

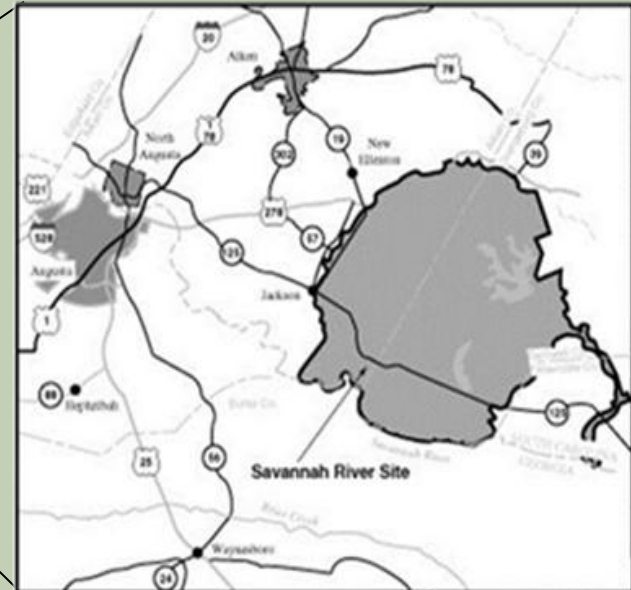
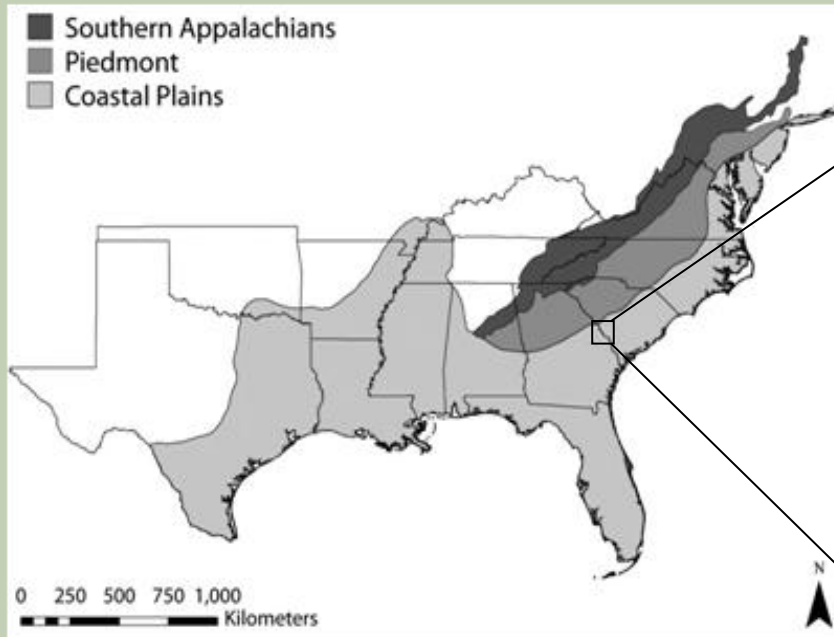
Analysis of inventory data derived fuel characteristics and fire behavior under various environmental conditions.

