The Links Between Forest and Public Health

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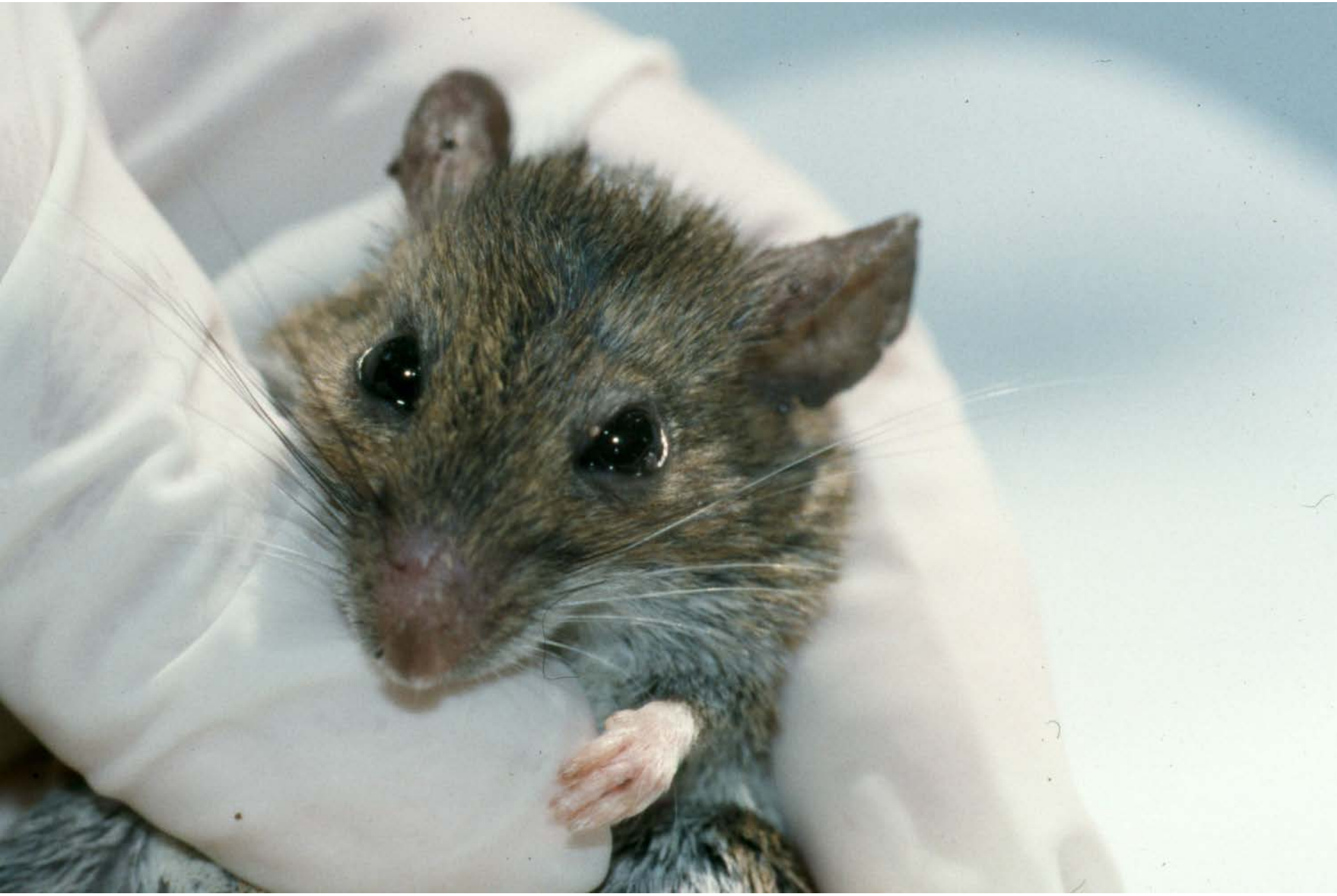
Our Journey

- Will discuss humans as part of the ecosystem
- Will discuss our work in unhealthy forests
  - Dominated by invasive plants
  - And public health risks
- Will discuss forested vs. residential habitats
  - Wildlife and health risks
- Will discuss “next steps” in statewide project

Connecticut's Forest

- 58% forested and stable
- 20th most heavily forested state
  - –(ME 89%, ND 1.8%)
- 3.59 million people in CT (2017)
- 4th most densely populated state
- Which make us all forest dwellers



USDA United States Department of Agriculture

White-tailed Deer in Northeastern Forests: Understanding and Assessing Impacts




U.S. Department of Agriculture
Forest Service
Northeastern Area
State and Private Forestry
Newtown Square, PA

Japanese barberry (*Berberis thunbergii*)

- Escaped ornamental
- Native to Japan
- Forms dense stands
- Forests, wetlands, and fields
- Displaces native vegetation
- Reduces litter layer in forests
- Alters soil pH and N
- Reduces habitat and forage.

