

Collaborative study and management of the Camp Johnson sandplain forest.

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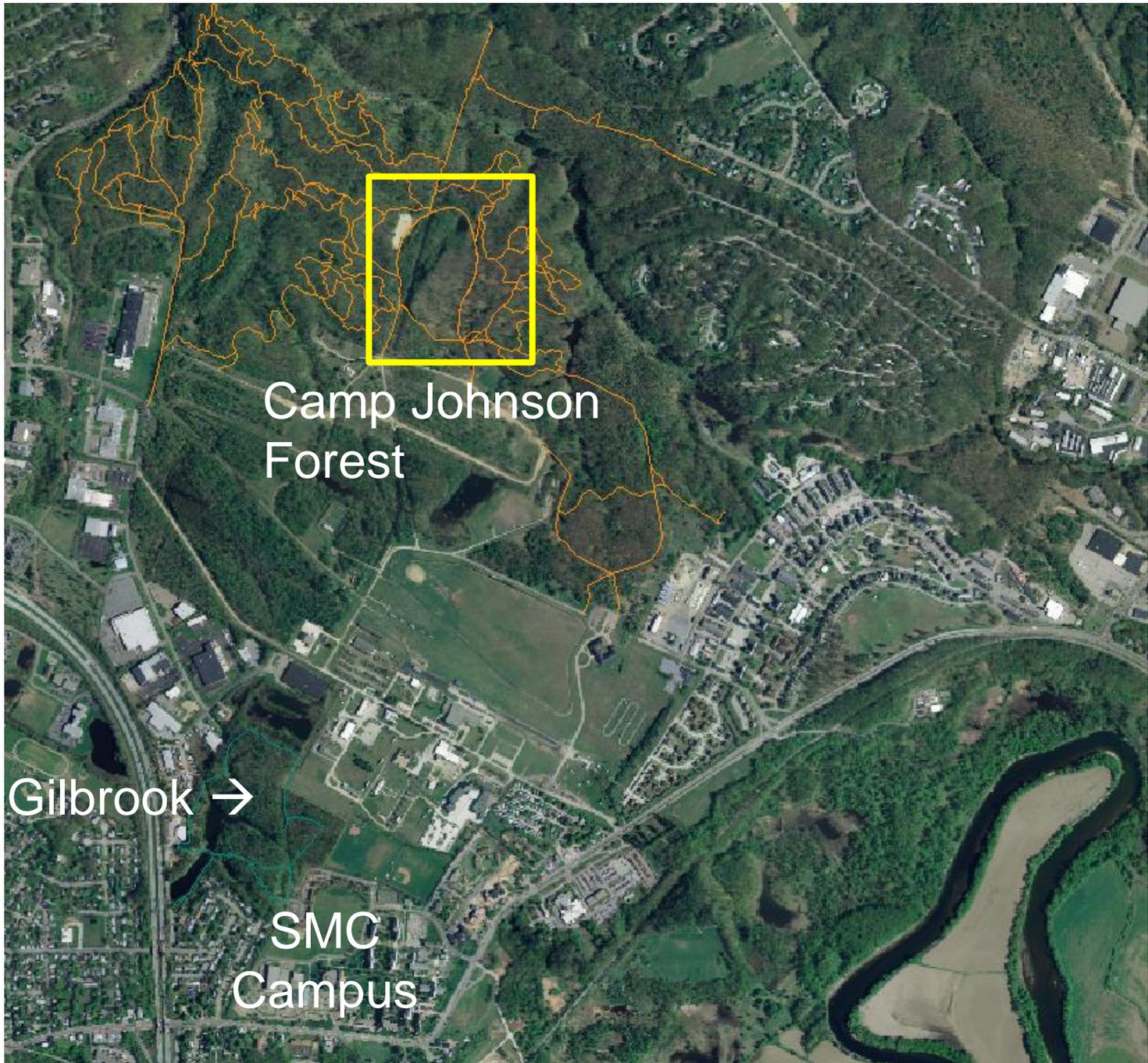


Special thanks to:

- Mike O'Hara (Military Lands Administrator, Vermont Army National Guard)
- Major Jacob Roy (Vermont Army National Guard)
- Bob Popp (Vermont Fish & Wildlife Department)
- Brett Engstrom (botanical consultant)
- The Vermont Nature Conservancy (provided pitch pine seedlings to plant after May 2013 burn)
- The John Hartnett Endowment at Saint Michael's College
- Scott Lewins and Mark Lubkowitz (SMC Biology faculty) and Saint Michael's College Biology Students