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Introduction



Savannah River Site

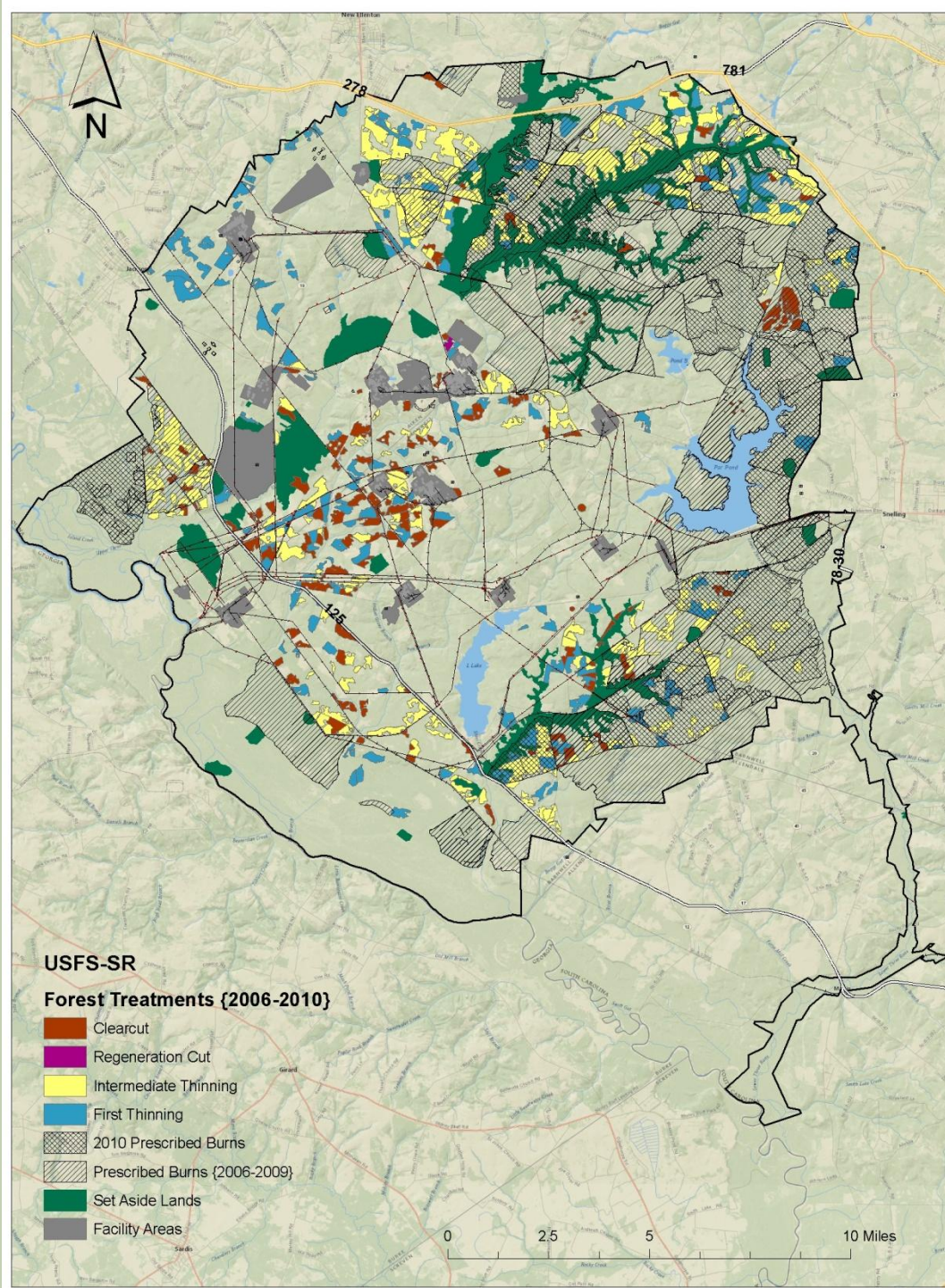
Upper Atlantic coastal plain

~ 198,000 acres

~ 170,000 acres managed by USFS – Savannah River

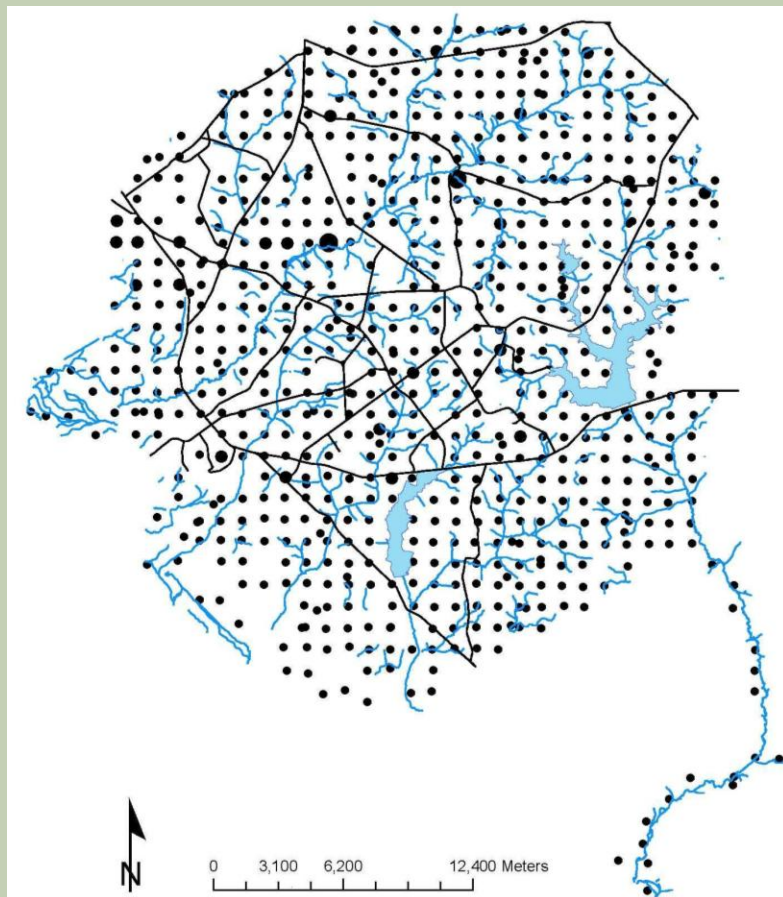
- ▣ Active management
 - Prescribed burns
 - Thinnings
 - Harvesting

- ▣ Inventory
 - Fuels conditions and stratum composition
 - Fire modeling
 - Treatment area prioritization

