

Ecological Impacts of White-tailed Deer on New York Forests



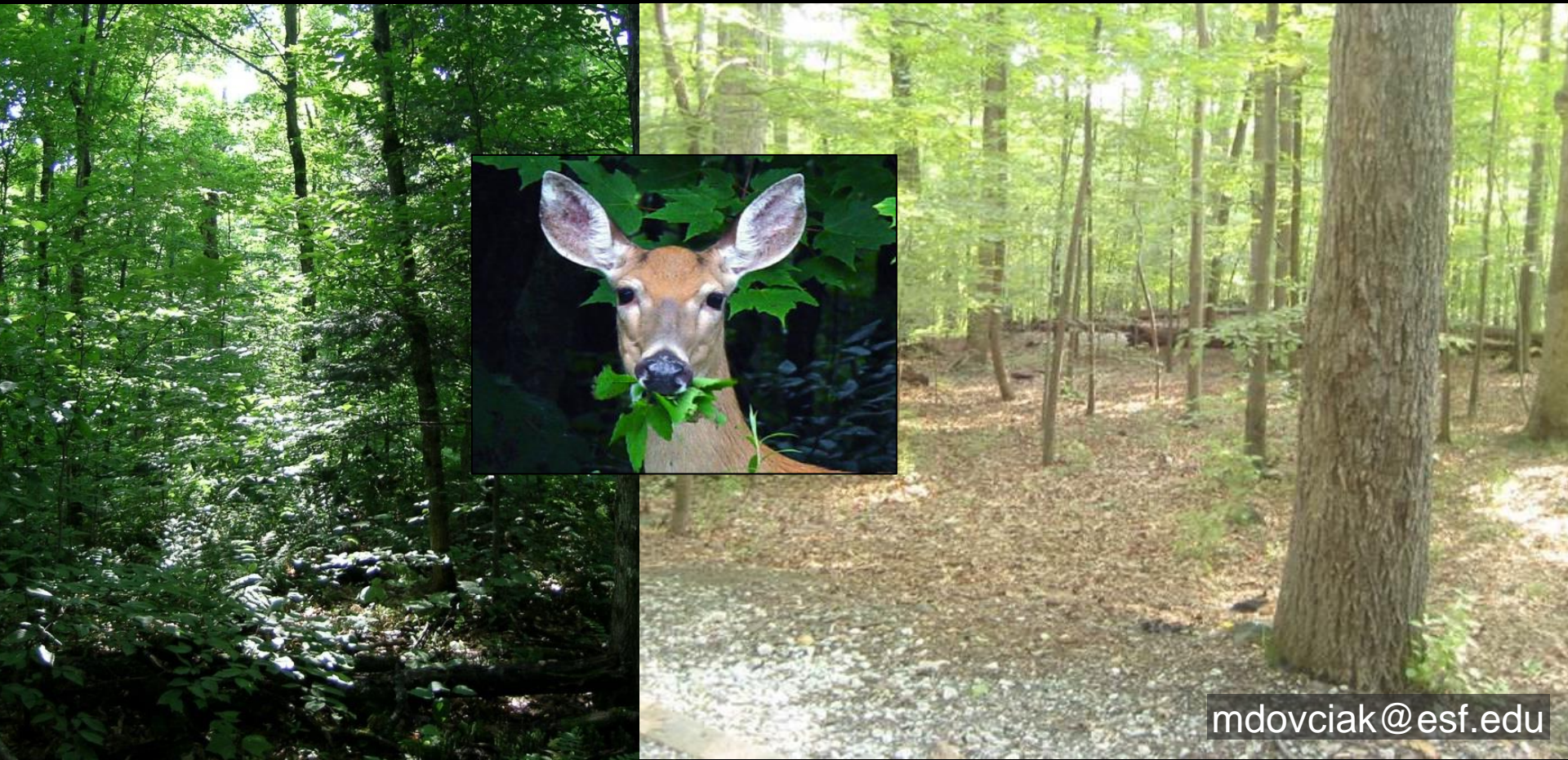
Martin Dovčiak, Jacqueline Frair, Mark Lesser, Jay Wason, Margaret Roberts



