



Monitoring Limber Pine Health in the Rocky Mountains

(Year 2 of a 3-year Study)

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Introduction

Limber pine is an ecologically and culturally important species that is widely distributed within the Rocky Mountains, yet little studied. Recent surveys suggest that significant ecological impacts are occurring as the result of the exotic, invasive disease, white pine blister rust (WPBR). Information is needed on the long-term ecological impacts of this disease to facilitate management and restoration efforts.

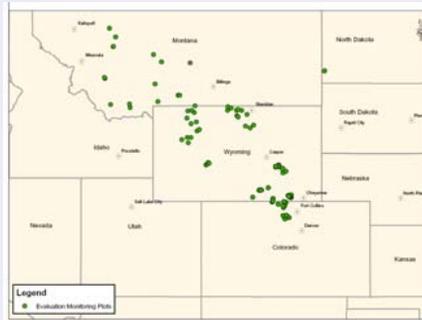
Objectives

This study was conducted to assess the ecological impacts of WPBR on limber pine stands within the Rocky Mountains and to gather baseline information needed to sustain, protect, and restore impacted stands.



Intensive measurements were taken to characterize crown impacts.

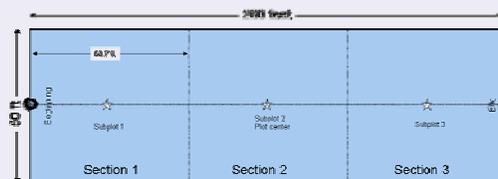
Plot information is being used to identify candidate trees for cone collections and future restoration projects.



Methods

- Eighty-three monitoring plots were installed in 4 study areas: 1) northern Colorado & southern Wyoming, 2) central and western Wyoming, 3) central Montana, and 4) southwestern North Dakota.
- Methods were adapted from the Whitebark Pine Ecosystem Foundation.
- Site data collected included: elevation, slope, aspect, stand structure, slope position, and disturbance history.
- Tree variables included: species*; DBH*; height*; health status*; crown class*; crown ratio; % canopy killed; incidence of cones; number, size, severity, and location of WPBR cankers; and other damages and severities.
- Three subplots were established to measure regeneration and understory vegetation.

*variables collected on all species



Plots were belt transects. All trees ≥ 4.5 ft tall were measured. Understory vegetation & regeneration were measured in three subplots.

Preliminary Results

Mistletoe and mountain pine beetle (MPB) were rare in all study areas (ND is out of the documented range of these agents) but minor damage caused by twig beetles was common.

Northern CO and Southern WY

- Thirty-six plots were established in 2006.
- Eighty-one percent of plots had WPBR and the average incidence of infected plots was 35%.

Central and Western Wyoming

- Twenty-nine plots were established in 2007.
- Eighty-six percent of the plots had WPBR and the average incidence for infected plots was 35%.

Central Montana

- Sixteen plots were established in 2007.
- Eighty-one percent of plots had WPBR and the average incidence for infected plots was 60%.

North Dakota

- Two plots were established in 2007.
- No WPBR was detected.



Twig beetles were common in all study areas although impacts were generally minor.

Future Work

Data analysis and reporting is planned for 2008-2009.