- Common barberry
- Wheat rust
- US Dept AG

- “The Japanese barberry is harmless”

Japanese barberry

We Burned It


We Really Burned It!!!

We Cut It

We Chopped It Up


We Poisoned It
solo

We Burned It Some More!

Tick Sampling

- For 10 years, we sampled ticks
  - 7,500 of them……

- Intact barberry
- Managed barberry
- No barberry


Healthy Forest =
10 *Borrelia* infected ticks/acre


Unhealthy Forest =
130 *Borrelia* infected ticks/acre


40-60% reduction

Connecticut's Forest

- In 1972, 50% of CT was forested
  - 33% of trees were small (< 5" DBH)
  - 33% of trees were medium (5 – 10")
  - 33% of trees were large (> 10")

- In 2015, 58% of CT was forested
  - 6% of trees were small (< 5" DBH)
  - 11% of trees were medium (5 – 10")
  - 83% of trees were large (> 10")

Connecticut's Wildlife

- In the past, it was thought wildlife needed huge areas of unbroken land
  - Turkeys
  - Deer
  - Fisher
  - Bobcat
- Do not need vast acreage, but respond to quality habitat

A Thought Crossed Our Minds

- Let’s see the diversity and abundance of wildlife in residential Connecticut as compared to large, wooded areas

- And look at ticks and associated pathogen prevalence as well

Backyard Photo

Backyard Photo

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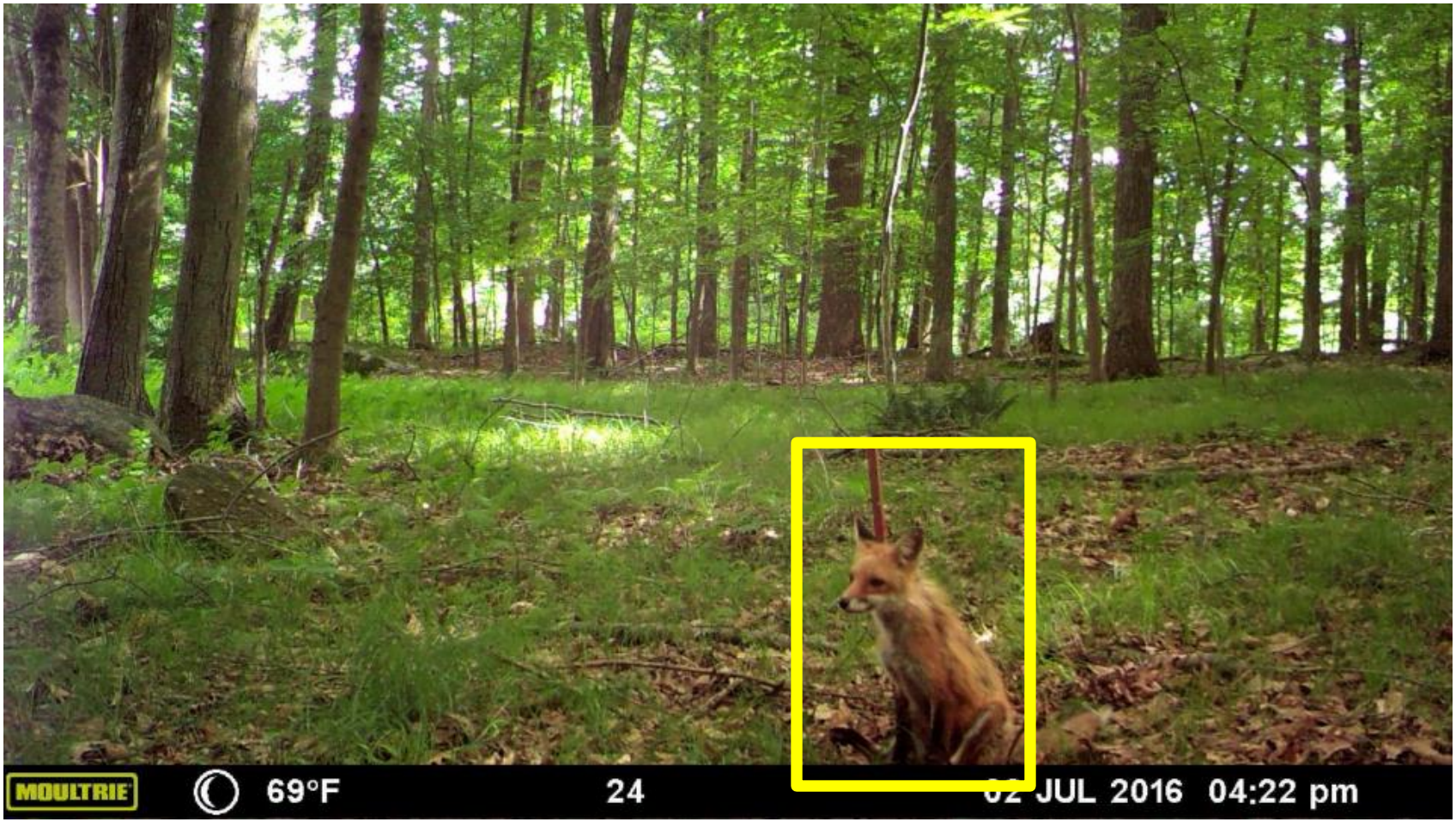

