

Mountain pine beetles in post-burn lodgepole pine forests

Crisia Tabacaru¹

Jane Park², Nadir Erbilgin¹



¹University of Alberta, ²Parks Canada

Acknowledgements

Foothills Research Institute: esp. Don Podlubny

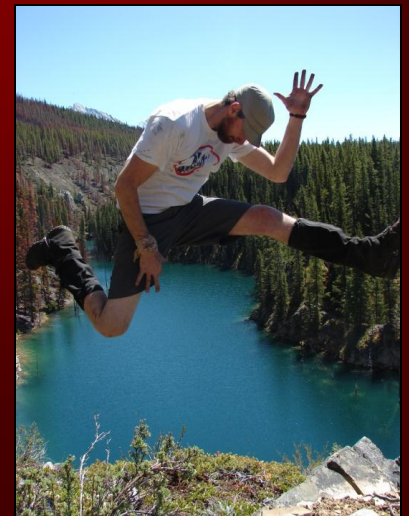
Alberta Parks: esp. Rod Gow, Deb Milhousen, Melanie Percy, Joyce Gould

Alberta Sustainable Resource Development: esp. Brad Jones, Seena Handel

Parks Canada: esp. Erin Shepherd, James Cook

Canadian Forest Service: esp. Brad Hawkes

Many amazing assistants and volunteers!



Management Options

Logging/Fire:

- cut and burn affected trees
- cut or burn unaffected trees to create boundaries
- cut or burn unaffected trees to heterogenize the landscape





© Brad Hawkes

BUT...

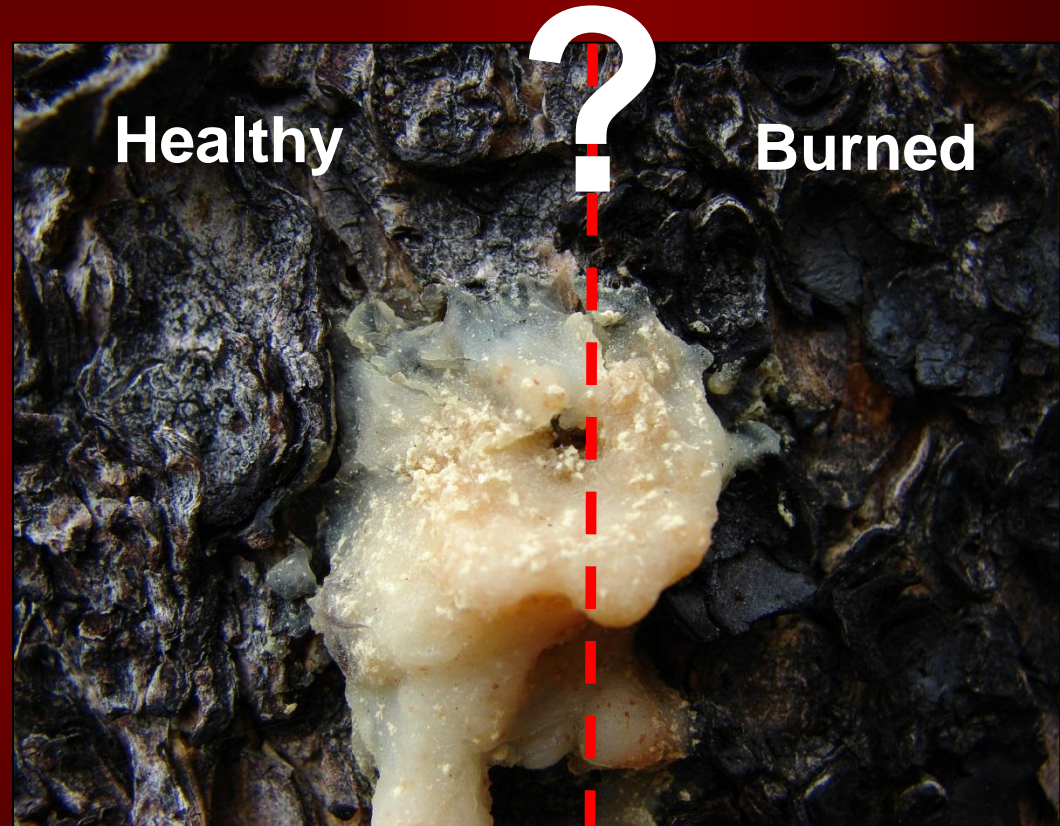
fire leaves live, partially burned trees



Conflicting results...

