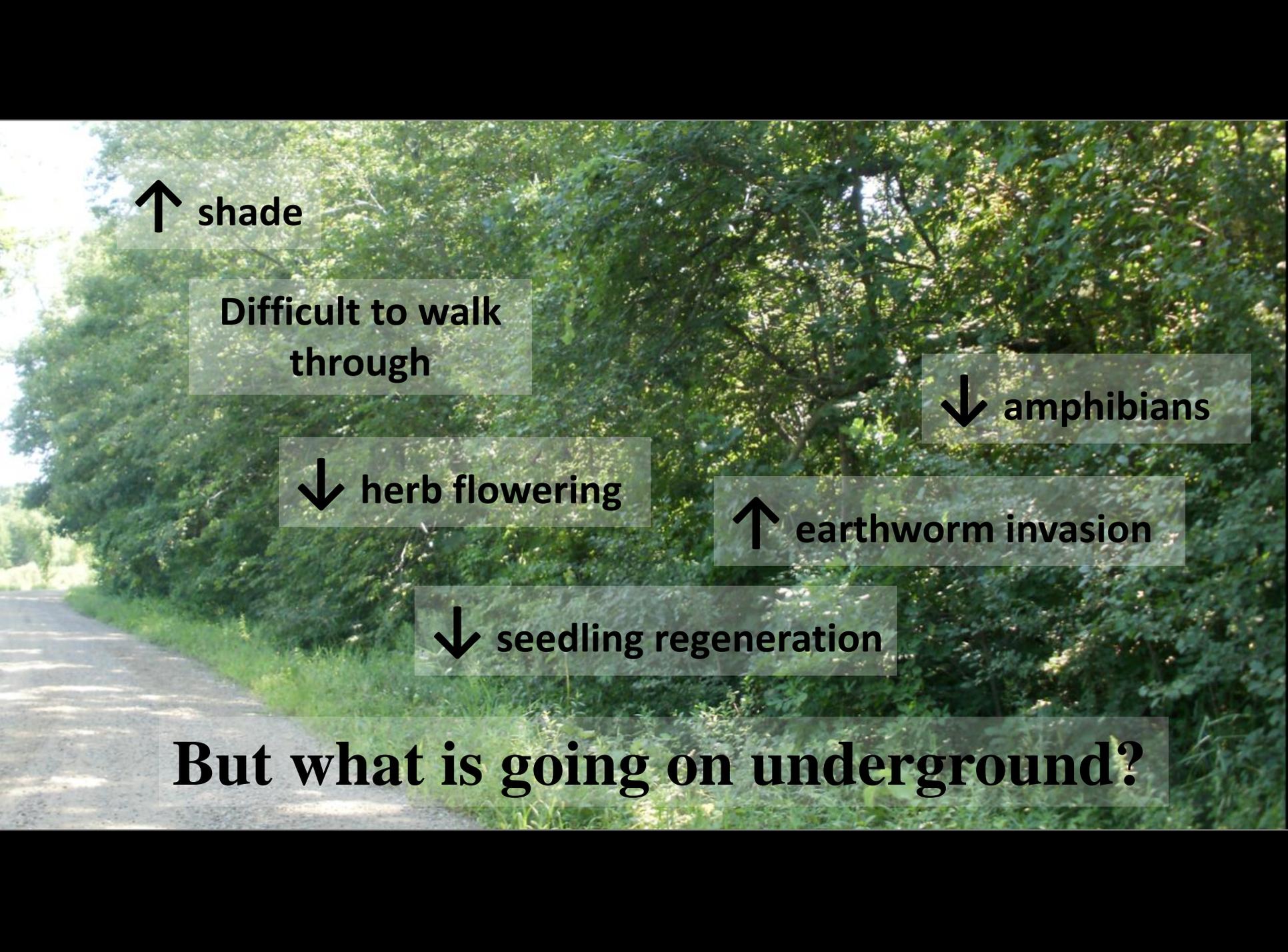




Unseen changes: The impacts of buckthorn leaf litter on forest nutrient levels

Alexandra (Sascha) Lodge, Kevin Mueller, Alex Roth, Peter Reich, Sarah Hobbie, & Tim Whitfeld



↑ shade

Difficult to walk
through

↓ herb flowering

↓ amphibians

↑ earthworm invasion

↓ seedling regeneration

But what is going on underground?

To what extent does the presence and abundance of buckthorn influence nutrient cycling in MN forests?

INPUTS

Are more nutrients entering the system?



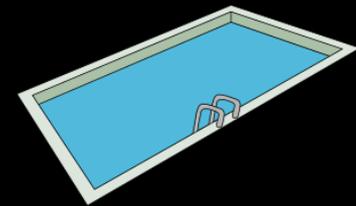
FLUXES

Is that changing nitrogen cycling?



