

Laurel Wilt in Forests: After the “First Wave”



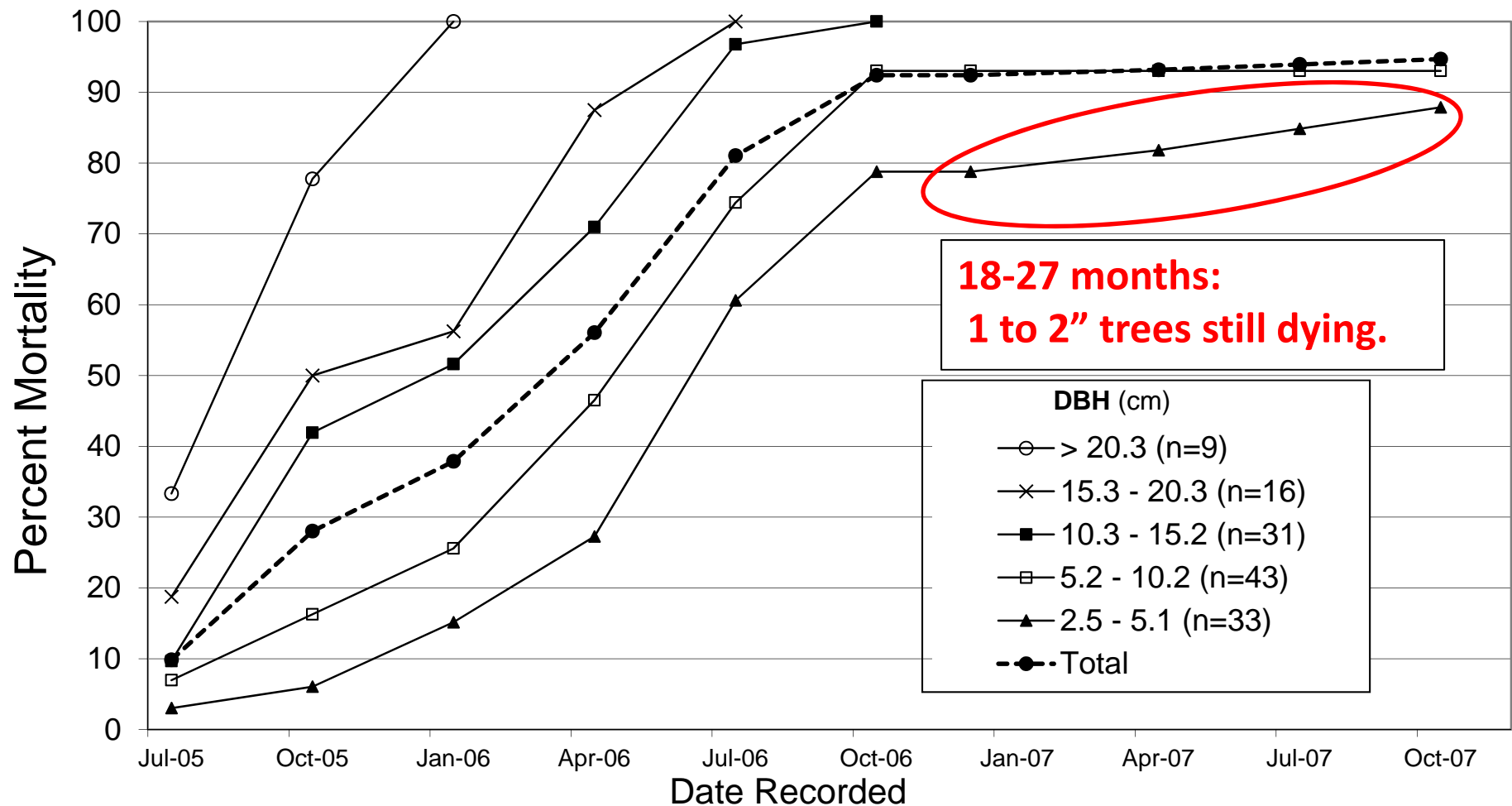
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Critical Questions

- **What happens to *Xyleborus glabratus* and *Raffaelea lauricola* after nearly all large Lauraceae have been killed?**
- Do they persist in the environment?
- If so, what are they using for hosts?
 - Smaller trees, resprouts and regeneration?
 - Alternate host species?
- What are the long-term prospects for the survival of native Lauraceae?