Backyard Photo

Backyard Photo

Woodland Photo

Woodland Photo

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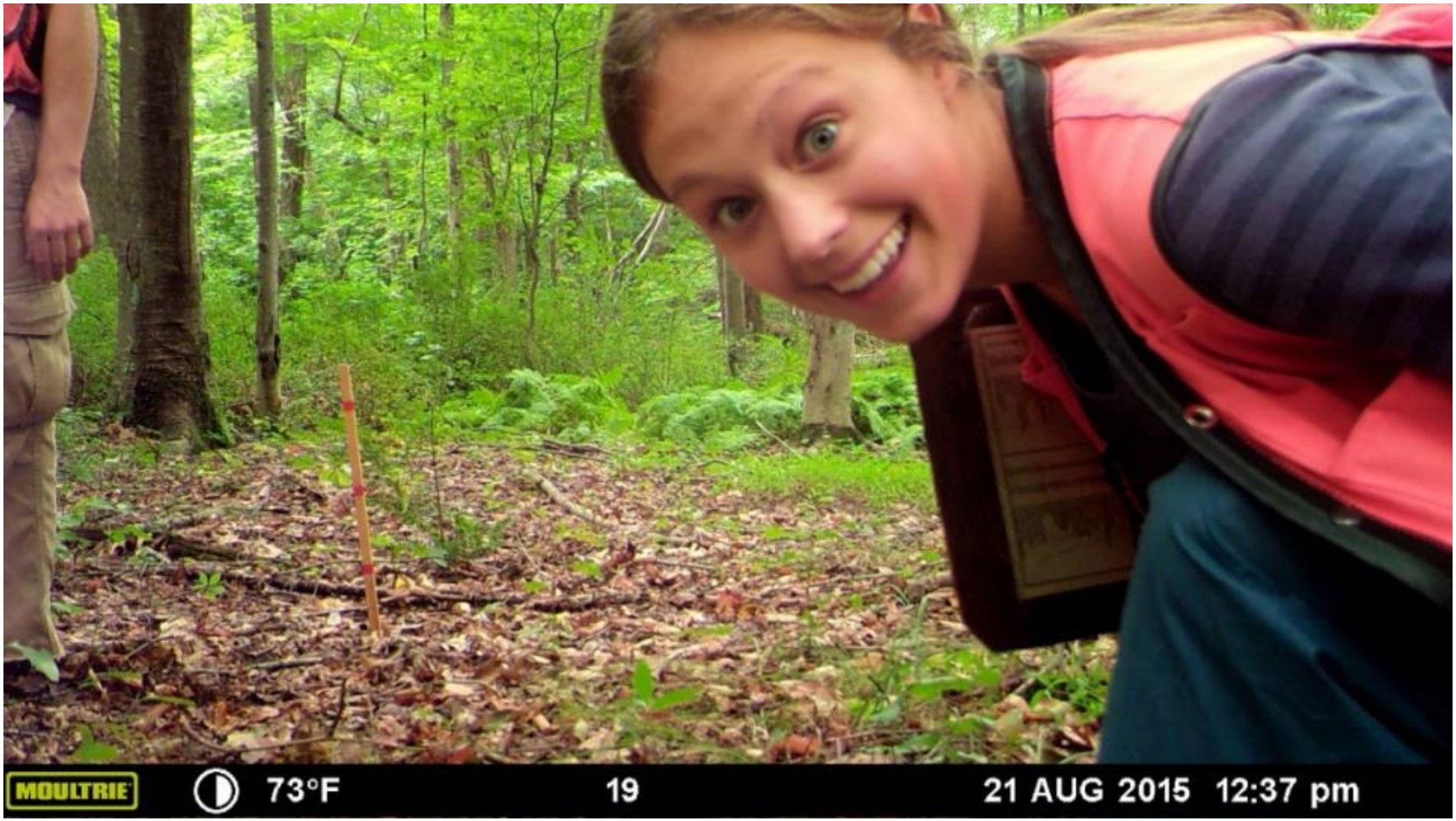