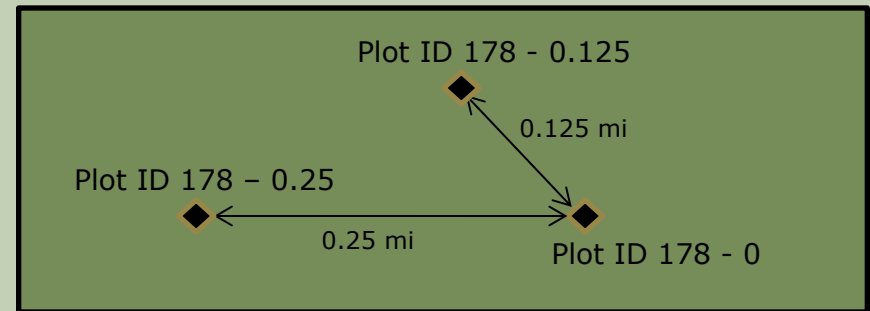


Methods

Potential locations



Plot arrangement



- 1680 plots
 - 560 randomly from grid
 - 2 additional at 0.125 and 0.25 miles

Forest types

Loblolly pine – 540 plots

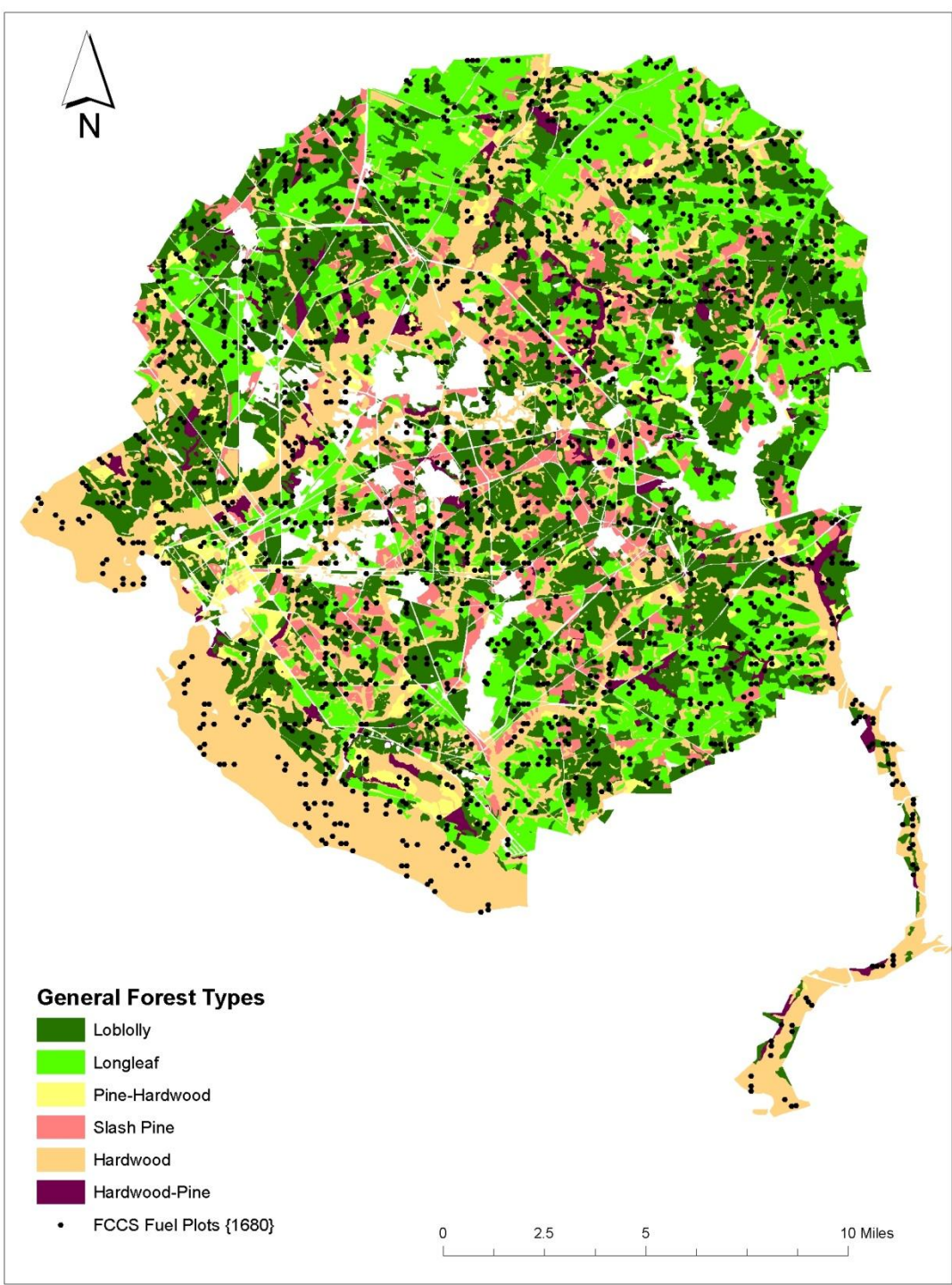
Longleaf pine – 409 plots

Hardwood – 330 plots

Pine-hardwood – 172 plots

Slash pine – 81 plots

Hardwood-pine – 64 plots



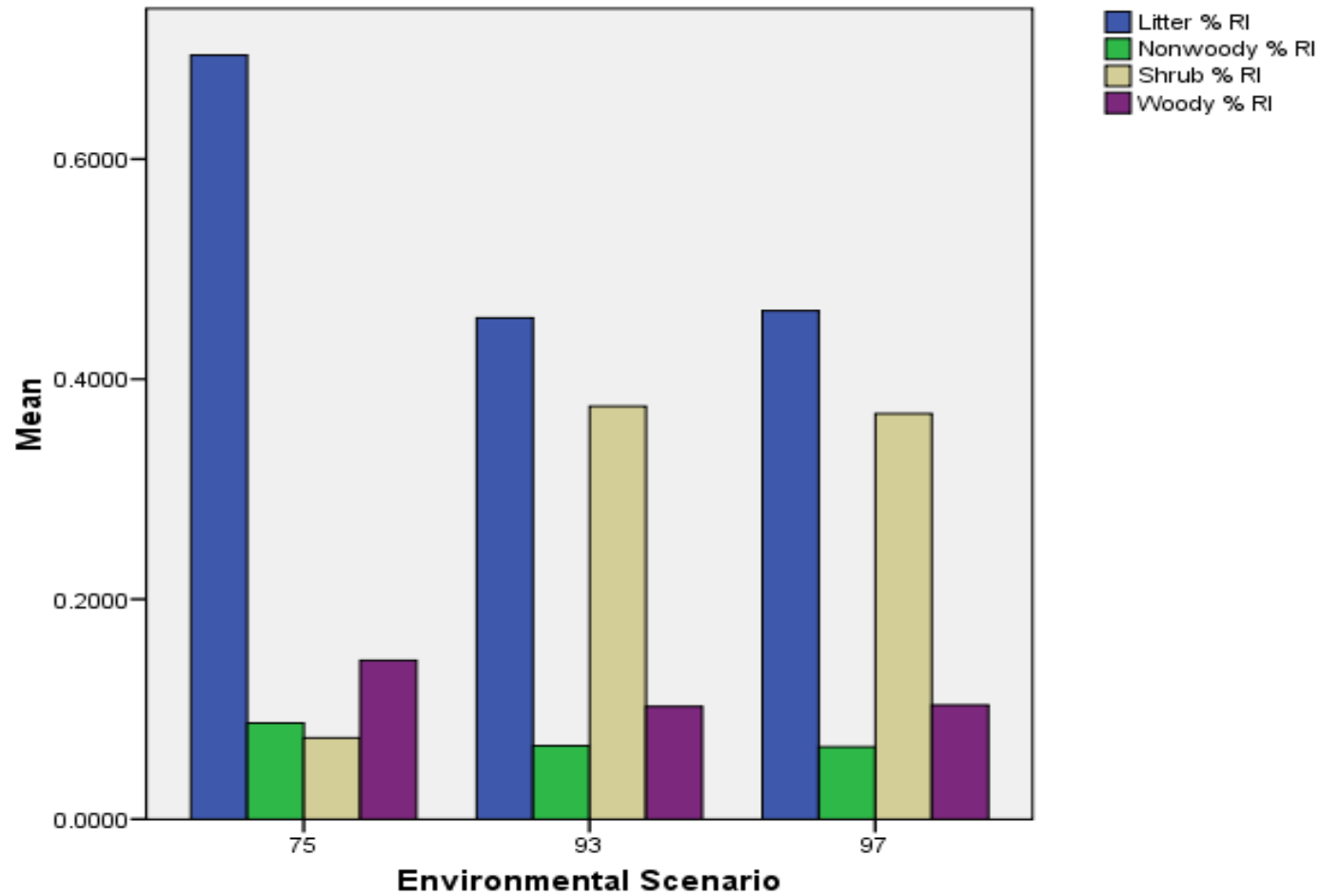
- ▣ Inventory data => FCCS fuelbeds
- ▣ Defined 3 sets of environmental variables

Fuel category	% Moisture		
	97th	93rd	75th
1-hr wood	5	6	7
10-hr wood	7	8	9
100-hr wood	14	16	17
1000-hr wood	17	19	21
Herbaceous	60	60	90
Shrub	90	90	120
MF wind speed	10 mph	4 mph	4 mph
% live shrubs	50%	50%	100%

