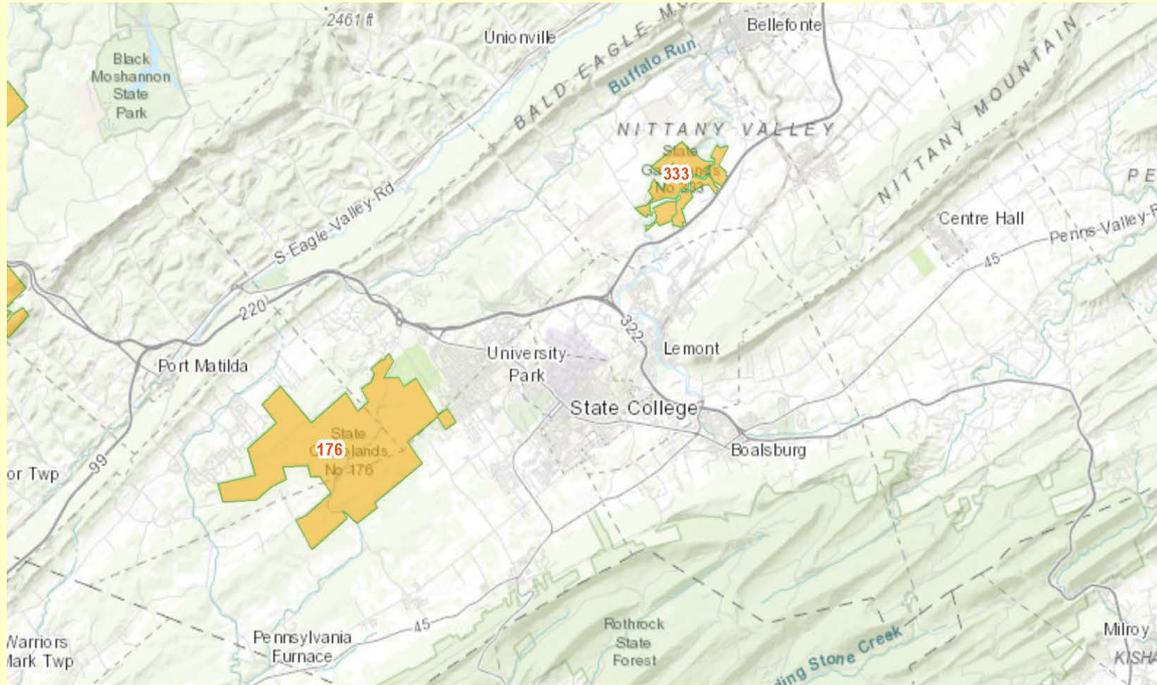


Scotia Barrens





Human History

- Muncy Tribe (Delawares) prior to 1728
- Shawnees until 1768
- 1770 – Thomas Smith – surveyor named the area “the great Pine Barrens”
- 1784 - Abraham Elder - first white settler
- 1800 – Tussey Furnace Lands
- PA Furnace Company and others – charcoal and iron ore
- 1884 – Tyrone Mining and Manufacturing Company
- 1885 – PA Railroad to Scotia – frequent fires
- 1900 – Carnegie Steel Company
- 1903 – D.M. Bare Paper Company and others – by 1918 clearcut
- 1942 – PA Game Commission – 5,811 acres – SLG176

1942



2012



1942



2012



Vegetation and Wildlife



- Scrub oak – pitch pine community.
 - Largest remaining patch in PA
 - (963 acres) occurs on SGL 176
- Oak woodlands (degraded)
- Aspen
- Frost Pockets
- Designated as an IBA and IMA
 - SGCN: GWW, App. Cottontail
- Several T&E Plants