Jeremy Hurst, synergies: Justin Perry, Josh Borst, Kate Yard



Paul Curtis, Peter Smallidge, Kristi Sullivan



mdovciak@esf.edu

Project Components

Quantifying impacts of deer on forest regeneration

- Determining past impacts using FIA data
- Recommendations for deer management



Developing indices to monitor deer impacts

- Designing field monitoring protocol
- Developing smart phone app for data collection (citizen science)



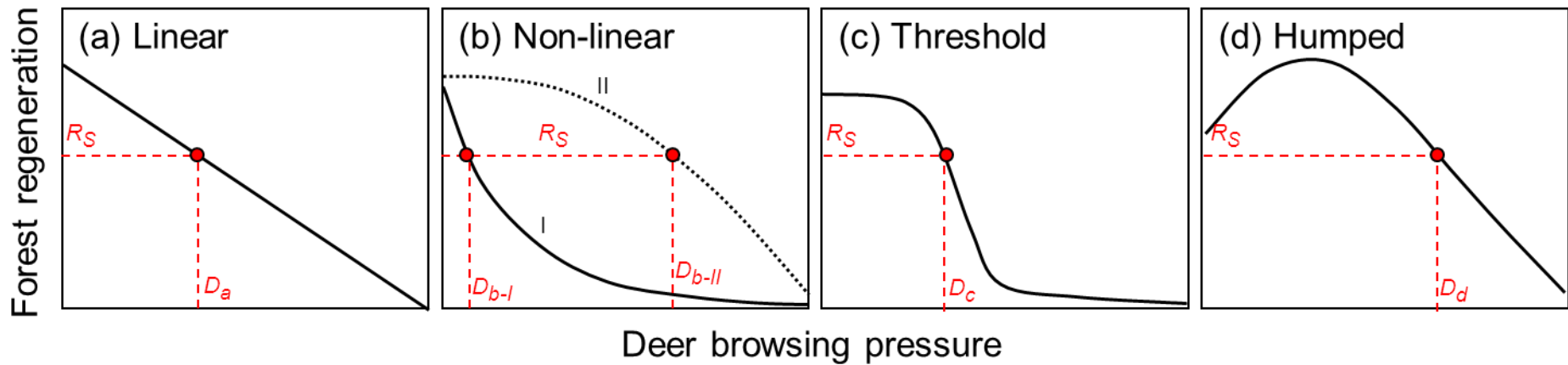
Some potential future projects

ESF synergies & Questions

Quantifying deer impacts on forest regeneration

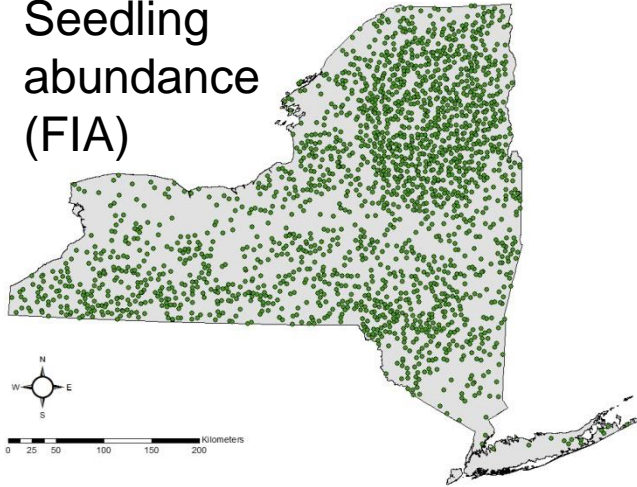


Questions: (a) What is a functional response of forest regeneration to deer abundance? (b) Does the effect of deer abundance vary with nearby land-use?