Elkin and Reid (2004):
MPB do NOT prefer
burned trees

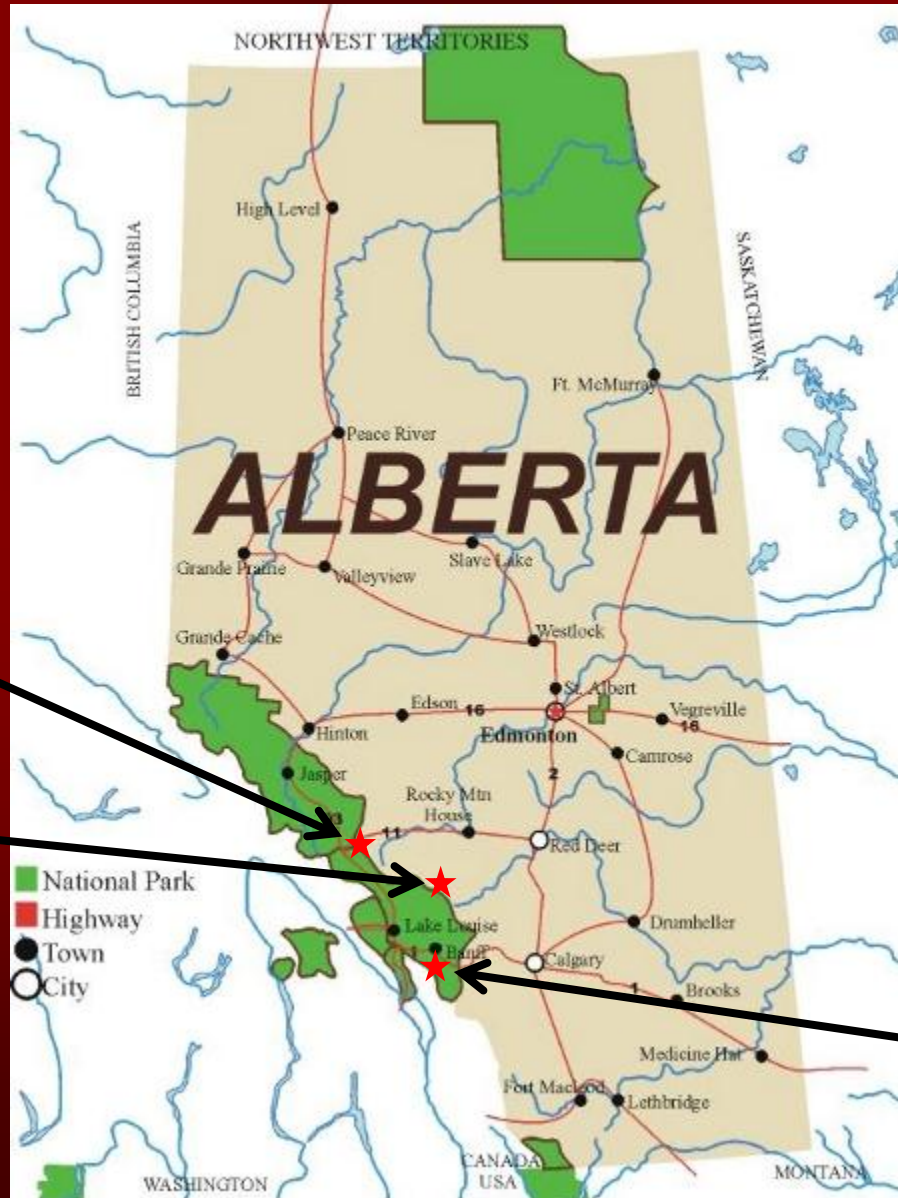
Powell et al. (2011):
MPB DO prefer burned
trees



Main Objective

To determine whether burned lodgepole pine stands become **sinks or sources** for MPB populations in Alberta...