Management Goals

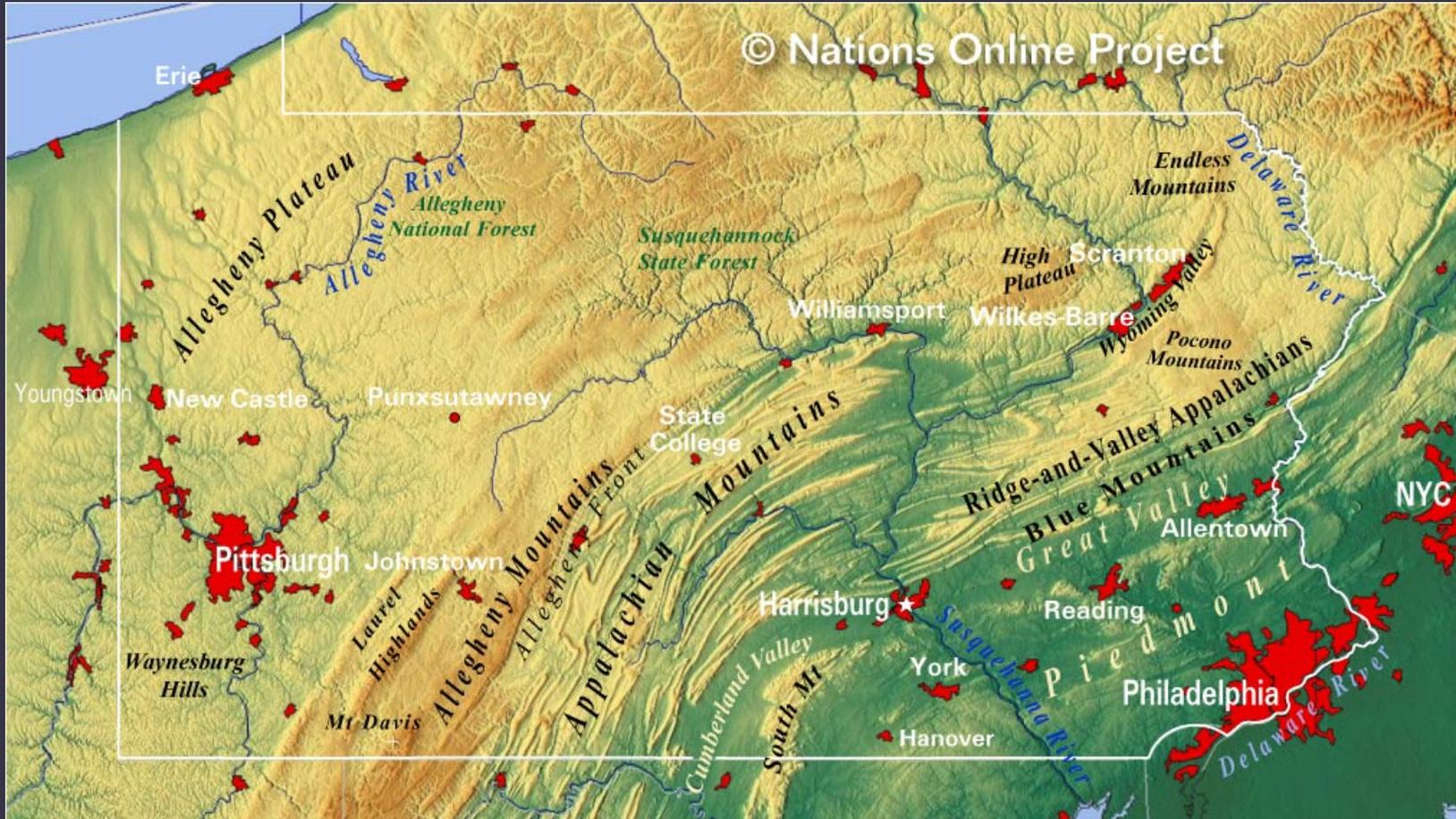
- Pitch Pine/Scrub Oak
- Oak Woodland
- Oak Regeneration – Better Quality Sites
- Aspen

Challenges: People, Invasives, Infrastructure, Equipment/Training



FIRE!

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PRESCRIBED BURNING PRACTICES ACT

Act of Jul. 14, 2009, P.L. 76, No. 17

Cl. 27

AN ACT

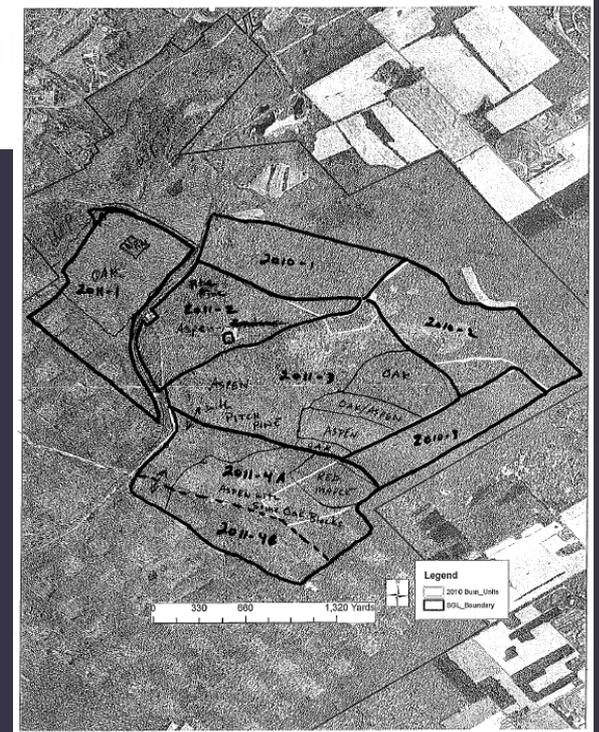
Regulating prescribed burning practices; providing for the powers and duties of the Department of Conservation and Natural Resources and the Department of Environmental Protection; and establishing certain immunities.

The General Assembly of the Commonwealth of Pennsylvania enacts as follows:

Section 1. Short title.

