GENETIC RESOURCE MANAGEMENT AND CLIMATE CHANGE: GROWING HEALTHY FORESTS FOR THE FUTURE

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Providing seed for operational reforestation and restoration has long been the principal focus of the U.S. Forest Service's Genetic Resource Management Program. Although this work will continue into the future, climate change predictions will require changes in the ways these needs are met.

The guiding principle for managing the genetic resources of National Forests has been through the use of local seed sources in reforestation and restoration. The advent of a rapidly changing climate, however, means that a new paradigm will be required to maintain healthy and productive vegetation on National Forests and to preserve at-risk species and populations. At a minimum, the current practice of relying on seed sources that were best suited to the past climate will need to shift to allow consideration of the source, or sources, of seed that will be best suited to predict future climates. In many cases, species and seed sources that may be optimal under climate change scenarios have not received adequate research or management attention and thus lack basic genetic information as well as sufficient representation in forest seedbanks. More aggressive gene conservation programs, especially ex situ seed collection, will also be needed for species and populations most vulnerable to climate change impacts.

At present, there is no generally applicable national guidance for incorporating climate change impacts into the management of National Forest genetic resources. In the spring of 2010, Forest Service and university geneticists convened to share background information and develop consensus for revising National Forests System genetic resource management guidelines. The goals of the meeting were to 1/ provide information on climate change scenarios and potential effects on vegetation and forest genetic resources, 2/ facilitate the interaction and exchange between climate scientists and geneticists to develop strategies for responding to climate change in Forest Service genetic resource management programs, 3/ identify genetic options for responding to climate change and its effects on vegetation and genetic resources, with an emphasis on the next 5-10 years, 4/ identify gaps related to information, resources, research, and tools needed to manage effectively within a changing climate. A whitepaper on key genetic issues, guidelines, and program gaps/needs in light of climate change is currently under development.