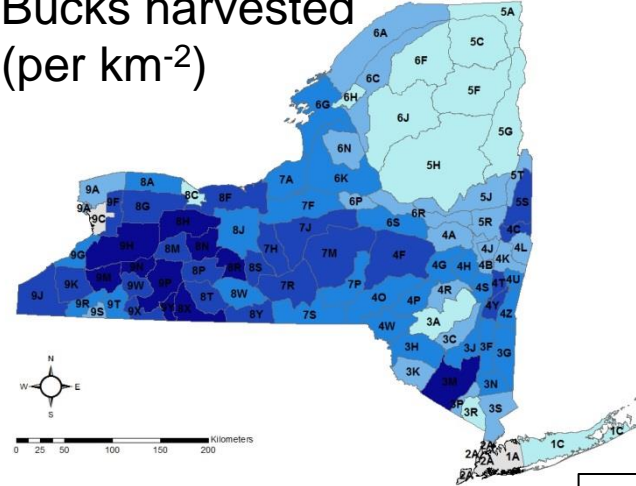


Quantifying deer impacts on forest regeneration

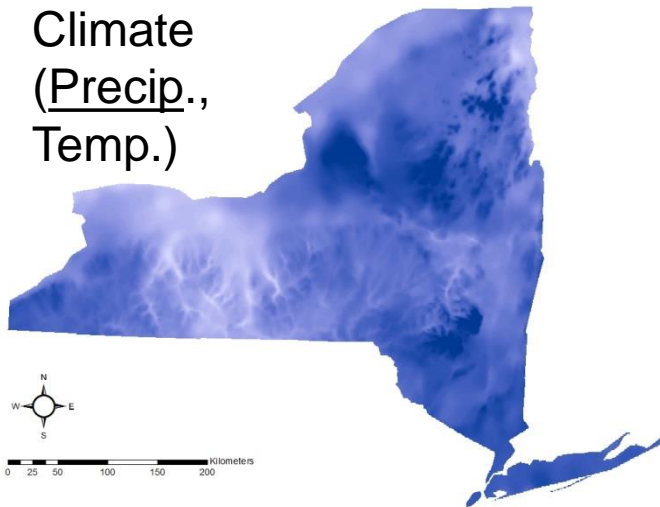
Seedling abundance (FIA)



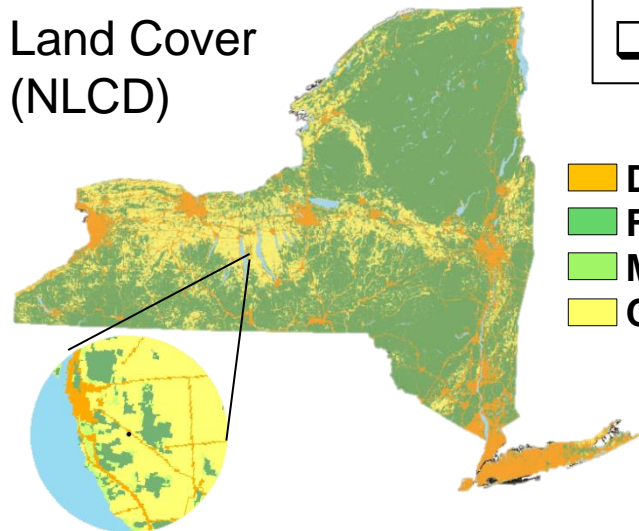
Bucks harvested (per km²)







Climate (Precip., Temp.)



Land Cover (NLCD)



- Negative binomial mixed effect model
- AIC model selection

-  Developed
-  Forest
-  Meadow (shrubland, herbaceous)
-  Crop (agricultural, pasture)