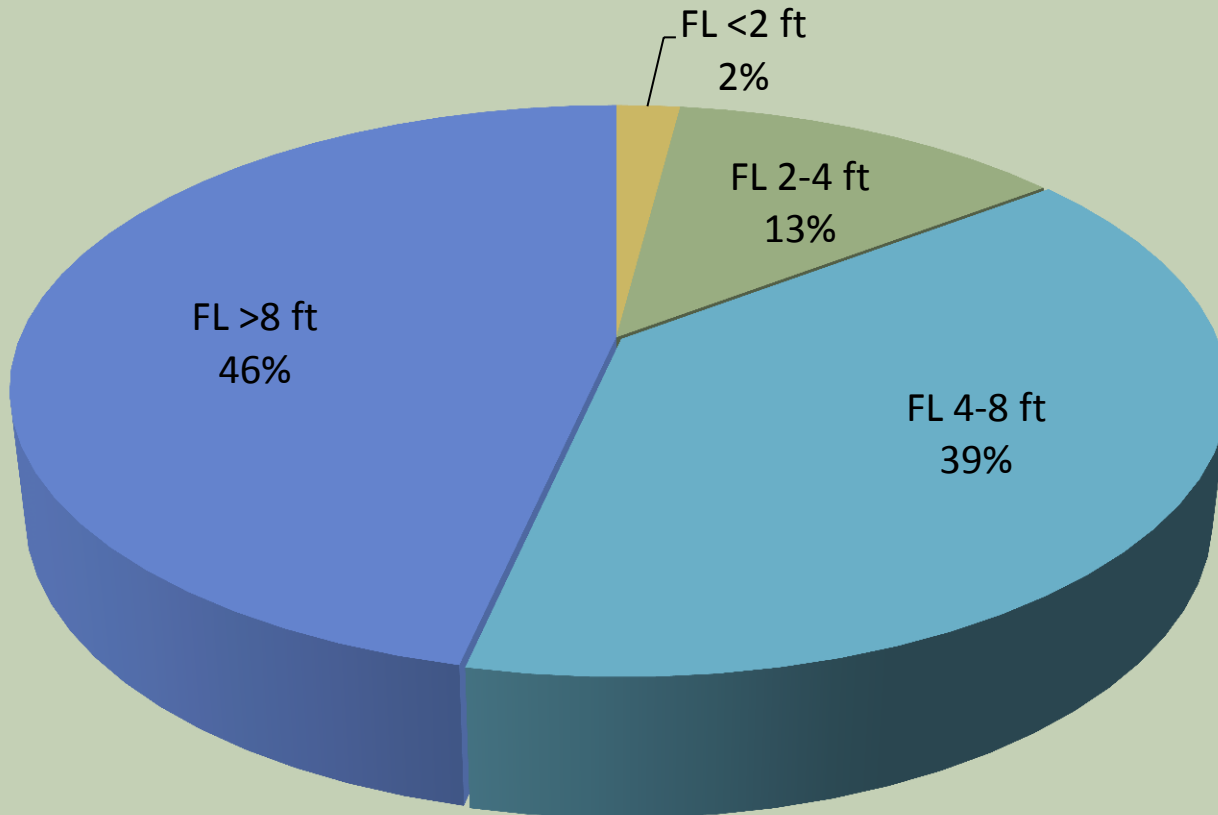
- ▣ Calculated fuel and fire characteristics
 - Flame length (ft)
 - Rate of spread (ft/min)
 - Surface fuel loadings by stratum (tons/acre)
 - Percent reaction intensity of each stratum (%)
- ▣ Mapped fuelbed characteristics and outputs (97th percentile)
 - Loadings
 - Flame length
 - Rate of spread
- ▣ Statistical analysis