Background

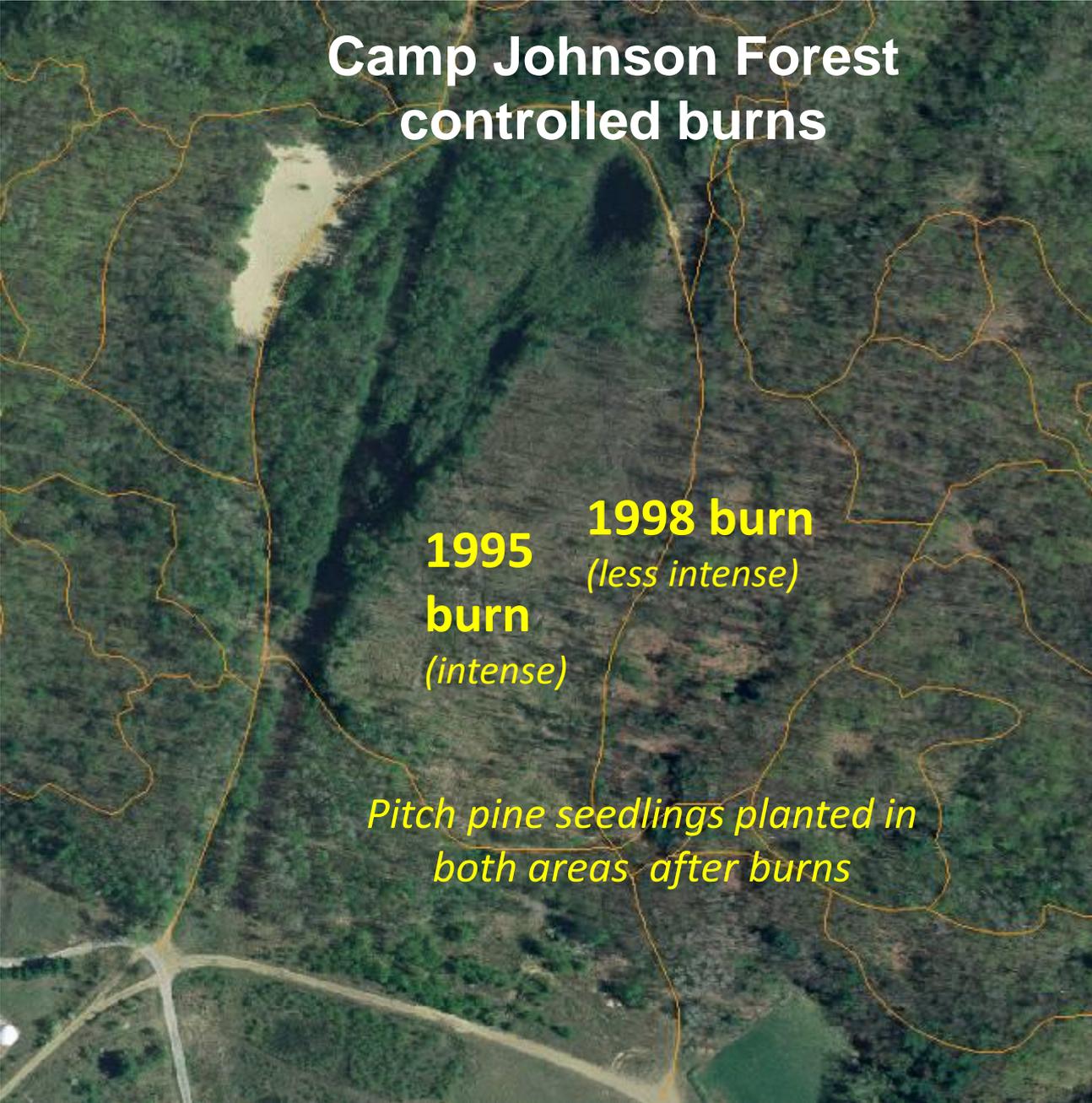
- SMC Intro Biology sequence, pre-2006
 - subcellular, cellular biology and genetics in fall → organismal biology and ecology in spring
 - ~3 weeks of Ecology in April, with limited field opportunities
- After over 2 years of planning, shifted focus & sequence
 - Ecology and Evolution in fall
 - Fall lab program –
 - Semester-long projects focusing on sandplain forest on neighboring properties
 - Gilbrook forest (Winooski)
 - Camp Johnson (Vermont Army National Guard)



