

Prescribed burning as a restoration tool for white and red pines

A restoration tool put on the fireline

Sylvain Gagnon^{1,2}, Jonathan Boucher², Yves Bergeron¹
¹Université du Québec en Abitibi-Témiscamingue, ²Natural Resources Canada

Context

White pine (*Pinus strobus* L.) and red pine (*Pinus resinosa* A.) are culturally, socially, and economically important species. But they have been experiencing a marked decline in abundance in eastern North America's forests since industrialization. This is due to multiple factors, including logging, reduced fire recurrence and climate change.

Regeneration of these species are known to be favored by fires, which improve seedbed quality, increase light availability, and reduce competition from saplings of other shade-tolerant tree species. Prescribed burning is a technique that has been used for restoring habitat and population of white and red pines. Though the use of prescribed burning in a silvicultural context is a possible avenue, it still needs more science-based guidelines to be well integrated operationally at the northern extent of the distribution of those pine species.

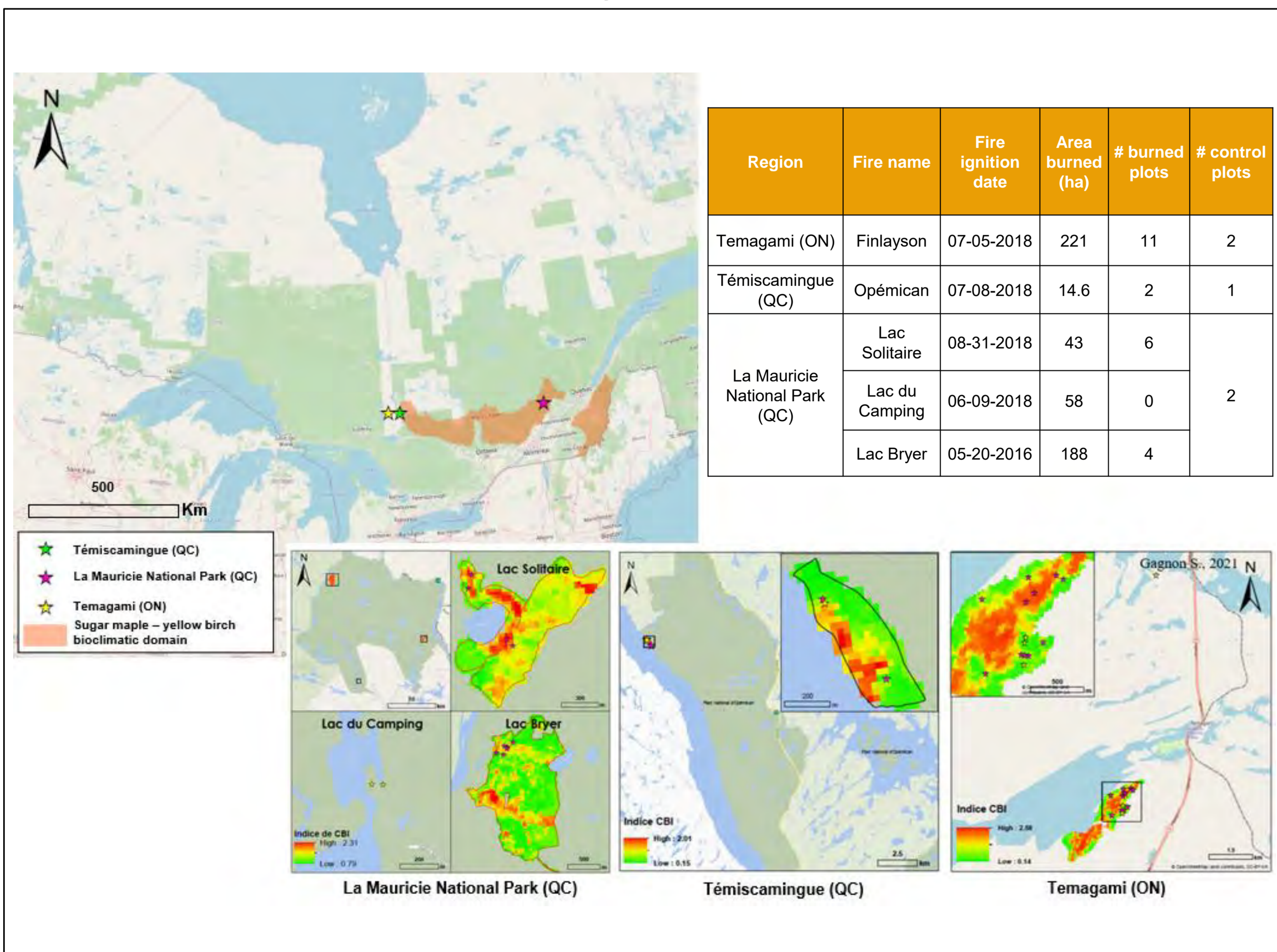
Objectives and hypothesis

Investigate the relationship between regeneration density and fire severity, as estimated on the field using the Composite Burn Index (CBI; Key and Benson 2006), while considering the effect of other environmental variables, such as the presence of seed trees, soil physical and chemical properties, canopy openness, and the presence of competing species.