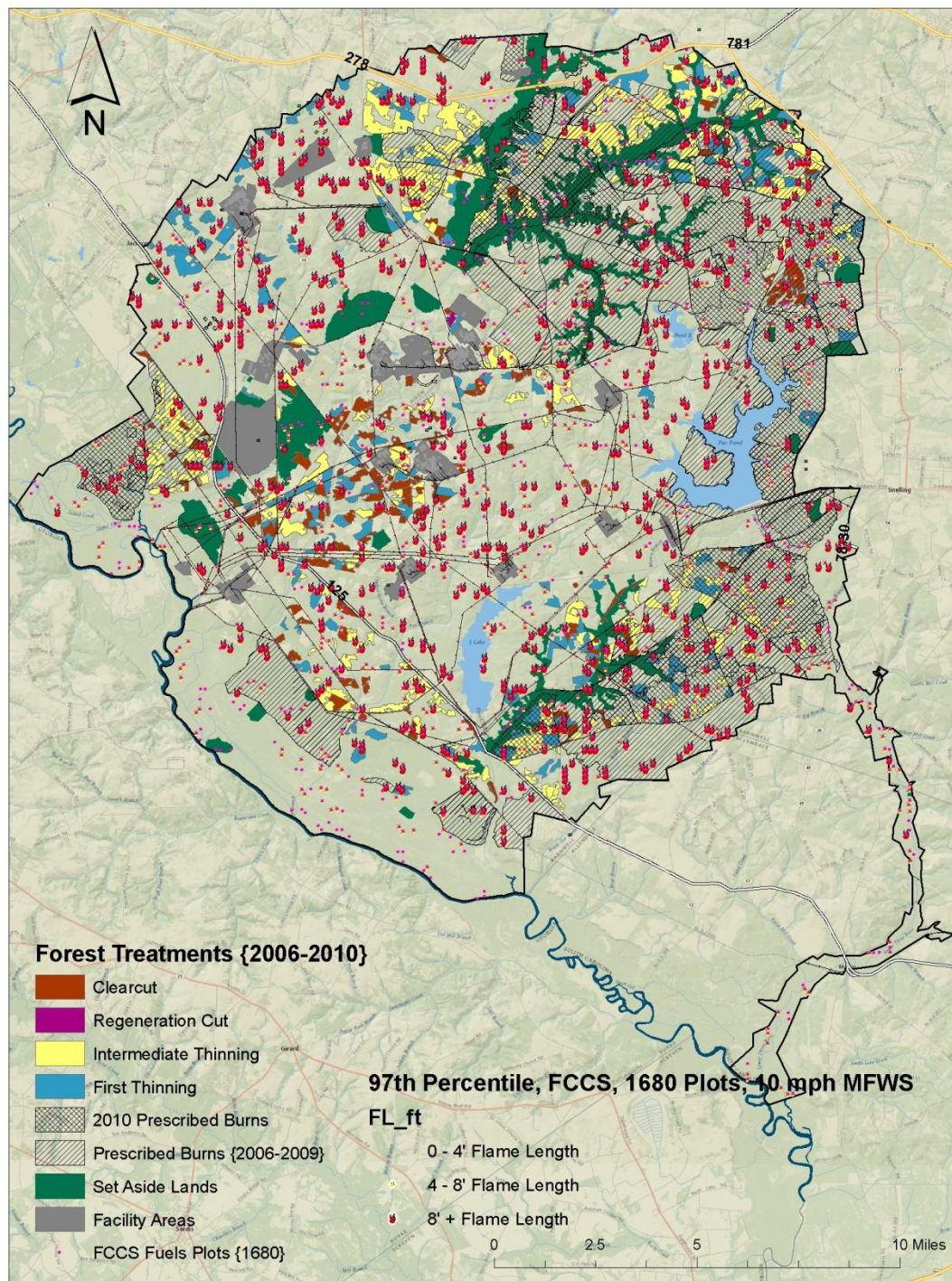
Results

Percent reaction intensity by stratum and environmental scenario












Percent of plots in flame length categories 97th percentile environmental scenario