Camp Johnson
Forest

Gilbrook →

SMC
Campus

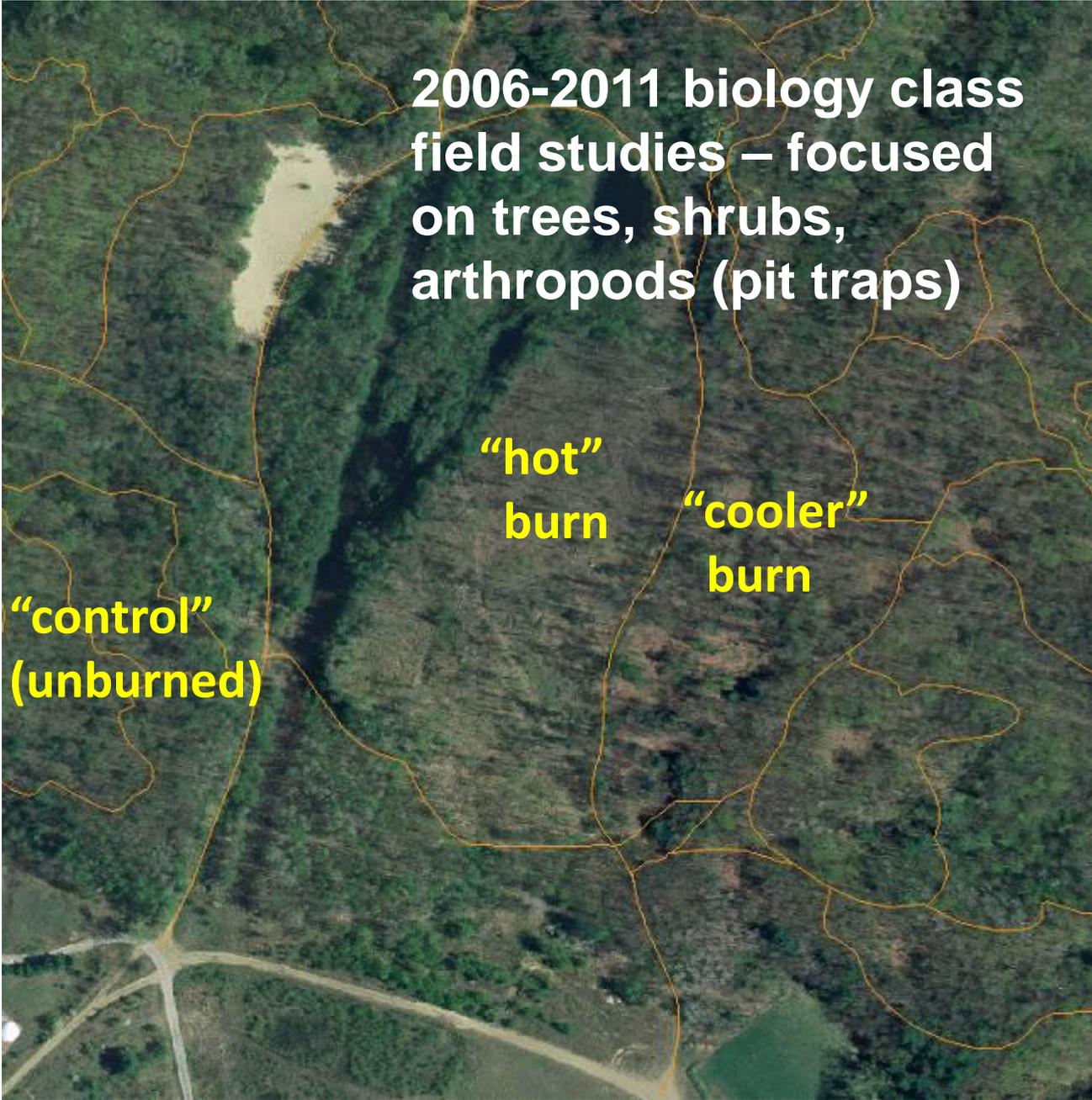


Camp Johnson Forest controlled burns

**1995
burn**
(intense)

1998 burn
(less intense)

*Pitch pine seedlings planted in
both areas after burns*



**2006-2011 biology class
field studies – focused
on trees, shrubs,
arthropods (pit traps)**

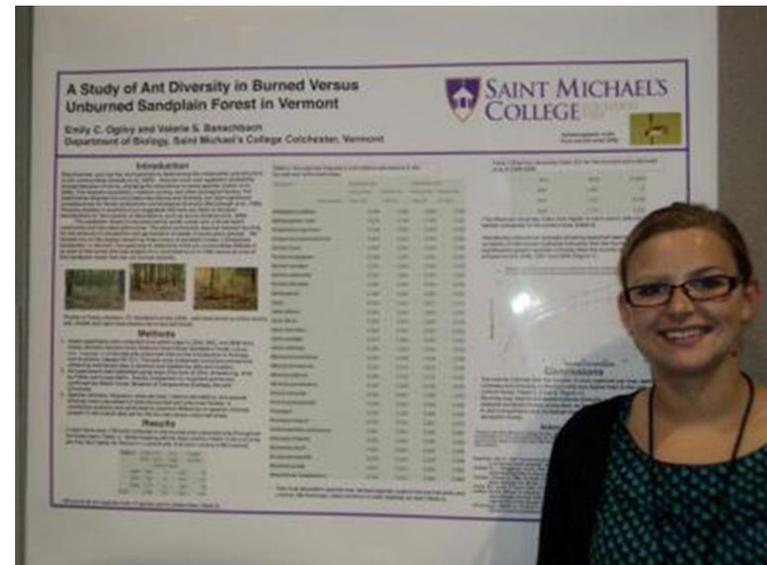
**“control”
(unburned)**

**“hot”
burn**

**“cooler”
burn**

- Some broad patterns...
 - Blackberries abundant in “hot” burn zone
 - More heaths in areas with open canopy
 - Some natural pitch pine regeneration in “cooler” burned area
 - Red maples becoming abundant in burned areas (many small trees)
 - Lots of millipedes and ants in burned areas

Ant Diversity....



Ant abundance highest in burned areas

- Increased sunlight, more open canopy → more rapid colony growth,
- particularly in cold temperate climates

Species richness highest in burned areas (29 spp. v. 17 in control)

- Increased vegetation and structural diversity important in creating more niches

It's been quite some time since the burns (1995, 1998)

- Could we study vegetation and arthropods pre-burn and shortly after a burn??
- ANG had a plan that called for more burning but lacked some of the resources needed
 - SMC Bio Dept made commitment to help out with some funding - an investment in future teaching and research opportunities

Planning for a new burn

- Discussions began in 2011
- Burn plan developed (thank you Mike O'Hara, Brett Engstrom, Bob Popp)
- Areas selected, some logging in early 2012 to remove trees and build fuel load...
- Pitch pine seeds collected to be planted to raise seedlings for post-burn planting (thank you Bob Popp, Green Mountain Power, and TNC)
- Summer and Fall 2012 – students gathered pre-burn data on vegetation and arthropods in areas designated to be burned, and also areas to be left alone



