



FIRE MANAGEMENT AND BUTTERFLIES

This historical role of fire



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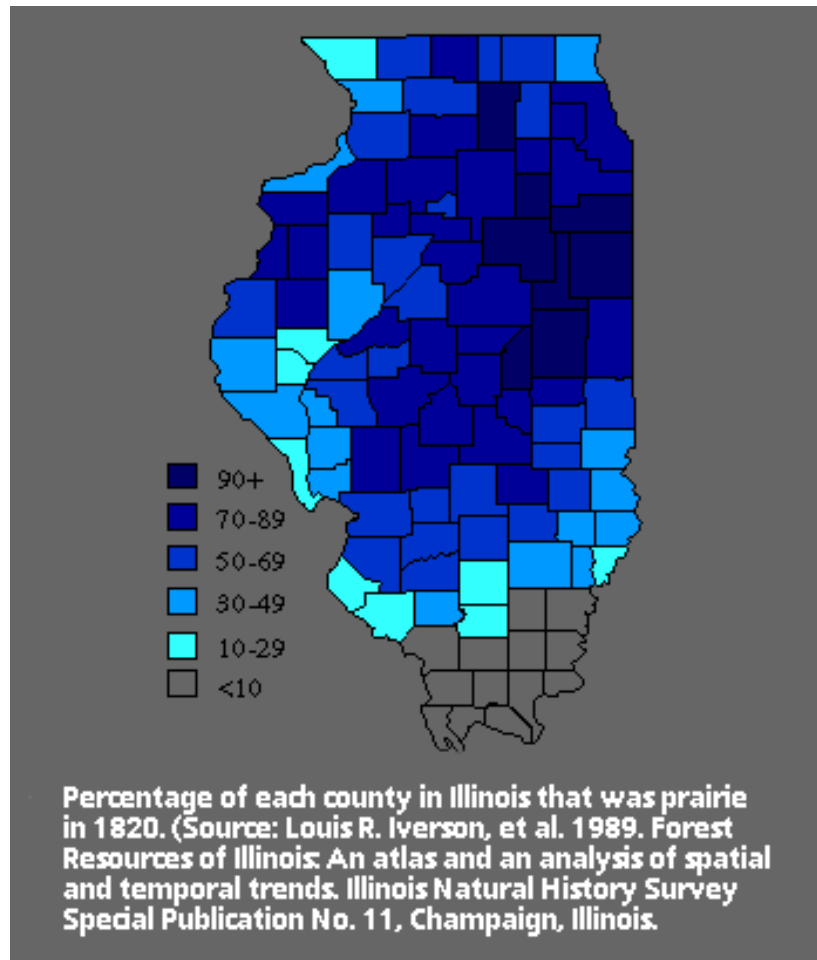


Why prescribed burning is important

- ❑ Controls invasive brush
- ❑ Helps with control of some exotic species
- ❑ Stimulates native plant growth
- ❑ Aids seed germination for some species (fire and smoke)
- ❑ Facilitates management



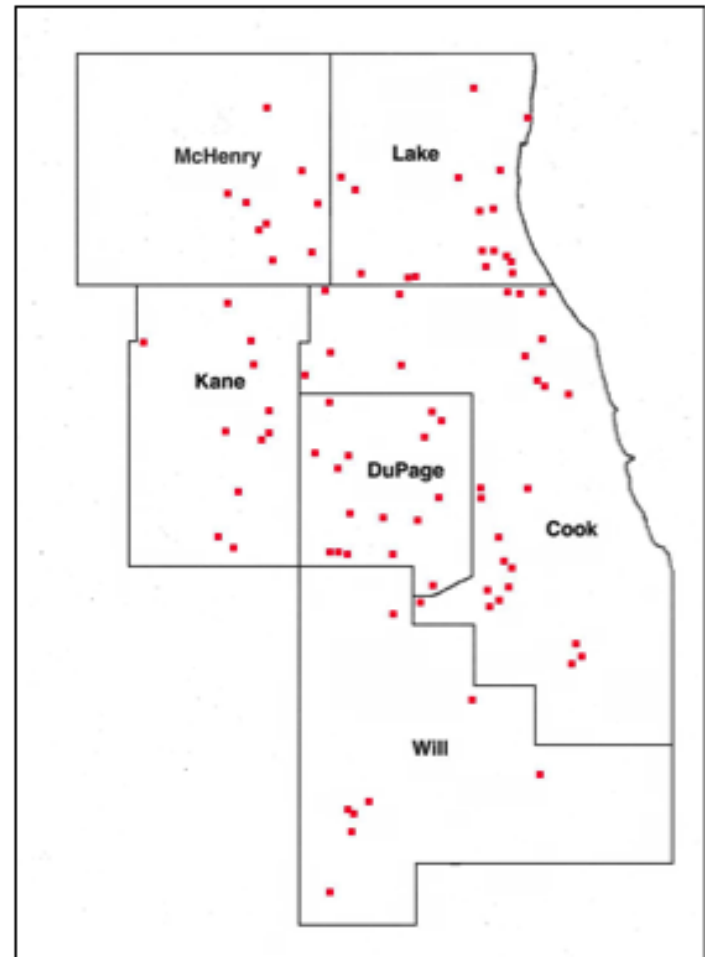
Prescribed burning does not replicate historical fire