Early Observations: Larger-diameter redbays killed quickest, smallest-diameter trees often remain.

(extended from dataset used in [Fraedrich et al. 2008](#))

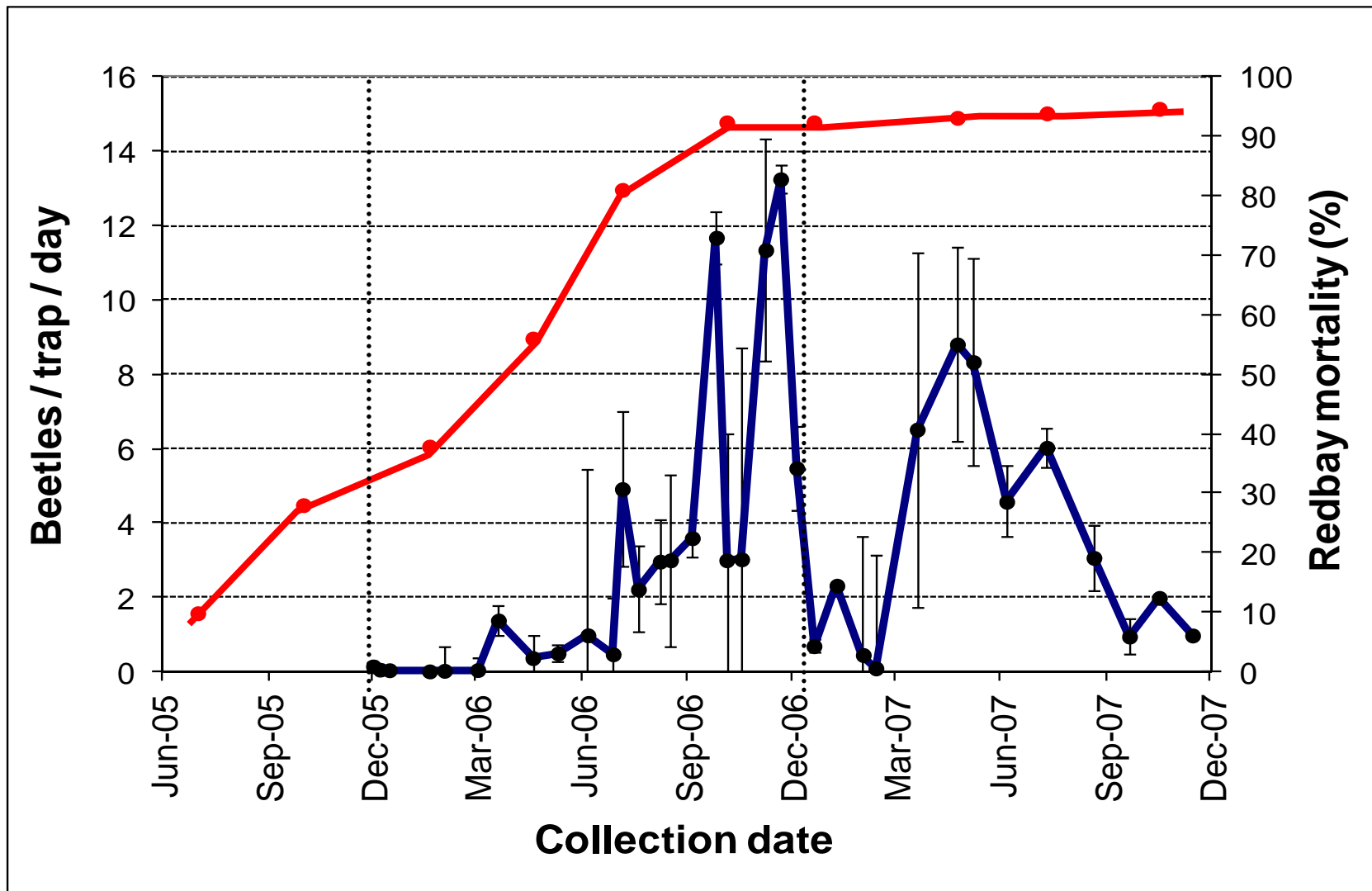


**18-27 months:
1 to 2" trees still dying.**