The Burn

May 3, 2013



[Some local media coverage](#)

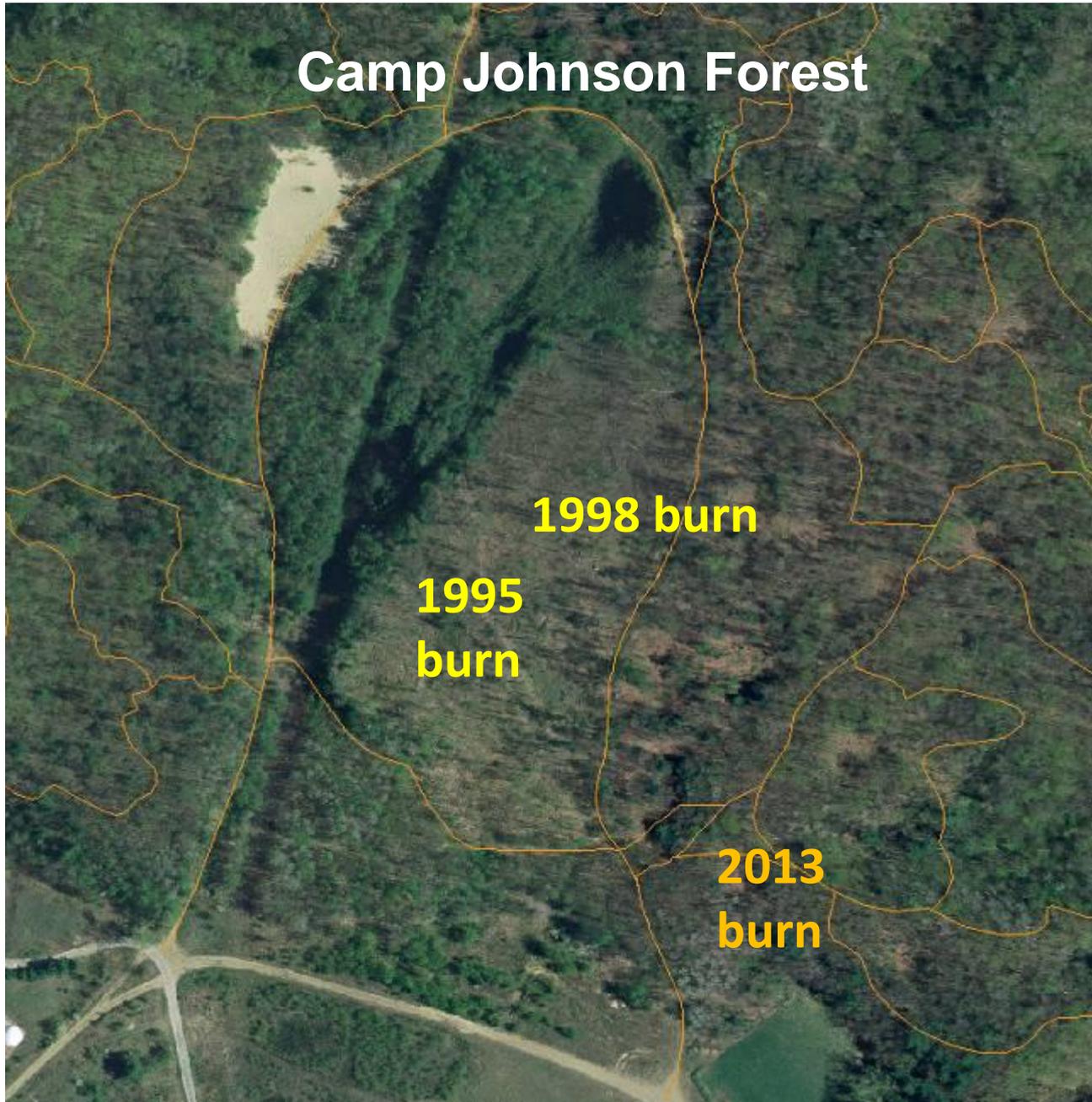
- Burned about 4 acres
- Wind picked up, so additional areas were not burned – perhaps next year
- Allows additional study this year of pre-burn area, as well as some recent post-burn

