WI Fire History and Fire Effects Research
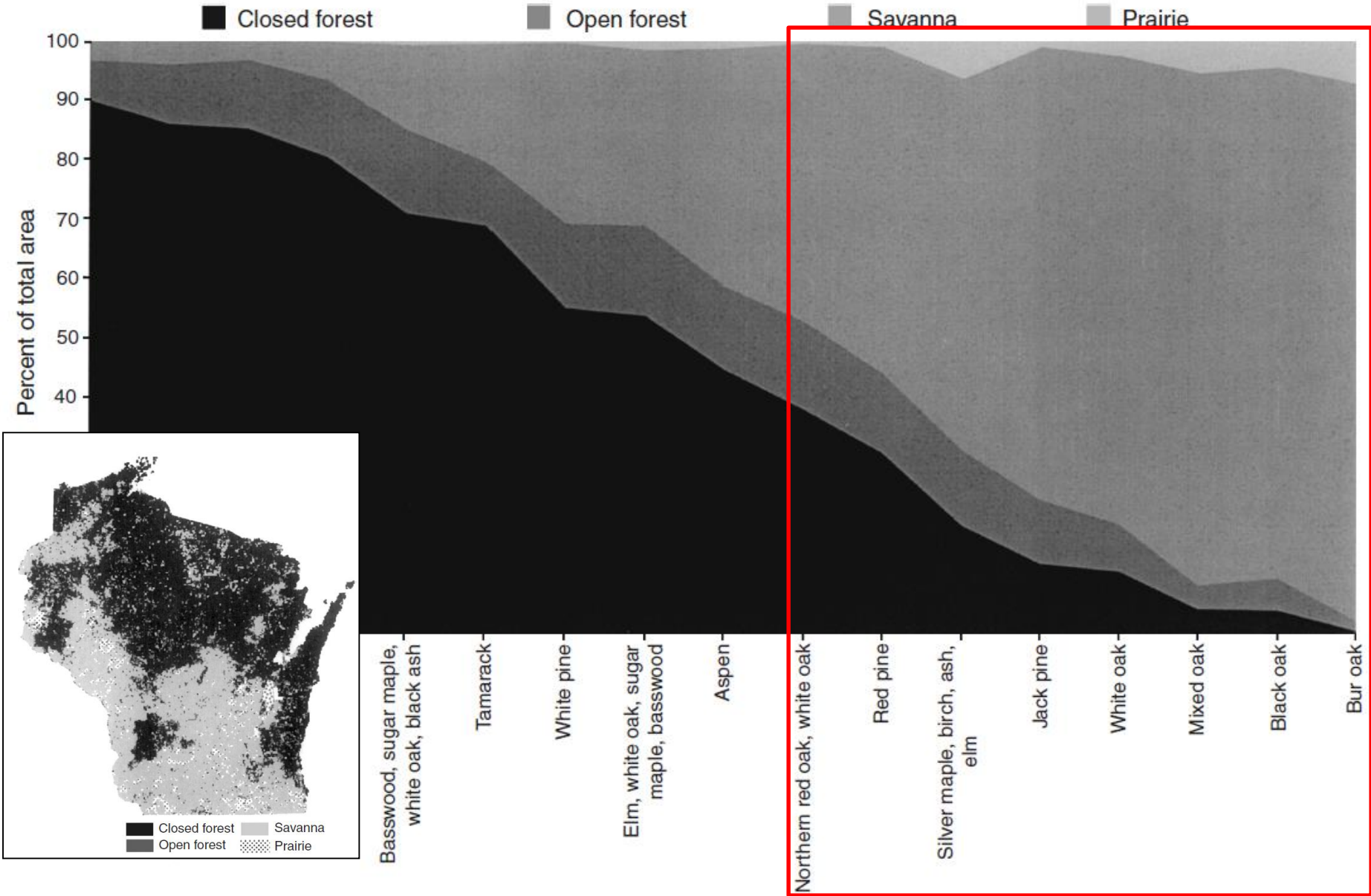
Nathan Holoubek and Jed Meunier

Why is fire important in WI?

Legend
- Prairie or Brush
- Aspen/Birch/Pine
- Oak and Oak Openings
- Pine and Scrub Oak
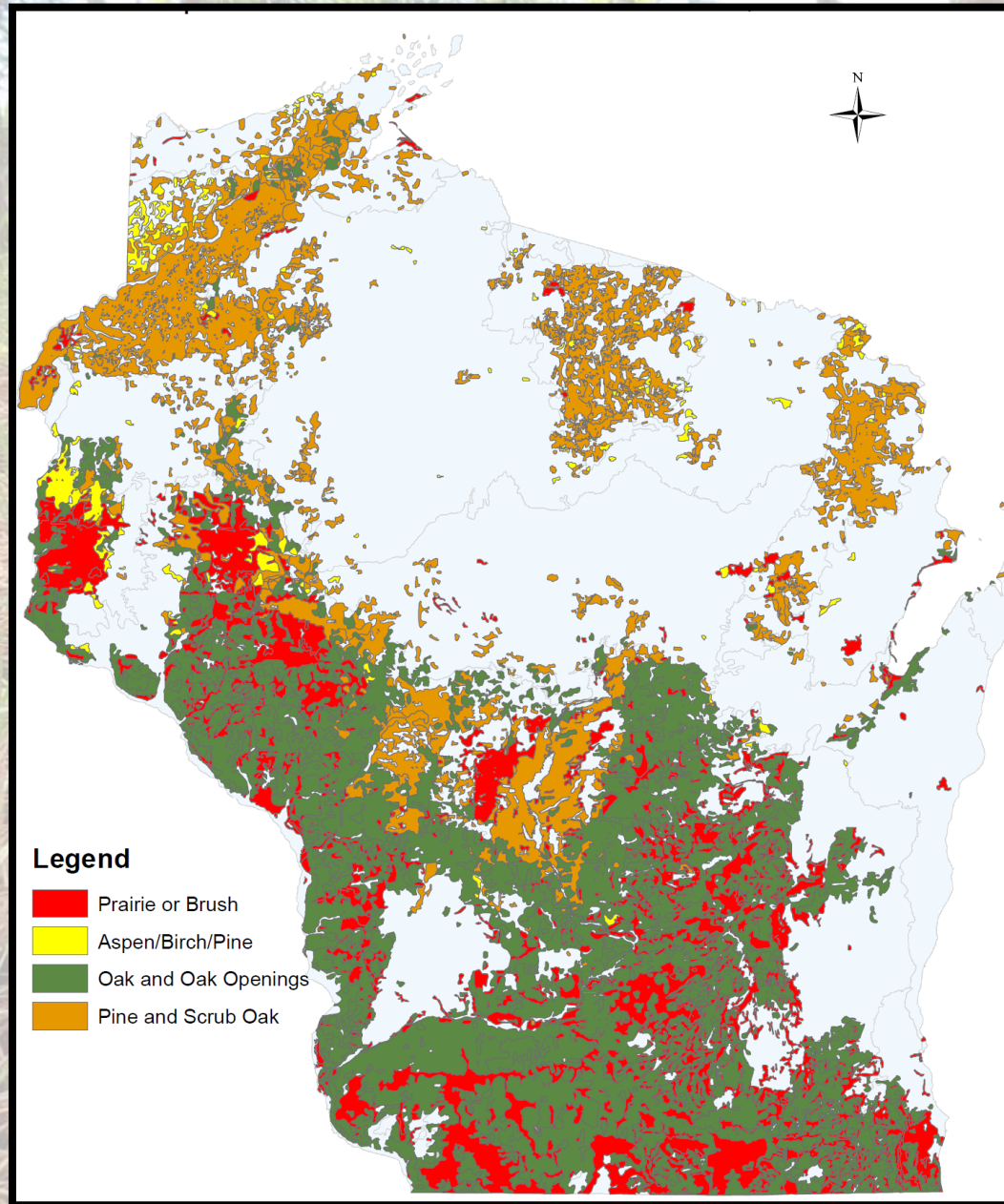
Bollinger et al. 2004

