

Climate Change and Forest Trees in the Pacific Northwest: a Vulnerability Assessment and Recommended Actions for National Forests¹

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Abstract

Climate change presents new challenges to land managers. At stake is our ability to make thoughtful, science-based decisions and to add climate change considerations to our project and management plans. We also must prioritize among the opportunities that can be included in adaptation strategies because funding and time are limited, now more than ever. In 2012, we conducted a vulnerability assessment of common overstory forest tree species for the Pacific Northwest and provided recommended actions based on the results of this assessment. These recommendations will sharpen the focus of activities on the most vulnerable species while simultaneously any recommended actions taken will help in conserving biodiversity and building resiliency. Our analytical approach did not include spatially explicit predictions of future tree species habitats. Rather, it uses life history traits, distribution, and pest and pathogen data for individual tree species, combined with consensus regional climate projections to rate each species' relative vulnerability to a changing climate. The analytic method we employed here with forest trees is transparent, flexible, and simple to apply and could be adapted to other native plants including forbs and grasses.

Vulnerability scores varied by species and geographic area, but there was a consistent positive relationship between vulnerability to climate change and mean elevation with many of the most vulnerable tree species occurring at the highest elevations. There were three overall recommendations for land managers that came out of this assessment: 1) learn about and track changes in plant communities as the climate changes, 2) maintain and increase biodiversity and increase resiliency, and 3) prepare for an uncertain future. Specific action items were proposed to address these recommendations based on the results of the vulnerability assessment.

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