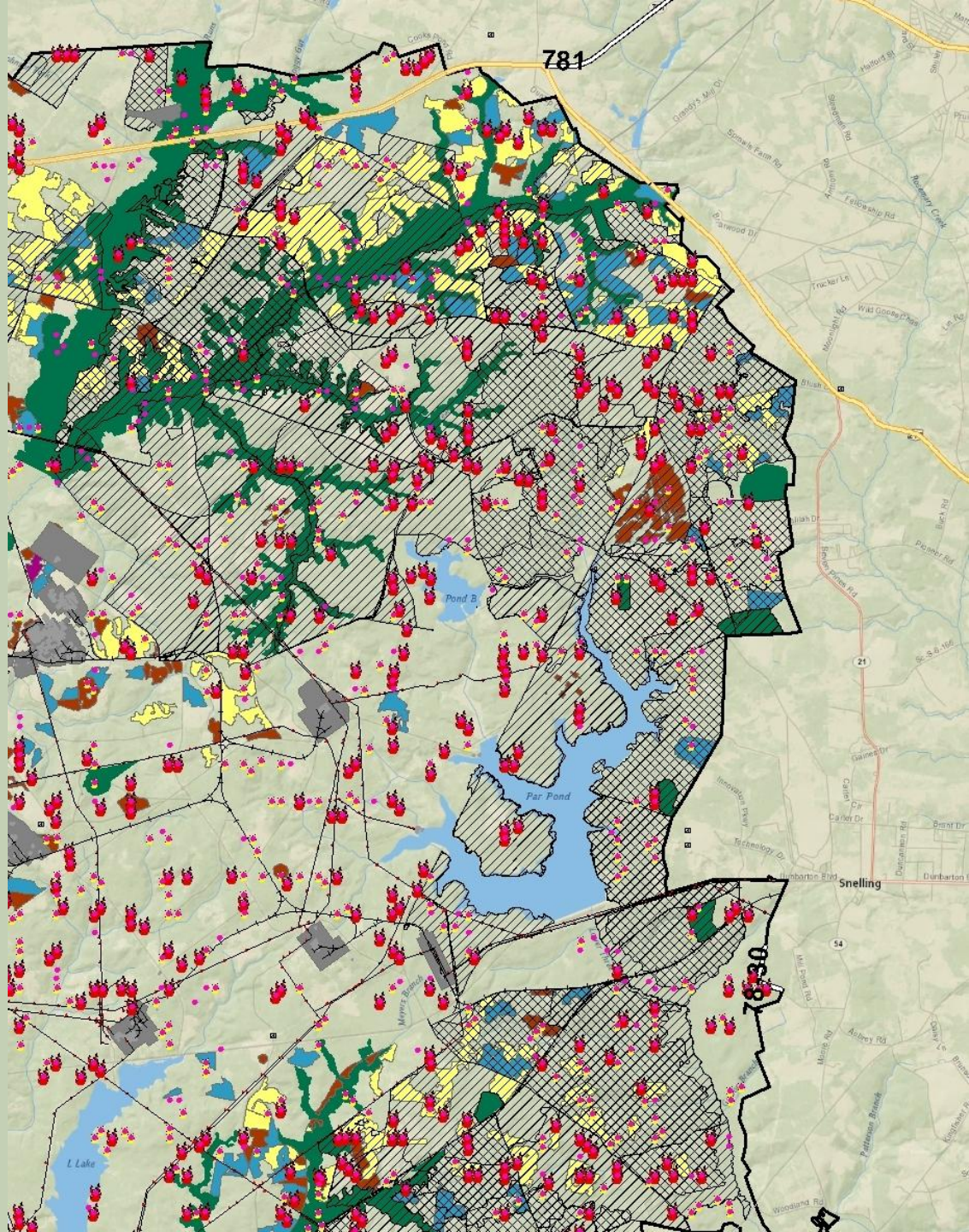


Forest Treatments {2006-2010}

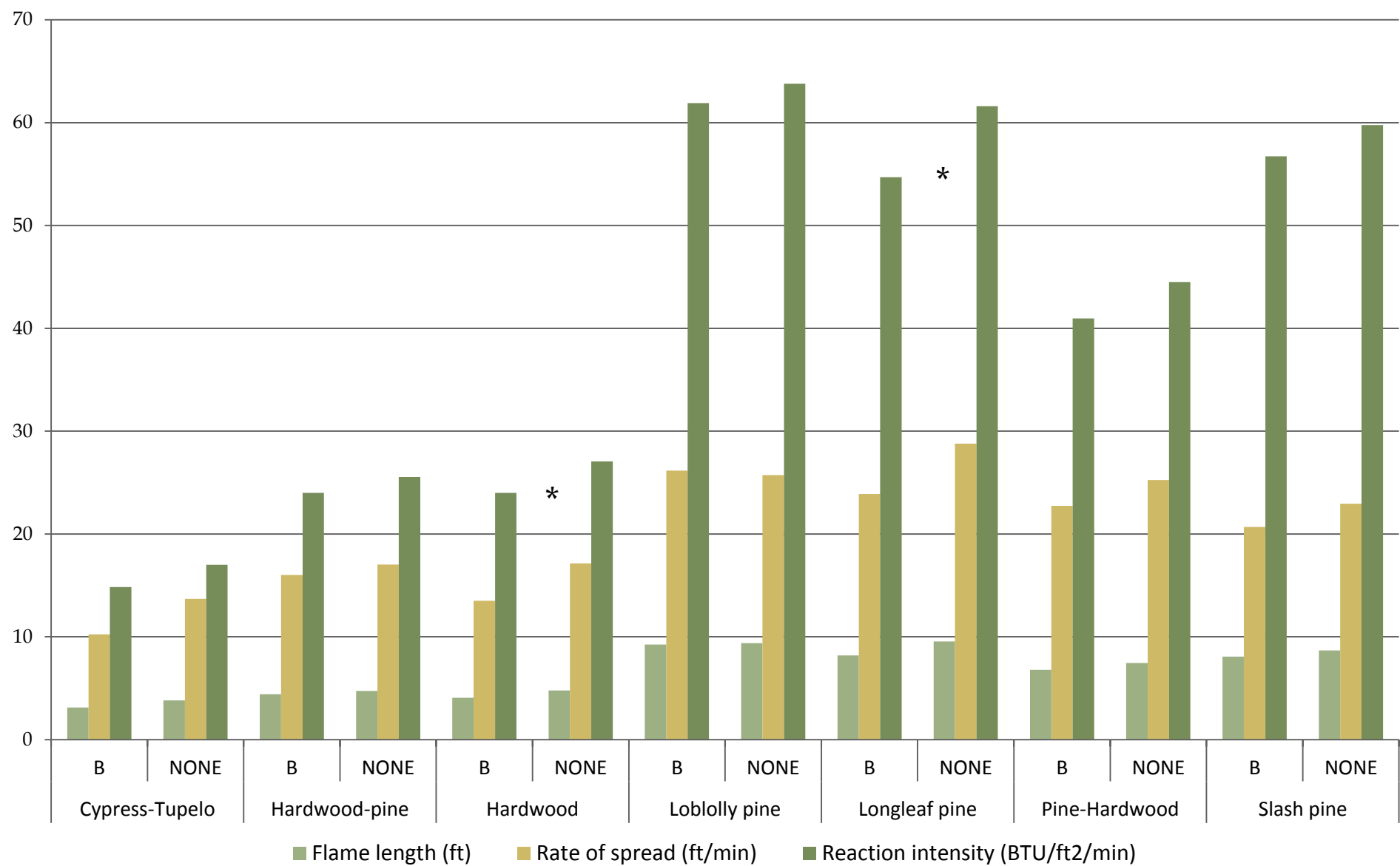
-  Clearcut
-  Regeneration Cut
-  Intermediate Thinning
-  First Thinning
-  2010 Prescribed Burns
-  Prescribed Burns {2006-2009}
-  Set Aside Lands
-  Facility Areas
-  FCCS Fuels Plots {1680}

FL_ft

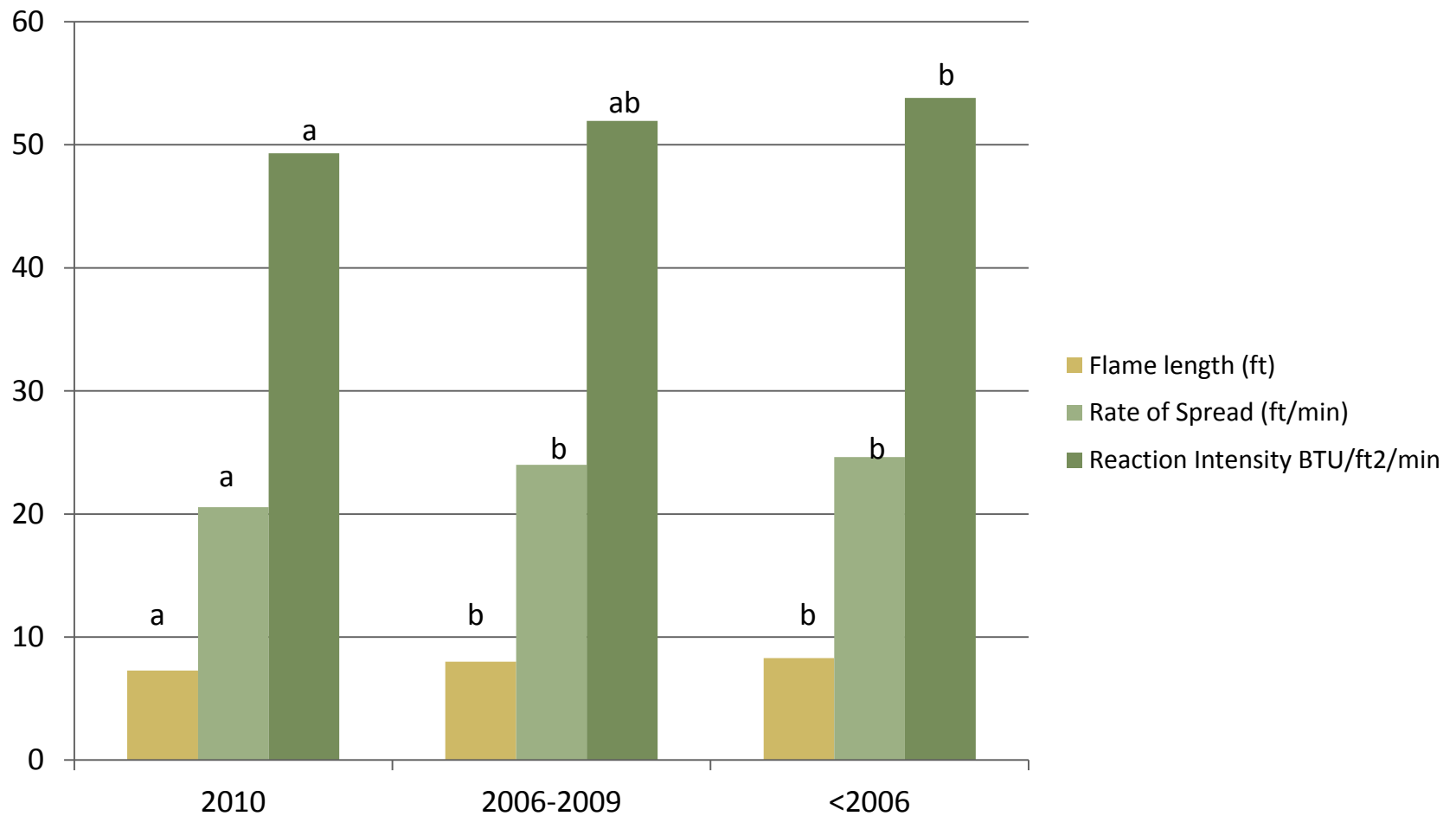
-  0 - 4' Flame Length
-  4 - 8' Flame Length
-  8' + Flame Length



