

Table Mountain Pine Conservation and Restoration Strategies

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Table Mountain Pine (TMP), *Pinus pungens* Lamb., is endemic to the Appalachian Mountains where it typically occupies xeric, southwest facing ridges between 305 and 1220 meters elevation (Zobel 1969). The native range of TMP extends from southern Pennsylvania south to northern Georgia, with numerous outlying Piedmont populations to the east and west of the Appalachian chain that are invariably associated with monadnocks. The species has been used commercially as a source of pulpwood, low-grade sawtimber, and firewood, but is most valuable for the ecosystem services it provides. The serotinous seed cones are a year-round source of food for wildlife, and the trees themselves help to stabilize soils along ridgelines, minimizing erosion and runoff (Della-Bianca 1990).

In the Southern Appalachian Mountains TMP populations are declining due to wild-fire suppression programs (Williams 1998) and periodic outbreaks of the Southern Pine Beetle, *Dendroctonus frontalis* Zimm. (Knebel and Wentworth 2007). As of 2008, U.S. Forest Service inventory data indicated less than 11,000 hectares of the Table Mountain Pine–Pitch Pine forest type surviving in the region (B.S. Crane, personal communication). TMP is a fire-adapted species, and historically successful regeneration on a site has been dependent on lightning and human caused wildfires that eliminate hardwood competition, release advanced TMP regeneration, and stimulate seed release from the serotinous cones of mature trees (Williams 1998). Since the late 1930s, an emphasis on fire suppression in the Southern Appalachians has prevented this process from occurring and allowed succession in these sites to move toward permanent dominance of oaks and other hardwoods. There has been much research on the use of prescribed fire to regenerate declining TMP populations (Welch and Waldrop 2001), but it remains unclear what intensities and frequencies of artificial fire are best for TMP regeneration (Waldrop and Brose 1999; Randles et al. 2002).

In the absence of consistently reliable methods for regenerating declining stands, an effort should be made to conserve those TMP genetic resources that remain before additional populations are lost. Camcore and the U.S. Forest Service National Forest System (NFS) are proposing to do this for surviving TMP populations located on the National Forests of the southern region. We will utilize an *ex situ* germplasm conservation approach similar to what Camcore has used to conserve numerous threatened pine species native to Central America and Mexico since 1980 (Dvorak et al. 2000) and declining populations of Eastern and Carolina hemlock in the southeastern U.S. since 2003 (Jetton et al. 2008 a,b). Genetic diversity of collections will be evaluated using DNA technology at the NFS National Genetics Lab (NFGEL, Placerville, CA).

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