Knowledge from GLO notes

HISTORIC VEGETATION

MAJOR NATURAL DISTURBANCES

FIRE
WINDTHROW

FOREST LANDSCAPE ECOLOGY LAB, UW-MADISON

0   25   50 Miles
0   40   80 Kilometers
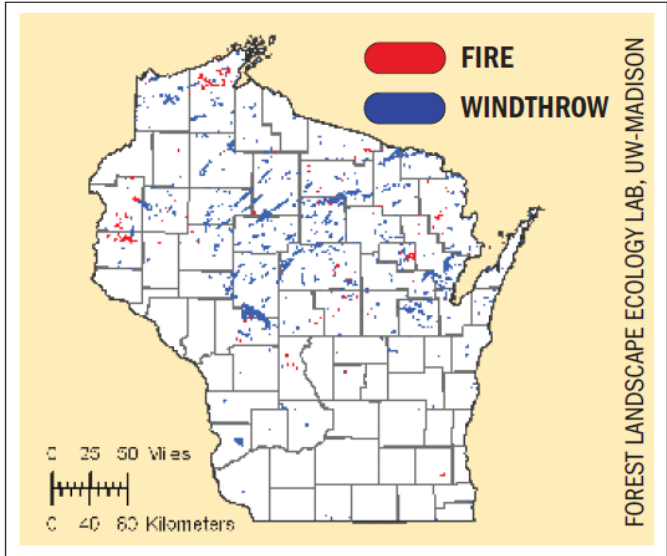
- Severity based on GLO tree density within disturbed and undisturbed patches.