POOLS

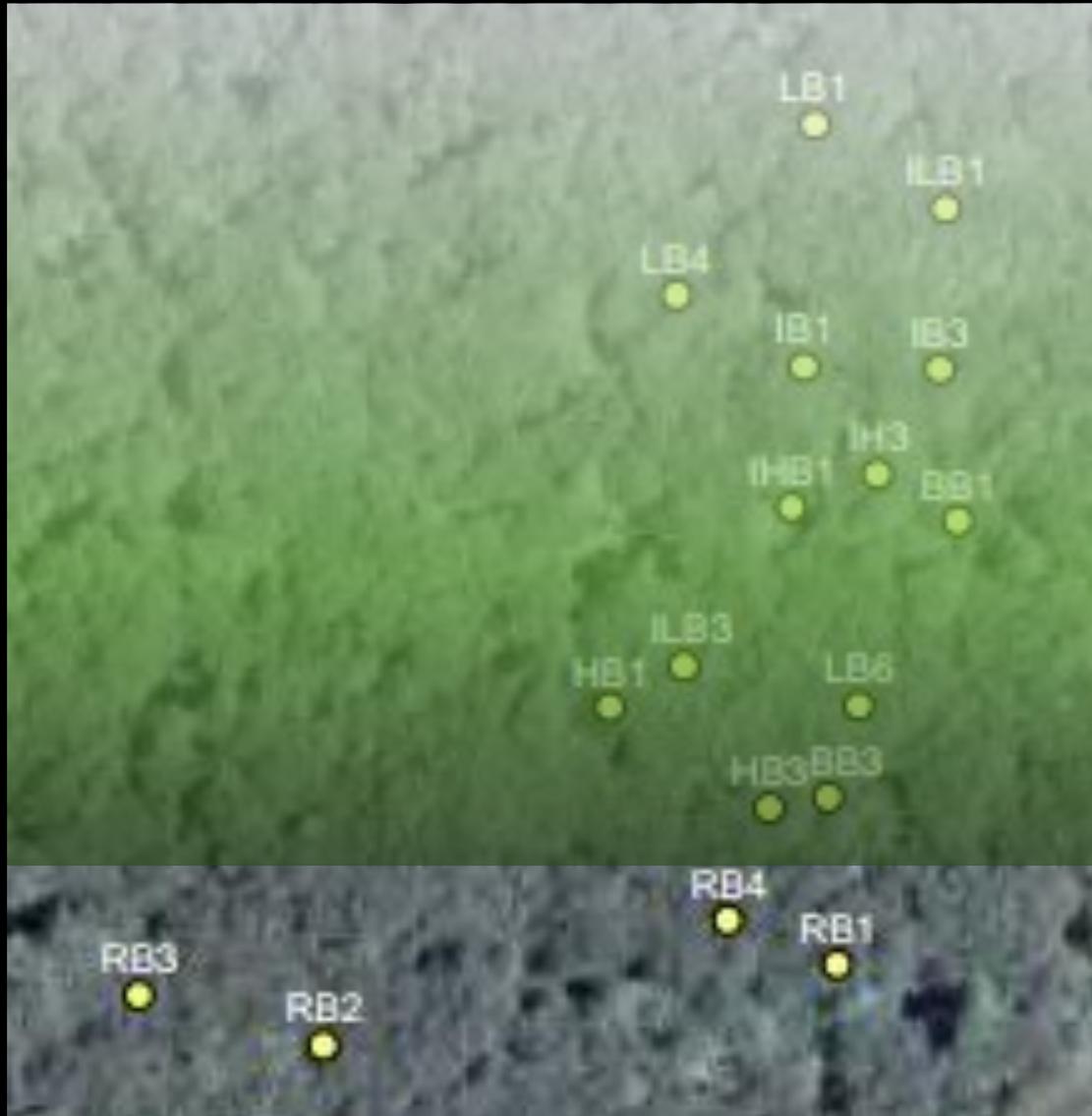
How are those inputs affecting nutrient stocks?



Study site







Sparse buckthorn

Invasion front

Dense buckthorn

Low buckthorn





High buckthorn

What did we do?



Green leaves:
buckthorn & red maple



Litter: red oak, white oak, red maple, buckthorn, black cherry

What did we do?