Study Sites



Saskatchewan
Crossing

Ya Ha Tinda
Ranch

Mt. Nestor

Methods



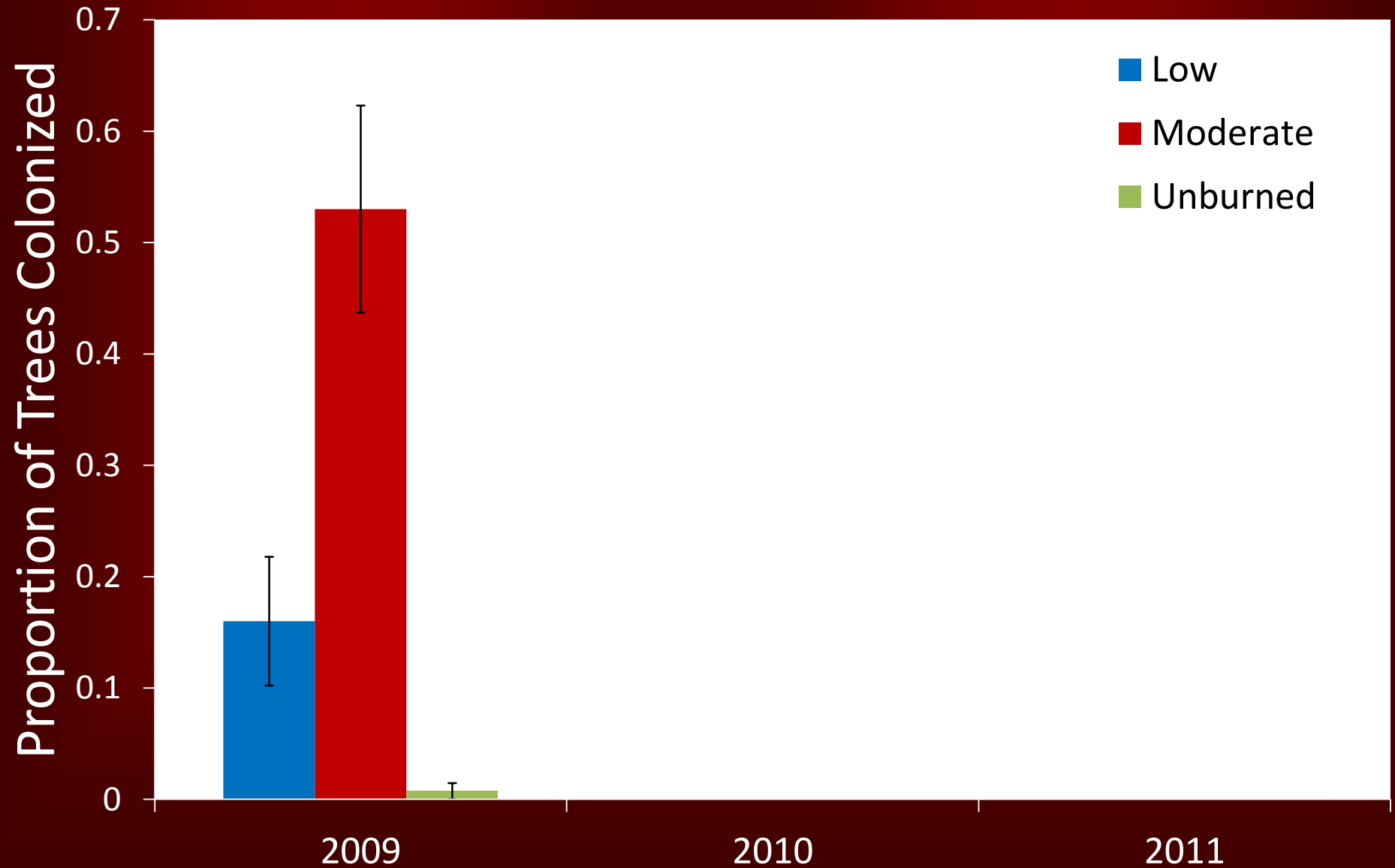
15 plots (10x10m) per fire injury class X 3