- Only sensitive to stand-replacing fire
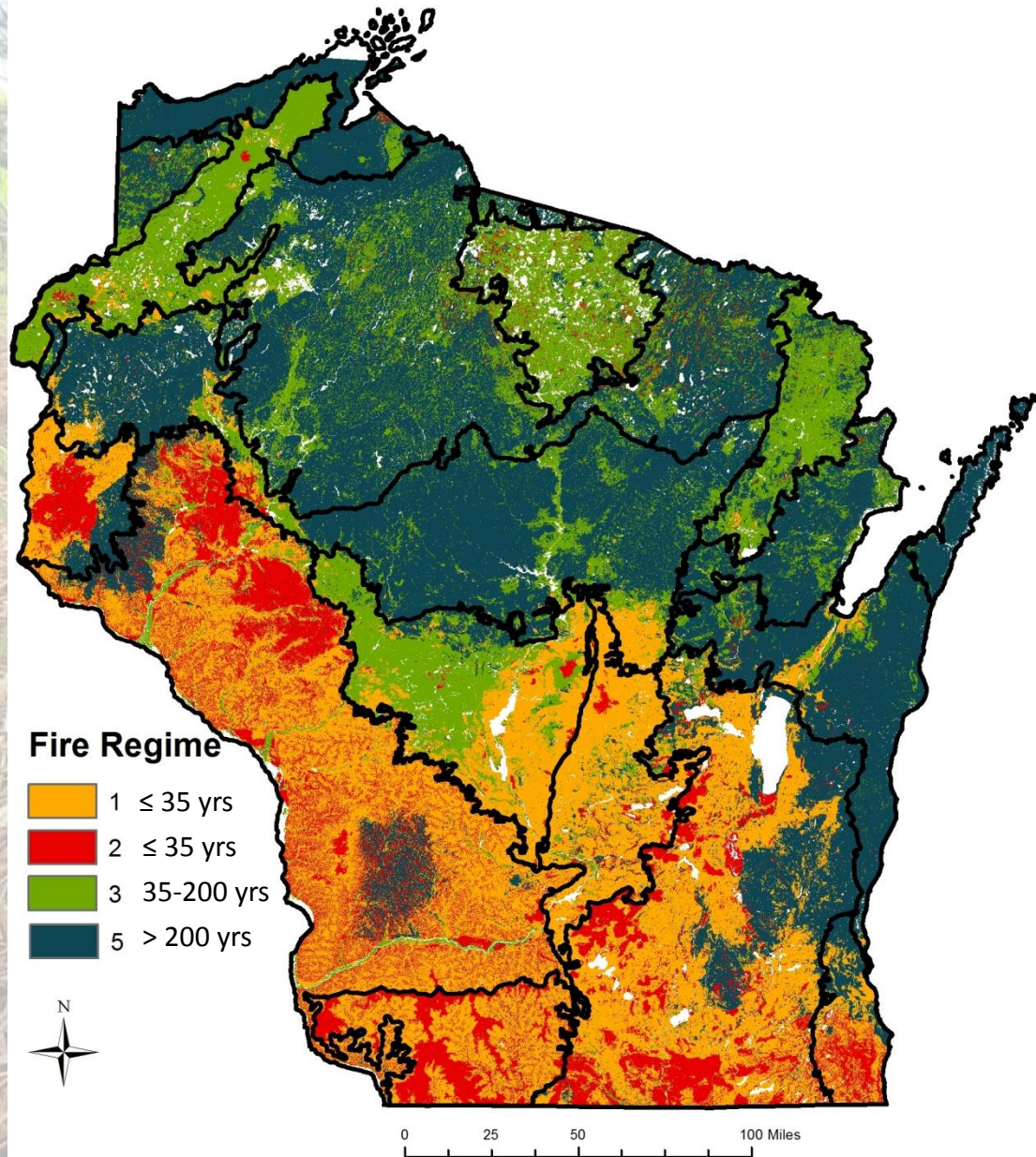
Fire rotation intervals (yrs):
Jack Pine – 488
Red Pine – 810
Aspen/Oak – 1,322
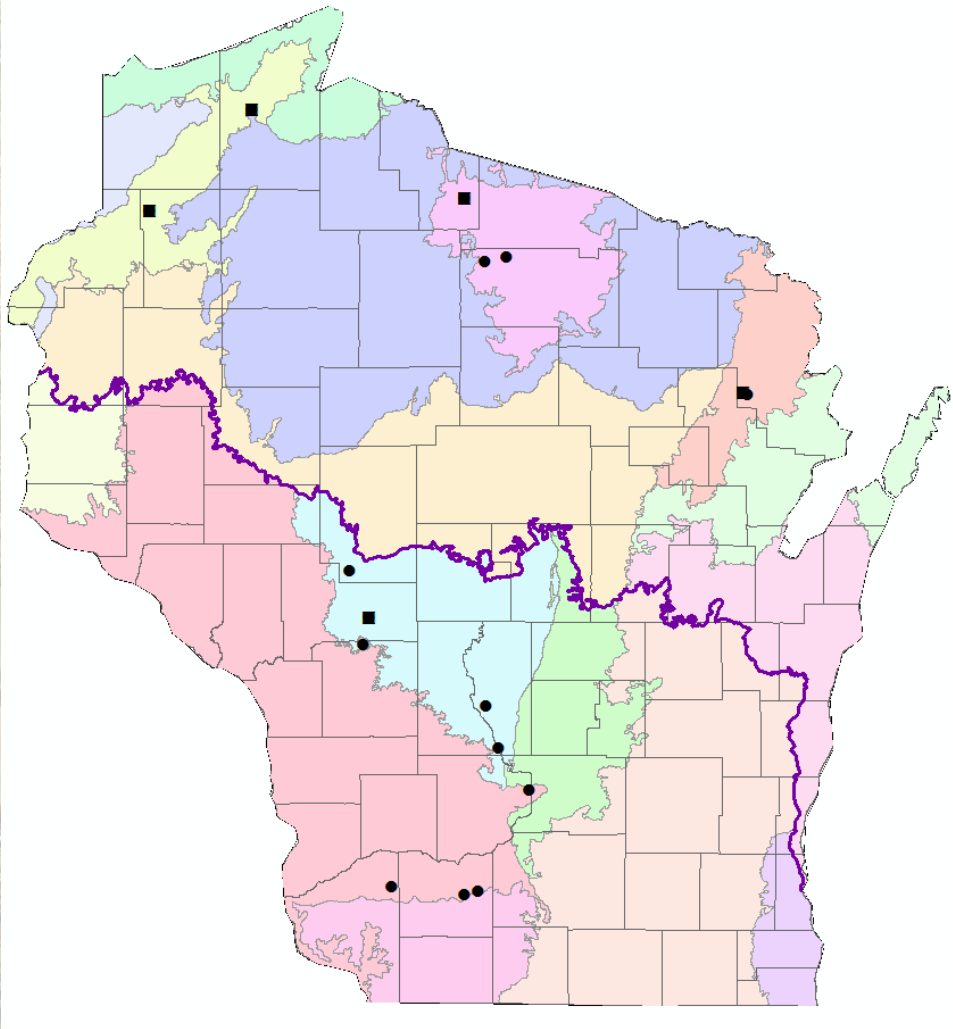White Pine – 3,029