Woodland Photo

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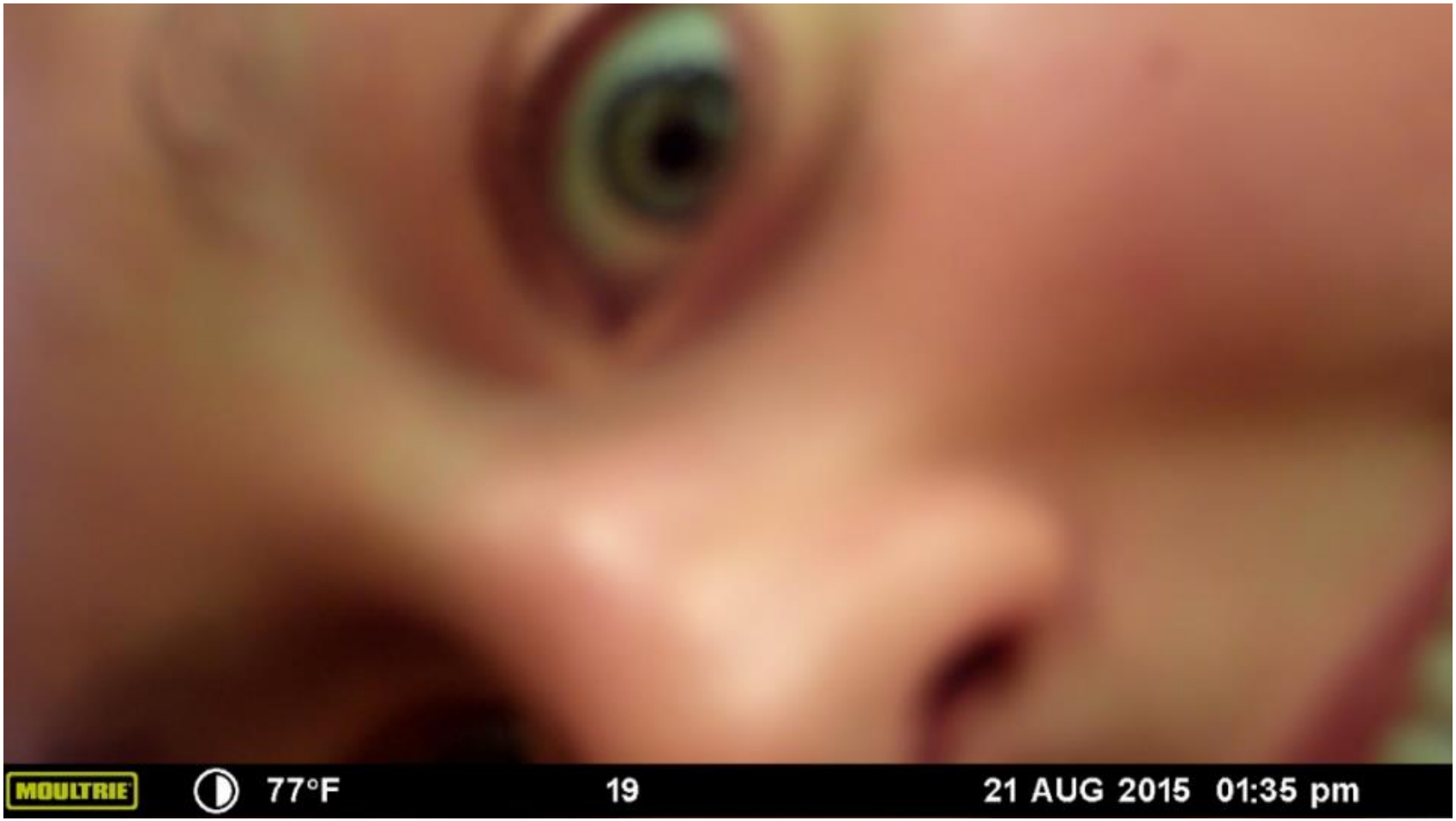