**Seedlings & Juvenile trees less than 1" DBH were rarely killed
(1 out of 222 monitored)**

RAB population decline over time?

Redbay ambrosia beetle flight activity, Ft. George Island, FL



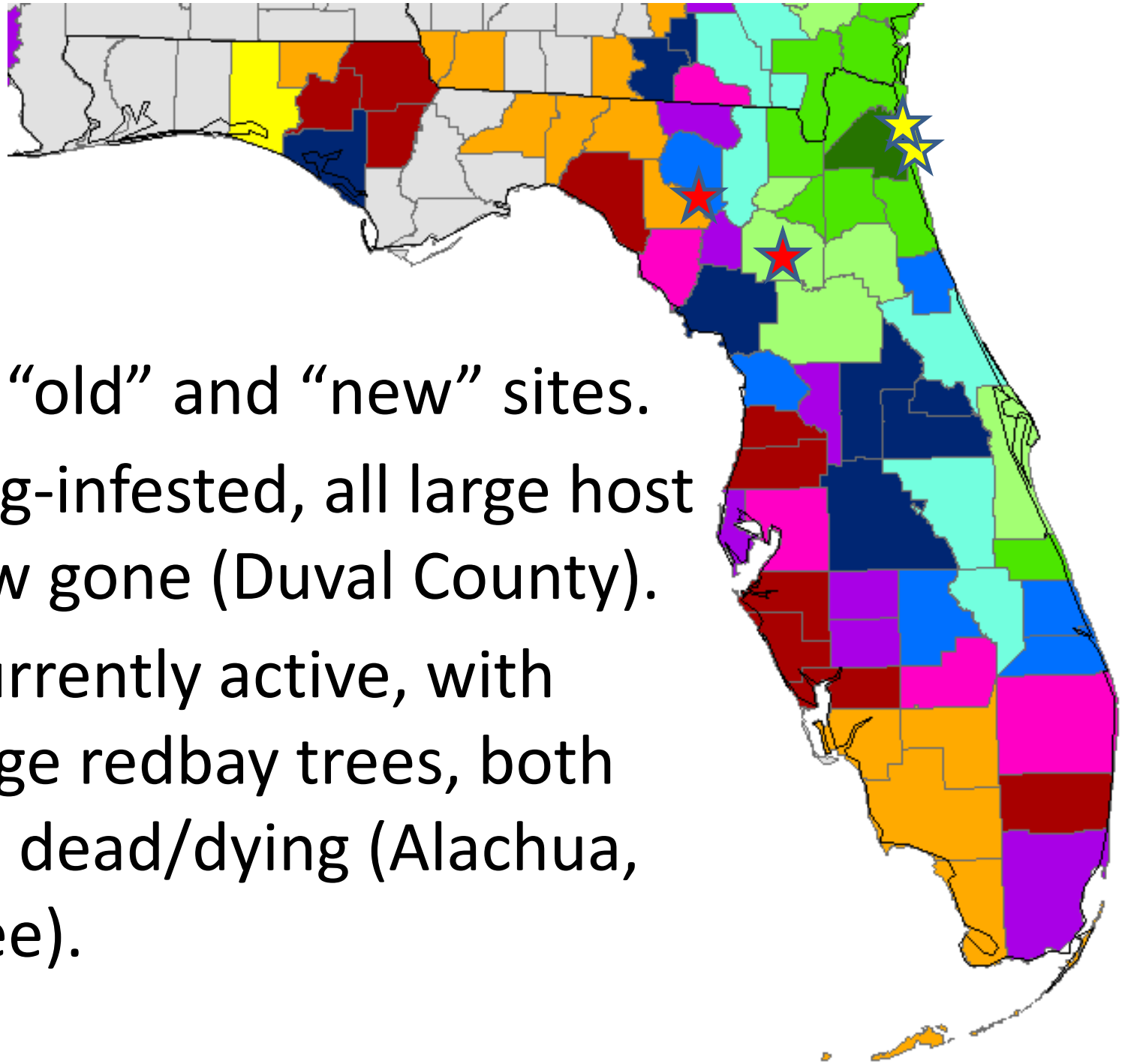
Hypotheses/Expectations:

In areas ~9 years post-invasion, as compared to recently-affected areas:

- The RAB will still be present, but at very low levels.
- RAB will be more likely to attack small-diameter host trees in the absence of large ones.

And:

- Trees < 1" (2.54 cm) DBH do not serve as effective brood material.



Selected “old” and “new” sites.

- **Old:** long-infested, all large host trees now gone (Duval County).
- **New:** currently active, with many large redbay trees, both alive and dead/dying (Alachua, Suwannee).

Methods

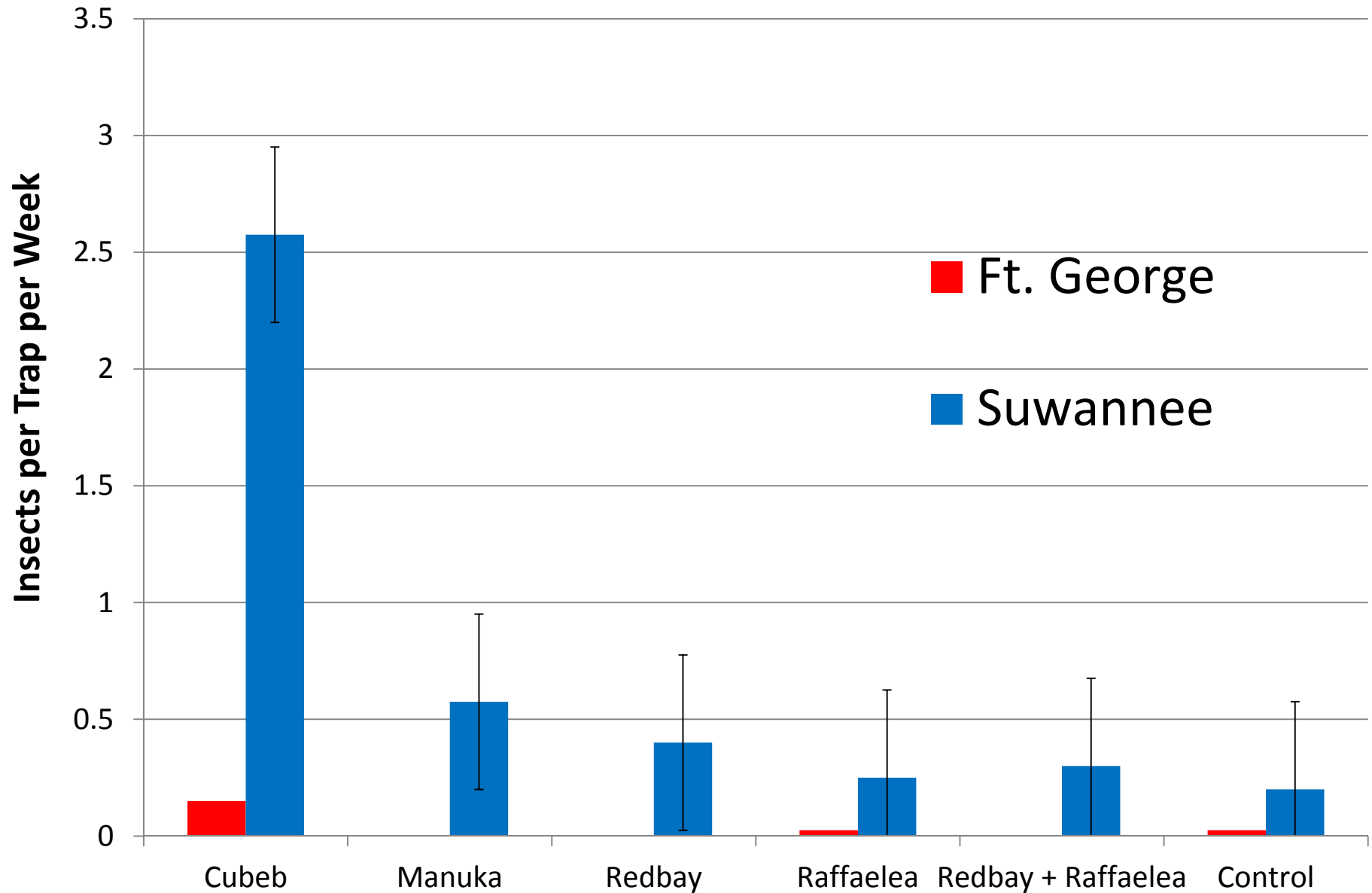
Trapping Grids:

- 5 reps of 5 different lures (+control) with sticky traps, for 7 weeks, at “old” and “new” sites (1 each).

Juvenile sampling:

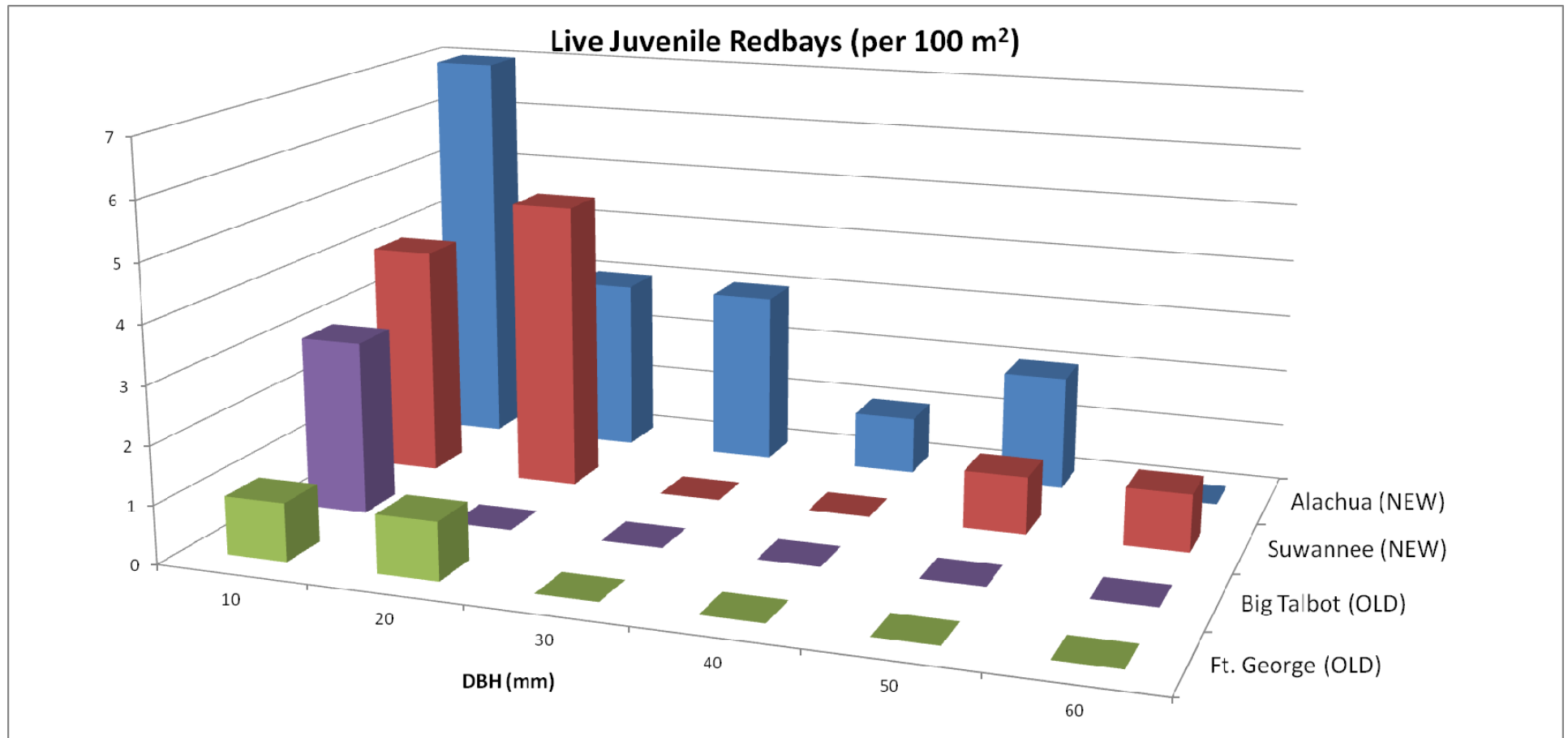
- Measured abundance/distribution juvenile and seedling redbays along 100-meter transects
- Collected all dead/wilted juveniles ≤ 6 cm DBH within plots 200 meters in diameter.
 - Excavated galleries – recorded presence of RAB, **especially larvae, pupae, callow adults, and males (evidence of breeding)**
 - Cultured for *Raffaelea lauricola*.