Landfire BioPhysical Settings

Fire Regime

- 1 ≤ 35 yrs
- 2 ≤ 35 yrs
- 3 35-200 yrs
- 5 > 200 yrs

N

0   25   50   100 Miles

The Physical Evidence

The Physical Evidence

Detailed local fire histories over a large geographic scale

- 11/21 fire history sites (8 m radius plots)

- 5/8 stand reconstructions sites (0.5 ha plots)

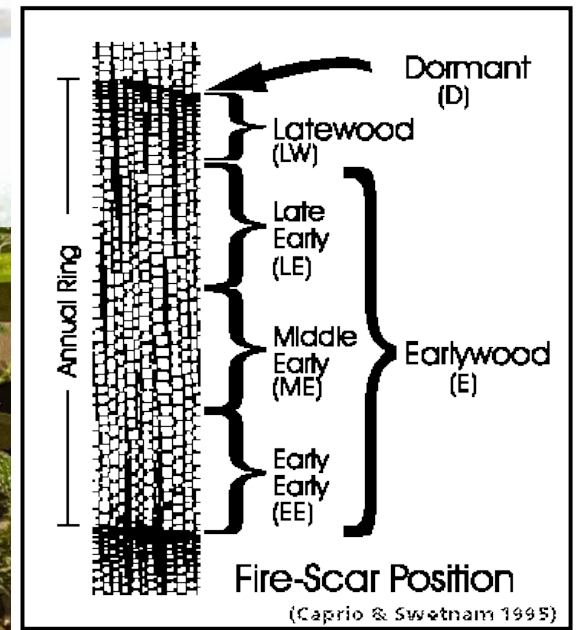- 436 cross sections, 2,380 cores

Historical fires

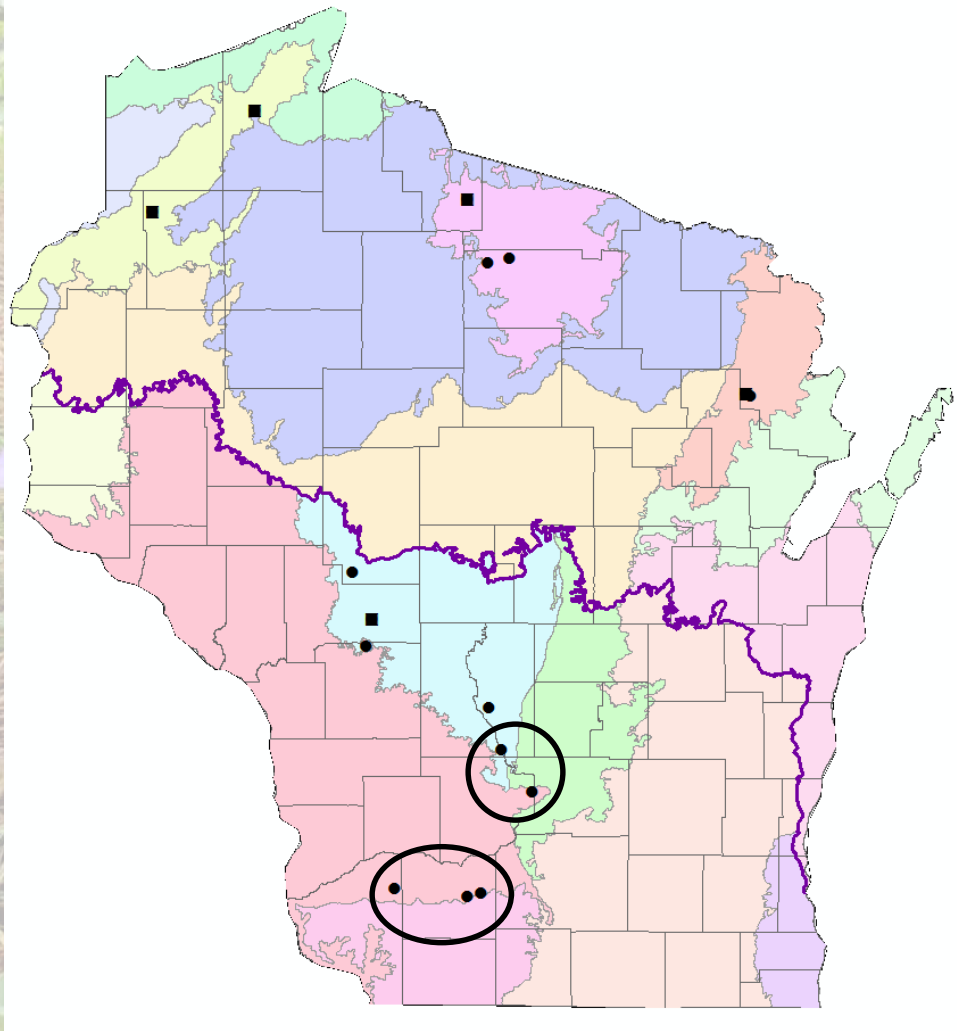1932 1923 1913 1901 1885 1887 1894

Historical fires

Southern Pine Relicts

Southern Wisconsin Relicts