Boots on the Ground Meeting:

- No set protocols – legislation passed in 2009
- Safety, Logistics
- Large burn for us at time
- People were not used to fire
- Crew was very green



Public Outreach

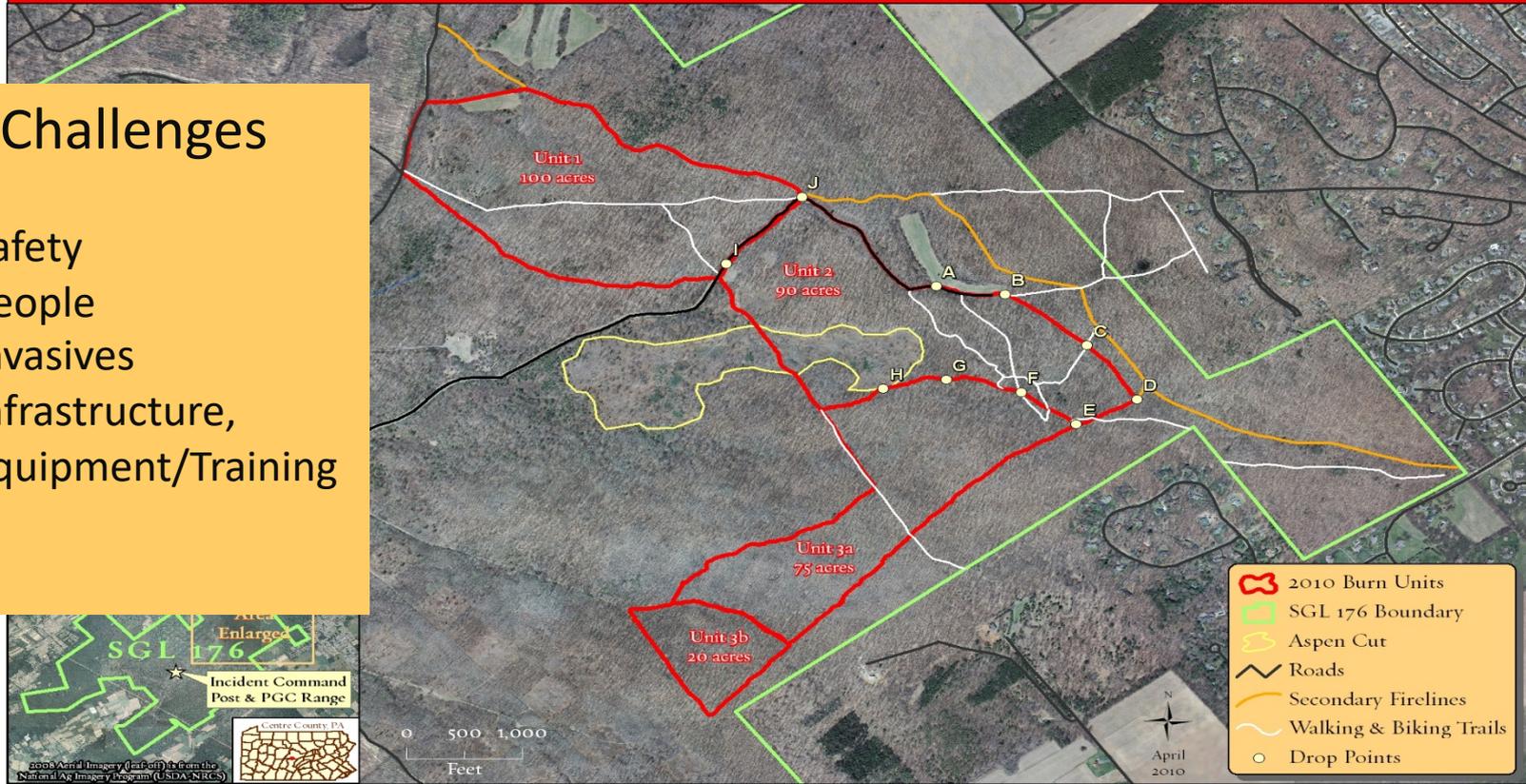
- Biggest effort made to date
- Total support from local Government
- Public used Scotia as a park
- All out effort to bring in support
- PennDOT put up highway signs