classes X 3 sites = 135 plots

Fire injury indices

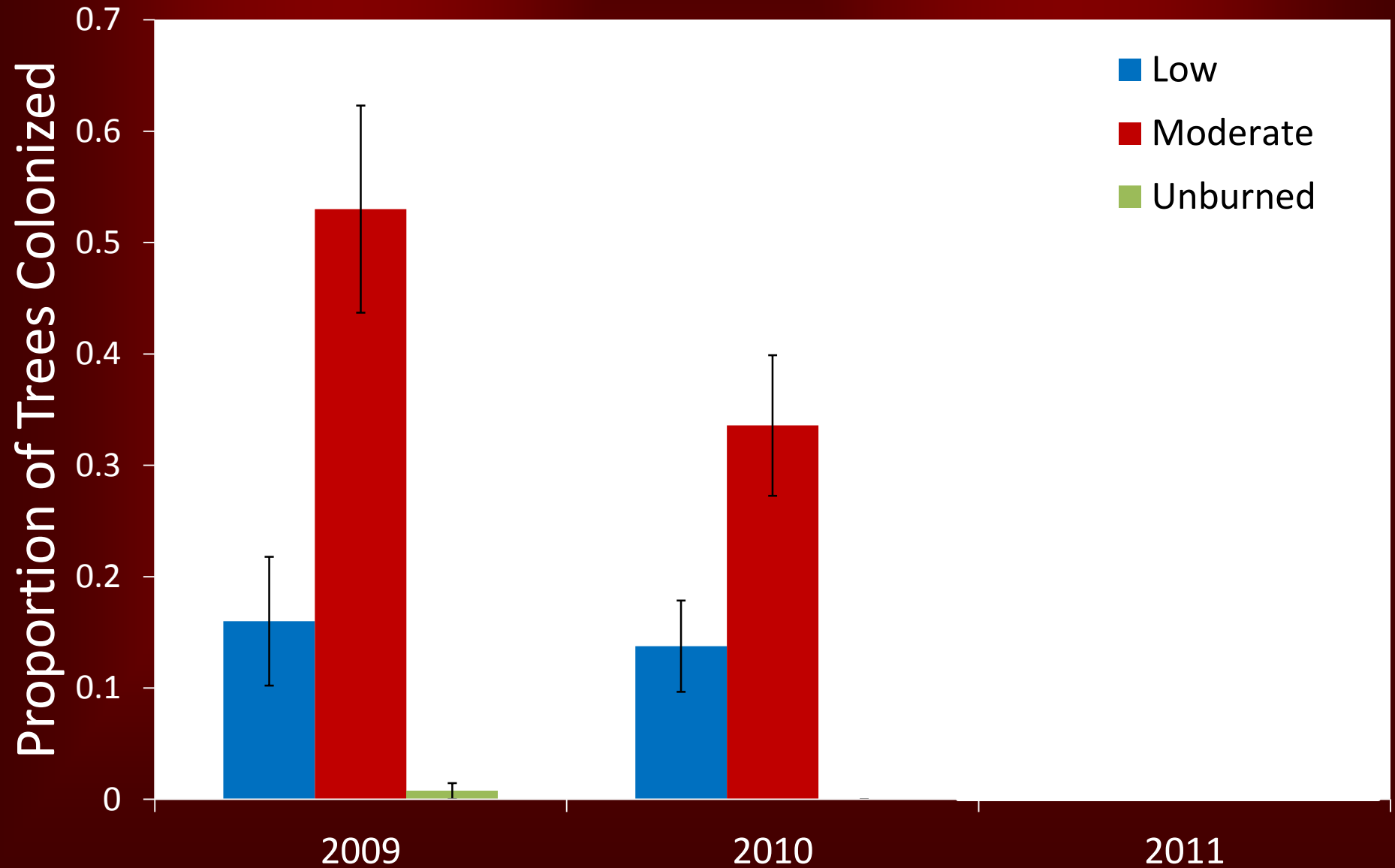
1. Bole char (%)
2. Bole char height (m)
3. Ground char (%)



