What is insect diversity like in a mature loblolly pine stand?

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Forestry in the Southeastern US

- Agricultural practices in the 1900s
- Large areas of monocultured pine species
- Pest insects typically respond to stressed trees
  - Poor soil, flooding, compaction, drought, mechanical damage
- Insects feed on tissues and vector pathogens

Insects in Forestry

- Nonnative pests are a large part
  - Economic damage
  - Alter ecosystems
    - Emerald ash borer, beech scale
- Native *Dendroctonus*
- Root feeding beetles of special concern
  - Belowground damage
  - Vector blue staining fungi that occlude xylem

Insects as Bioindicators

- Water quality
  - Mayflies, stoneflies, caddisflies
- Not all are pests
  - Pollinators, predators of pests, food for wildlife, biocontrol of weeds, human food source
- Ecosystem health
  - Decomposition
- Stand health

Objective

To obtain baseline data on annual insect population dynamics for a study investigating the impact of a beetle vectored fungus, *Leptographium terebrantis*

Experimental Design

- 1 field site in Eufaula, AL
- 15 plots
  - 2 pitfall traps per plot (30 total)
  - 6 panel traps through out the study area, 2 on each side and 2 in the middle
- Insects were collected bimonthly for 1 year
  - Stored in the cooler until processed
  - Identified to family, sorted by morphospecies

