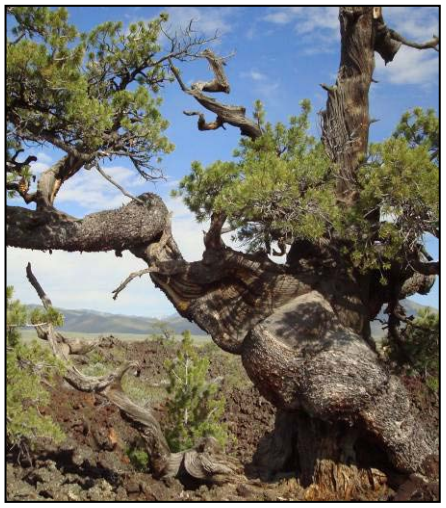
Upper Columbia Basin Network
Resource Brief

Inventory & Monitoring
National Park Service
U.S. Department of the Interior

Monitoring Limber Pine Stands in Craters of the Moon

Network parks where resource is being monitored

- Craters of the Moon National Monument (CRMO)

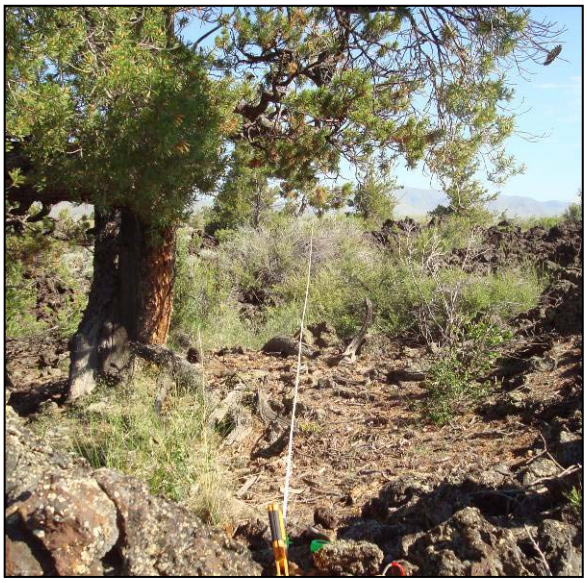


Limber pine in CRMO

Importance: White Pine Blister Rust and Stand Health

White pine blister rust, an introduced disease which causes mortality in five-needled pine trees, including limber pine (*Pinus flexilis*) is caused by the fungus *Cronartium ribicola.* The disease is widespread and may be considered the most significant disease affecting five-needled pines, resulting in altered stand structure in infected areas. The fungus must use an alternate host, usually *Ribes spp*, to move from an infected tree to one that is healthy. Infection from white pine blister rust can directly kill the tree, while leaving surviving trees more susceptible to attack from mountain pine beetles and mistletoe infections. The limber pine trees in CRMO are susceptible to these diseases and insects. Predicted impacts of climate change also extend to CRMO limber pine stands because drought stress can increase their vulnerability.

Limber pine stands in CRMO are a unique and important ecological resource for the park, and widespread infection and mortality from white pine blister rust and pine beetles in CRMO could be very destructive. Monitoring of the limber pine stands for white pine blister rust as well as for changes in stand structure and composition will gather valuable information about the status of the disease in the park and overall stand health, and will support more informed management decision-making.



A 2009 limber pine monitoring plot in CRMO

Preliminary Results

CRMO and the UCBN have joined with three other Pacific West Region Networks to develop a coordinated protocol. A pilot monitoring study was initiated in CRMO in 2009. 22 transects were placed in 5 separate stands of limber pine in an effort to evaluate existing methods, and to record representative conditions of stand health and composition. Blister rust infections were found in the park in 2006, but no active infections are known in the park currently. Mistletoe infections are widespread in CRMO limber pine stands but don't appear to be adversely impacting the population. Evidence of a low-level pine beetle infestation was found in some stands.

Objectives

- Estimate status and trend in *Cronartium ribicola* infection in the park.
- Measure key attributes of stand health, including structure and composition, mortality, and reproduction.

Management Applications

- Provide information about *Cronartium ribicola* distribution in the park.
- Update park management knowledge of limber pine stand health, including impending threats to its long-term persistence, and potential management options.
- Support park resource planning and land health reporting efforts, and inform resource management planning in the park.

Contact Information

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