Trapping survey: RAB still present on “old” site, but at very low numbers (8 beetles over 7 weeks)



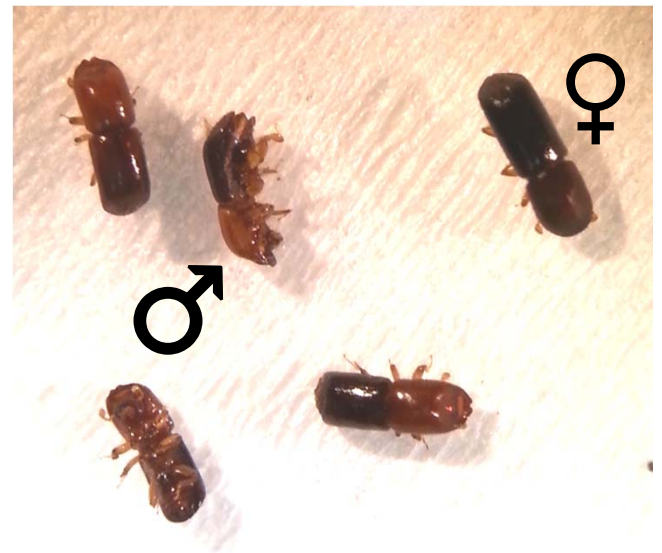
Juvenile population sampling:

- Smaller juveniles and seedlings still present at old sites
- Trees >2 cm DBH are not abundant at old sites.



Some surprises:

- Could not find any infested/infected juveniles in or around the “old” site plots (28-49 found in “new” site plots)
- Dead saplings ≤ 2 cm fairly common in “new,” actively-infested areas (18 found in plots).
 - Recovered *R. lauricola* from 57%.
 - Adult RAB found in 40%.
 - Clear evidence of breeding found in 10%.
 - Most extreme example: male RAB recovered from 0.9 cm (dbh) sapling.



Possible Interpretations

- Small-diameter trees are mainly at risk where the RAB population is high. (corroborated by Maner et al. 2014)
- The long-distance host-detection behavior of RAB may be less targeted, and more random than expected.
- Trees surviving after RAB population drops may persist for long periods.



A close-up photograph of a bright green caterpillar resting on a large, vibrant green leaf. The caterpillar's body is covered in a pattern of brown and black spots that form a face-like appearance, complete with two large, dark, circular eyes and a small, open mouth. The caterpillar is positioned in the lower right quadrant of the frame, with its head facing towards the left. The background is a soft-focus view of the leaf and some blurred greenery.

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