**Centre Region Council of Governments
Office of Emergency Management**

**Event Action Plan
for
SGL 176 Prescribed Burn
April 6th – May 8th**

Challenges

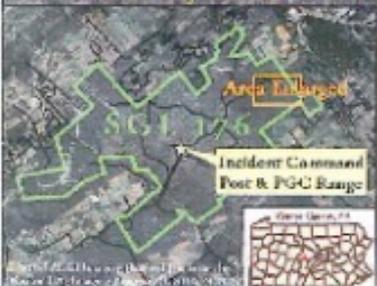
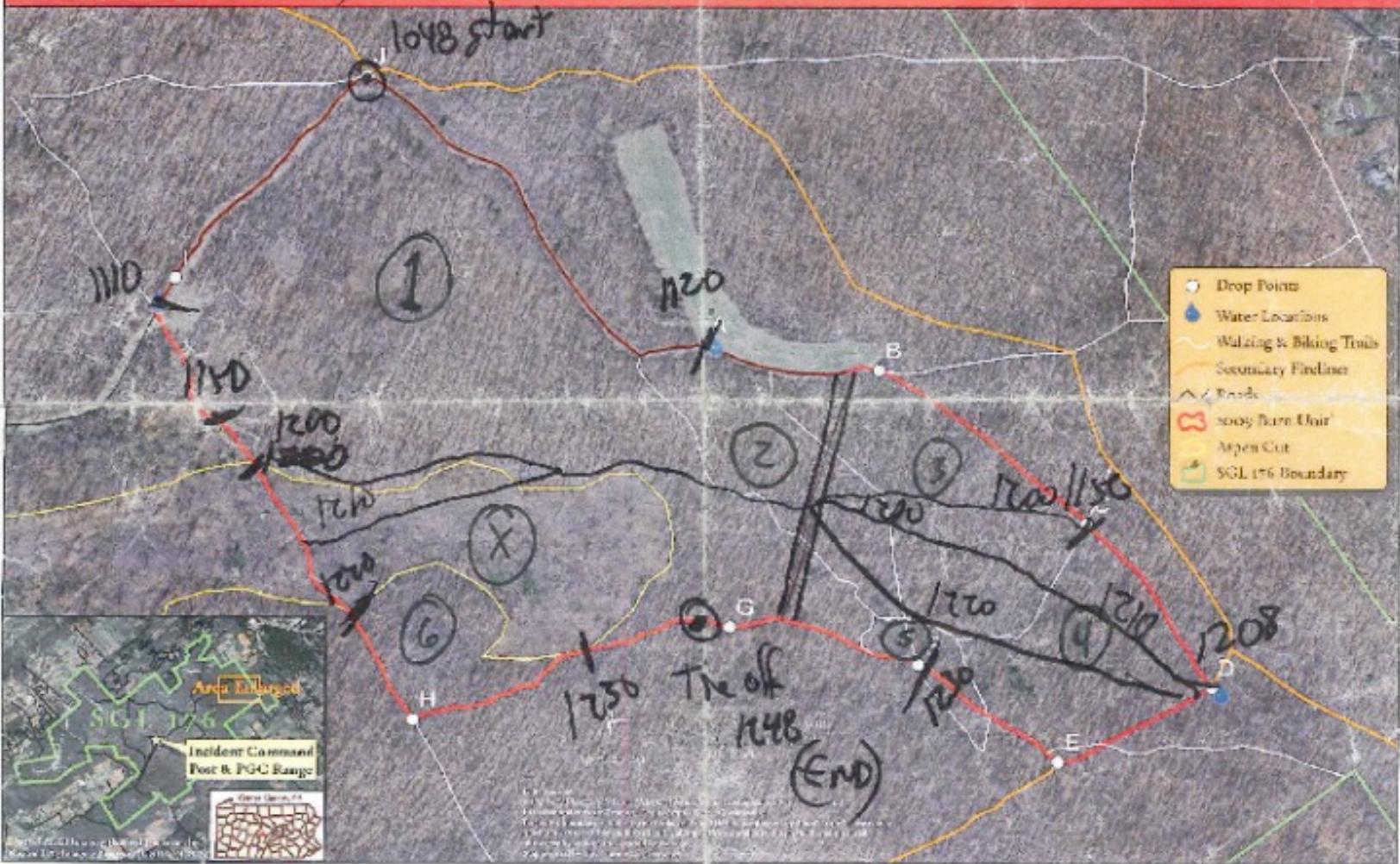
- Safety
- People
- Invasives
- Infrastructure,
- Equipment/Training





Burn Day
April 1, 2010

PREScribed BURN ON STATE GAME LAND 176



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Post burn

- media follow-up was quick and positive
- No smoke issues reported

Quick recovery

June 5, 2010 10:40pm EDT

Seeds fluttered from a charred pitch pine cone. Dwarf ginseng, wild indigo, whorled pogonia, orchids and other plants sprouted from the blackened forest floor. Six to a dozen or more vigorous scrub oak shoots were growing — replacing each that had



Photos for the CDT/Mark Nale

Pennsylvania Game Commission biologist Mike Pruss examines one of the many wild indigo plants that were sprouting from the blackened Scotia Barrens forest floor after 300 acres of State Game Lands 176 was the subject of prescribed burns in April.

[View larger](#)



burned. A small toad searched for insects among debris, and butterflies were in the air.