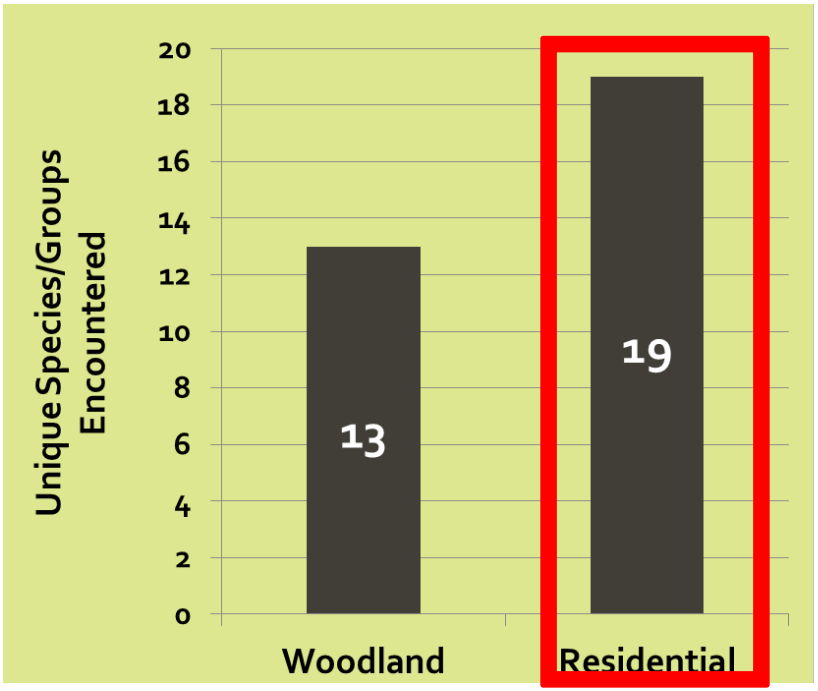
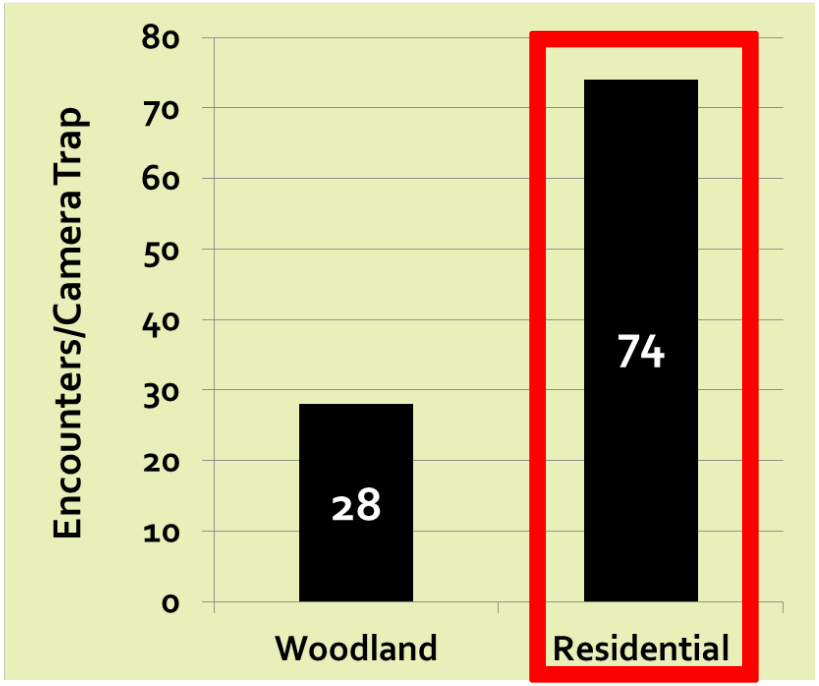