Experimental Design

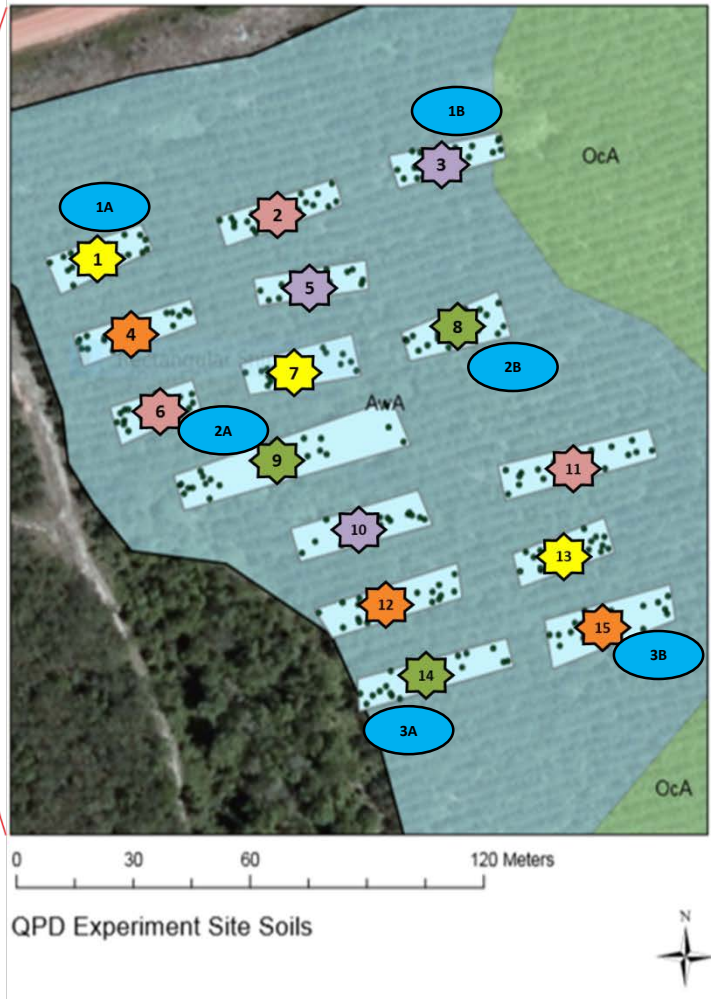


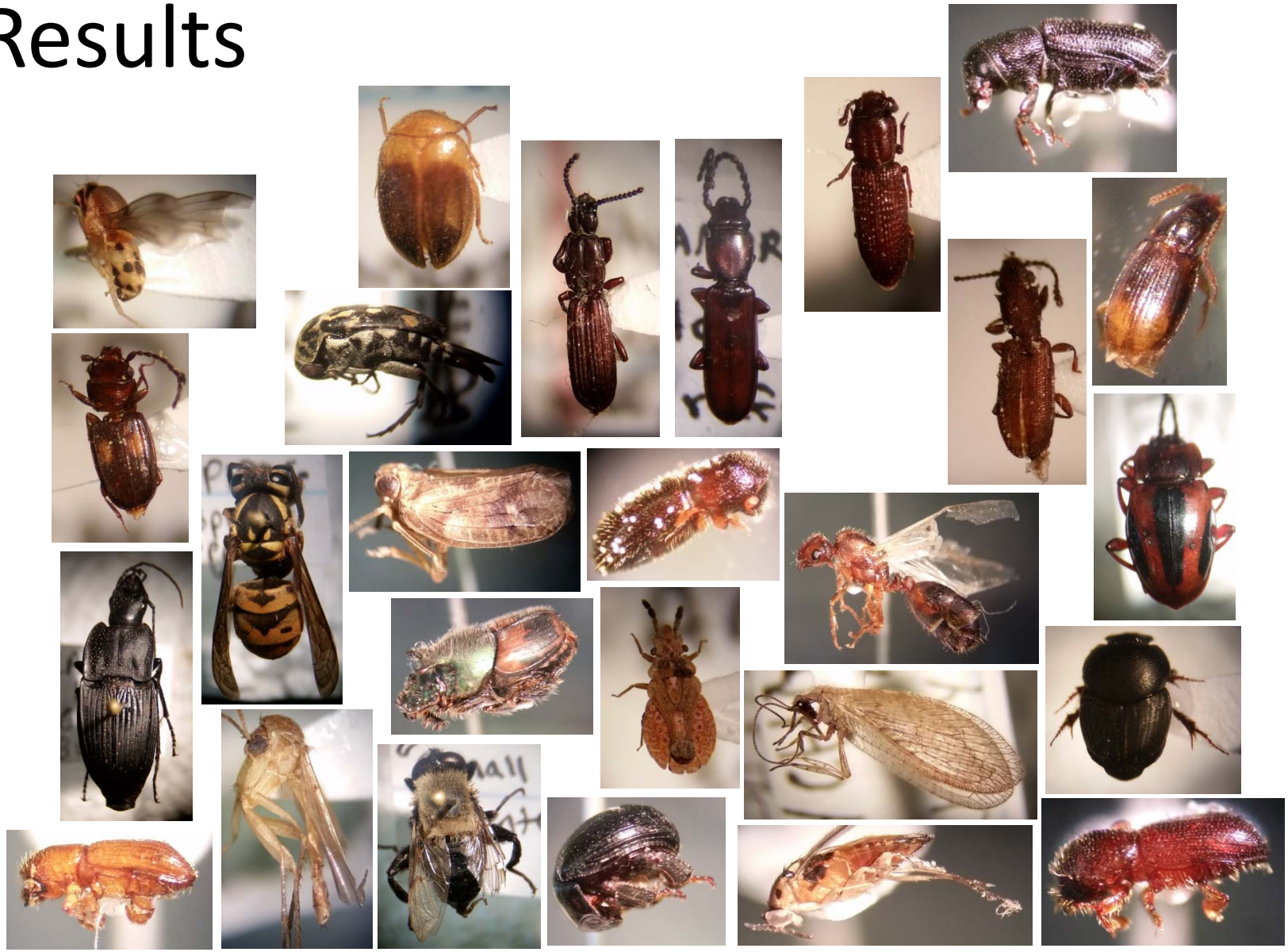
Figure 1: The location of the Eufaula, AL study site on an Alabama map and the layout of the 15 study plots and panel trap locations. Stars correspond to plots while ovals are panel traps.