If you

are looking for the death and destruction that resulted from the recent controlled burns at the Scotia Barrens, you will have a hard time finding it. Lush new growth is springing from the ashes as a rare plant and animal community rejuvenates itself.



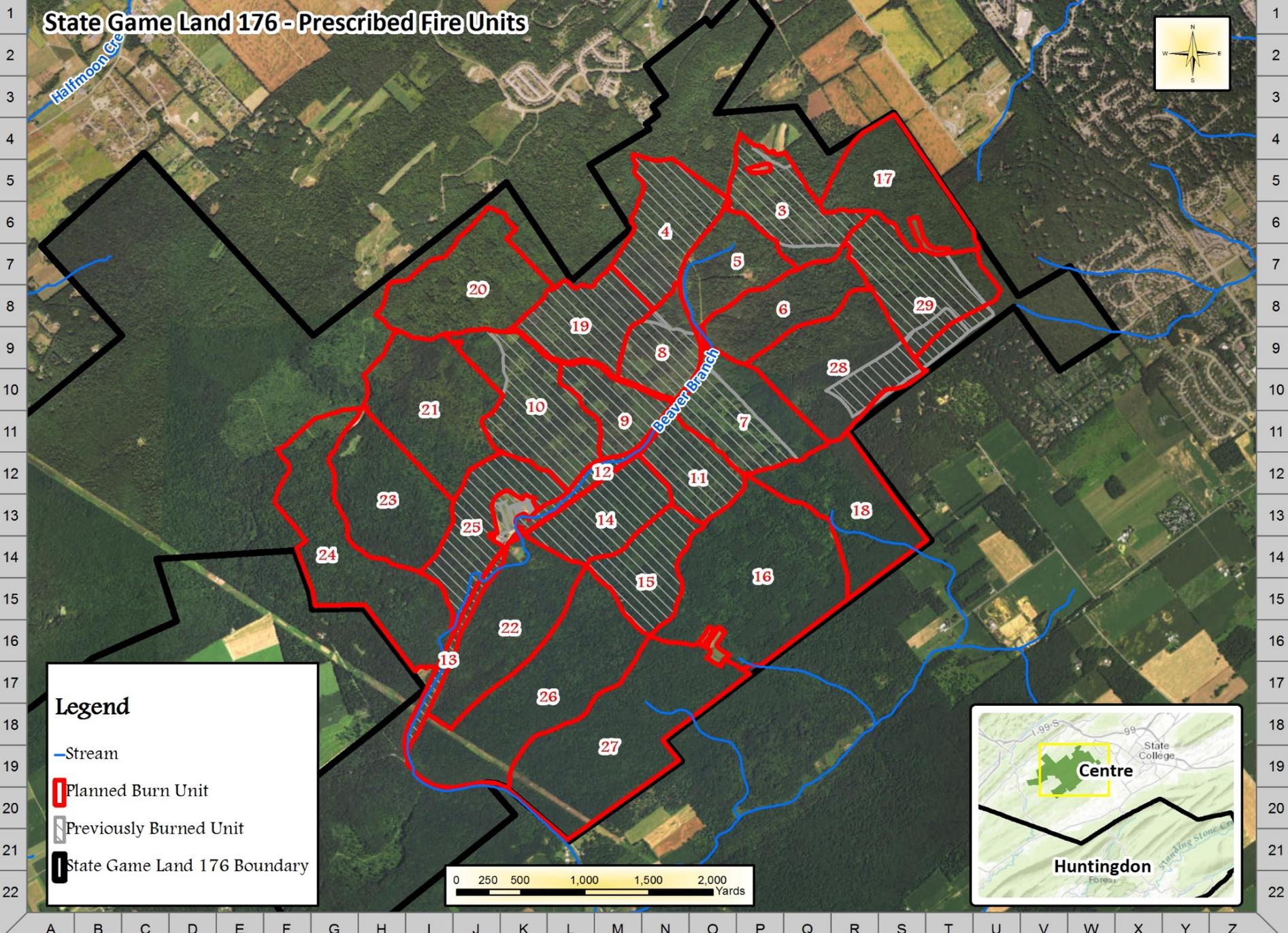
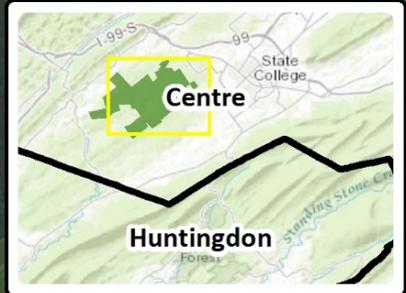
Lessons
learned