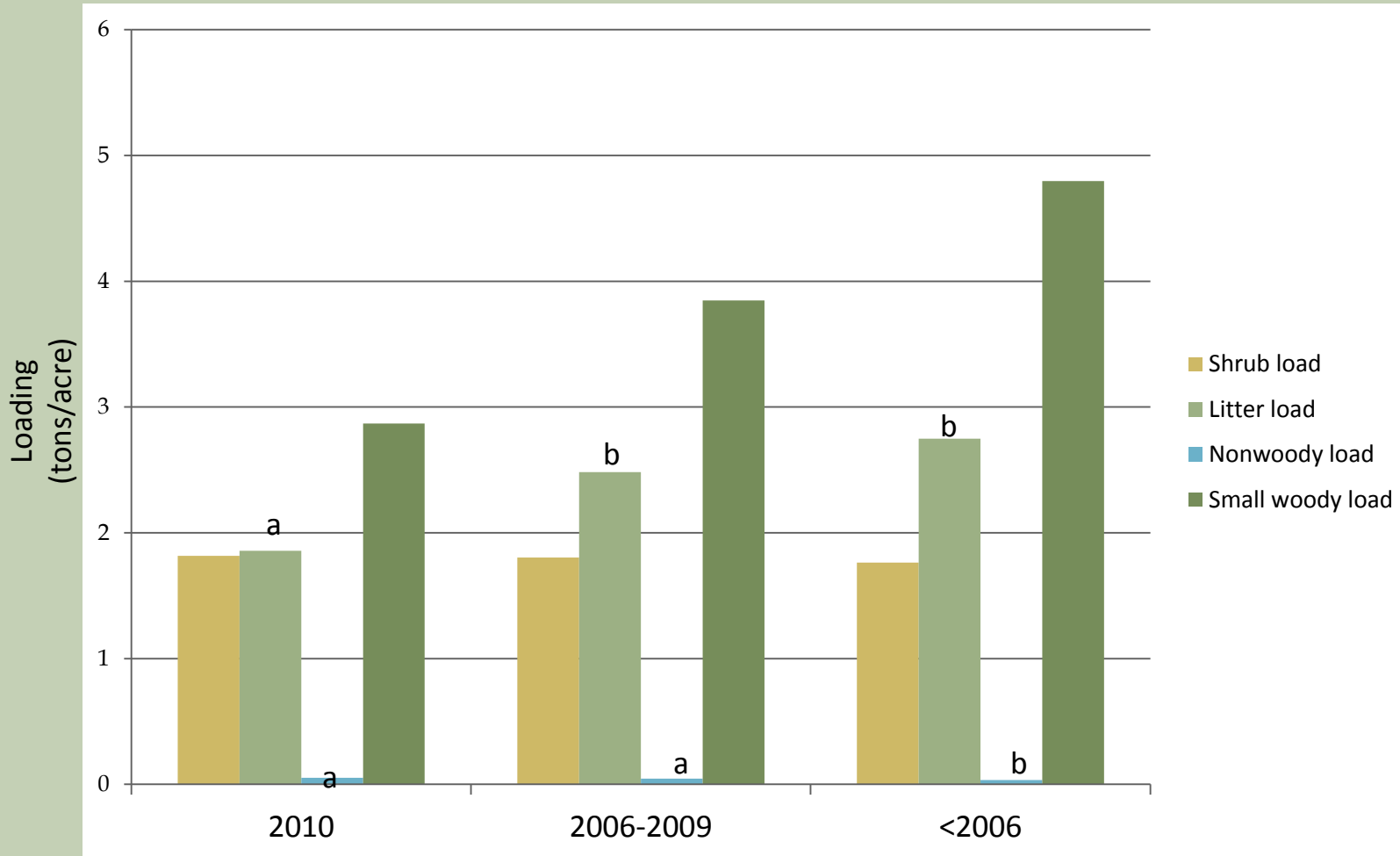
Average surface fire behavior outputs by forest type and Rx burn history



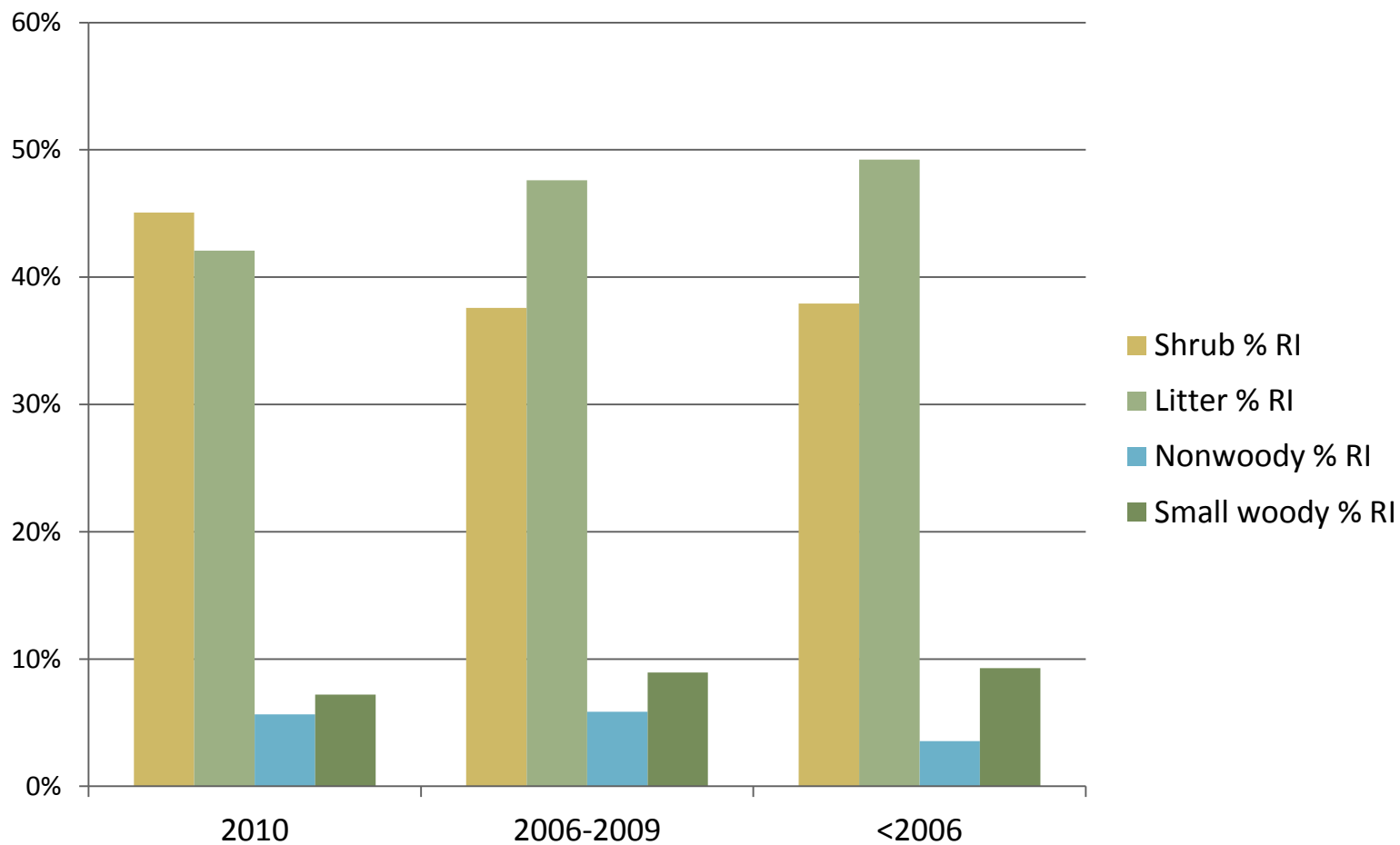
Average surface fire behavior by burn year group