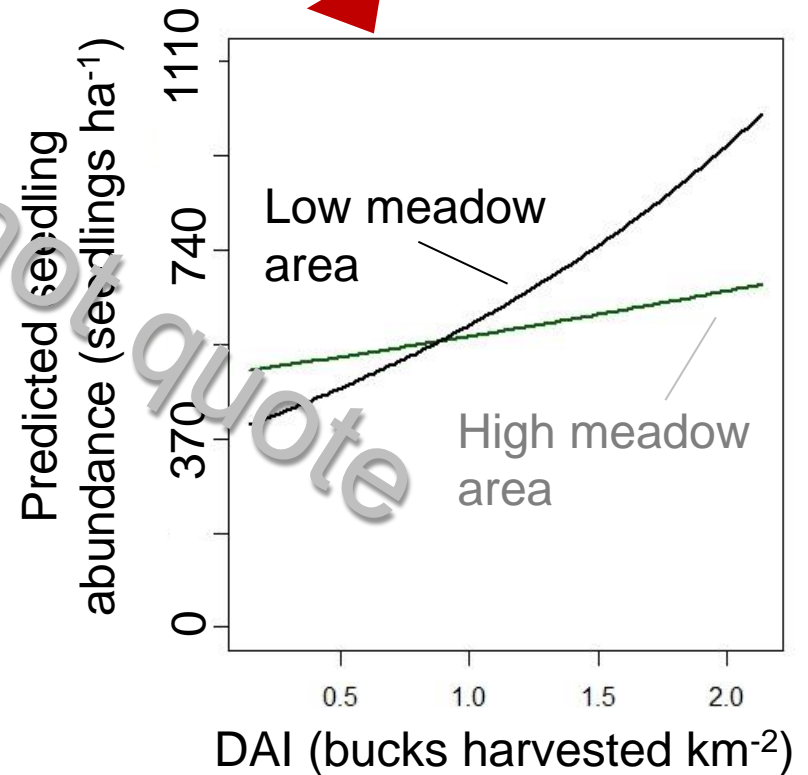
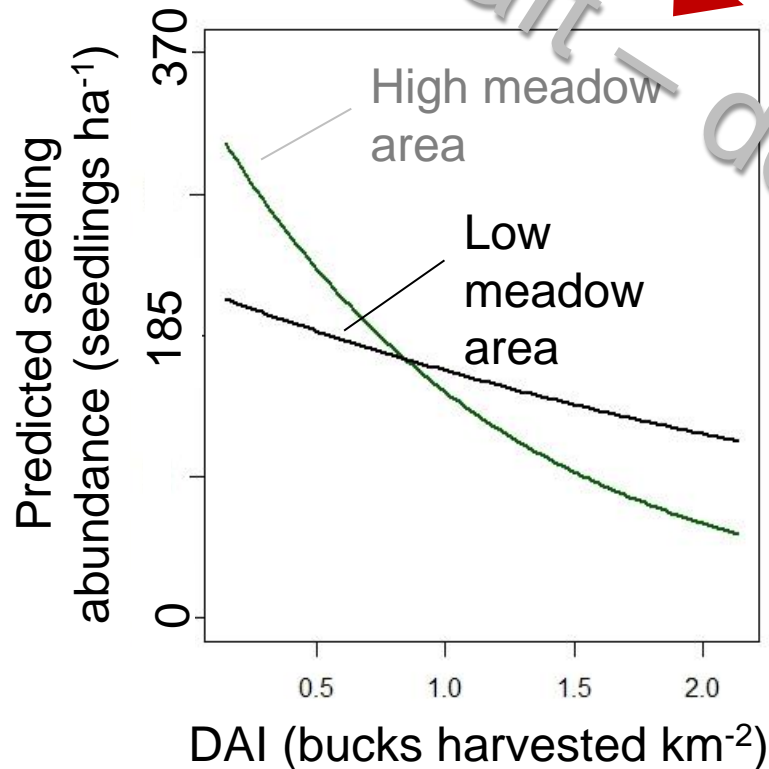
Quantifying deer impacts on forest regeneration