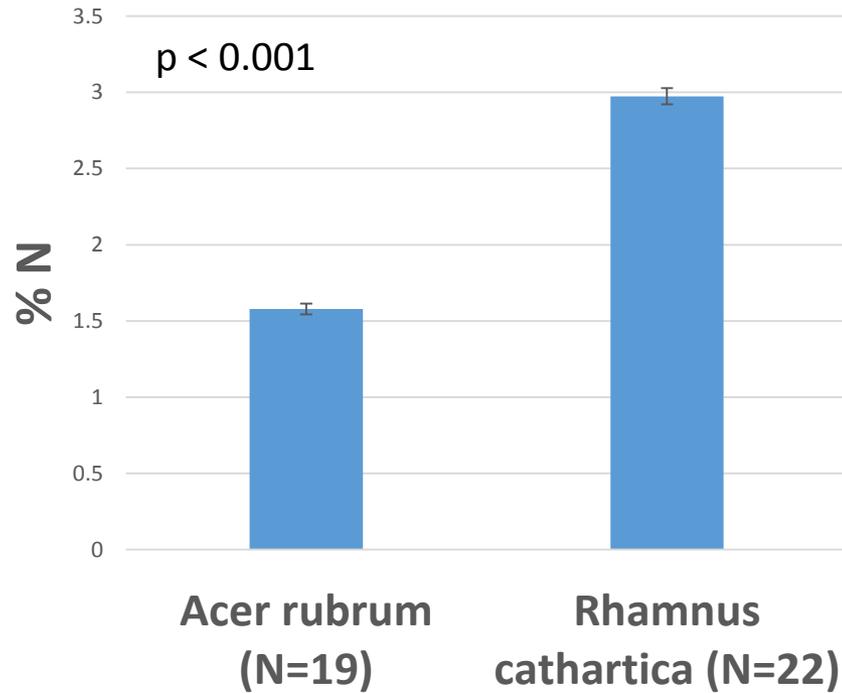
What did we do?