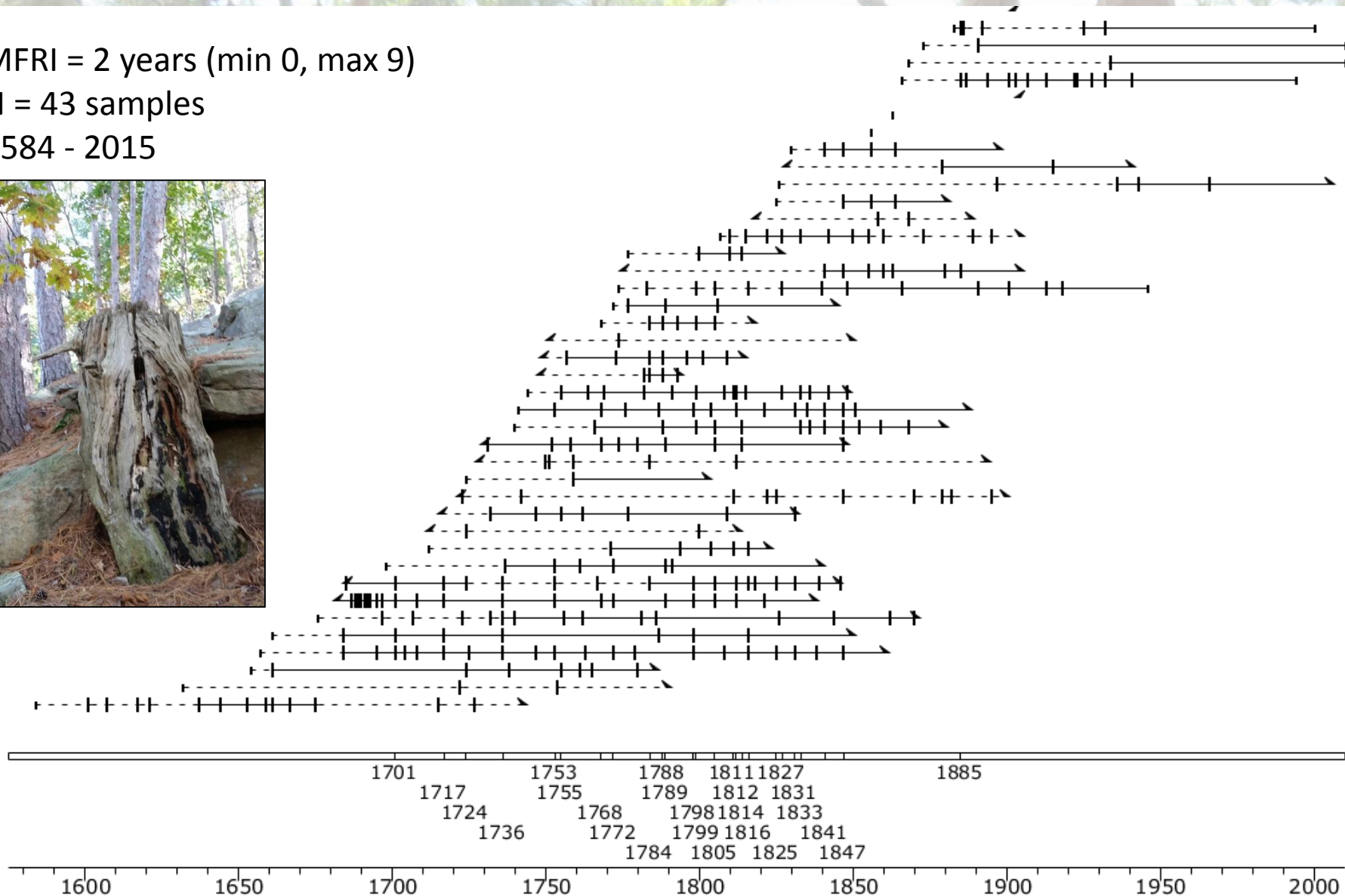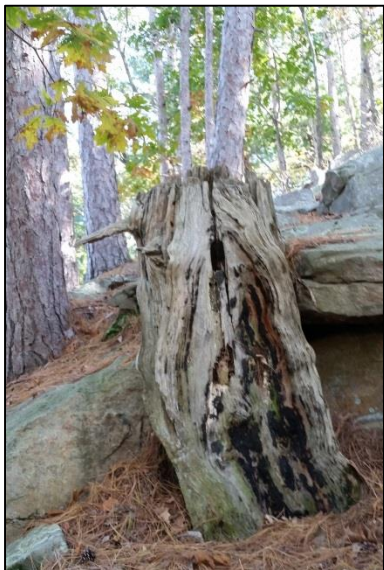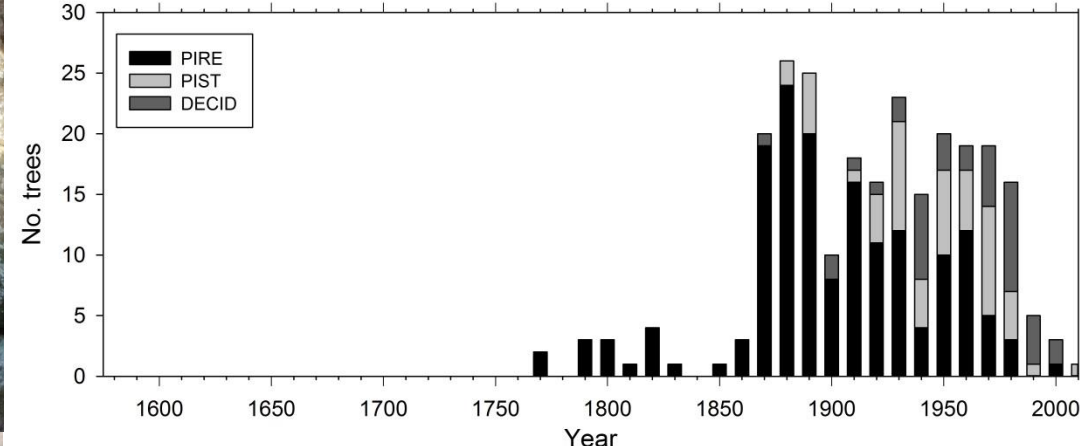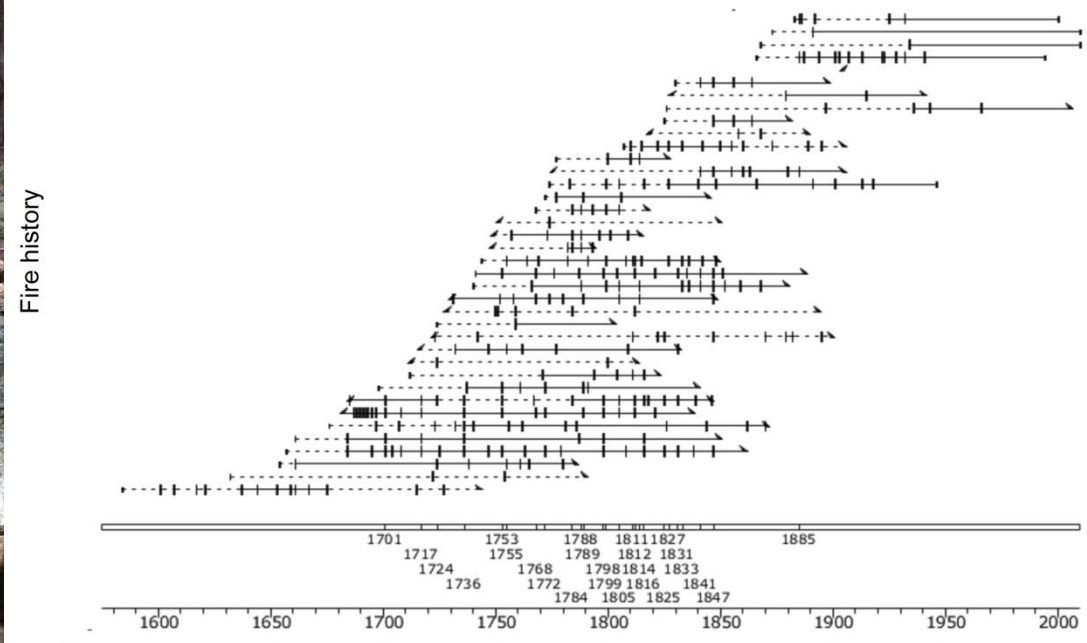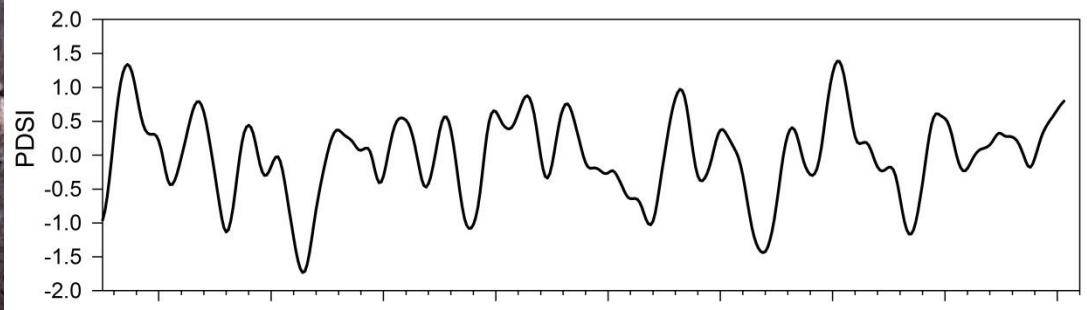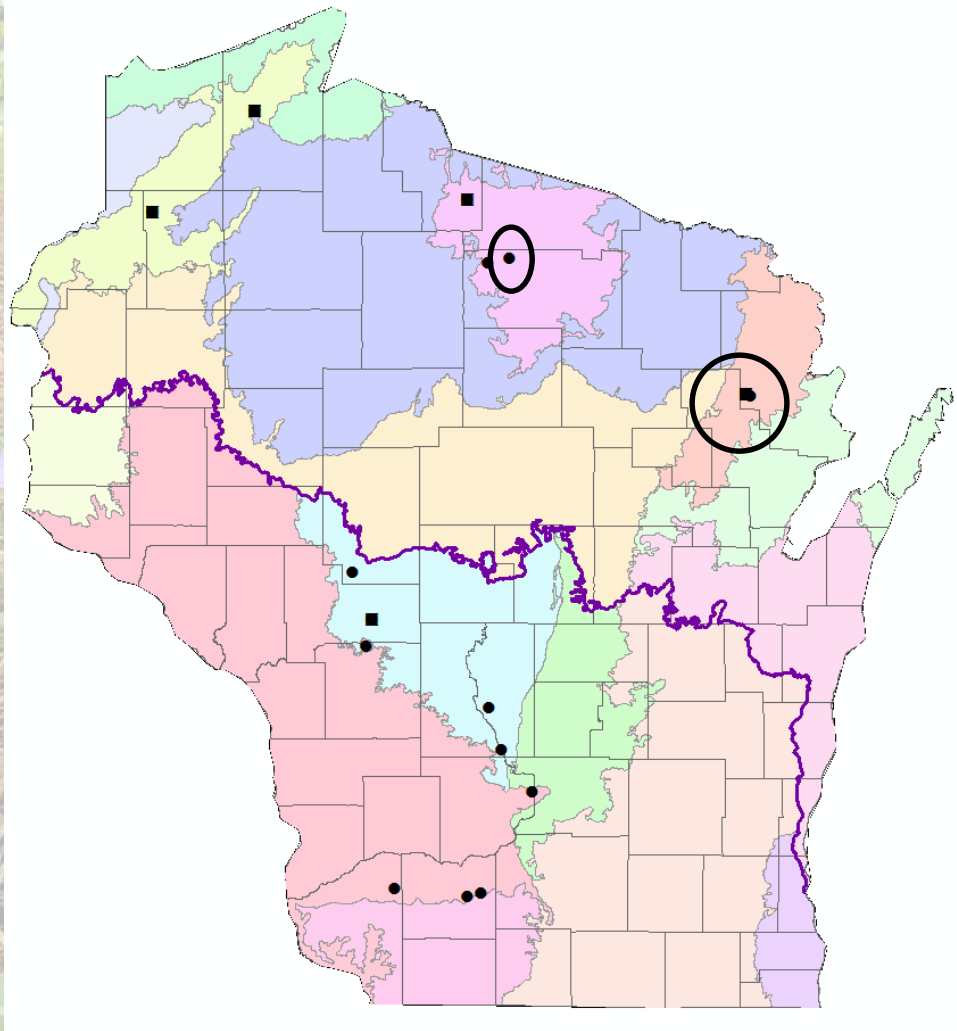
MFRI = 2 years (min 0, max 9)
N = 43 samples
1584 - 2015