Methods

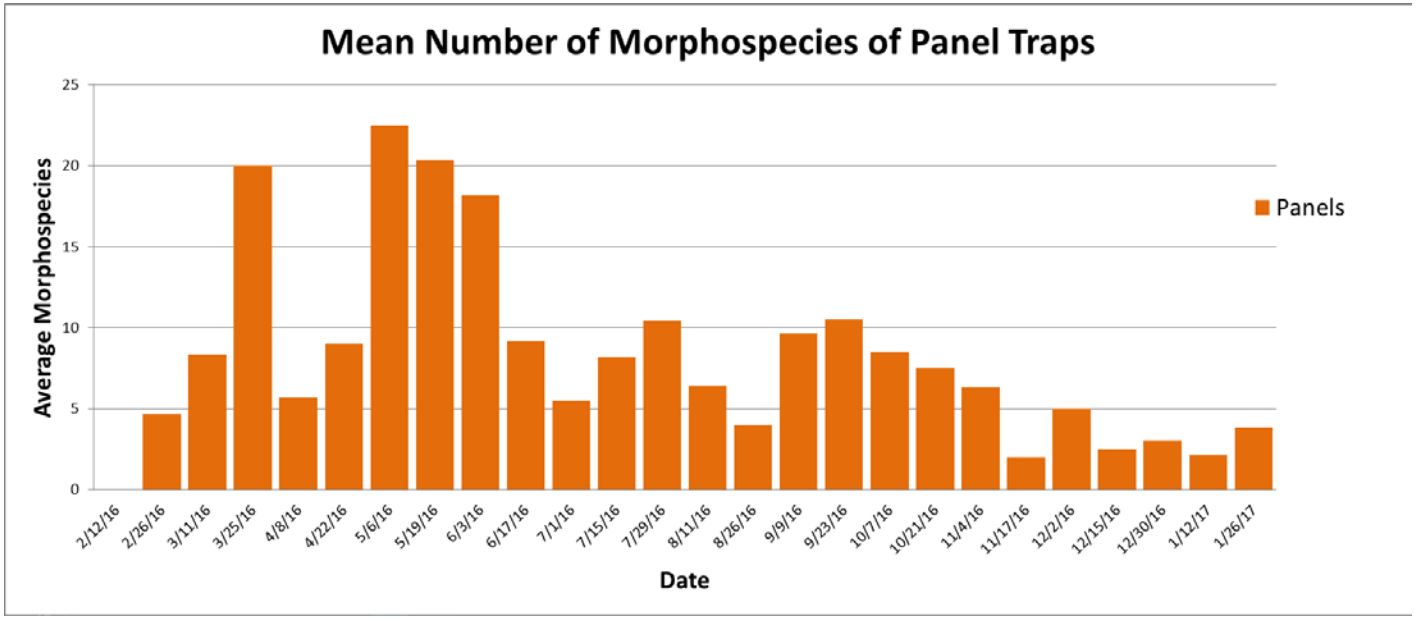

Plot
1 SA
5-18-17

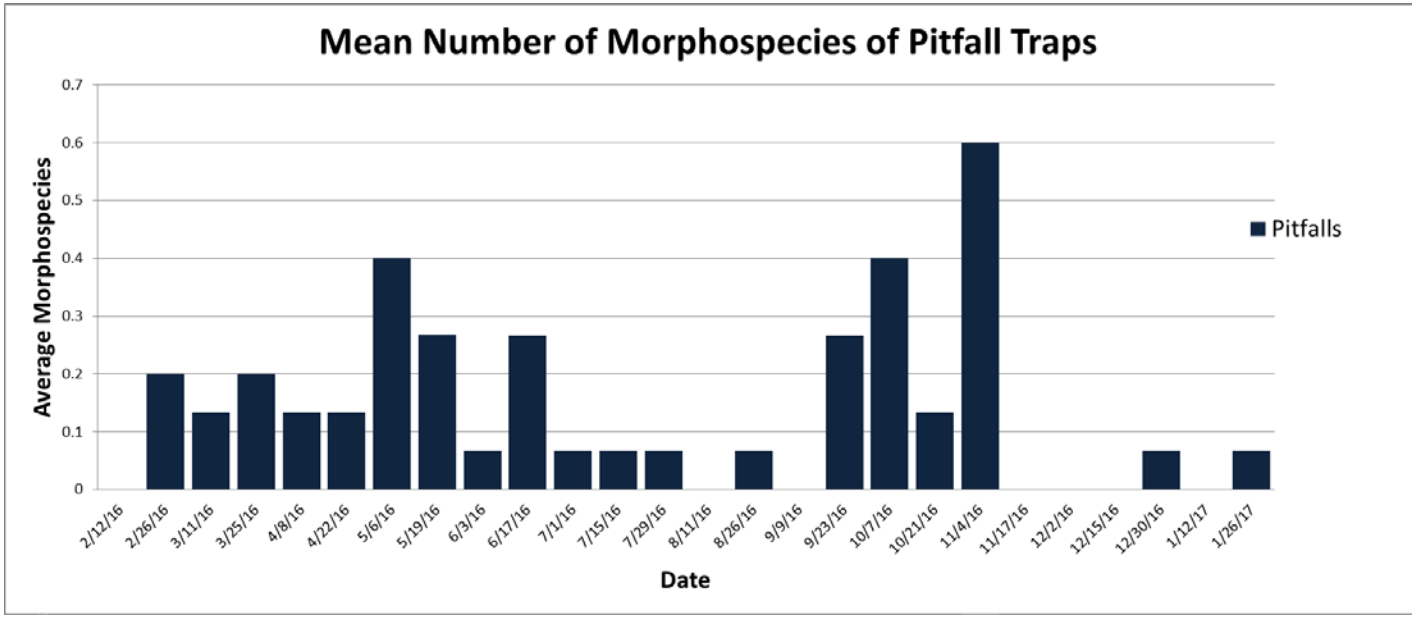

SUPER TECH
ANTIFREEZE/
COOLANT
REFRIGERANTE/
ANTICONGELANTE

Results

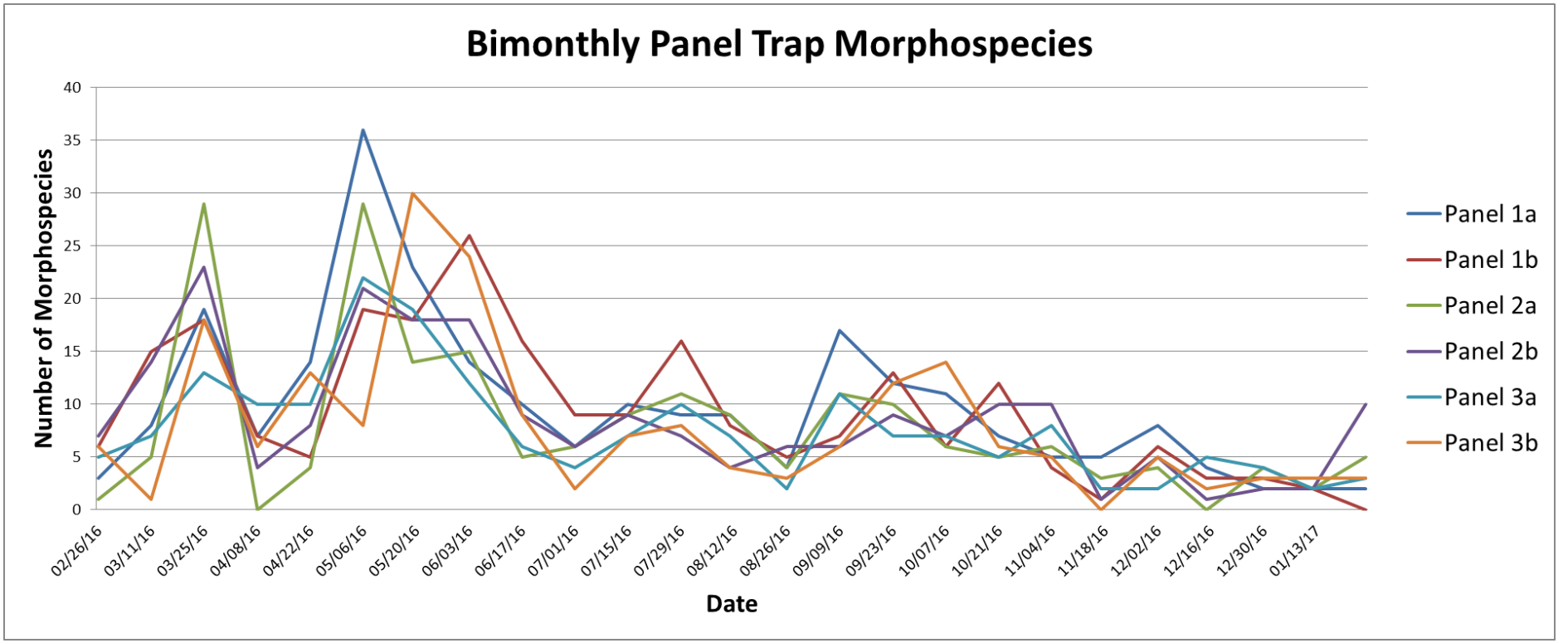


Results

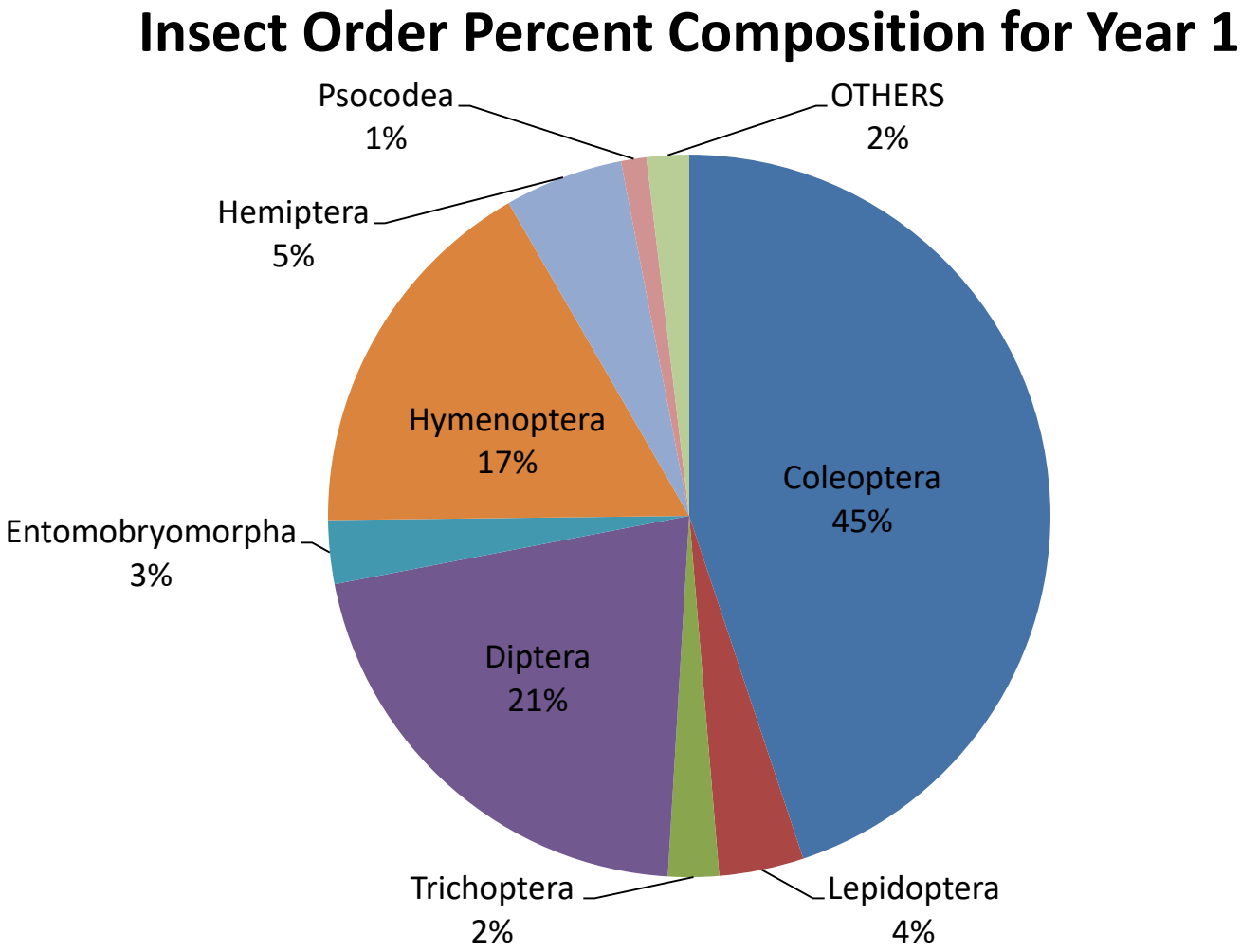

Mean Number of Morphospecies of Panel Traps
Average Morphospecies
25
20
15
10
5
0
Panels
2/12/16
2/26/16
3/11/16
3/25/16
4/8/16
4/22/16
5/6/16
5/19/16
6/3/16
6/17/16
7/1/16
7/15/16
7/29/16
8/11/16
8/26/16
9/9/16
9/23/16
10/7/16
10/21/16
11/4/16
11/17/16
12/2/16
12/15/16
12/30/16
1/12/17
1/26/17
Date


Mean Number of Morphospecies of Pitfall Traps
Average Morphospecies
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Pitfalls
2/12/16
2/26/16
3/11/16
3/25/16
4/8/16
4/22/16
5/6/16
5/19/16
6/3/16
6/17/16
7/1/16
7/15/16
7/29/16
8/11/16
8/26/16
9/9/16
9/23/16
10/7/16
10/21/16
11/4/16
11/17/16
12/2/16
12/15/16
12/30/16
1/12/17
1/26/17
Date