Backyard Photo

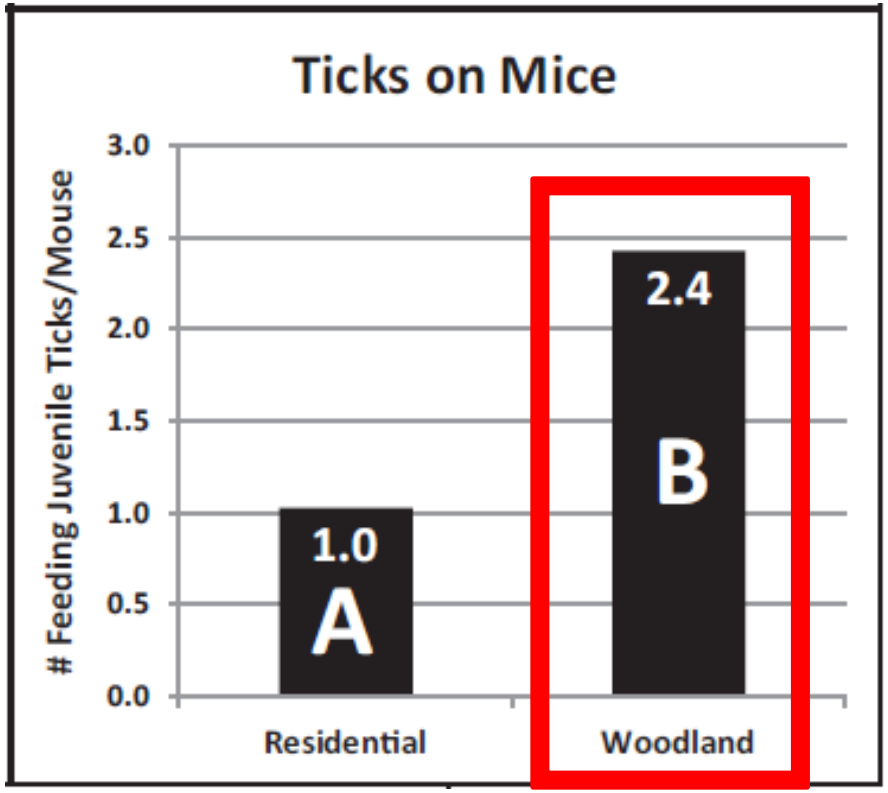
Differences between Landscapes





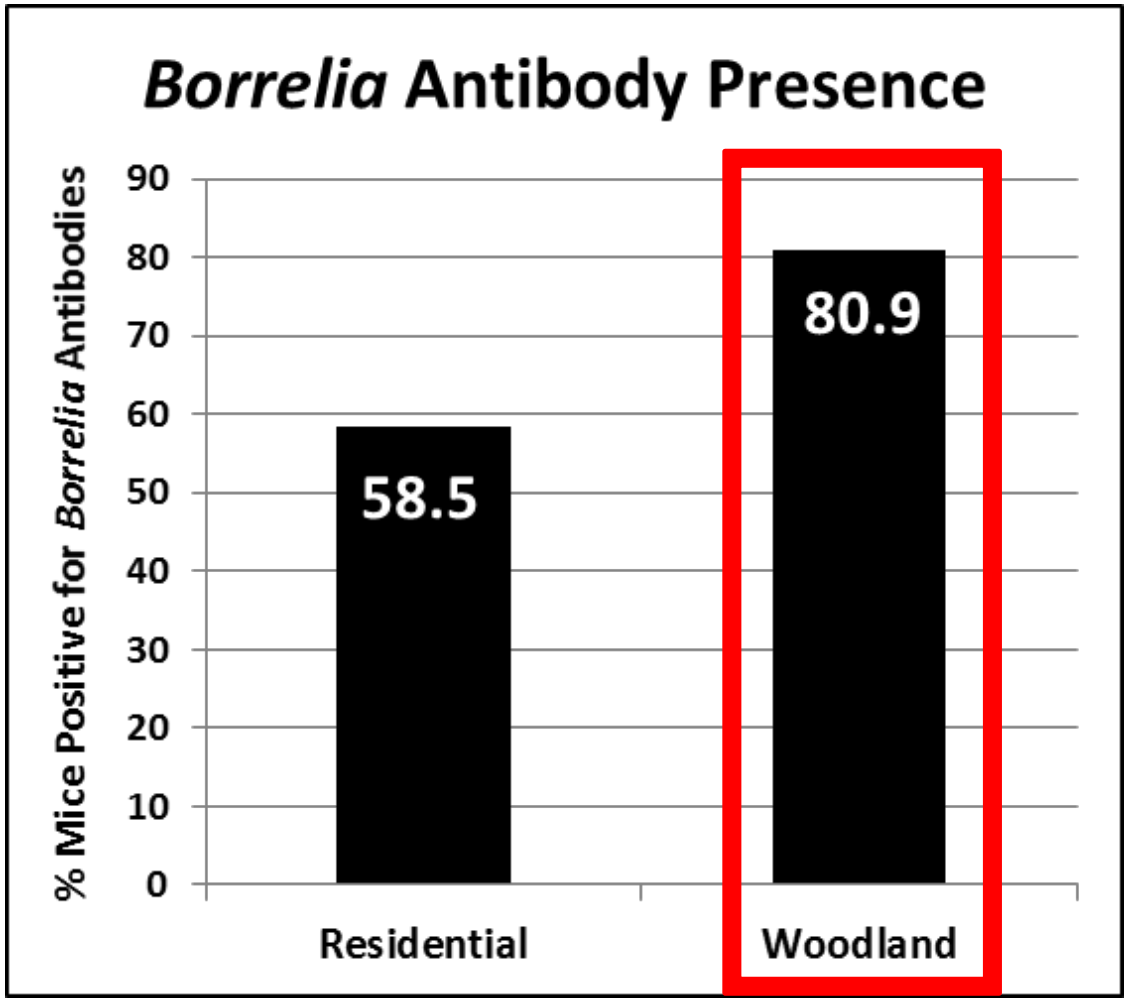
- Shows greater diversity and abundance of hosts in residential settings as compared with woodlands

