

# Impacts of *Rosa multiflora* invasion on plant community dynamics

Heather L. McFarland & Scott J. Meiners  
Eastern Illinois University, Charleston, IL 61920

## Introduction

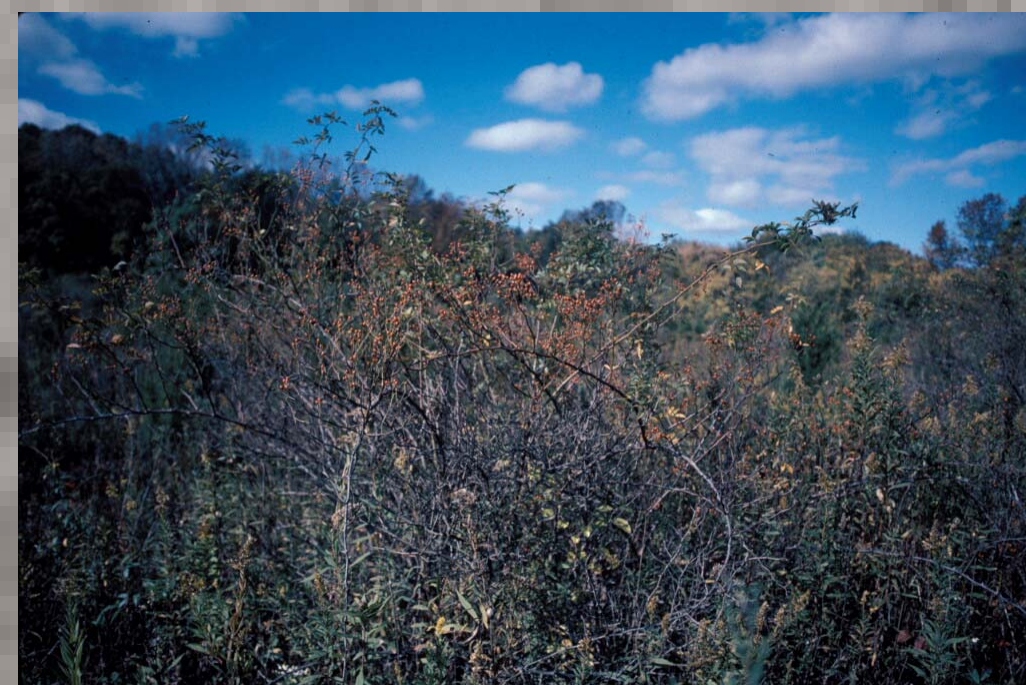
Exotic plant invasions are a major threat to biodiversity, however the mechanisms of these impacts are poorly understood.

*Rosa multiflora* Thunb. was introduced into the United States from Asia in the 1860's and has since become a problematic invader of fields in the eastern and central United States.

We used data from a long term succession study to assess the impact of *Rosa multiflora* invasion on species richness and community dynamics.