State Game Land 176 - Prescribed Fire Units



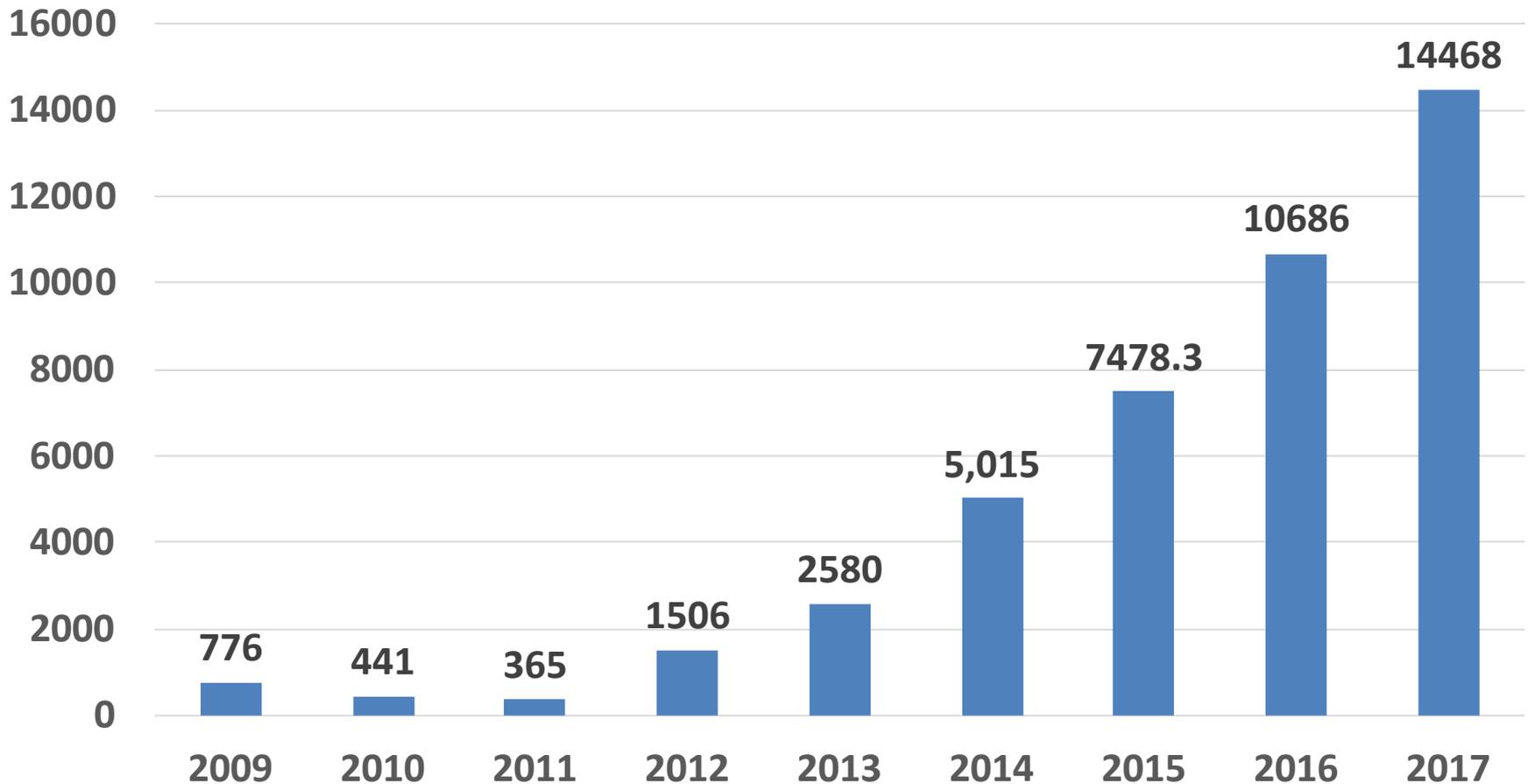
Legend

- Stream
- Planned Burn Unit
- Previously Burned Unit
- State Game Land 176 Boundary





Acres Treated with Prescribed Fire





- 215 Qualified (of Approx. 270 Habitat Management Staff)
 - Entry Level Crew Member – 127
 - Squad Boss – 49
 - Firing Boss – 20
 - Burn Boss 3 (Low Complexity) – 11
 - Burn Boss 2 (Moderate) – 6
 - Burn Boss 1 (High) – 2
- Only 1 full time fire position
- Working with WRI and Smoked Goose to provide contract Burn Bosses during spring season