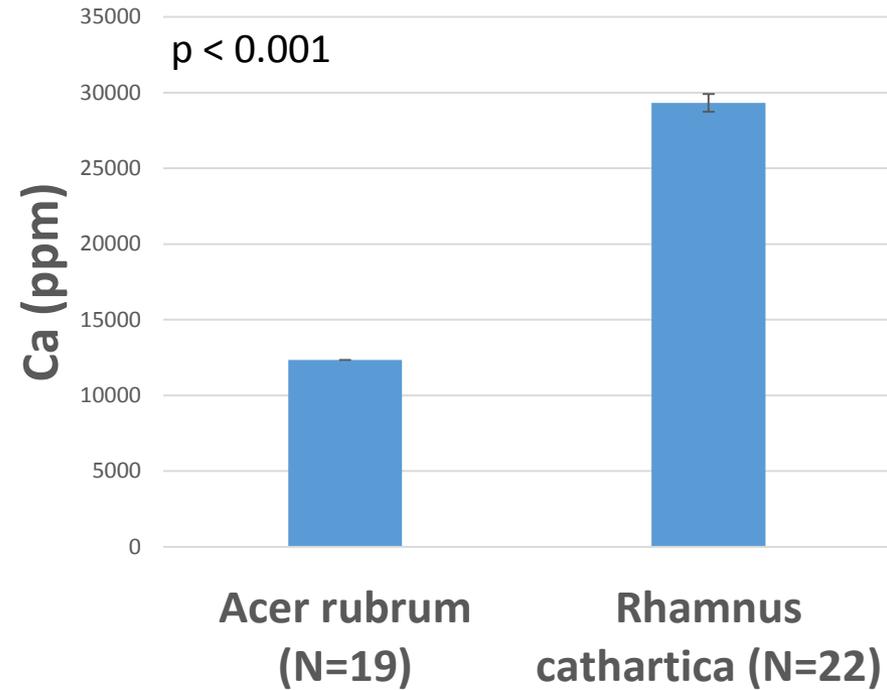
Green leaf nutrients

INPUTS

Mean Green Leaf Nitrogen



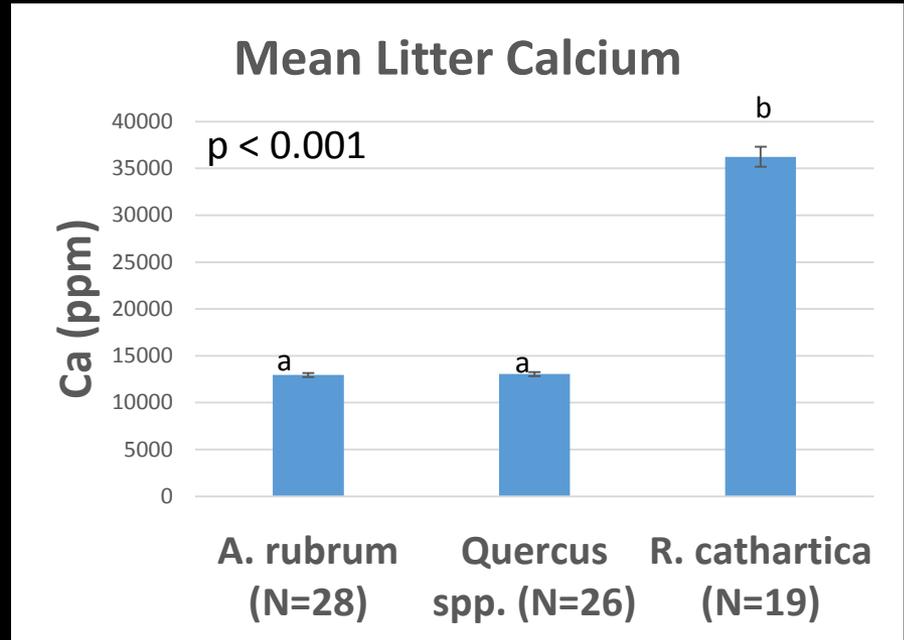
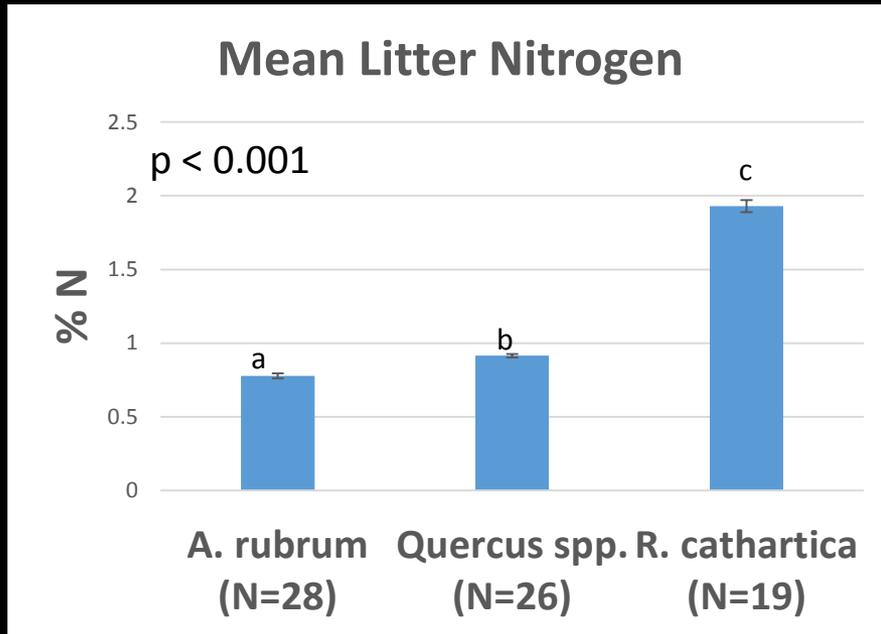
Mean Green Leaf Calcium



Error bars are standard error.

Leaf litter nutrients

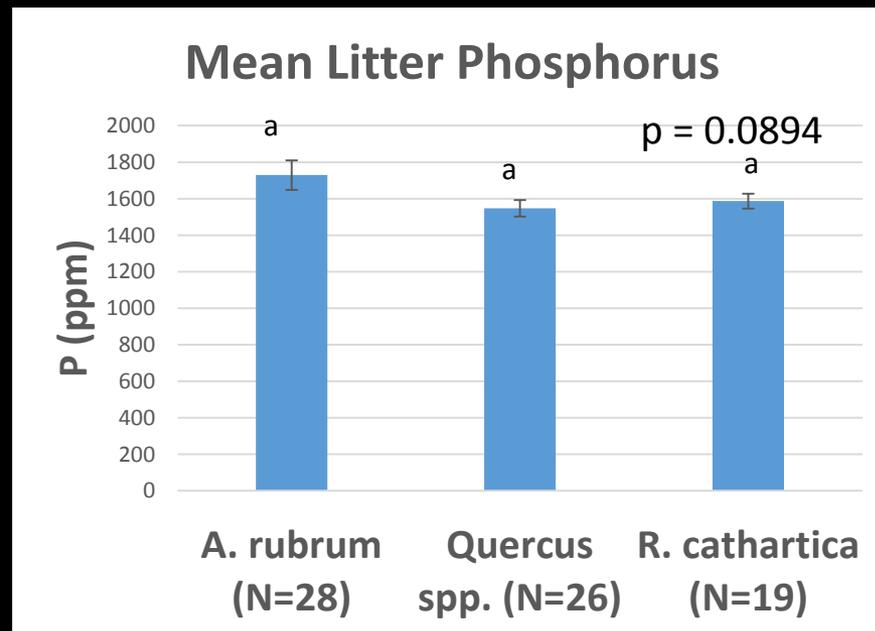
INPUTS



Error bars are standard error.