Ticks/mouse Between Landscapes



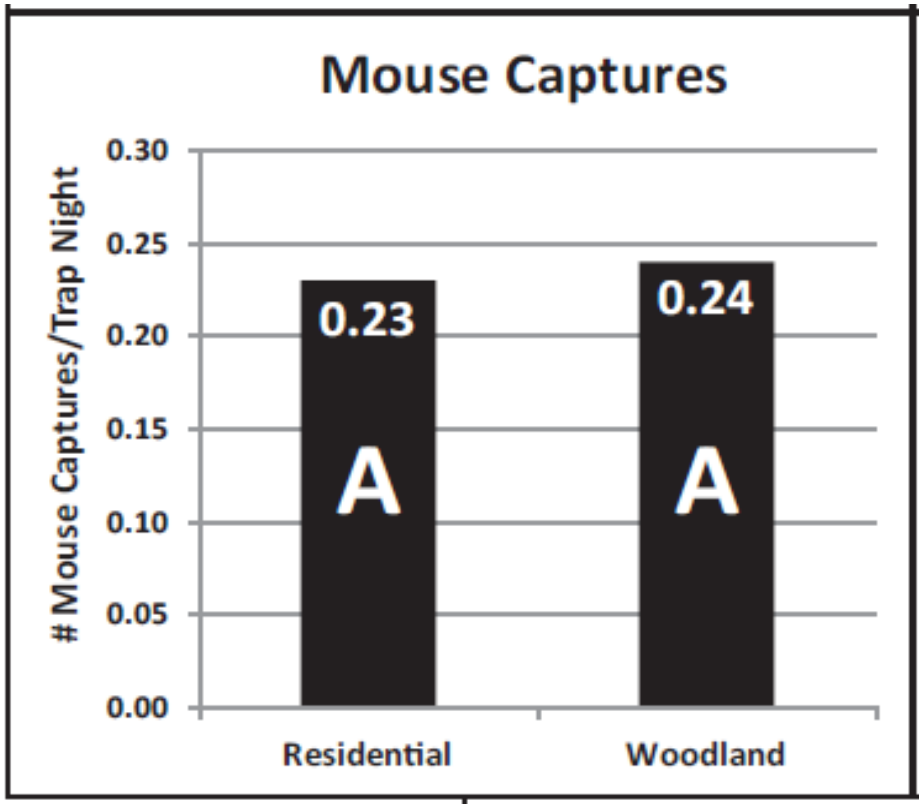
- Suggests a lack of host diversity/ availability in woodlands

Borrelia antibodies in captured mouse blood



- Suggests a lack of host diversity/ availability
- Ticks prioritize bloodmeals on competent mice
- Ramps up infection