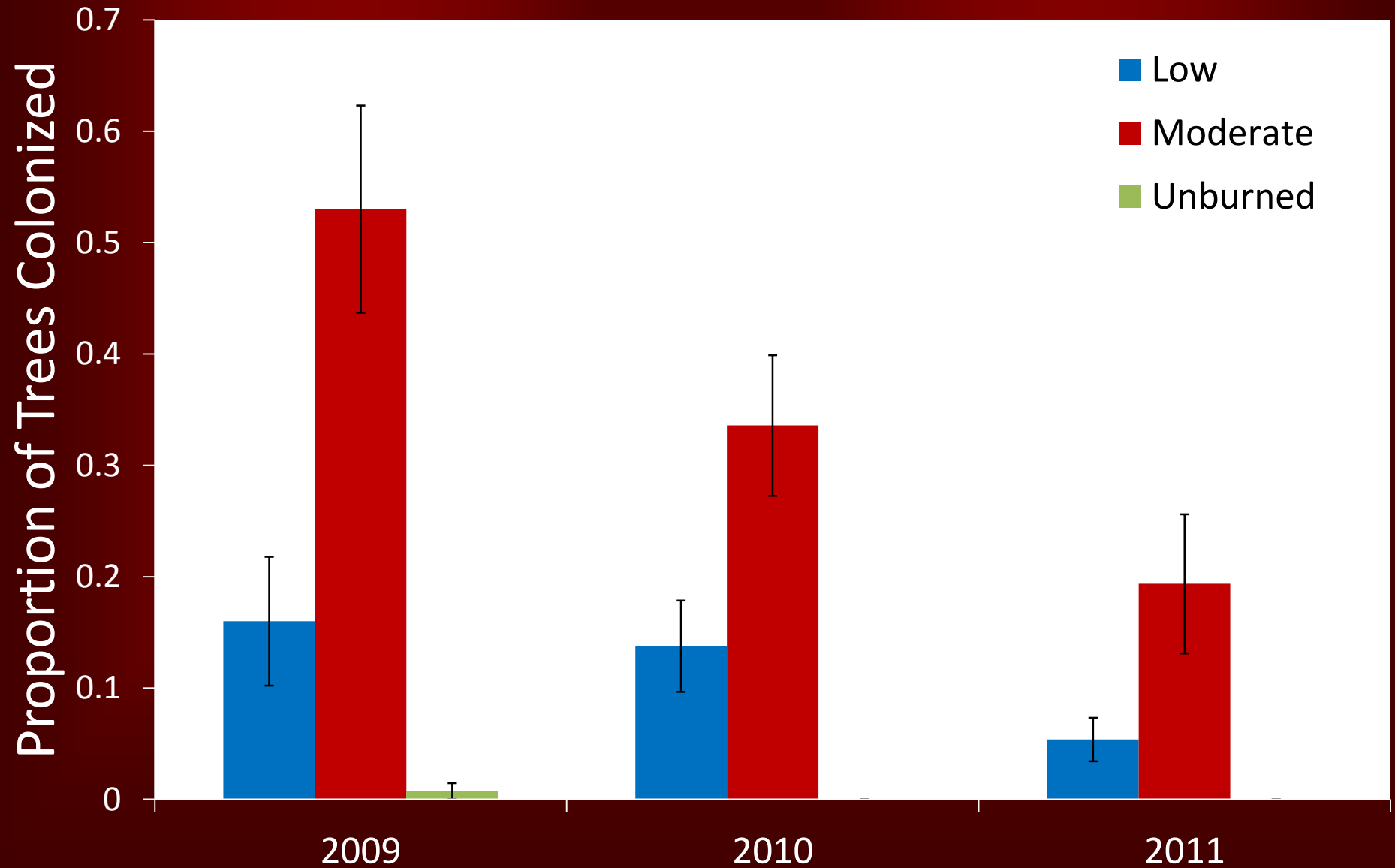
MPB colonization—Mt. Nestor



MPB colonization—Mt. Nestor



MPB colonization—Mt. Nestor



Individual fire-injury predicts MPB colonization

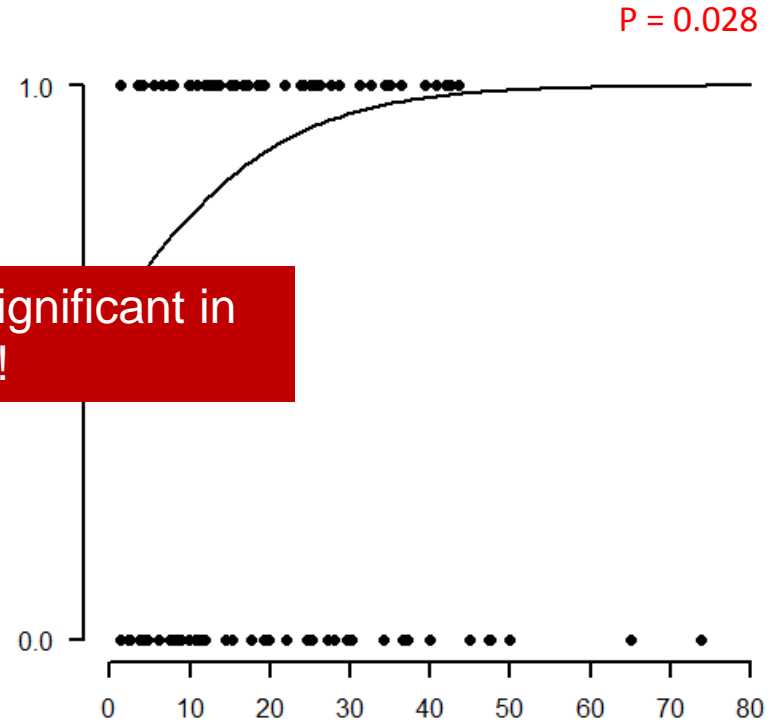
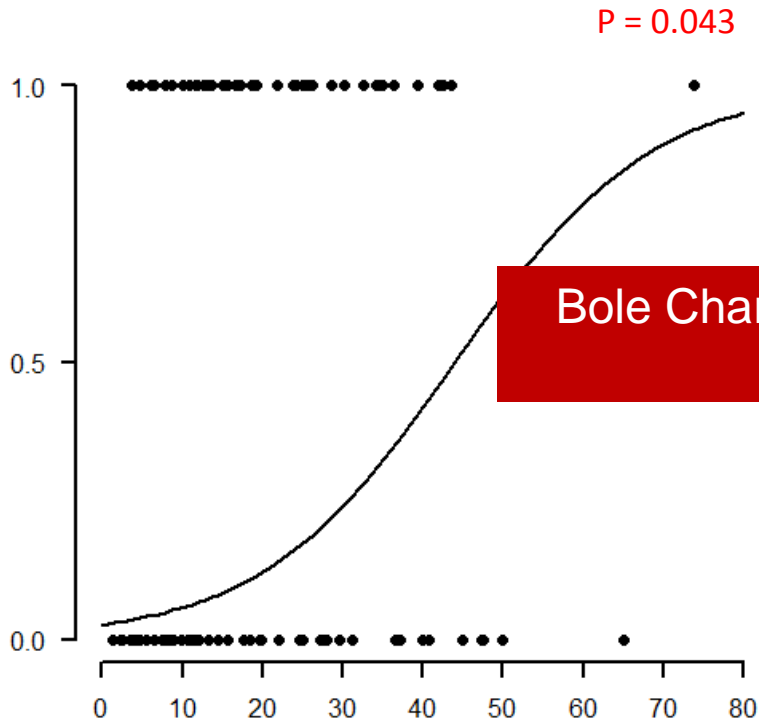
	2009	2010	2011
Bole char	✓	✓	
Bole char height	✓	✓	
Duff char	✓		

An example: bole char

2009 (year of fire)

2010 (1 year post-fire)

