

Table Mountain Pine (*Pinus pungens*) Research Summary

Research Question: *How do we use prescribed fire to successfully regenerate the declining Table Mountain Pine (TMP) populations in the Southern Appalachian Mountains?*

Through a partnership with the USFS Chattahoochee National Forest and the Sumter National Forest along with funding through the Joint Fire Science Program, an extensive research effort to learn the basic ecology of TMP was implemented by the Southern Research Station of the USFS in 1997.

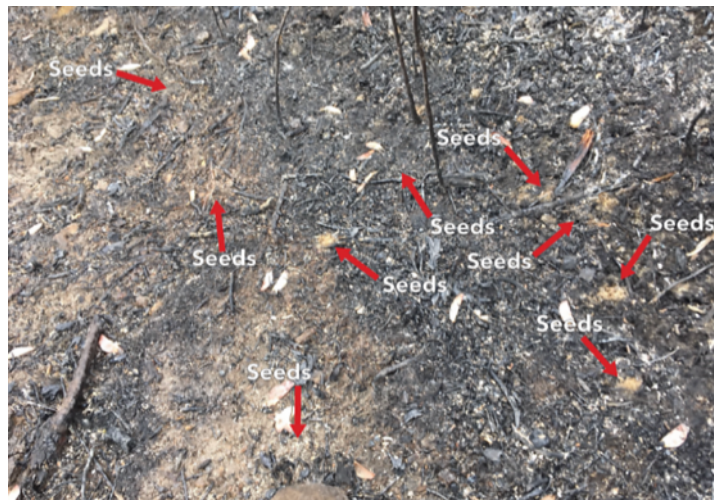
This successful research has yielded numerous refereed journal publications, countless field trips, and a frequently asked questions document. This research now guides the management of this fire dependent species that grows on the steep, rocky, south facing slopes along the Appalachians. The first of many prescribed fires needed to conduct this research was in the Warwoman WMA of the Chattahoochee NF. Through a strong partnership between USFS research and the National Forest system we have a better understanding of how to manage this declining species with fire.

Resources:

- Regeneration History of Three Table Mountain Pine/Pitch Pine Stands in North Georgia.
Patrick Brose, Frank Tainter, Thomas Waldrop
https://www.srs.fs.usda.gov/pubs/gtr/gtr_srs048/article/gtr_srs048-brose02.pdf
- Fire and the Origin of Table Mountain pine-pitch pine communities in the southern Appalachian mountains, USA.
Patrick H. Brose and Thomas A. Waldrop
https://www.srs.fs.usda.gov/pubs/ja/ja_waldrop006.pdf
- Optimal Seedbed Requirements for Regenerating Table Mountain Pine.
Helen H. Mohr, Thomas A. Waldrop, Victor B. Shelburne
https://www.srs.fs.usda.gov/pubs/gtr/gtr_srs048/article/gtr_srs048-mohr01.pdf
- For more publications visit: <https://www.fs.usda.gov/treearch/>
*Keyword: Table Mountain Pine



Open TMP cones following a prescribed burn



TMP seeds on prepared seedbed following a prescribed fire



New TMP regeneration following a prescribed burn

FAQs about TMP (based on a combination of experience and hard research data)

What are the target conditions for TMP regeneration?

Open woodlands having TMP with healthy cones in the overstory, little or no mid-story, sparse understory, 30 percent shade, duff less than 3 inches thick.

What type of fire will accomplish these targets?

Multiple low-intensity fires on a 3- to 7-year cycle may eventually reach this goal. The key is to create a thin duff, partial shade, and maintain a seed source.

Will a single stand-replacement fire accomplish the same objective?

No. A single fire can be very successful at killing overstory trees and regenerating pines but it will not eliminate hardwood sprouting. Pine seedlings will compete well among hardwood sprouts but a pure stand of TMP will not result.

If I can only burn once, should I prescribe a crown fire?

No. We found that the overstory was killed immediately if the flames were tall enough to reach into the lower portions of the crown. In other cases, overstory pines and hardwoods were killed over a 6-year period by fires with flame heights of 6 to 8 feet.

What is the impact to soils?

As long as the duff remains intact, there is essentially no erosion or loss of soil fertility. Mycorrhizae are not as abundant after crown fires (50+ foot flames) but this effect is temporary.

Should I time the burn to match a good seed crop?

No – but make sure you have seed. TMP has serotinous cones and can store seed for several years. However, cones can open without fire during hot droughty conditions so a quick check for closed cones is a good idea. Seed viability is about 30% for trees over 10 years old.

What is the history of fire in TMP stands?

Every stand we measured was all-aged, with trees in every age class from 50 to 150+ years old. This suggests regeneration after frequent disturbances. Most were low-intensity fires but others were high-intensity stand-replacement fires. Regeneration was not evenly distributed possibly due in part to individual tree mortality or localized hot spots. Mountain laurel began regenerating about 50 years ago as fire exclusion became successful.

How old does the stand need to be reintroduce fire after regeneration?

None of the stands that we have measured are tall enough to answer that question. With other pine species, a rule of thumb is to keep fire out until the trees are 20 feet tall. A few trees in stands burned in 1997 are reaching that height but most are smaller.