Red maple

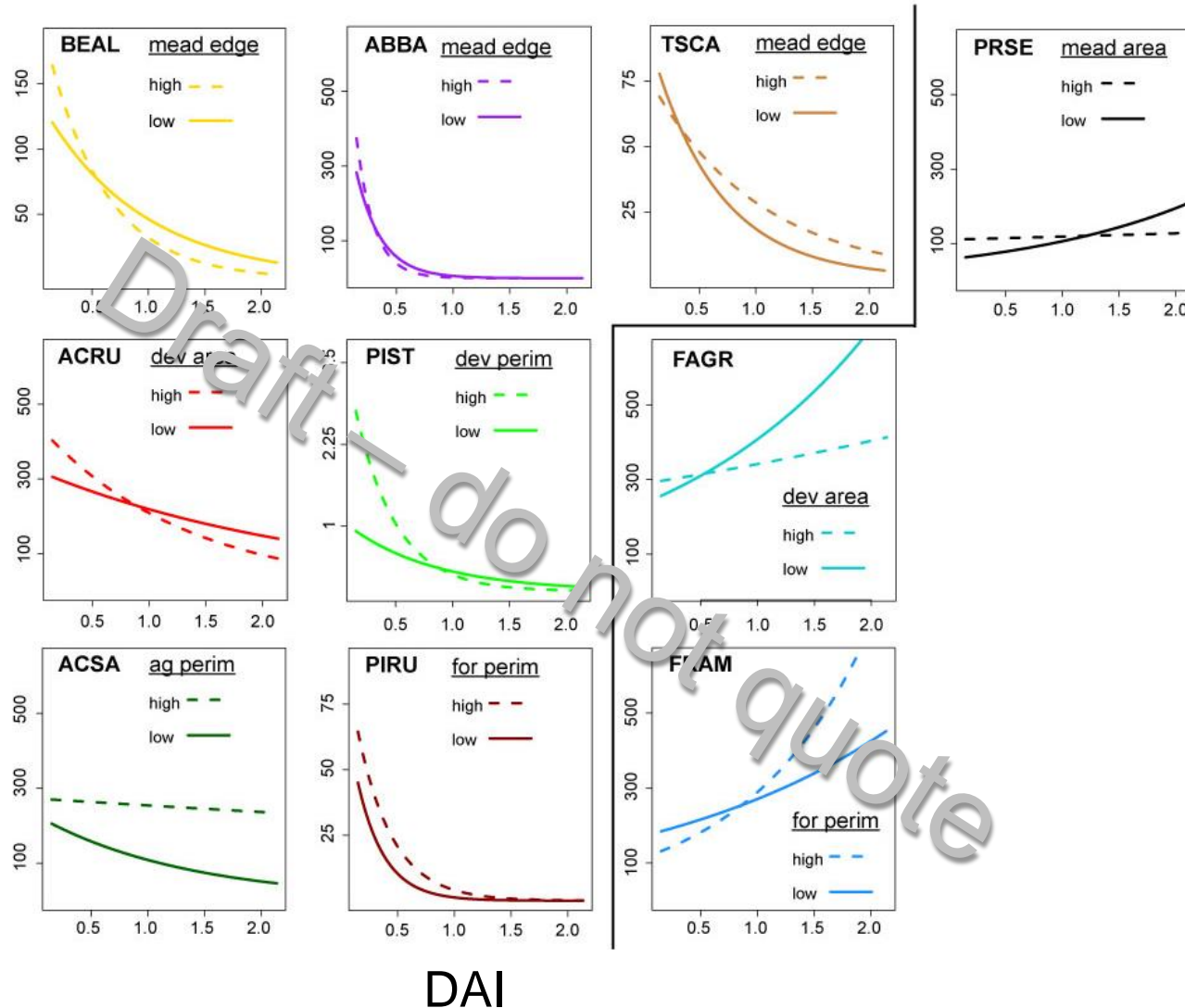


American beech



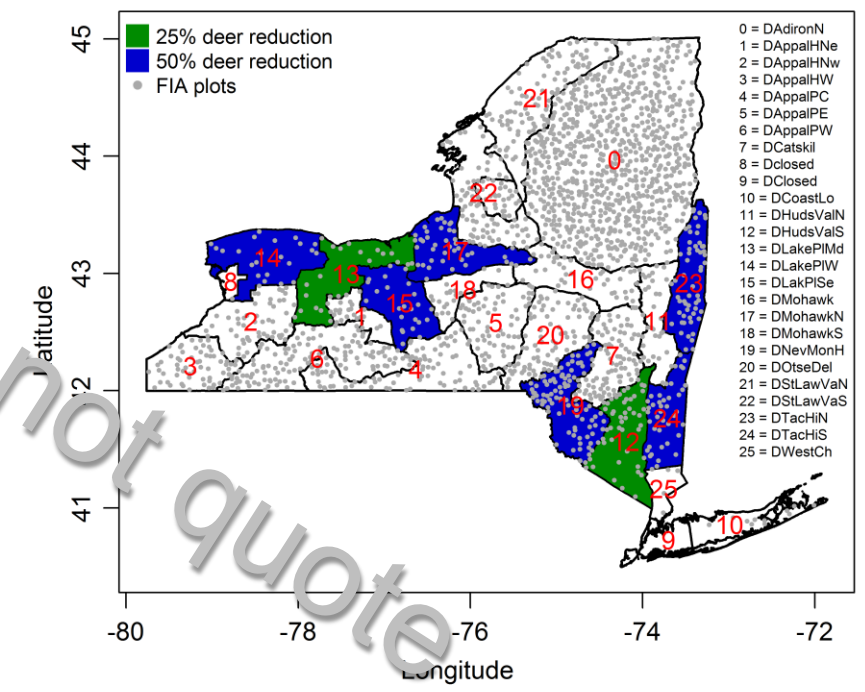
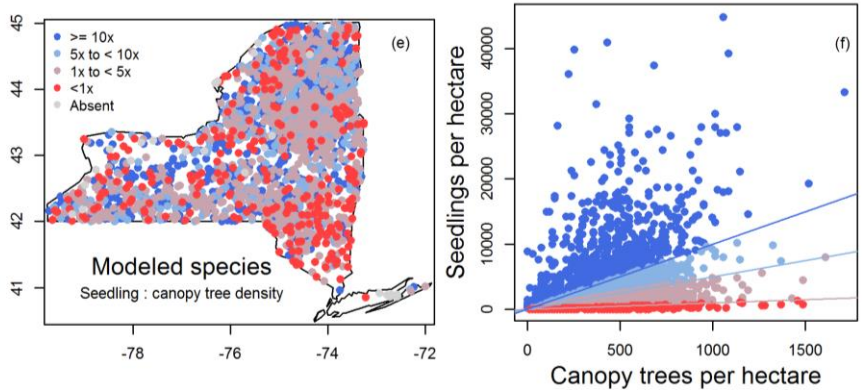
