PROJECT CAPTURE: A U.S. NATIONAL PRIORITIZATION FRAMEWORK FOR TREE SPECIES THREATENED BY CLIMATE CHANGE AND OTHER THREATS

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A variety of threats, most importantly climate change and insect and disease infestation, will increase the likelihood that forest tree species could experience population-level extirpation or species-level extinction during the next century. Scientists and managers from throughout the United States Forest Service have cooperated to develop a framework for conservation priority-setting assessments of forest tree species. The Project CAPTURE (Conservation Assessment and Prioritization of Forest Trees Under Risk of Extirpation) framework is data-driven and guided by expert opinion, and allows for the quantitative grouping of species into vulnerability classes that may require different management and conservation strategies.

The first application of this framework uses trait data and predictions of expected climate change pressure to categorize and prioritize 339 native tree species for conservation, monitoring, management and restoration across all forested lands in the contiguous United States and Alaska. This categorization is based on risk factors relating to the species' (1) exposure to climate change, (2) sensitivity to climate change, and (3) capacity to adapt to climate change. We used K-means clustering to group species into seven classes based on these three vulnerability dimensions.

The most vulnerable class encompassed 35 species with high scores for all three vulnerability dimensions. These will require the most immediate conservation intervention. A group of 43 species had high exposure and sensitivity, probably requiring conservation assistance, while a group of 69 species had high exposure and low adaptive capacity, probably needing close monitoring. This assessment tool should be valuable for scientists and managers determining which species and populations to target for monitoring efforts and for pro-active gene conservation and management activities.

The Project CAPTURE framework is being applied separately for an assessment of the threats to North American tree species posed by pest and pathogen infestations, and for tree species in Hawai'i and Puerto Rico.

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