* –like sp., *O. ips*, *L. terebrantis*, *L. procerum*, *Graphium* sp. |
| 3 | Asymptomatic 2-3 year burn rotation | *G. alacris*, *O. minus* –like sp., *O. ips*, *L. terebrantis*, *L. procerum*, *Graphium* sp. |
| 4 | Unmanaged control (Hwd/Pine Mix) | *O. minus* –like sp., *L. terebrantis*, *L. procerum* |
| 5 | Unmanaged control (Hwd/Pine Mix) | *G. alacris*, *O. minus* –like sp., *L. terebrantis*, *L. procerum*, *Graphium* sp. |
| 6 | Unmanaged control (Hwd/Pine Mix) | *G. alacris*, *O. minus* –like sp., *L. terebrantis*, *L. procerum*, *Graphium* sp. |
| 7 | Symptomatic non burned | *O. minus* –like sp., *O. ips*, *L. procerum* |
| 8 | Symptomatic non burned | *O. minus* –like sp., *O. ips*, *L. procerum* |
| 9 | Symptomatic non burned | *O. minus* –like sp., *O. ips*, *L. terebrantis*, *L. procerum* |
| 10 | Asymptomatic Burned | *O. minus* –like sp., *O. ips*, *L. terebrantis*, *L. procerum* |
| 11 | Asymptomatic Burned | *O. minus* –like sp., *O. ips*, *L. terebrantis*, *L. procerum* |
| 12 | Asymptomatic Burned | *O. minus* –like sp., *O. ips*, *L. terebrantis*, *L. procerum* |
| 13 | Asymptomatic Not Burned | *G. alacris*, *G. huntii*, *O. minus* –like sp., *O. ips*, *L. terebrantis*, *L. procerum* |
| 14 | Asymptomatic Not Burned | *O. minus* –like sp., *O. ips*, *L. procerum* |
| 15 | Asymptomatic Not Burned | *G. alacris*, *G. huntii*, *O. minus* –like sp., *L. terebrantis*, *L. procerum* |

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# Fungal Conclusion

- Seven pathogenic fungal species were isolated from the roots of trees on these sites
- Pathogenic fungal samples were recovered from all trees on all sites, regardless of management regime
- Unburned and unmanaged control sites more commonly hosted *Grosmannia* spp., the most severe and virulent pathogens
- Currently, most severe pathogen species found on the sites with the lowest insect infestation levels

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SCOTCH LAND MANAGEMENT, LLC

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