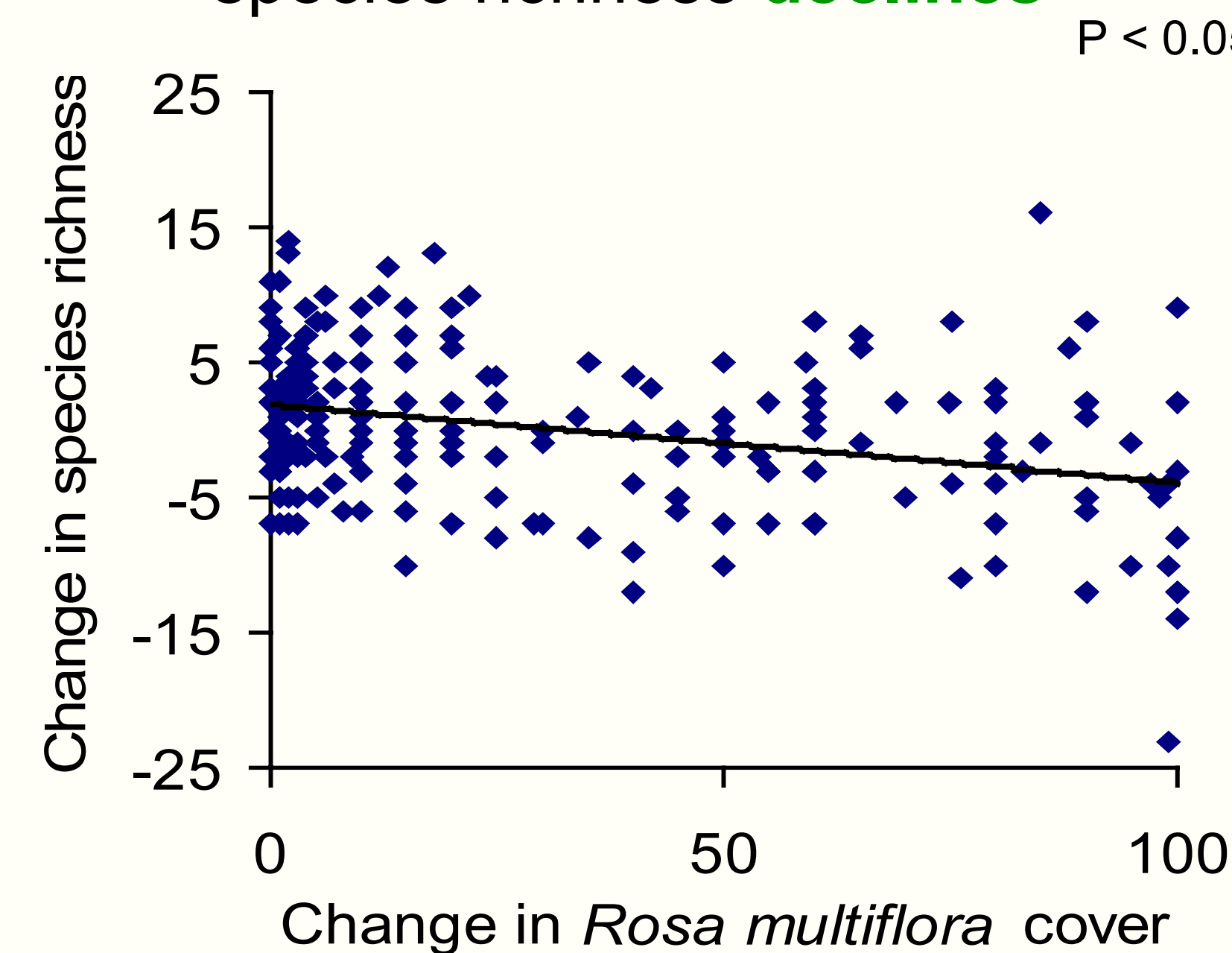
Successional field of the BSS



*Rosa multiflora* in fruit

## Does *Rosa multiflora* impact diversity?

As *Rosa multiflora* cover increases, species richness **declines**



Changes in species richness could be caused by decreased rates of **colonization** or by increased rates of species **extinction** in invaded plots.



Entrance to the Hutcheson Memorial Forest, site of the BSS



*Rosa multiflora* thicket in the BSS

## Conclusions

Invasion of *Rosa multiflora* caused a decrease in species richness.

Both colonization and extinction are mechanisms for change in species richness.

*Rosa multiflora* caused an increase in the number of species lost, and a decrease in the number of species that colonized plots.

*Rosa multiflora* has a stronger effect on colonization rates than it does on species extinction rates.