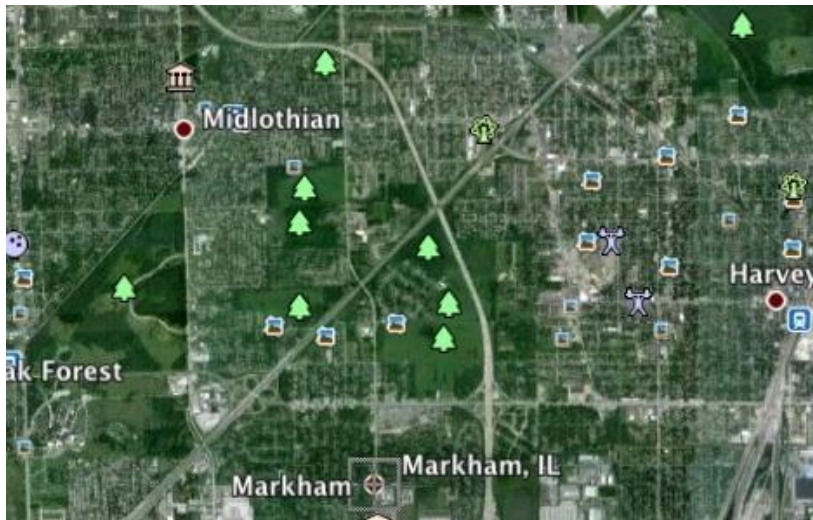
- Historically fires covered large areas
- Large unburned areas adjacent
- Large refugia of unburned areas within burn zone

Prescribed burning does not replicate historical fire

- Modern fire much patchier
- Adjacent unburned areas typically not refugia
- Burned areas may be more uniform and lack unburned refugia



Why Fragmentation Matters



- Over 99.9% of Illinois' prairie destroyed
- Parcels now isolated, surroundings highly unsuitable for specialist species
- Recolonization, metapopulation dynamics highly disrupted
- Local extinctions a risk

The Conundrum



- Fire is an extraordinarily valuable tool
- Approximates historical process
- Some species dependent on it
- Fire often more cost effective than other methods

The Conundrum

- Fire can damage sensitive insects
- Other management techniques are available



I am not without bias on this issue

- Co-steward at Bluff Spring Fen since 1986
- I participate in burns and I do butterfly restoration
- ‘Ecosystem Approach’ to management/conservation



Fire effect on insects: The data

Approach 1

Ann and Scott Swengel

- Surveyed large number of sites with different management techniques
- Compared diversity, abundance of specialist, generalist species on sites with different management histories



Fire effect on insects: The data



Approach 2

Ron Panzer

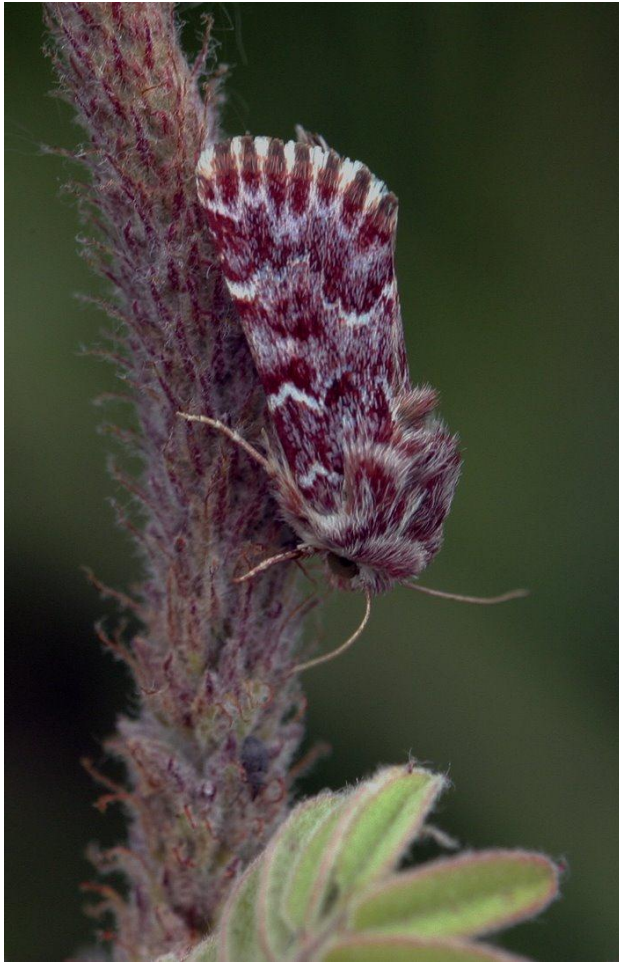
- ❑ Surveyed a smaller number of sites before and after burning
- ❑ Surveyed for multiple years
- ❑ Compared diversity and abundance over time

Insects are Sensitive: the data

- Specialist species lower on sites with burn management
- Specialist species significantly higher on sites managed by haying/mowing
- Regal Fritillaries significantly lower densities on burned sites



Insects are adapted: the data



- Insects rebound rapidly from fire
- 40% of species show initial negative response
- 60% of these rebounded in 1 year
- All 163 populations rebounded in two years

Different species show different susceptibilities

- Species that live in canopy – less so



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- Species that winter in canopy or below ground – less so
- Species that winter in low vegetation – more so



Different species show different susceptibilities

- Species that winter in canopy or below ground – less so
- Species that winter in low vegetation – more so
- Species that winter in leaf litter/duff – more so



The bad news: one size doesn't fit all

- Some sites (for example prairie reconstruction projects) can be burned with little regard for the insects

The bad news: one size doesn't fit all

- Some species have become so isolated that species-specific management is important



The bad news: one size doesn't fit all

- Most cases will fall in between these two extremes.
- Good communications between insect conservation community and restoration/management community will be increasingly essential