Southern Relicts

Northern Pines

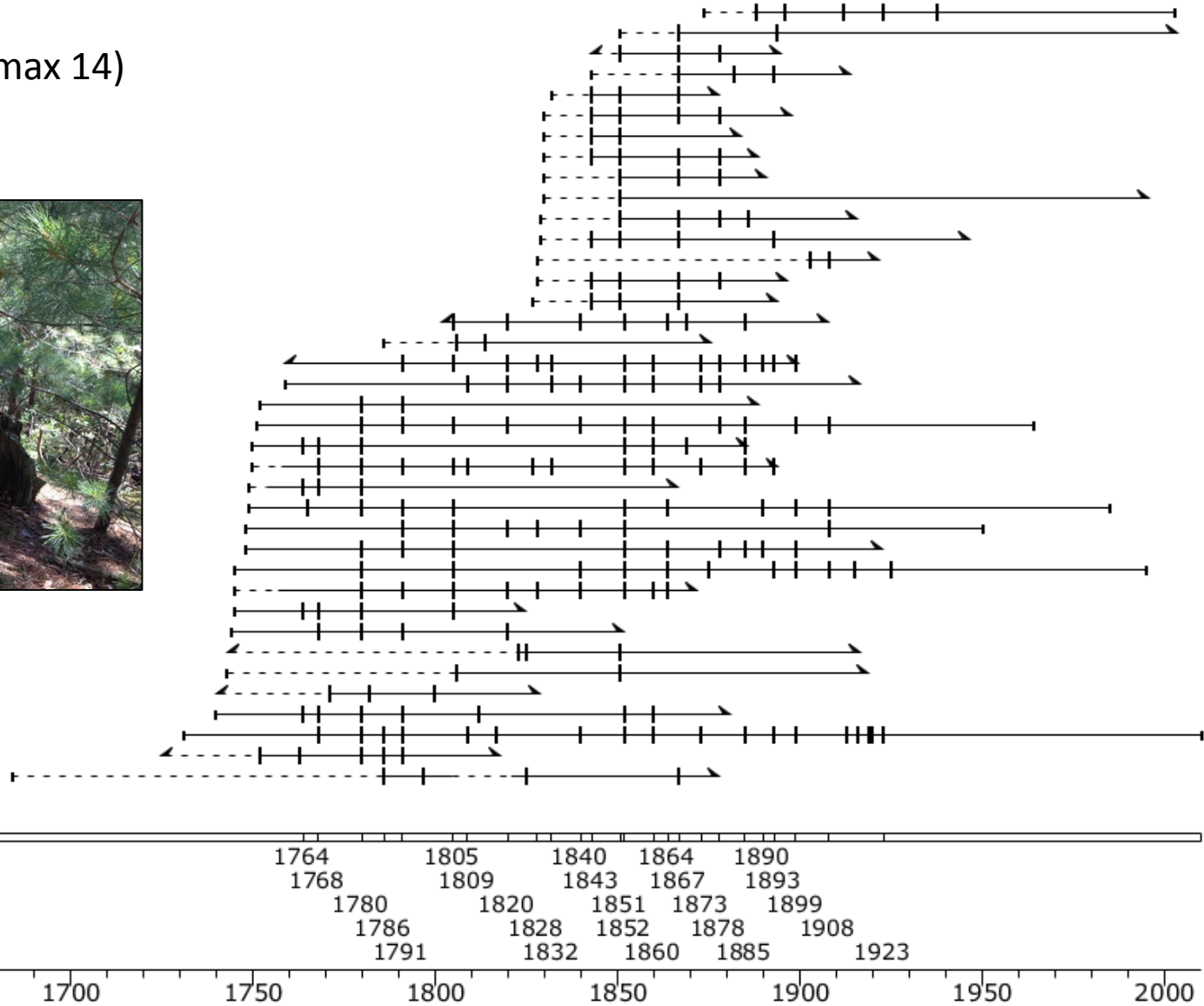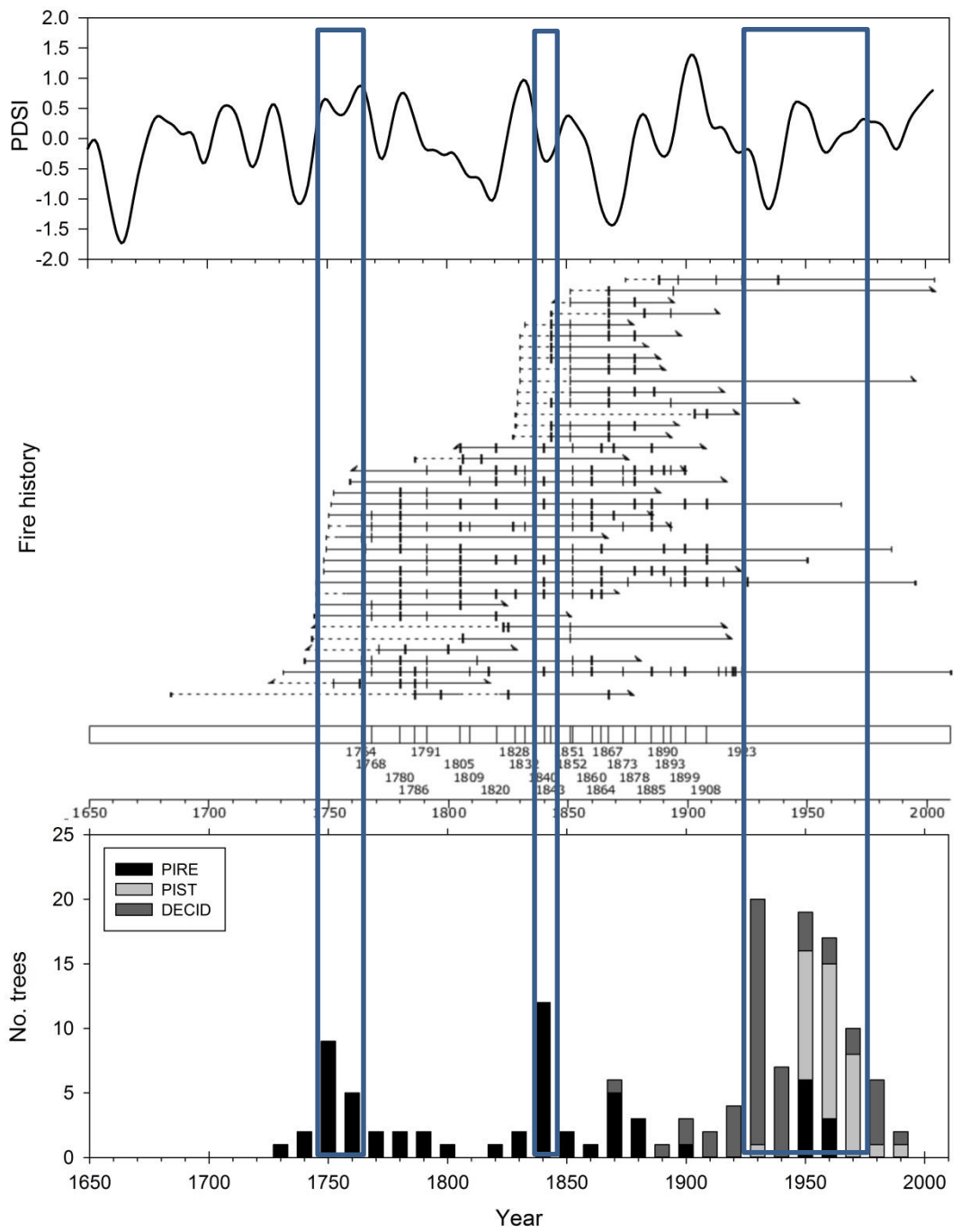# Northern Wisconsin Stands

MFRI = 6 years (min 1, max 14)
N = 39 samples
1684 - 2013

Northern Stands

Fire seasonality

Finnerud Pines (FP)

Camp Bird (CB)

WI Dells (WD)

Snow Bottom (SB)

Pine Bluff (PB)