Camp Johnson Forest

1998 burn

1995
burn

2013
burn



Some examples of results this fall

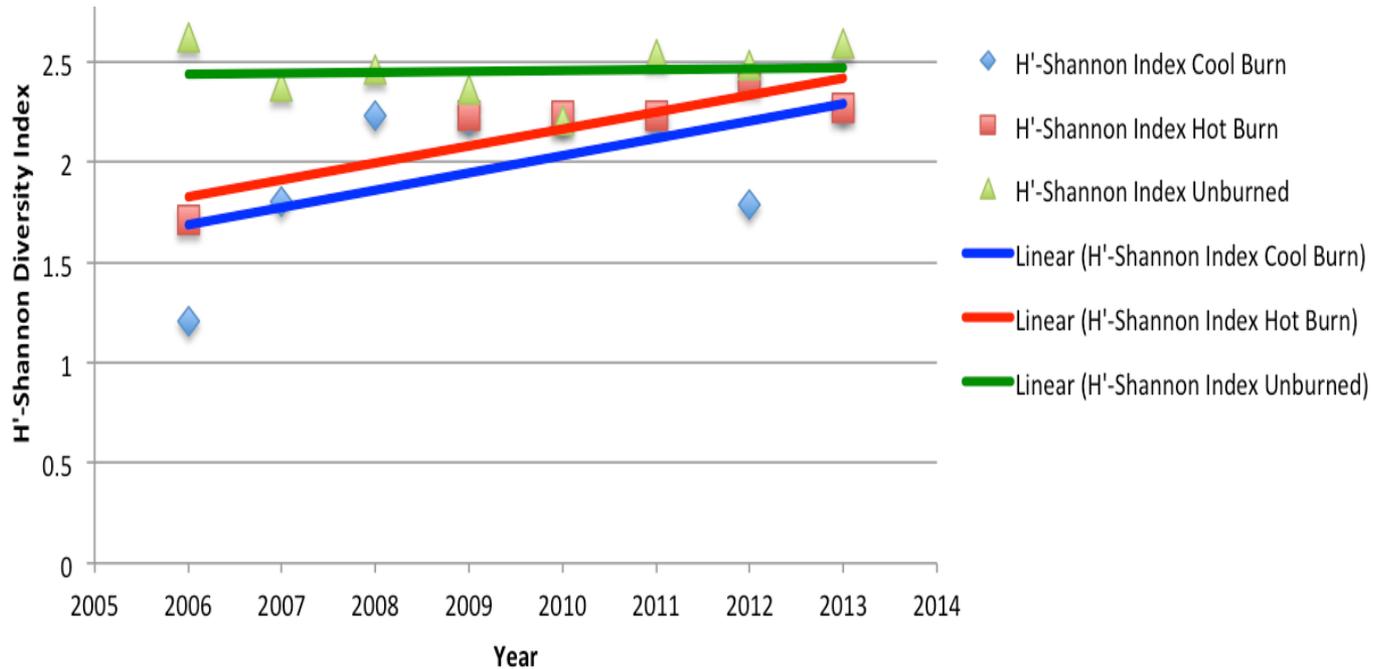


Figure 1: Shannon Diversity of Species Found in Pitfall Traps at the the Cool Burn, Hot Burn, and Unburned Sites at Camp Johnson, Colchester Vermont from 2006 to 2013. Linear Regression Analysis Values for Cool Burn: $P= 0.13927$. Hot Burn: $P= 0.02291$ $R^2= 0.76342$ $F= 12.90741$. Unburned section: $P= 0.84311$.

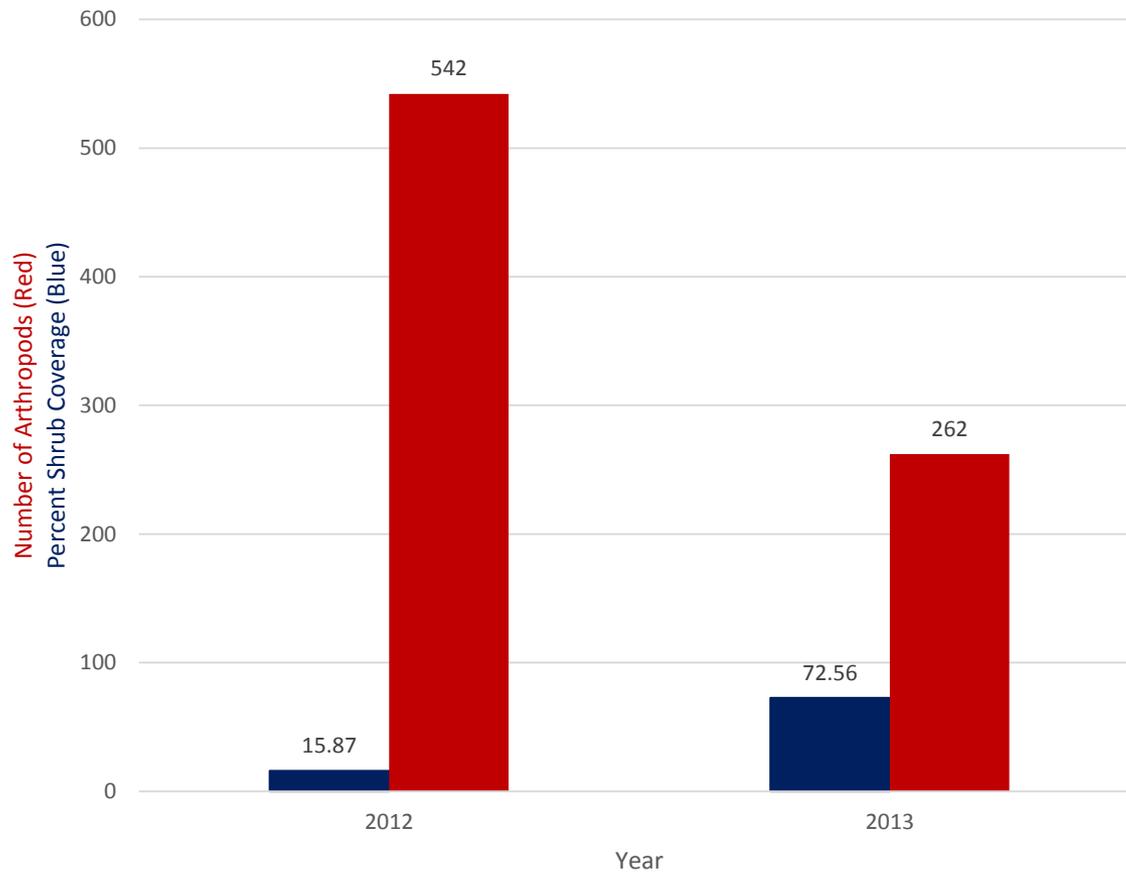
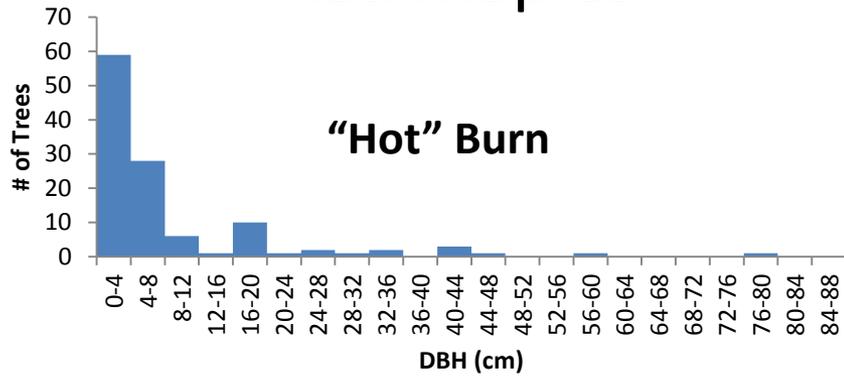