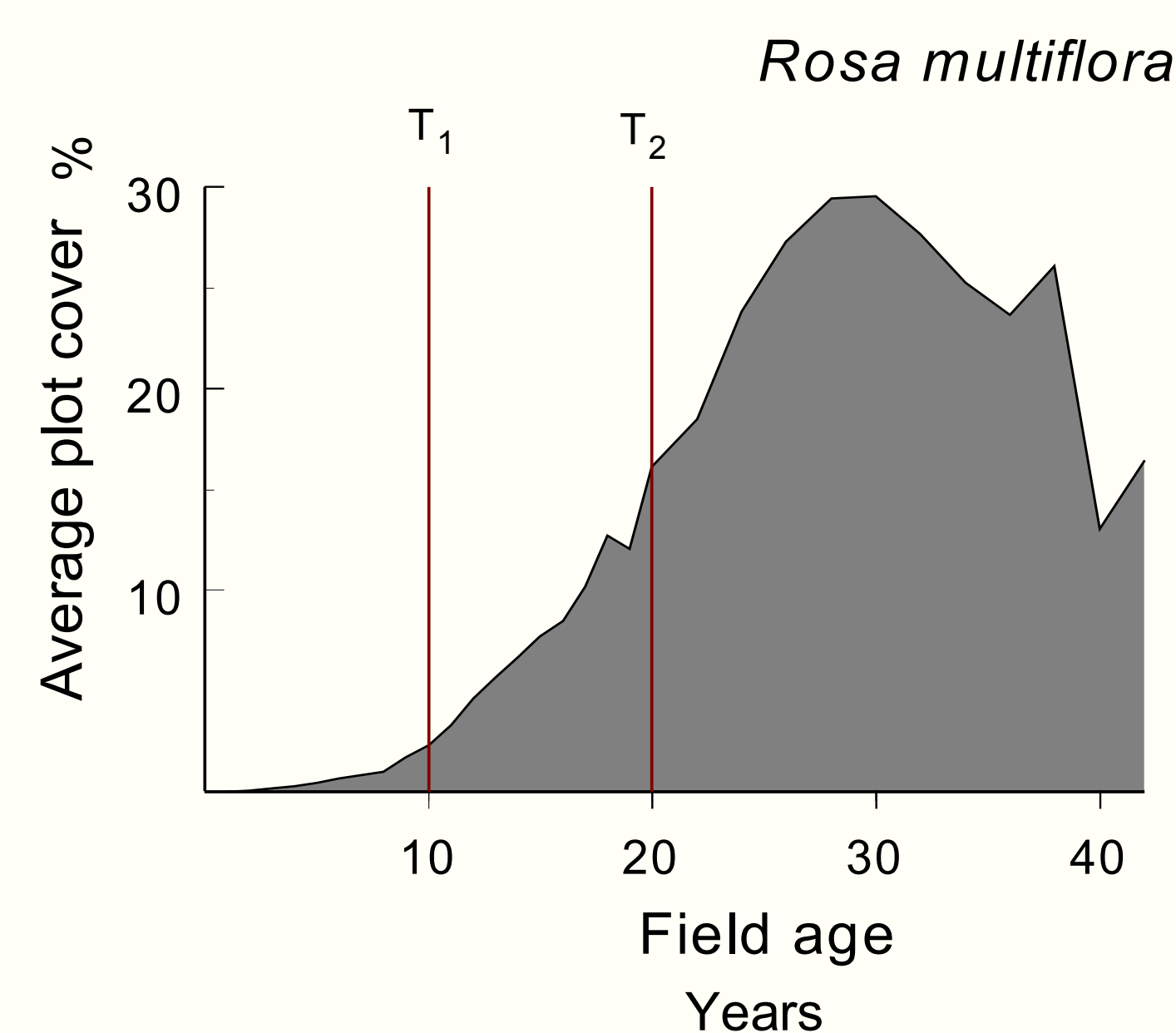
This is contrary to the traditional competitive exclusion view, which would predict primarily species extinctions.

## Methods

We used permanent plot data from the Buell-Small Succession Study, to look for changes in community composition from the beginning ( $T_1$ ) to the midpoint ( $T_2$ ) of the *Rosa multiflora* invasion.