Results

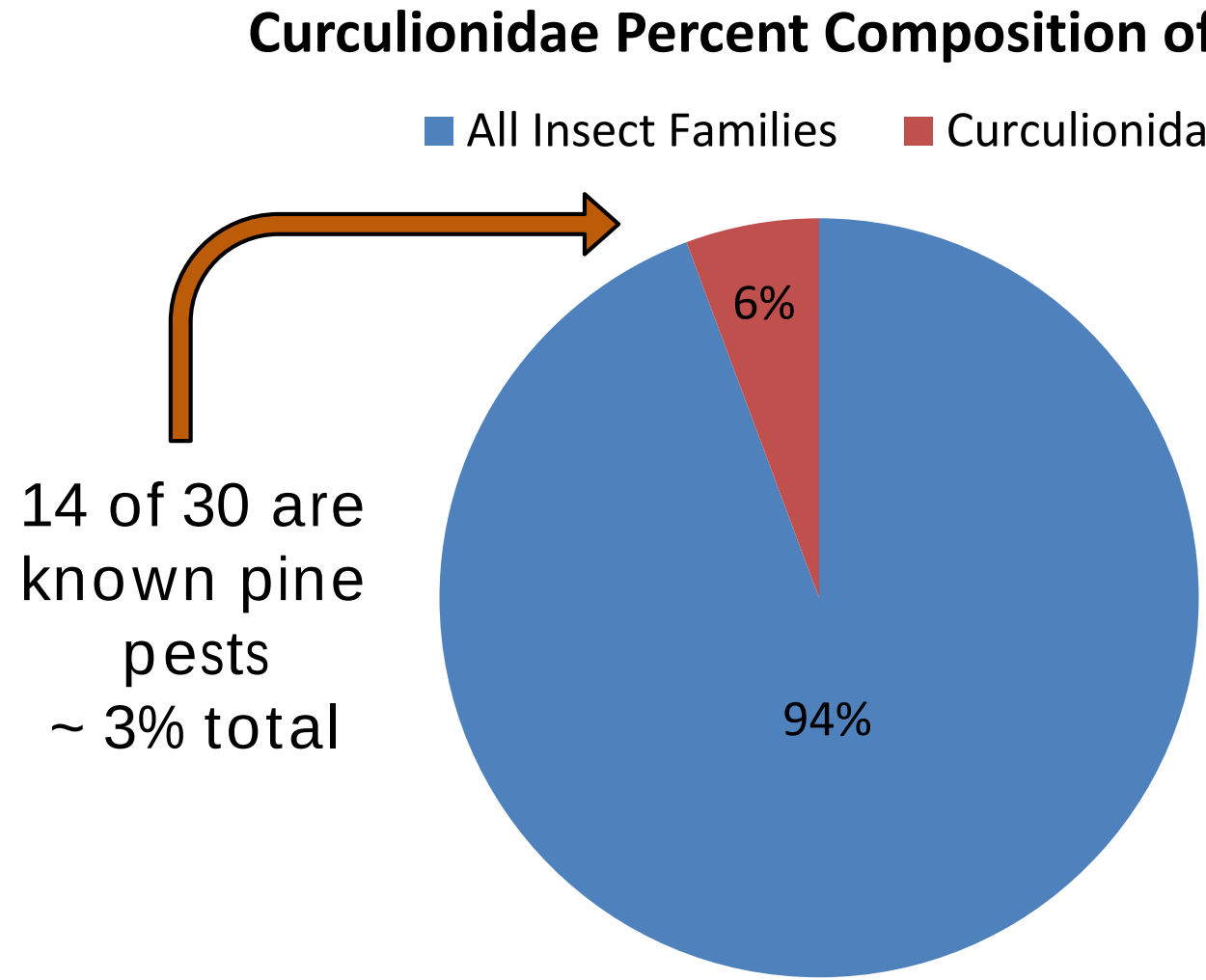

Bimonthly Panel Trap Morphospecies
Number of Morphospecies
0
5
10
15
20
25
30
35
40
02/26/16
03/11/16
03/25/16
04/08/16
04/22/16
05/06/16
05/20/16
06/03/16
06/17/16
07/01/16
07/15/16
07/29/16
08/12/16
08/26/16
09/09/16
09/23/16
10/07/16
10/21/16
11/04/16
11/18/16
12/02/16
12/16/16
12/30/16
01/13/17
Date
Panel 1a
Panel 1b
Panel 2a
Panel 2b
Panel 3a
Panel 3b

Results



OTHERS: composed of the orders Orthoptera, Psylloidea, Pseudophasmatidae, Mecoptera, Blattodea, Neuroptera, Symphypleona, and unknowns.

Results


Curculionidae Percent Composition of Year 1
All Insect Families
Curculionidae
6%
94%
14 of 30 are known pine pests
~ 3% total

Conclusions

- Insects in 15 orders, including bark beetles and other insects of concern
- Panel traps caught more morphospecies than pitfall traps
- Insect totals varied seasonally
- Pitfall traps caught different species than panel traps
- A 3rd type of trap – a pitfall with larger holes and with propylene glycol – will be used in ongoing sampling

Acknowledgements

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