Probability of MPB Colonization

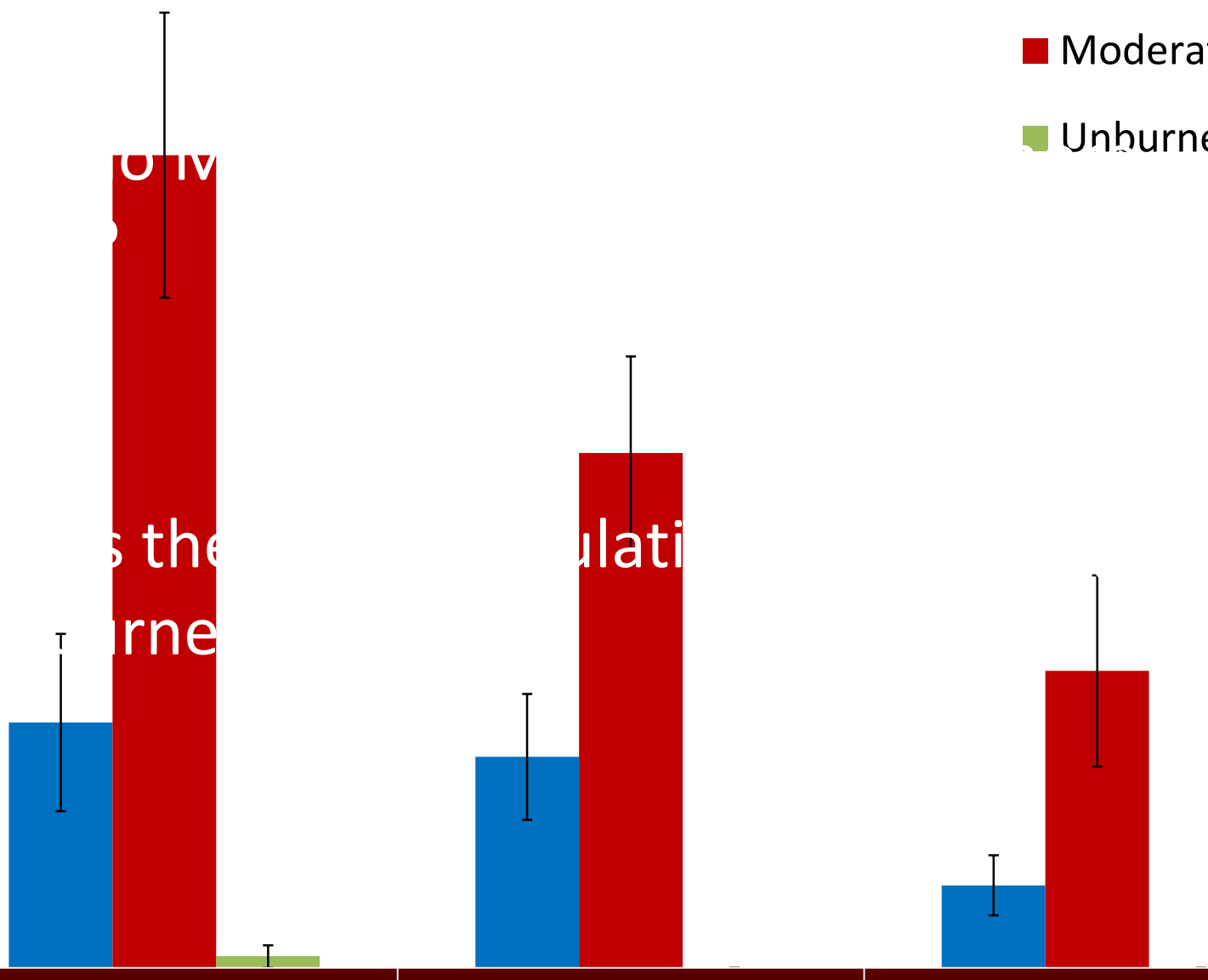


Bole Char not significant in 2011!

Bole Char (%)