From these data we quantified:

1. Change in *Rosa multiflora* cover
2. Change in species richness
3. Number of new species colonizations
4. Number of local species extinctions

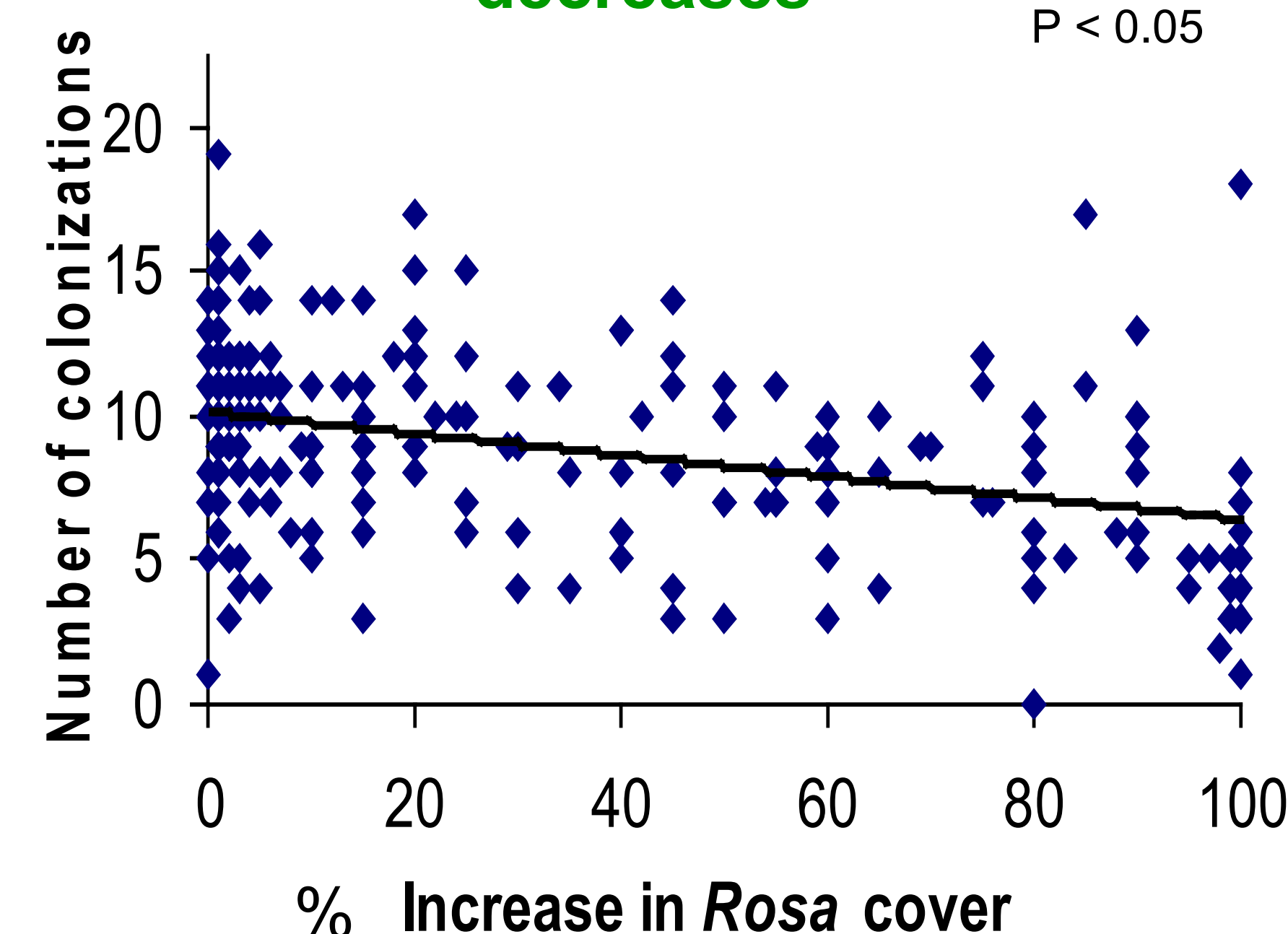


We used these data to investigate dynamics associated with an invasion.