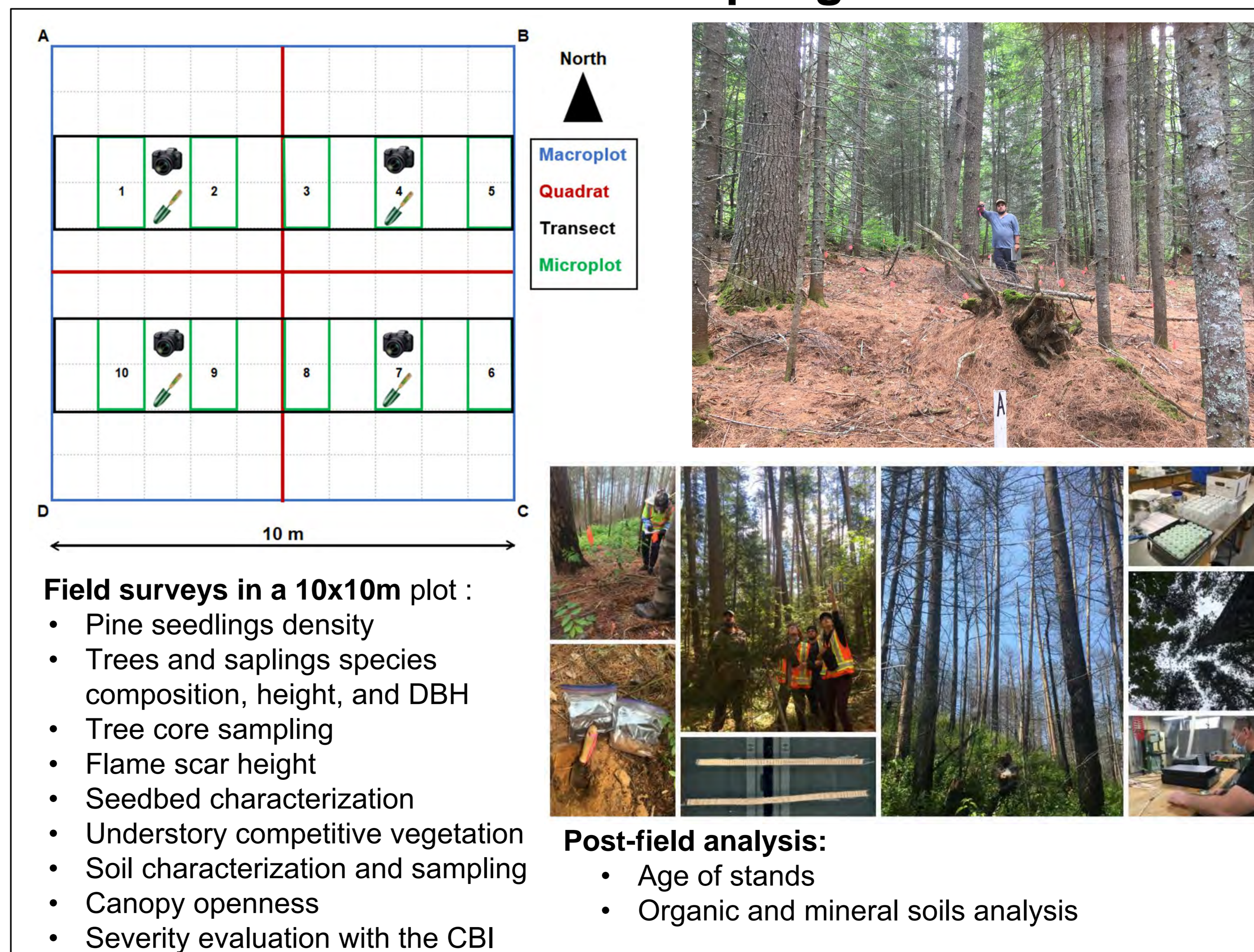
We hypothesize that mid fire severity will lead to highest pine regeneration density, where site conditions should be optimal in terms of stand openness, competing species, and seed beds.