Mouse Captures Between Landscapes

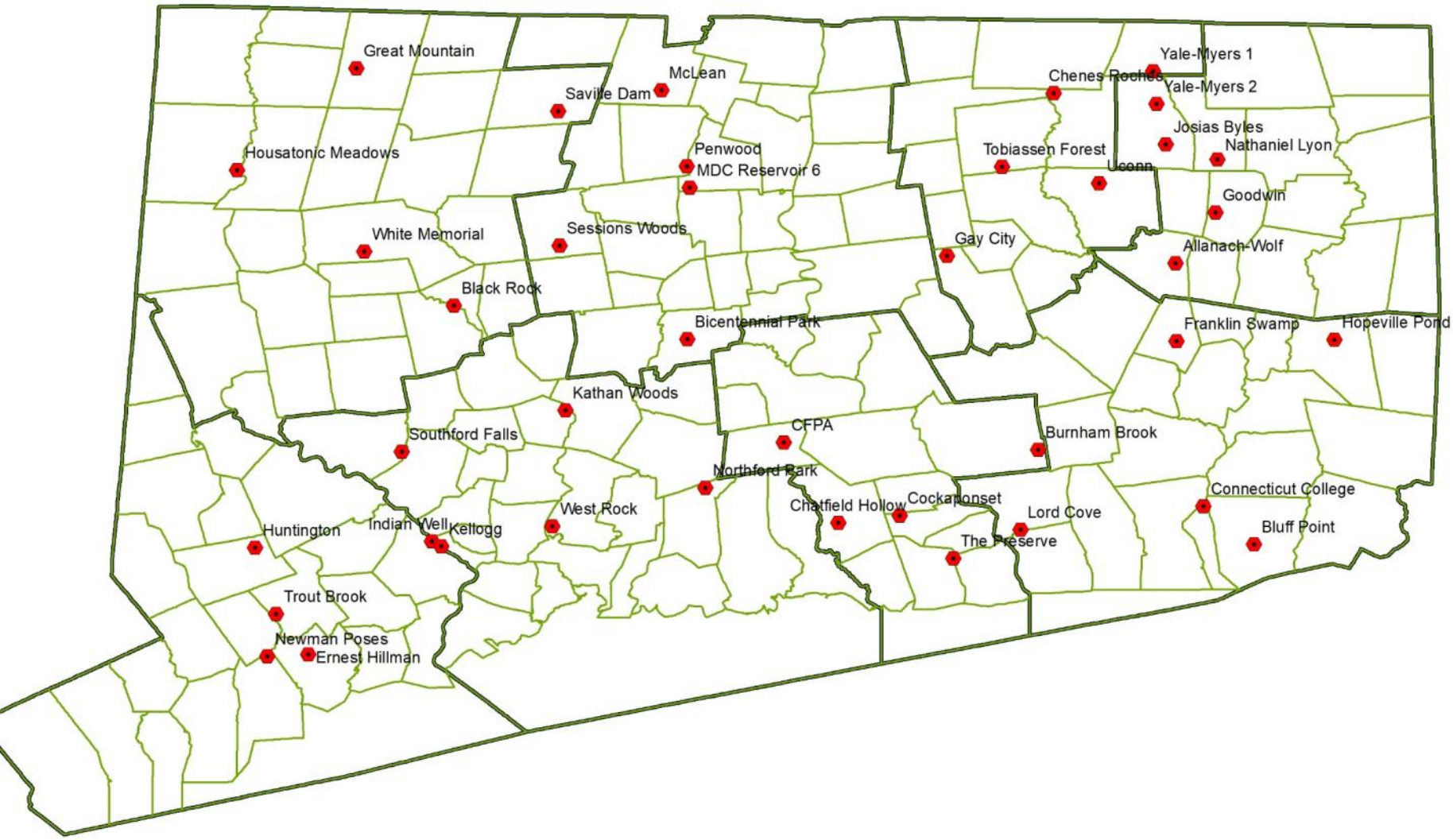


- No difference in mouse abundances between residential and woodland landscapes

In Summary

- Residential areas have better habitat diversity
- Wildlife are responding and living with people
- A diversity of wildlife spreads less disease
- Unhealthy forests harbor more infection and higher tick abundances
- Need better forest management practices

Active Tick Surveillance



Next Steps

- Currently sampling ticks at all 40 locations
- Eventually will quantify a measure of forest health at each site
  - Invasive plants
  - Tree species, age, abundance
  - Understory vegetation
- Then be able to compare forest health with tick abundance

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