SHORTLEAF PINE GENETIC RESOURCE-SUPPORTING RESTORATION IN THE SOUTHERN REGION

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The USDA Forest Service National Forest System (NFS) in the Southern Region actively supports shortleaf pine (*Pinus echinata* MILL) restoration. Shortleaf pine has the largest range of the four major southern pines. It is a long lived species, genetically diverse, and successfully managed using fire. NFS's reforestation activities include planting several million shortleaf seedlings annually. State and private nurseries grow both bare root and container stock for the Forest Service, using our seed orchard seed. Forest Inventory and Analysis has estimated that the shortleaf pine ecosystem has declined by 50% of the original range noted in 1915. Hence shortleaf pine is the second most important species targeted for restoration by the Forest Service.

The NFS Genetic Resources Management Program (GRMP) actively manages 1200 acres of shortleaf pine seed orchards in North Carolina, Mississippi, Louisiana and Arkansas. This is 70% of all known shortleaf pine seed orchard resources in the south. The orchards contain varying amounts of 1st and 2nd generation material. Cones are harvested on 5-7 year intervals. The GRMP seed bank has 900 pounds viable shortleaf pine seed in storage, 2-25 years old, representing 9 southern seed zones. The GRMP maintains 155 shortleaf progeny tests, which will provide scion material for orchard expansion, backup seed production areas and opportunities for climate change research.

The GRMP is involved in several projects and partnerships, with the purpose of supporting shortleaf pine restoration. The GRMP has sent samples of each of the seed zones to ARS's National Center for Genetic Resources Preservation facility (Ft. Collins, CO) for long term storage and research. The GRMP is working with the Eastern Environmental Threat Assessment Center (EFETAC) to develop new planting zones to prepare for climate change challenges. The GRMP and North Carolina Forest Service have a MOA in place, for the purpose of sharing shortleaf pine improved genetic material. Exchange of scion material between the two agencies helps to replenish seed orchards, increase genetic diversity, and provide a secondary site for some of the material. In support of the Shortleaf Initiative, the GRMP is circulating a Shortleaf Pine Seed and Orchard Resources Survey throughout the south. Data collated includes information about the state of shortleaf seed orchards, e.g. ownership, acreage, age, seed zones, generations, cone crop cycles, and seed inventory. This information will help identify seed zone gaps. The GRMP, in collaboration with Southern Research Station, is helping to fund Oklahoma State University to study shortleaf X loblolly hybrids, and identify any in our shortleaf seed orchards. Forest Service seed orchards typically manage four or more pine species in each orchard, therefore all trees are being DNA fingerprinted to ensure species purity. The work is being done at the NFS National Genetics Lab (NFGEL, Placerville, CA).

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