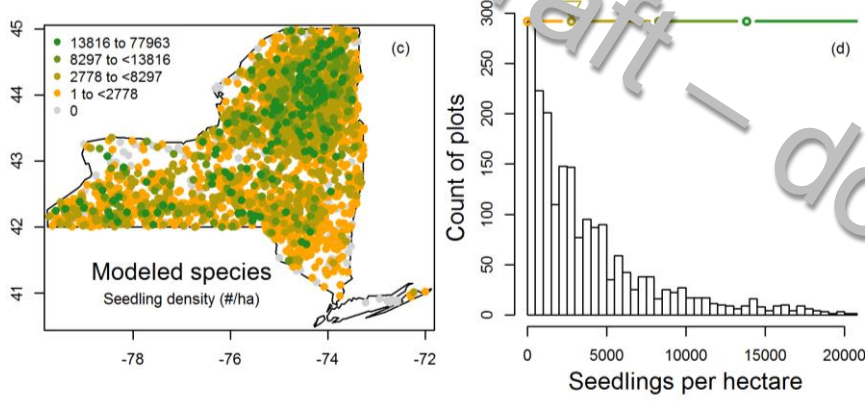
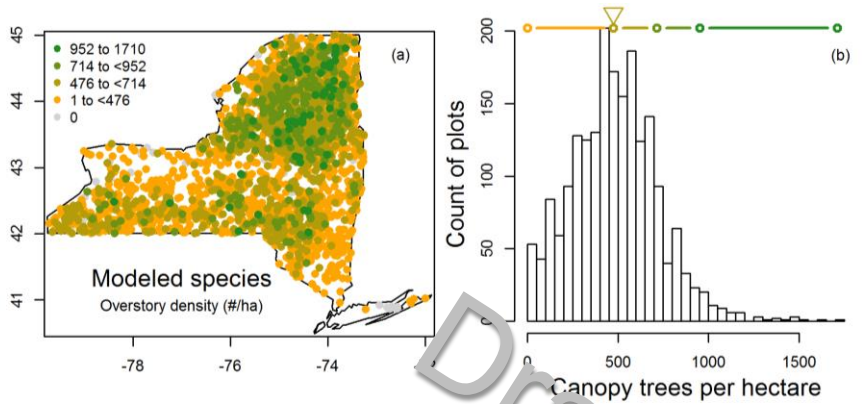
Quantifying deer impacts on forest regeneration

