Evolution of the Forest Service's National Forest System Genetic Programs

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The USDA Forest Service National Forest System (NFS) land base includes 45 states that are divided into nine Regions. Acreages total approximately 188 million and are managed within 155 Administrative Units. Seventy-eight percent of the land base is out West, where most of the catastrophic wildfires occur. The National Forests were established in the early 1900's. The original focus was to provide an adequate supply of timber products for a growing population. The Forest Service began tree improvement (TI) programs in the early 1960's to better manage the variety of commercial species and capture their associated geographic variation. Traditional activities included superior tree selection, seed orchard and seed production area establishment, breeding and progeny testing. First generation seed orchards were established for many of the species, and second generation orchards for only a few. All orchards would provide genetically improved seed needed for reforestation, following timber harvesting, on the National Forests.

In the late 1980s NFS goals and objectives shifted from timber production to ecosystem management and conservation of biodiversity. Timber harvesting decreased up to 90% in some regions, resulting in a drastic reduction in seed needs. The TI programs' objective of genetic improvement for quality timber was no longer the top priority. As a result, some orchard components and most progeny testing were terminated. In 1992 the National Genetics Strategic Plan was penned and in 2002 was revised to focus on three main objectives: genetic conservation, ecosystem restoration and partnerships. Consequently TI programs shifted from traditional tree improvement to genetic resource management. Genetic diversity of tree species became a priority, rather than furthering genetic gains in volume. Currently the Genetic Resource Management Programs (GRMPs) focus on meeting the seed needs for operational reforestation and restoration. Genetic work related to disease resistance continues. Genetic conservation targets preservation of pine and hardwood tree species being impacted by disturbances (i.e. fire, pests, diseases, climate change). Partnerships have been formed with universities, other federal, tribal and state programs, private industry and Forest Service Research facilities to support and strengthen the GRMP goals. One critical partnership is with NFGEL, the NFS National Genetics Lab in Placerville, CA. Scientists provide valuable assistance with genetic diversity and population genetic questions related to conservation, reforestation and restoration.

Ecosystem restoration, and maintenance and sustainability of forested lands on National Forests are long-term commitments. The GRMPs continue to manage current species in the orchards and clone banks, incorporate new species into the orchards and establish seed production areas on National Forests. Ensuring a stable supply of seed that is well adapted is critical for species' perpetuation.