## Why does richness decrease?

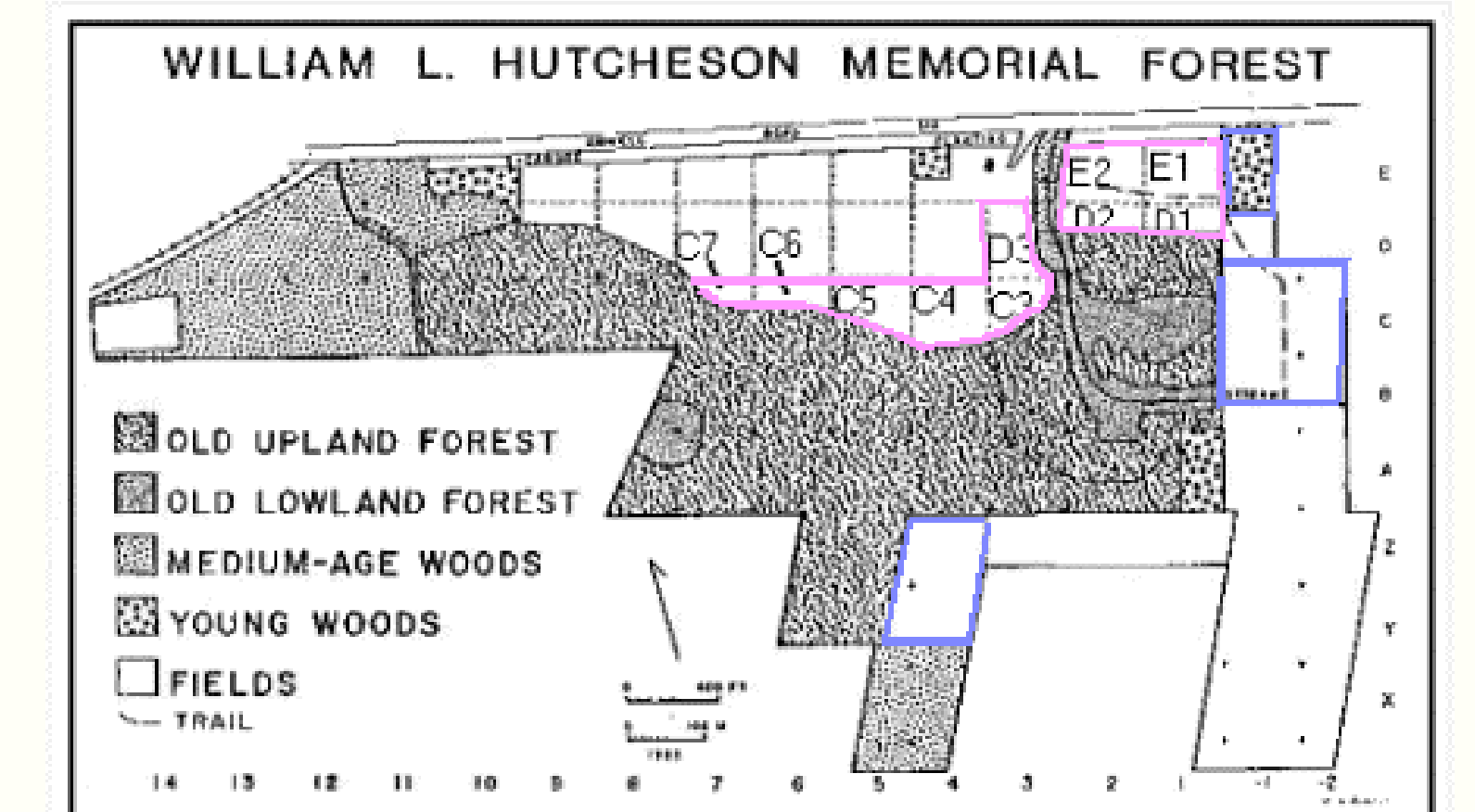
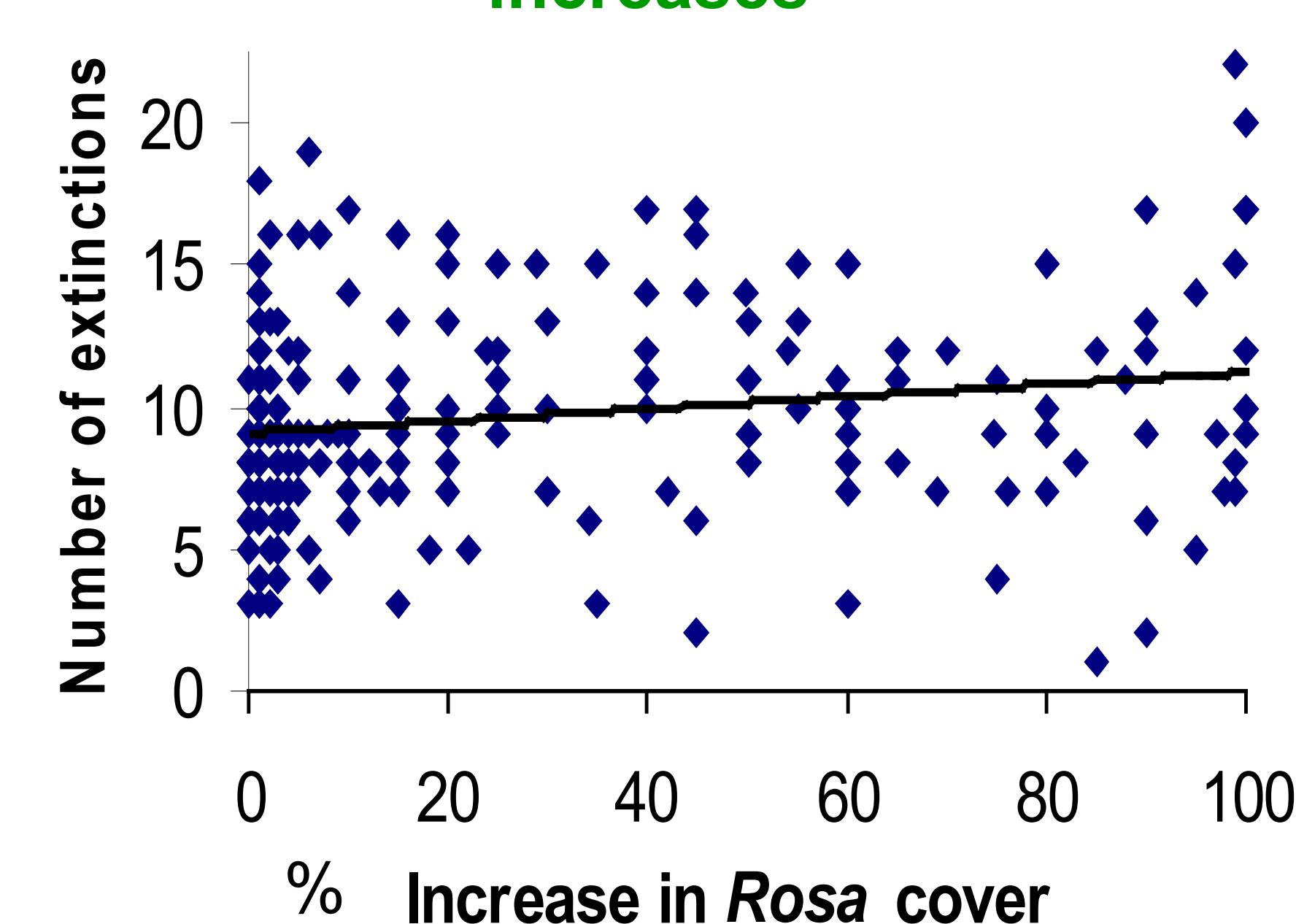
Colonizations

As *Rosa multiflora* cover increases, the number of new species colonizations **decreases**



Extinctions

As *Rosa multiflora* cover increases, the number of local species extinctions **increases**



## Buell-Small Succession Study

This is a long term ecological study designed to document old field succession.

The study includes ten fields abandoned from agriculture beginning in 1958.

Vegetation dynamics have been followed in 48 permanently marked 0.5 x 2.0 m plots in each field.

For more information go to:  
[www.ecostudies.org/bss](http://www.ecostudies.org/bss)