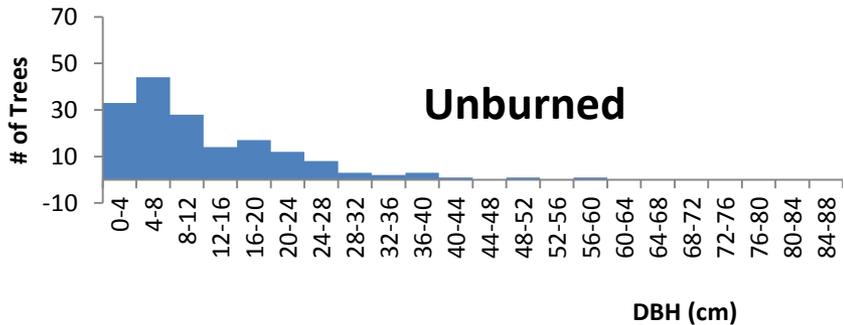
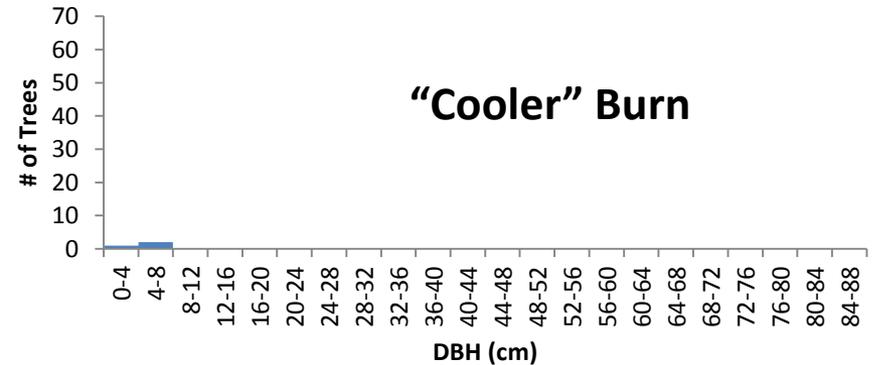
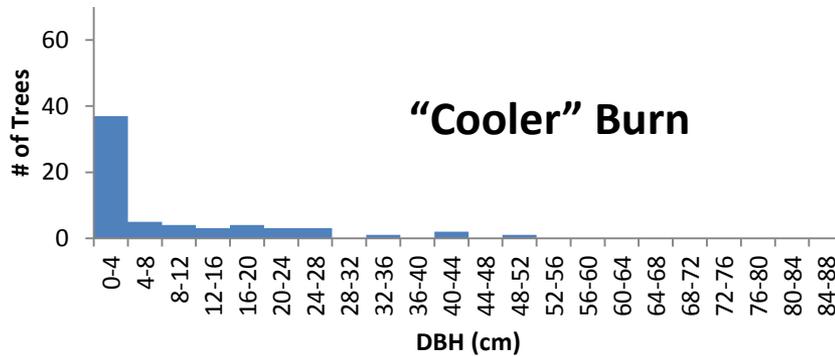
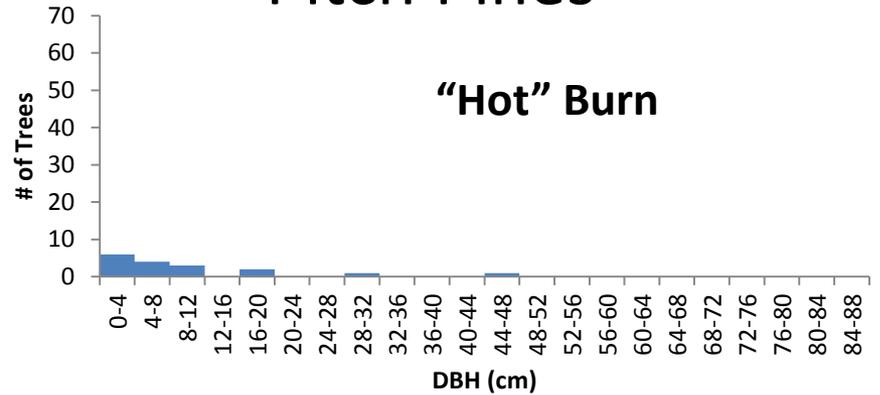
Figure 1. Inverse relationship of shrub coverage and number of arthropods in 2012 before the burn and in 2013 after the prescribed burn