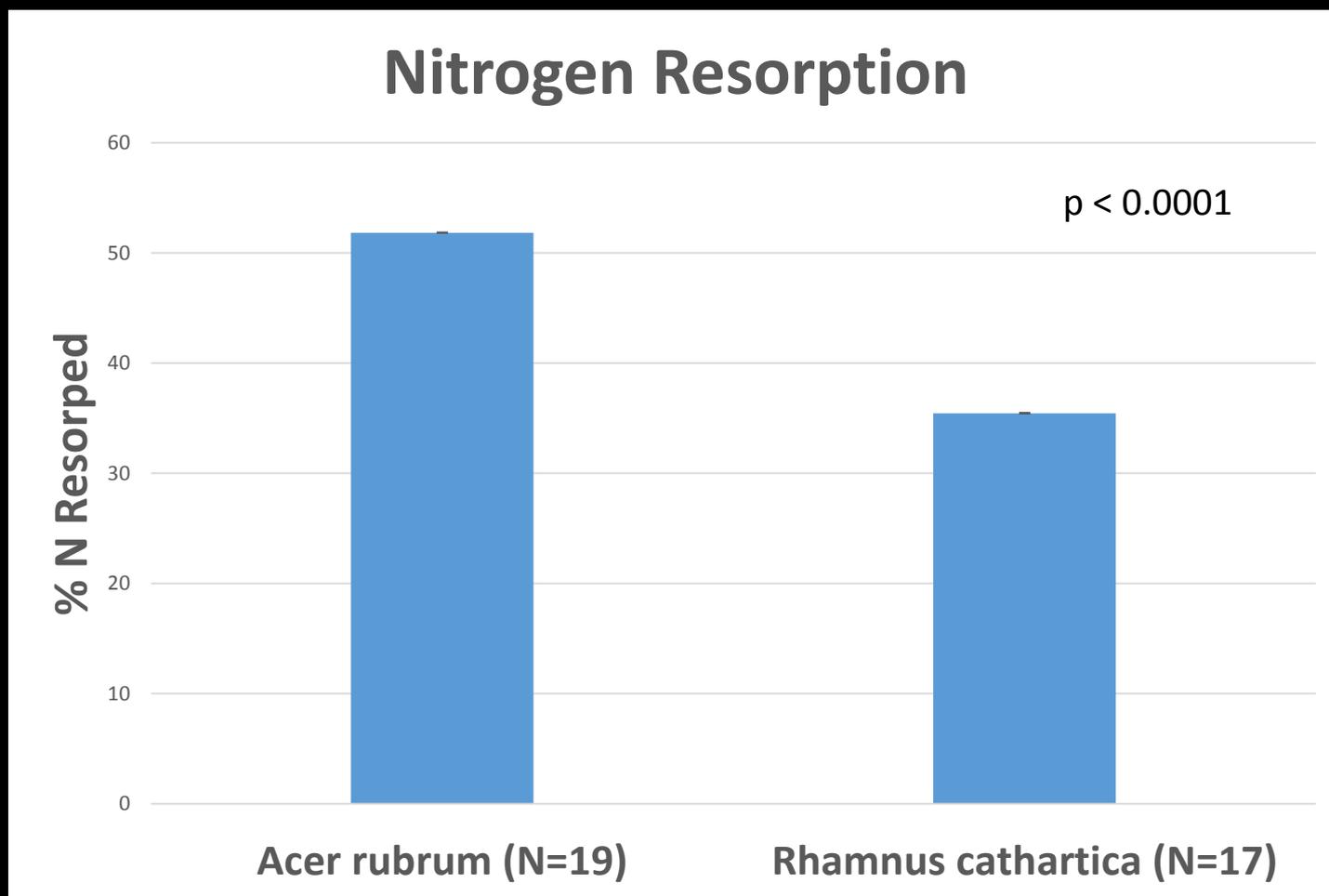
Leaf litter nutrients

INPUTS



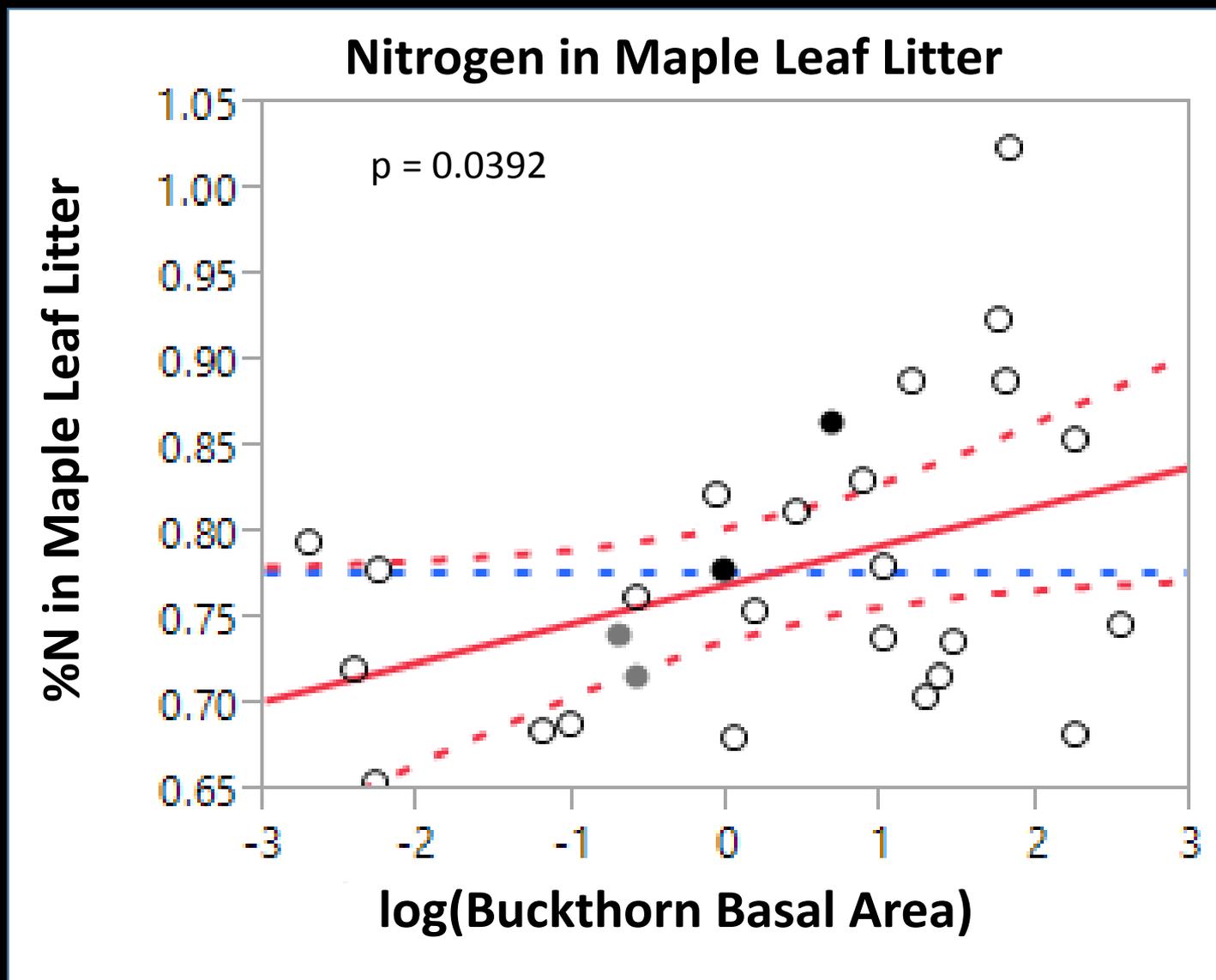
Error bars are standard error.

Nutrient resorption



Error bars are standard error.