Key Pieces to Making This Happen

1. Drive and support within the agency
2. Funding – Pitman Robertson
3. Partnership with The Nature Conservancy





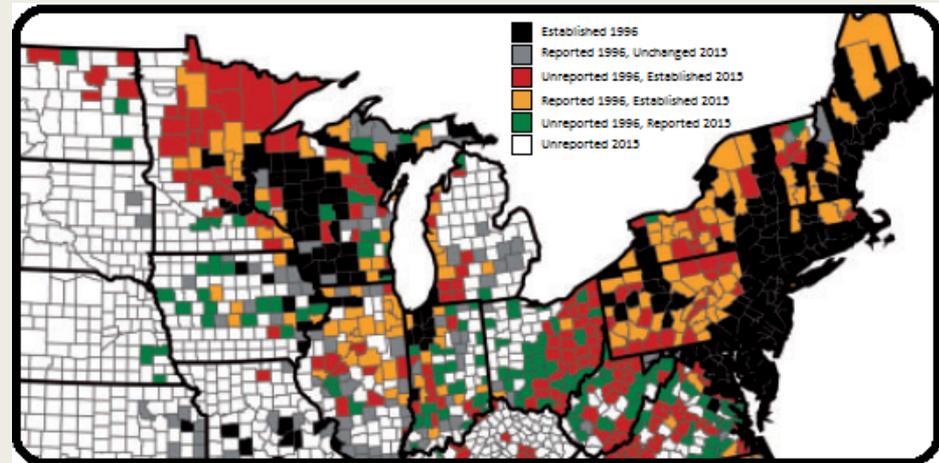
PRESCRIBED FIRE AND DEER TICKS



Shane Tripp

Lyme, Ticks, & Fire

- Lyme disease and deer tick's expanding geographic ranges
- Fire suppression
- Dispersal, establishment, and population growth
- Prescribed fire



Northeastern United States Deer Tick Range
Expansion Map
Inset from Eisen, Eisen, and Beard (2016)

Tick Habitat Suitability

- High humidity
- Hardwood dominance
- High shrub density
- Deep leaf litter
- Host presence