*same number of pitfall traps used in 2012 as in 2013

Red Maples



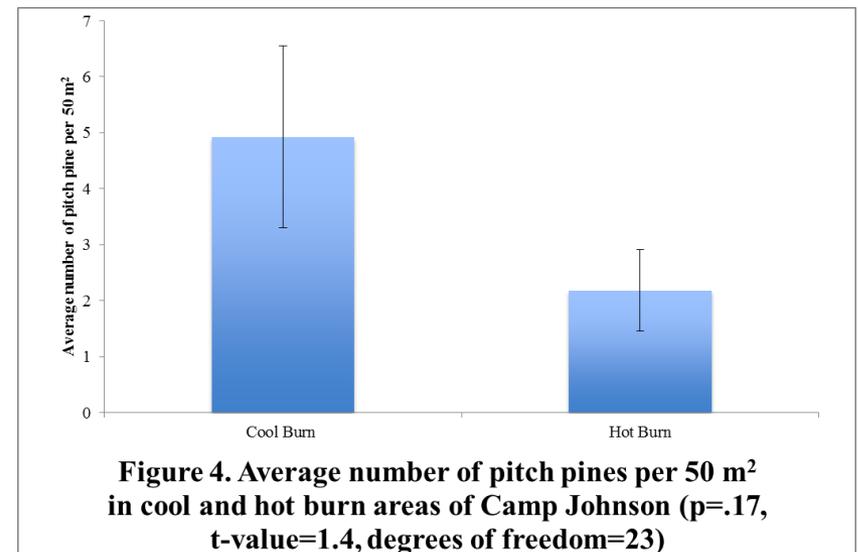
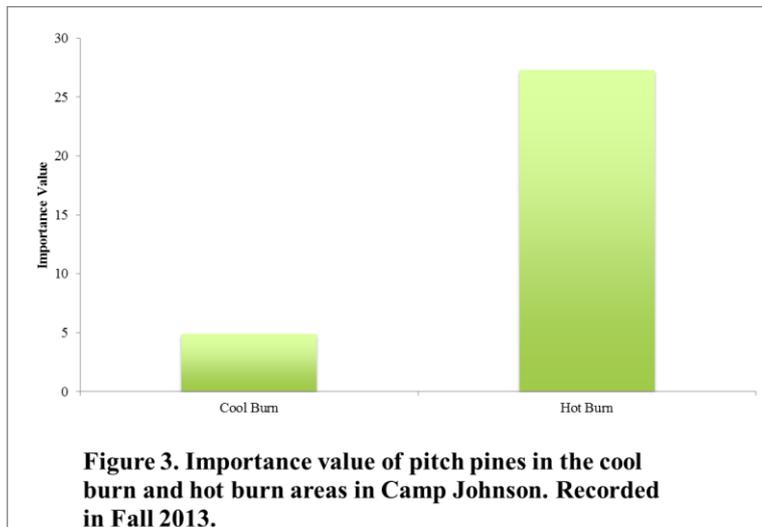
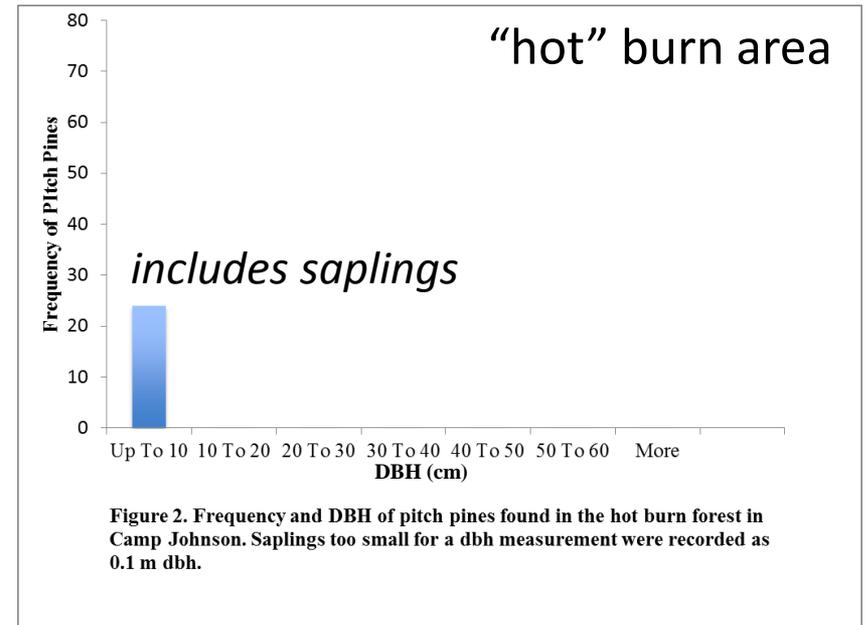
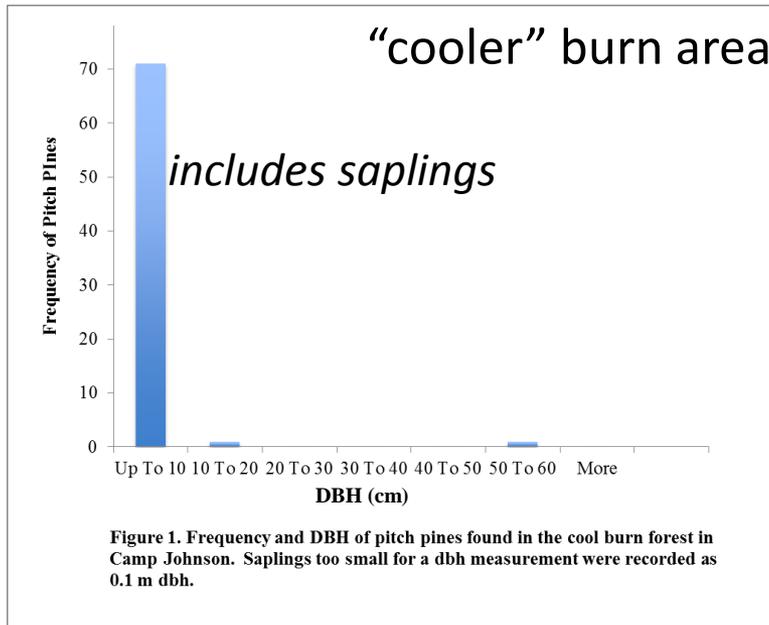
Pitch Pines