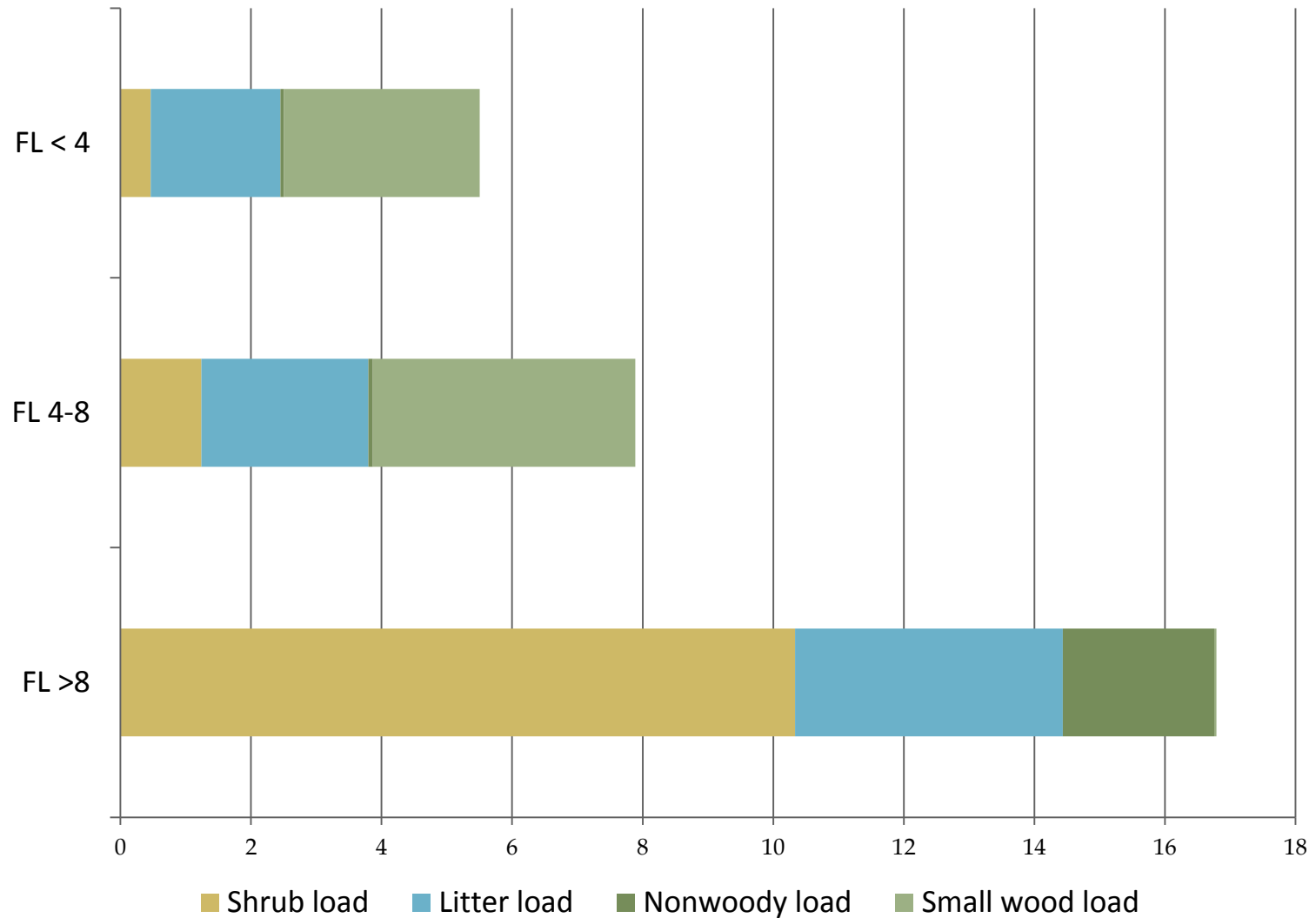
Average loadings of surface fuel strata by burn year group



Average loadings of surface fuel strata by burn year group



Average stratum loads within flame length groups





Conclusions

- ▣ Drivers of surface fire behavior differ with environmental scenarios
- ▣ Main drivers of SFB in these forests are litter and shrubs
- ▣ Management with Rx fire reduces SFB and time since fire is important
 - In all forest types average surface fire behavior tends to be lower on burned plots than on unburned plots
 - Recently burned plots have lower average SFB those burned longer ago
 - Increase in SFB metrics due primarily to increased litter loads with time since fire
- ▣ Mechanical treatment of shrubs may be necessary



FCCS website:

<http://www.fs.fed.us/pnw/fera/fccs/>

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