Predicted seedling abundance
(seedlings ha^{-1})

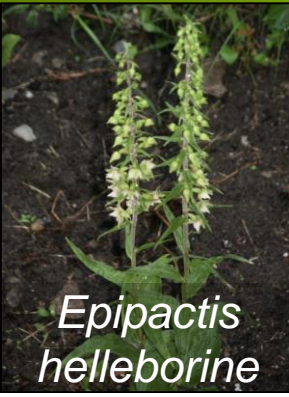


DAI
(bucks harvested km^{-2})

Draft recommendations for deer impacts at NYS scale



Extension: Modelling non-native species in NYS forests



Veronica officinalis

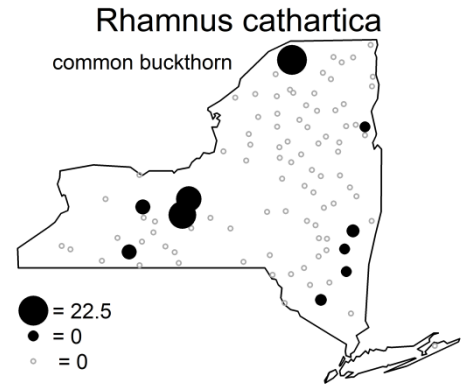
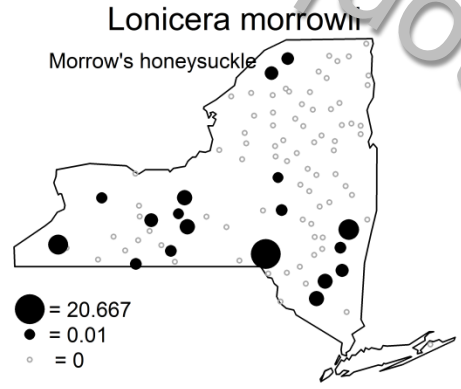
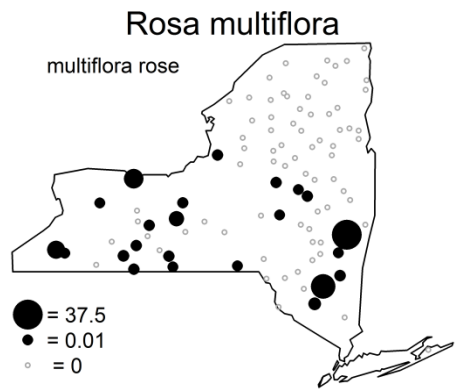
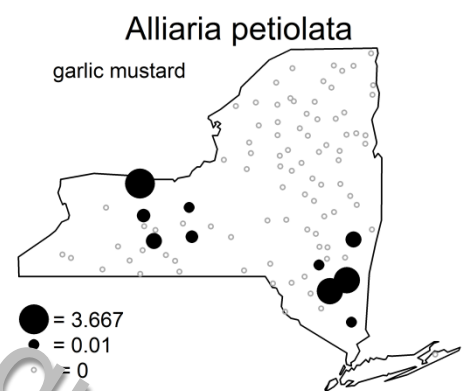
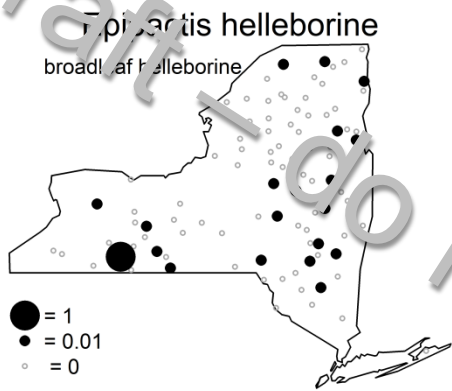
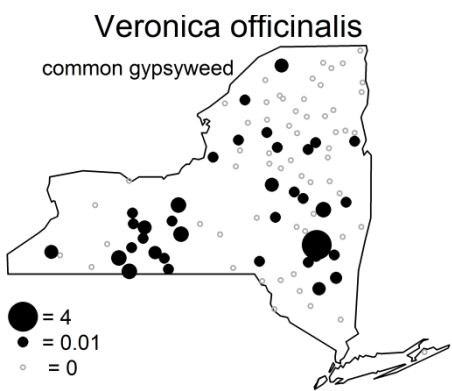
Rosa multiflora