Notes :

- No Pitch Pines in the unburned section
- No seedlings counted (of any trees)

How are the Pitch Pines doing?





We welcome....

- **Ideas and suggestions**
- **Specific questions that our students might address**
- **Additional collaborators**
- ***Questions?***

- Some lab sections focused on trees and shrubs
 - 20 x 20 m plots for trees (above ~1.4 m tall)
 - transects within the plots for shrub coverage
 - evaluated canopy coverage with densiometers
 - tested hypotheses by evaluating pooled data
 - ex: relative abundance of shrubs (esp. heath community) or specific tree species in burned vs. unburned
- Other lab sections focused on arthropods
 - mainly pit trapping
 - some experimental design and habitat manipulation (placement of traps, changes in leaf litter)
 - ex: relative abundance or overall diversity of invertebrates in different areas (“hot” burn, “cooler” burn, unburned) ; manipulations of leaf litter coverage; trap distance from trees/shrub coverage

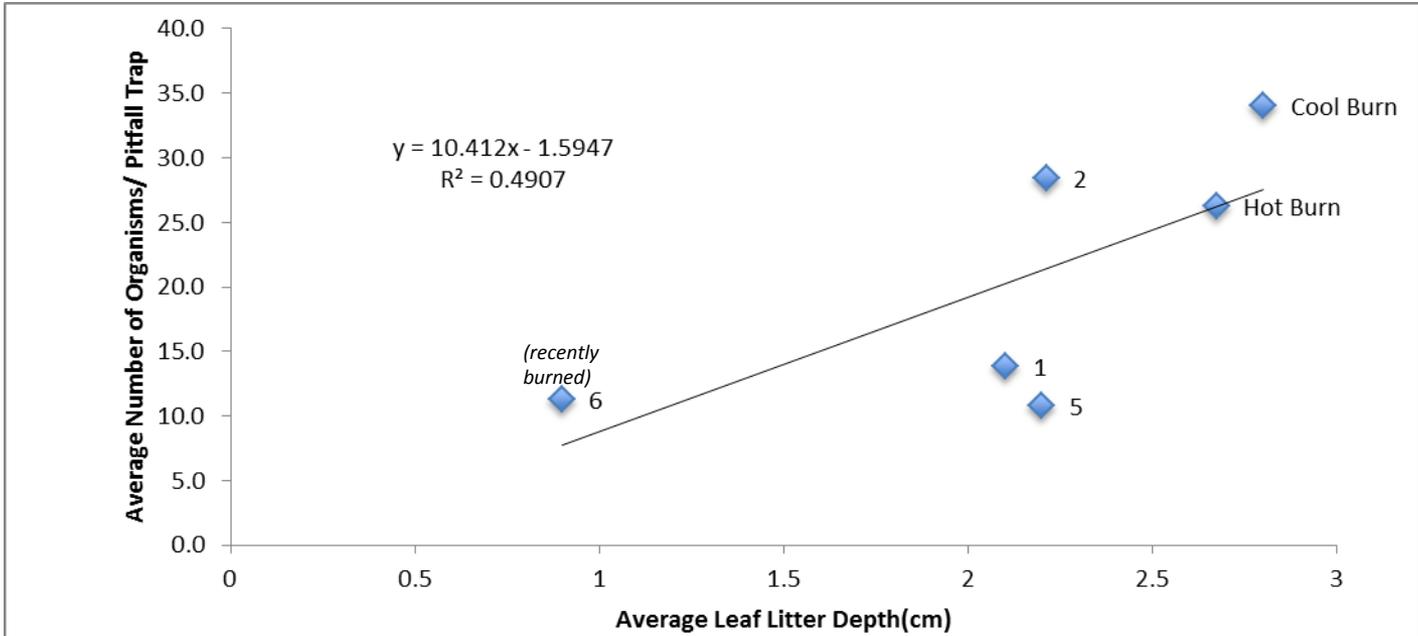


Figure 3: Association Between the Average Leaf Litter Depth and Number of Organisms in Each Area