Proportion of Trees Colonized

- Low
- Moderate
- Unburned



2009

2010

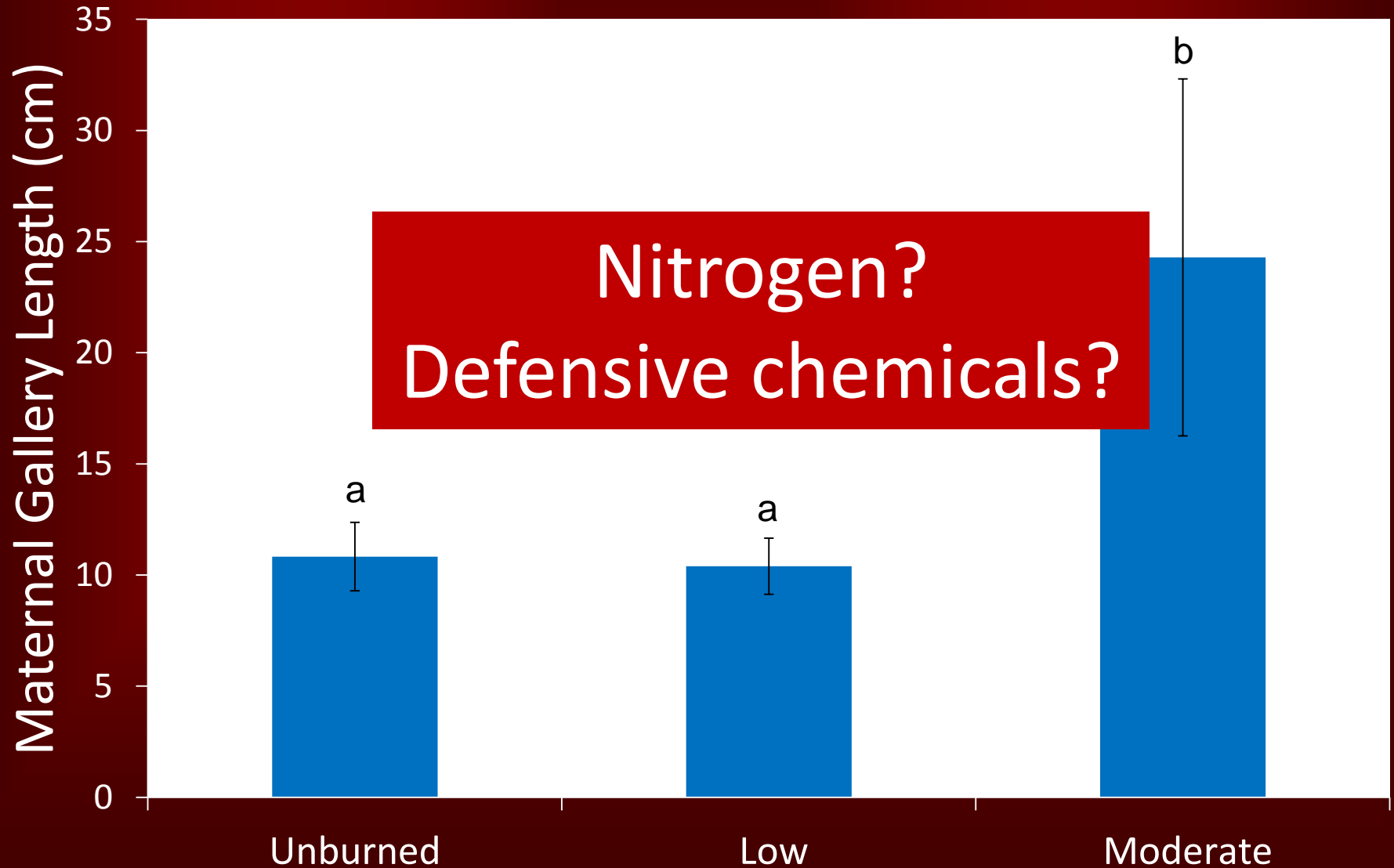
2011

Why do MPB attack burned trees more often?



Reproduction?

MPB Reproduction



Why is the MPB “population” decreasing in the burned area?



http://diptera.info/forum/viewthread.php?thread_id=18523&pid=83798;<http://www.biolib.cz/en/image/id24102/>;<http://www4.agr.gc.ca/AAFC AAC/display/afficher.do?id=1266016811893&lang=eng>;<http://bugguide.net/node/view/247151>;<http://amberbam.com/omeka/items/show/15>;<http://www.flickrriver.com/photos/ngompel/tags/automontage/>