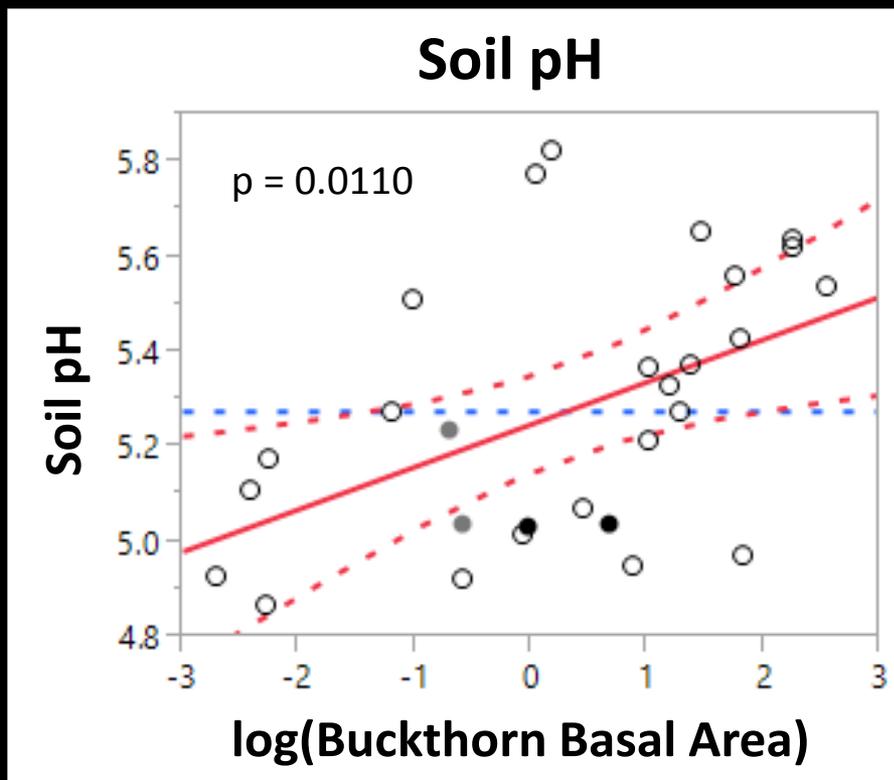
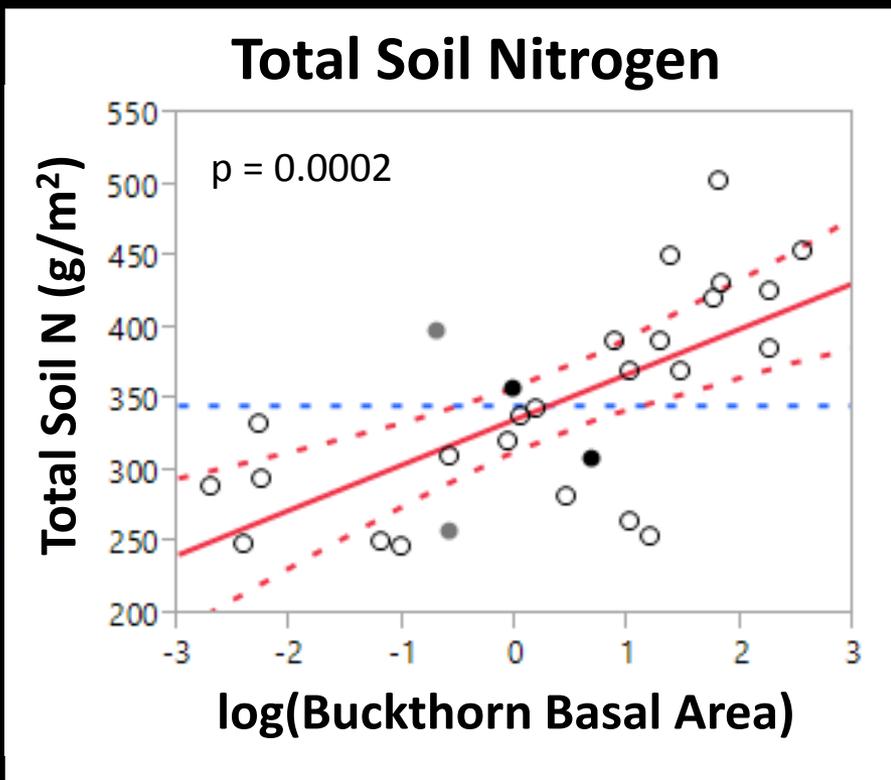
Leaf litter nutrients & buckthorn