Epipactis helleborine

Lonicera morrowii

Alliaria petiolata

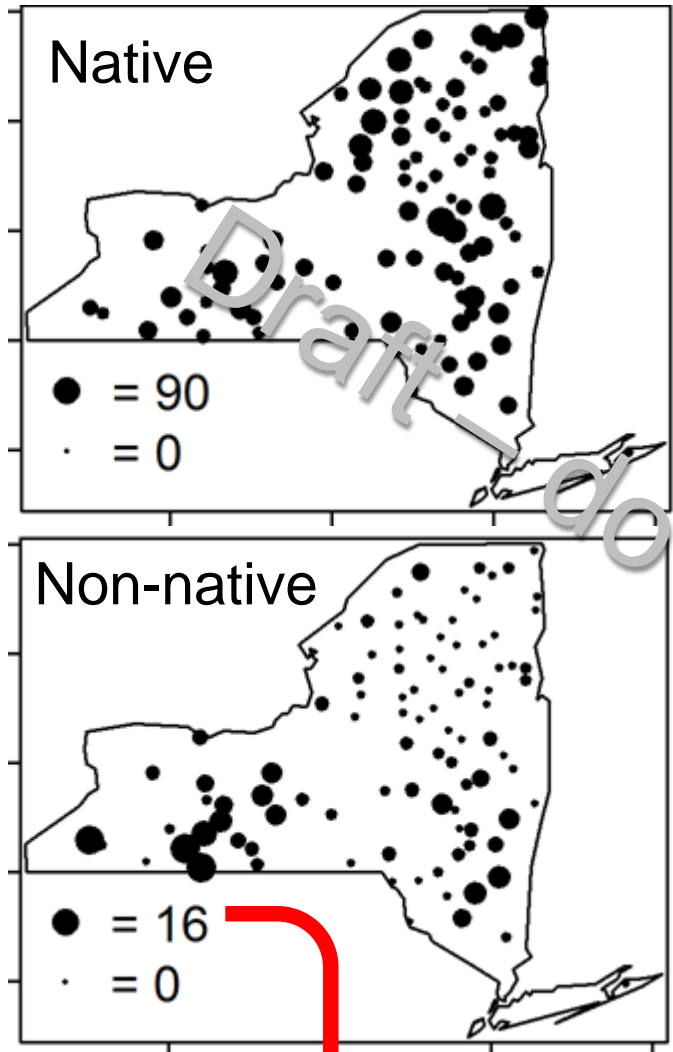
Rhamnus cathartica



Draft - do not quote

Extension: Deer effects on native & non-native plant diversity

Species richness in NYS



18% of max. native richness!

Some potential future projects

- Deer impacts on forests (not just regeneration!)**
 - Field verification/refinement of the regeneration model (FIA & app)
 - Adapting the model to predict impacts on herbs (native and non-native)
 - Adaptive deer management on a 5-10 year cycle in New York State

- Implementing Regenerate! (field monitoring)**
 - Continuing field verification and refinements of Regenerate app
 - Developing online component, data storage & management

- Integration of FIA-modelling & Regenerate!**
 - Build broader partnerships within DEC and with others (TNC, USFS)
 - Potential for national leadership

- General wildlife-habitat modeling at NYS-scale**
 - Expanding beyond deer impacts (e.g., global change, other species)
 - Collaborations!

Synergies: ESF graduate students at work



Synergies: Undergraduate education w/applications



Questions?