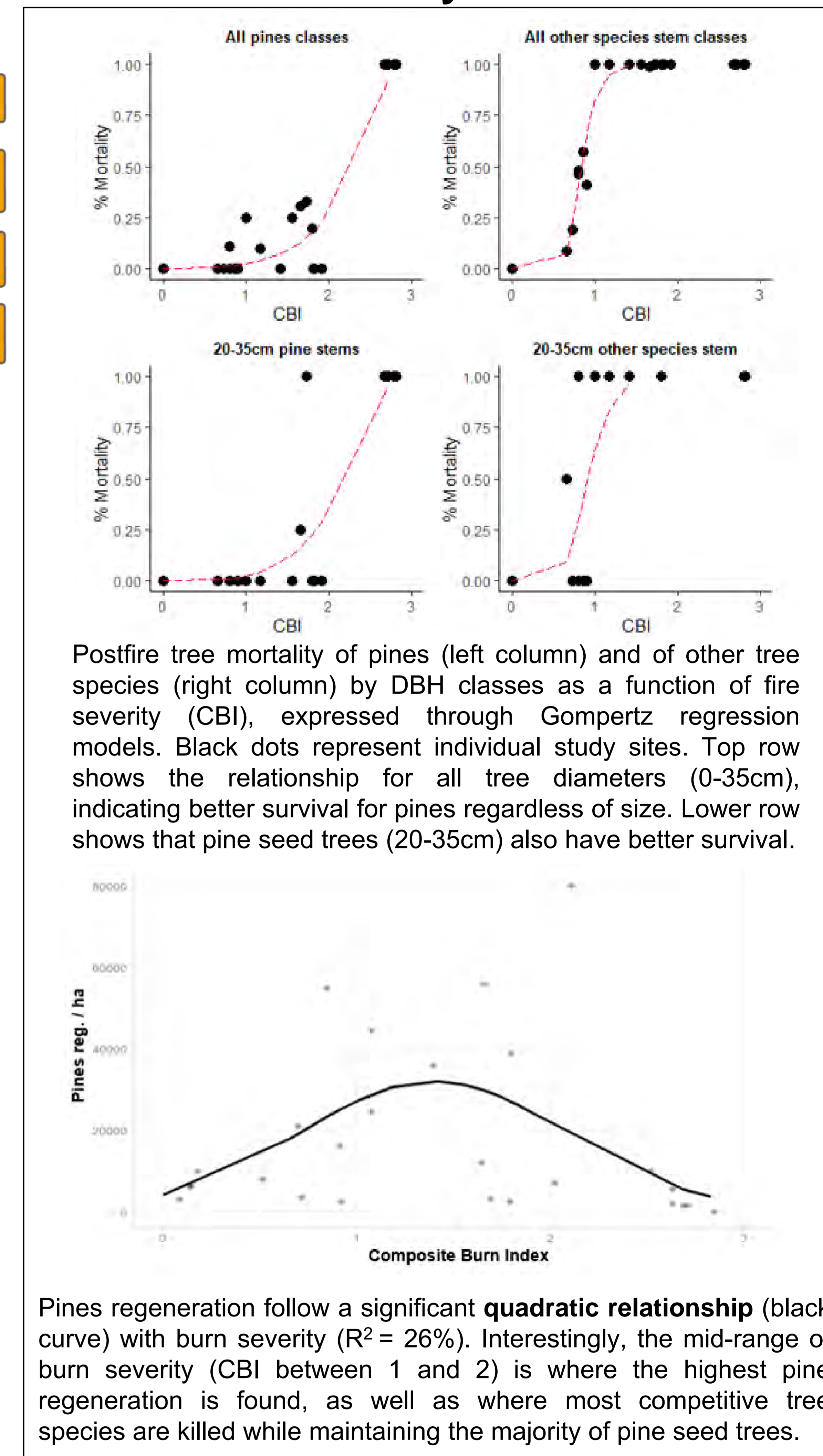
Study Area



Field Sampling



Preliminary Results



Significance of Research

This study will allow managers to better understand the best range of burn severity conditions to promote the regeneration of white and red pines in their northern range using prescribed burning as a silvicultural tool. An improved understanding of these ecosystem processes will facilitate the optimization of both harvest, site preparation, and prescribed burning strategies, i.e., the range of operational fire intensities necessary to lead to burn severities that maximize regeneration potential and minimize competition based on stand attributes.