Ridgeway Pines (RP), Trout Creek (TC)
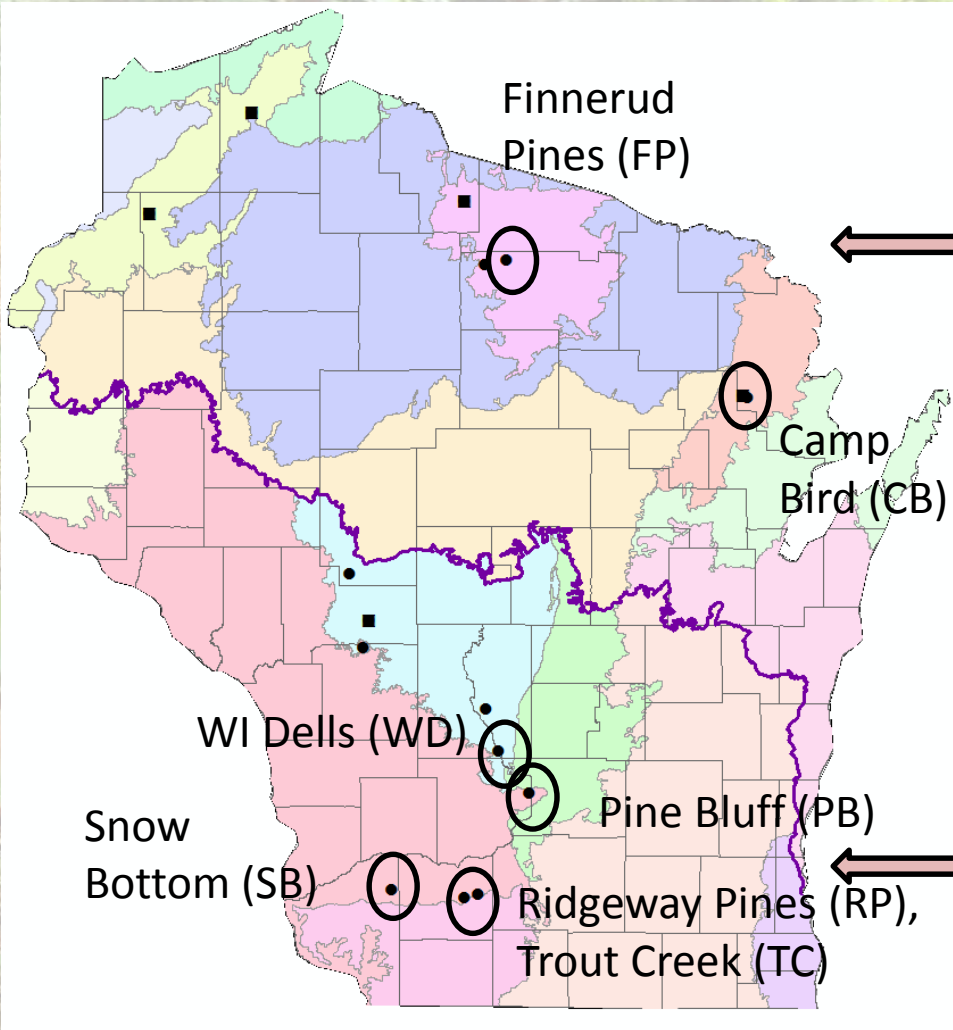
Northern Stands
83% Dormant Season
11% Growing Season
6%   Fall

Southern Relicts
42% Dormant Season
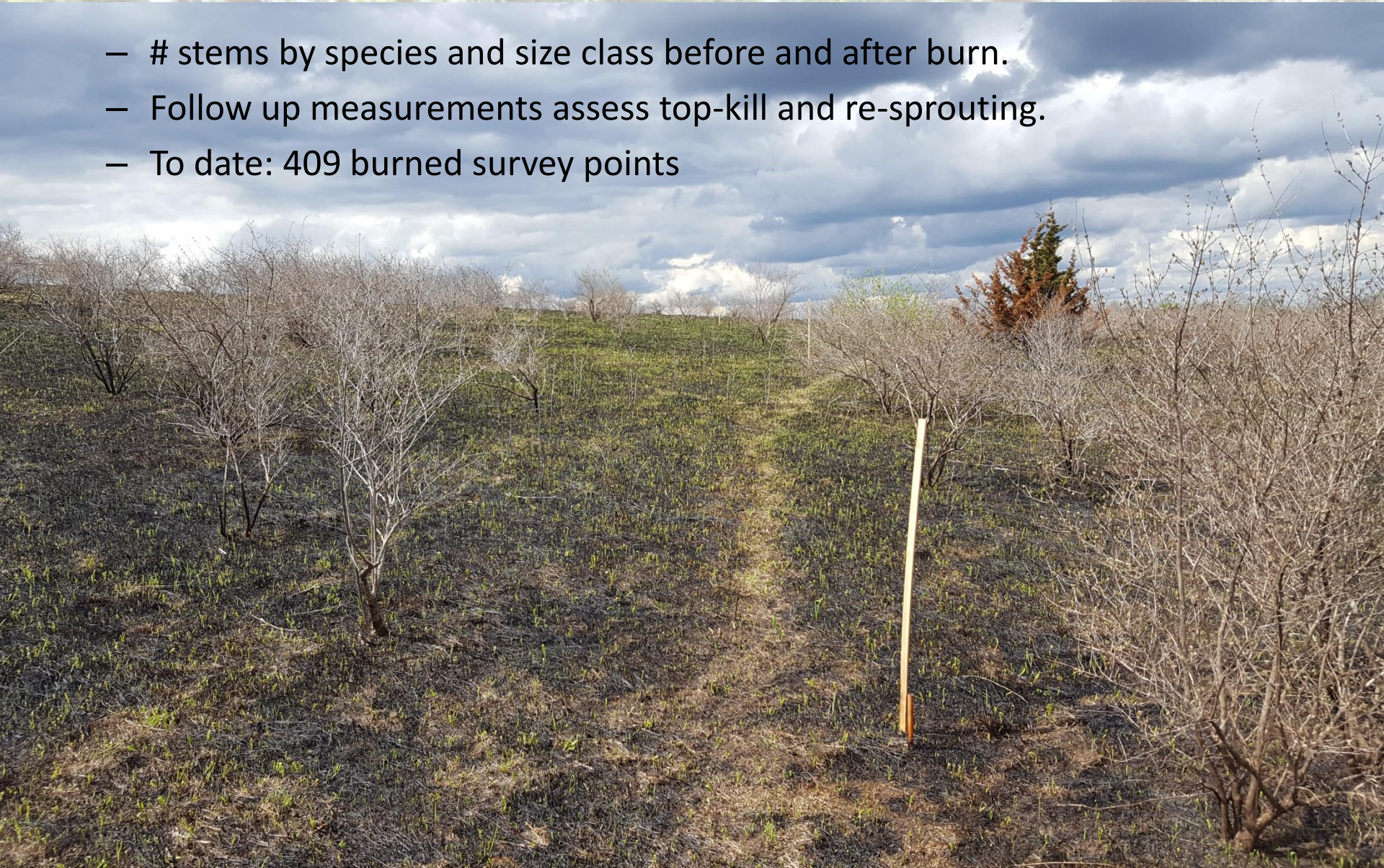49% Growing Season
9%   Fall

Are we setting back brush?

- Are we burning in the right conditions to meet minimum objectives?
- Can we alter our burn conditions or seasons to do a better job?

Evaluating fire's effect on brush

- # stems by species and size class before and after burn.
- Follow up measurements assess top-kill and re-sprouting.
- To date: 409 burned survey points

Linking historic patterns with today's opportunities