Tick Control with Prescribed Fire

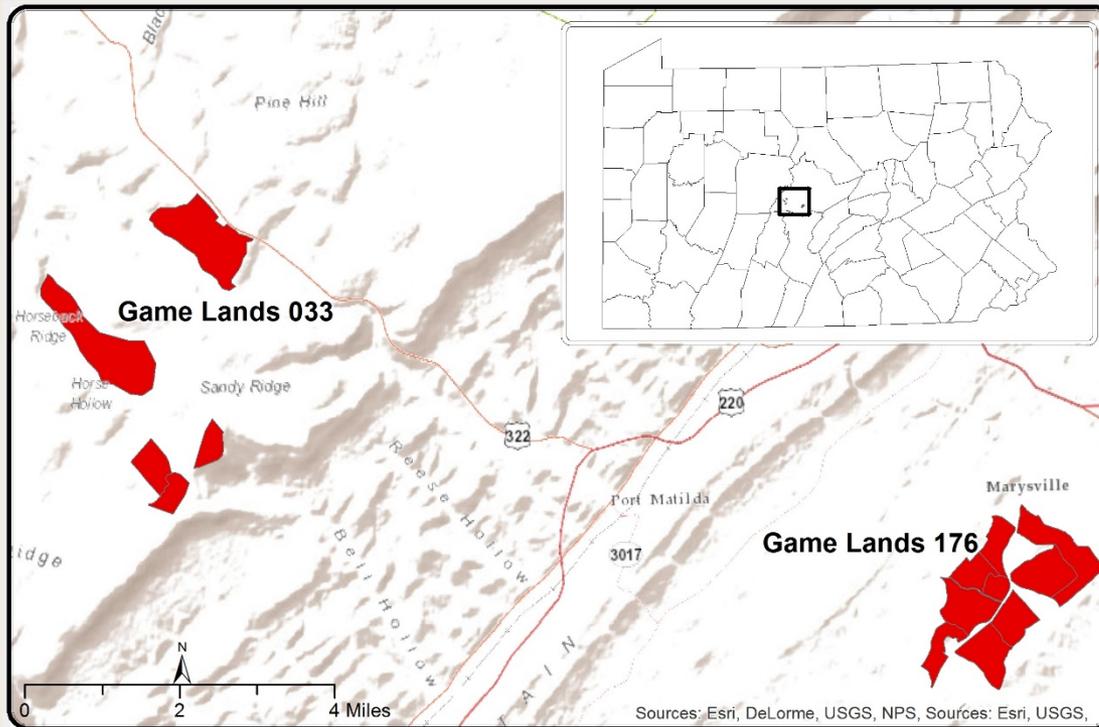


- Post-burn die-off
- Fire effects
- Recolonization uncertainty

Other Examinations of Prescribed Fire's Effects on Ticks

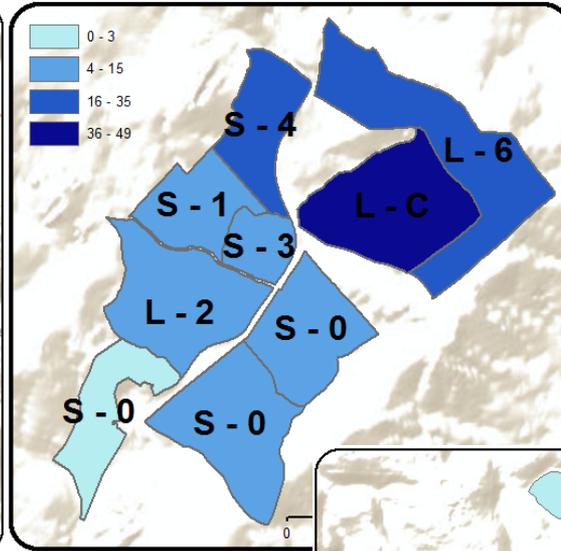
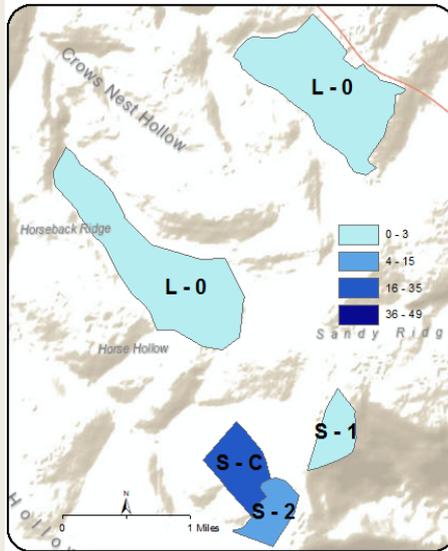
- Inconclusive results, conflicting studies
- Importance of realistic management conditions
- Burn size and frequency
- Gleim et al. suggest 'that regular prescribed burning is an effective tool for reducing tick populations and ultimately may reduce risk of tick-borne disease'(2014)

Central Pennsylvania Scotia Barrens



- Fire-dependent barrens habitat burnt since 2010
- Open canopies, low vegetative densities, thin leaf litter, high habitat heterogeneity
- Fire suppression effects

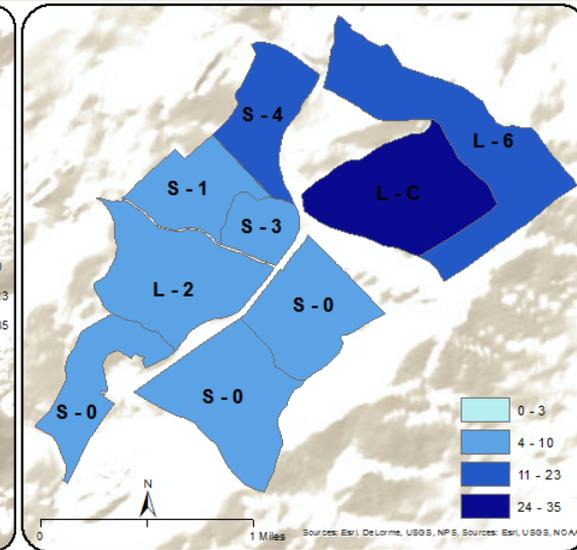
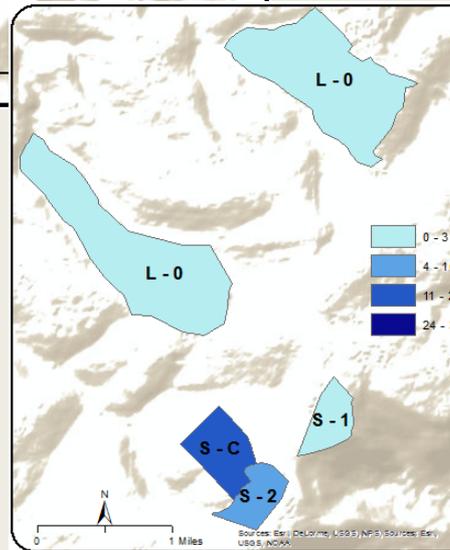
Summer



- Sampled from 8240 acres in 2016
- 316 ticks from 42 100 m² sample plots
- Tick density means: 4 in summer, 5 in fall, range from 0 to 19
- Collected data on canopy closure, understory density, leaf litter depth, temperature and relative humidity

Fall

- Examined recolonization rates, unit size effect, unit clustering
- Tick densities in units burnt over 2 years prior recorded **statistically significant** lower densities than in unburnt units



Tick densities may remain significantly lower several years post-burn!

Limitations and Improvements

- Purpose of a pilot study
- Funding & research assistants
- Annual data collection over several years
- 033 & 176 equivalence
- Intensive and strategic sampling
- Rodent and deer densities
- Slope, aspect and elevation
- Precise measurement methods for canopy cover, understory density, & soil type

- Repeat this study in different common ecosystems with uniform methodology
- Construction of a generalized model for predicting burning's effect on tick densities



Implications for Management

- Lyme disease risk reduction as a fire management goal
- Public perception of fire
- Landscape-scale habitat unsuitability may be key to block post-fire population recovery
- Elimination of source populations and inhibiting dispersal
- 'Human' environments and nearby natural areas
- Mechanical and chemical alternatives

Questions?

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