UGA1306041

Trapping

- Passive flight intercept traps
- Emergence traps
- Landing rate traps

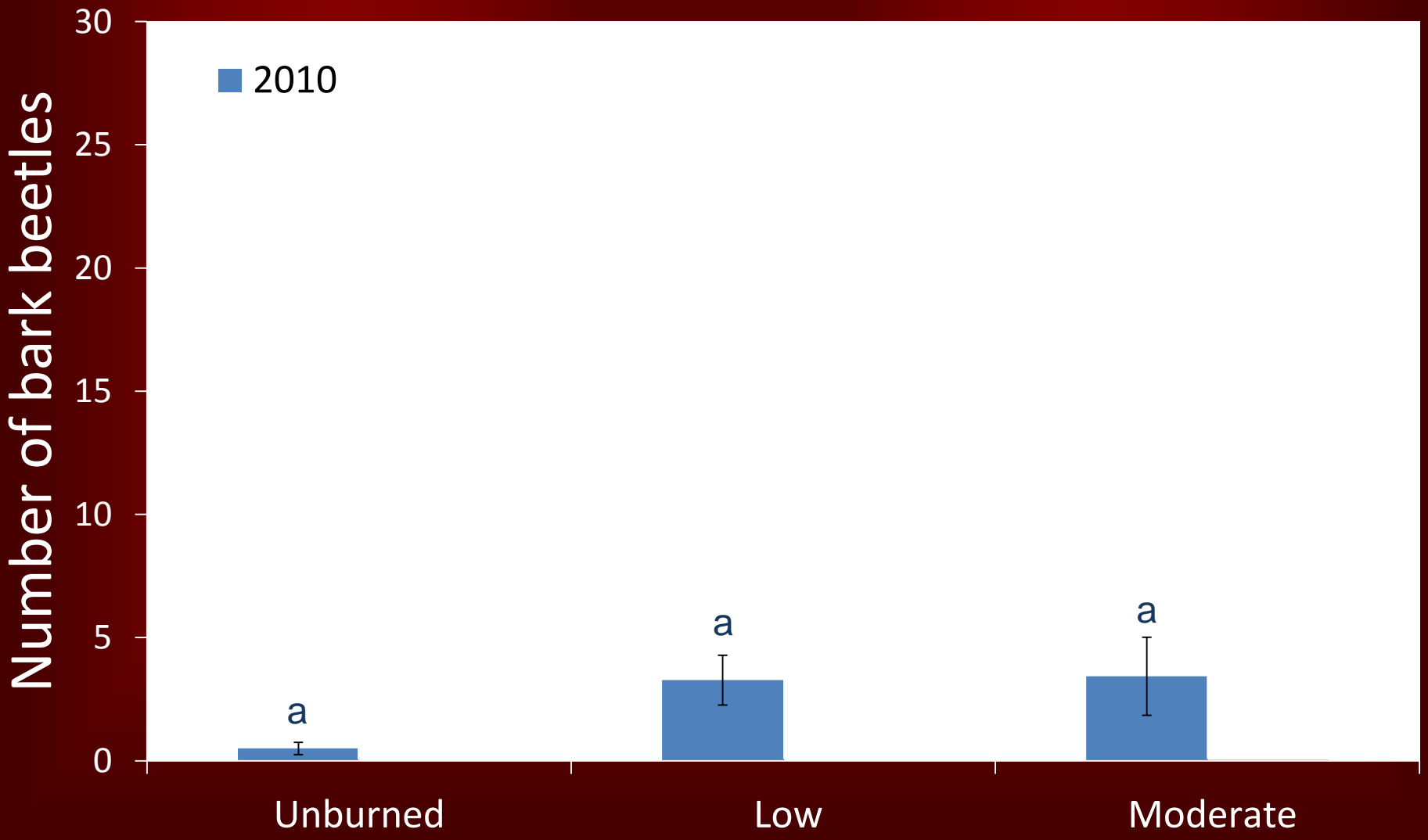


Rearing

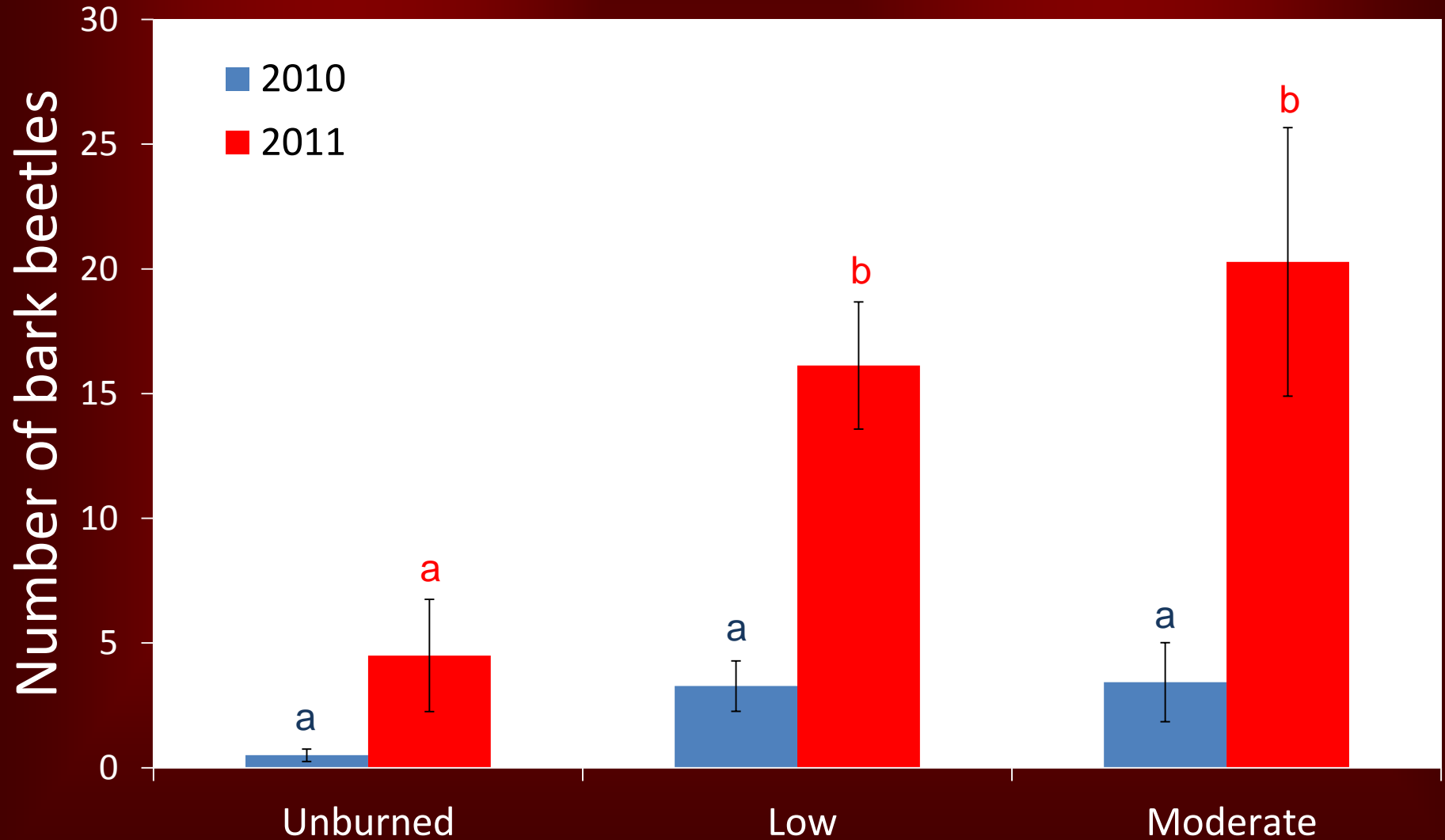
What is emerging from logs in the three fire injury classes?



MPB competitors (sub-family Scolytinae)



MPB competitors (sub-family Scolytinae)



Management Implications



Questions?