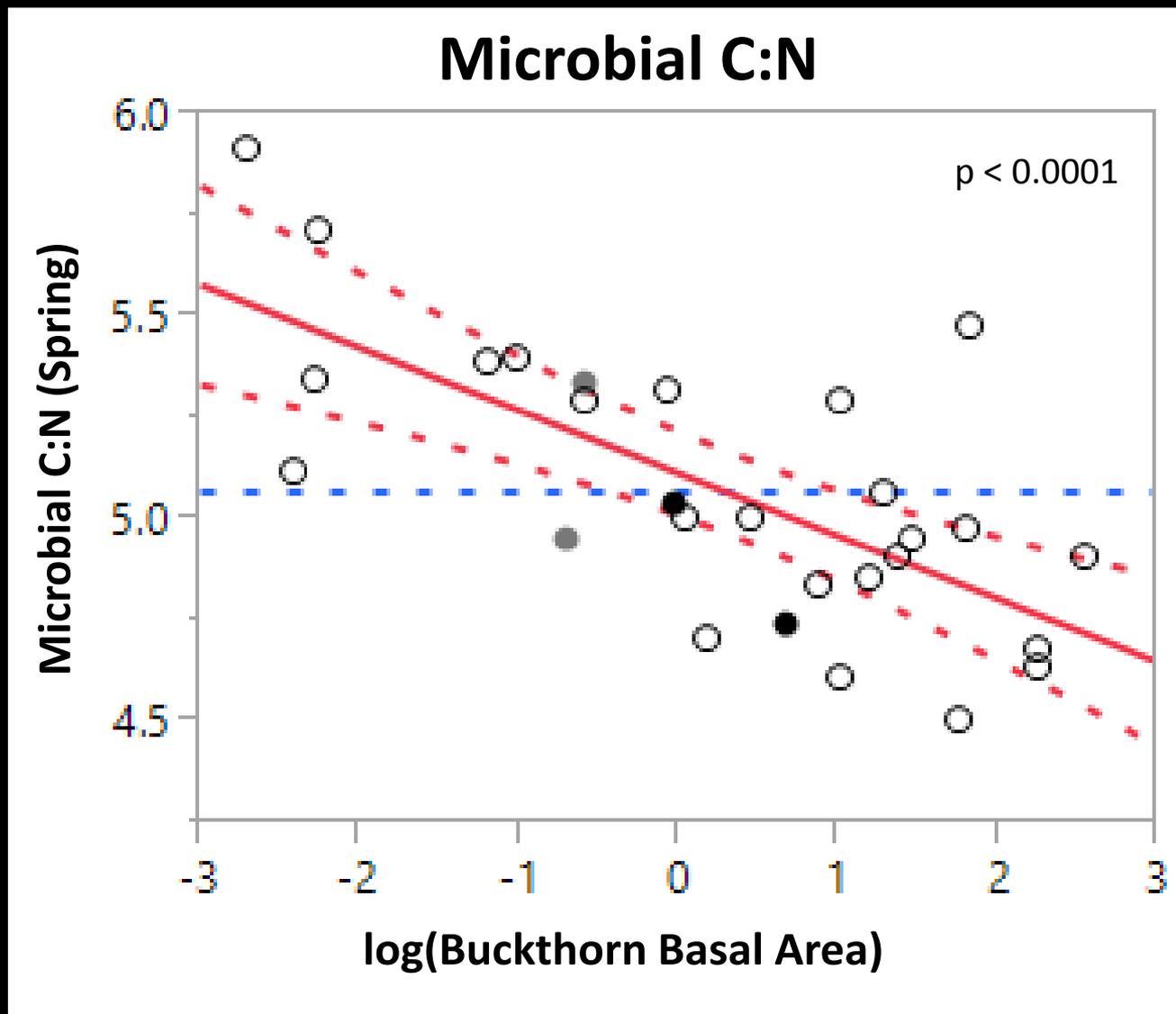
Nitrogen cycling



Nitrogen pool and pH

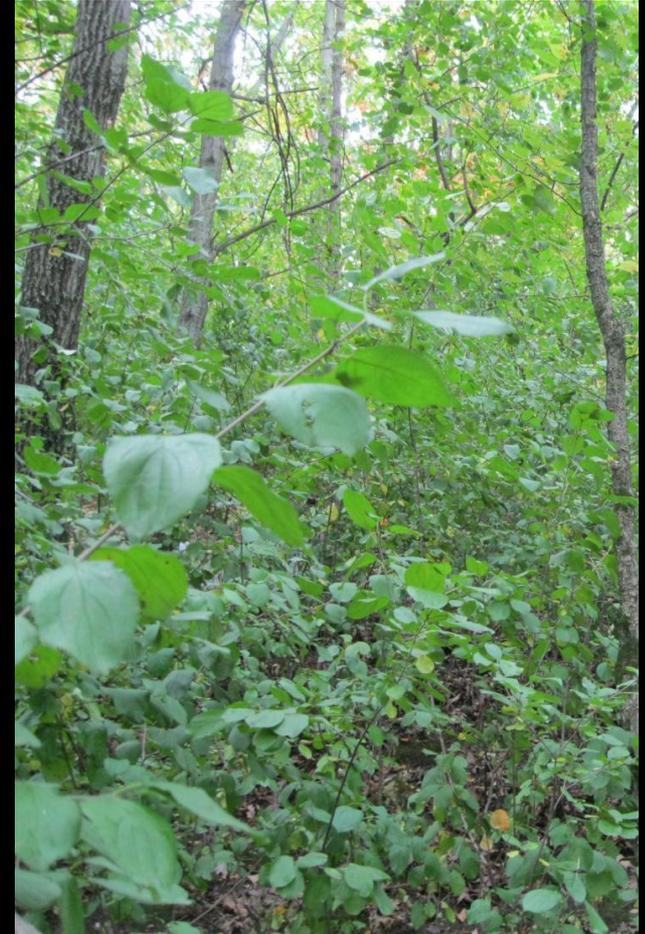


Microbial C:N



Conclusions

- Buckthorn affects...
 - Litter nutrient content (INPUTS)
 - N mineralization? (FLUXES)
 - Total soil N pool (POOLS)
 - Spring microbial C:N (POOLS)
- Lack of legacy effects in removal plots



Acknowledgements

- Rachael Nicoll & Chris Buyarski
- Field and laboratory assistants
- Warner Nature Center
- Funding sources: LCCMR, ISG-IGERT, GSF, Dayton Fund of the Bell Museum of Natural History
- Conference travel support: Canadian Institute of Forestry and MN SAF



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