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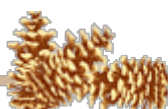
TREE FARM BULLETIN

NEW MEXICO TREE FARM PROGRAM SPRING FIELD DAY

*By Laura Moser, Cooperative Forestry – Assistant Program Manager
USDA Forest Service Southwestern Region*

May third this year was a lucky day for those of us at Rancho Gascon, northwest of Las Vegas at the foot of the mountains. Amongst the idyllic setting of tall trees and green meadows and the multi-generational Bartley Tree Farm, we learned about the basics of soil composition, structure and function. Soil health is defined by the capacity of a soil to function within an ecosystem, to sustain biological productivity, maintain environmental quality, and promote plant and animal health (Doran et al. 1996). It takes a very long time to develop healthy soils that will support a complex forest from the basic rock in our landscape. However, soils can be quickly disturbed by a variety of forest management activities. As tree farmers and forest managers we impact these factors both positively and negatively. Dr. Owen Burney, from NMSU and the John T. Harrington Forestry Research Center, discussed three main activities causing environmental changes to our forest soils.

Wildfire –Excessive fuel loads on the forest floor and in the canopy can tie up nutrients that would normally be available to forest vegetation. The resulting high severity wildfire events may cause an initial increase in available nitrogen; however, it will be quickly followed by a rapid loss through leaching, run off, and gaseous emissions. Post wildfire there is also a decrease in soil microbial activity and a sharp increase in erosion with rainfall events.



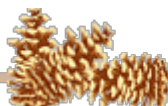
Prescribed Fire – Introduced fire under prescribed conditions is typically used after thinning operations to reduce fuels on the forest floor. Low to moderate severity fires can improve soil conditions, releasing nutrients while not destroying soil structure, flora and fauna. The interval for prescribed fire also affects soil conditions. In Ponderosa pine in AZ more frequent fire (1-6 yrs.) showed a reduction in soil Nitrogen and Carbon compared to an 8-10-year interval between fires. However, intervals greater than 25 years were lower in soil N and C than burn intervals from 1-10 years. Minimizing the patch size of high severity burns (defined as complete fuel consumption and extensive soil heating killing more than 70% of vegetation) in any prescribed fire can improve soil conditions (Stephens et al. 2013).

Thinning operations – Mechanical soil disturbances are inevitable during a fuel's reduction or thinning operation. The machinery used to move logs from the stand to the landings move a long-designated skid trails. The number of passes over the same area can result in severely compacted soils. In Colorado skid trails were measure 16 years after harvesting and were found to be just as compacted as the year of harvest. A study in Minnesota looked at the impacts of skidding traffic on soil disturbance. For areas with 4 or less passes under dry soil conditions, soil health recovered after 3 years. In areas with more than 10 passes they saw no recovery from compaction after 3 years and a significant reduction in aspen regeneration. Use the New Mexico Forest Practices Guidelines (EMNRD – NM State Forestry) to better design your roads (p. 53) and skid trails (p. 87) to minimize soil compaction and erosion from your thinning operations. http://www.emnrd.state.nm.us/SFD/Publications/documents/NM_ForestPracticesGuidelines2008.pdf

- A. Design trails ahead to limit the number of passes
- B. Conduct mechanical activities on frozen or dry soils whenever possible
- C. Don't place skid trails on steep slopes, stream channels or banks
- D. Don't skid within watercourses
- E. Keep trails as narrow as possible
- F. Suspend the lead end of the log during skidding
- G. Place water bars on sloped trails during and after operations



1. J.W. Doran and A.J. Jones. 1996, *Methods for assessing soil quality*, SCIENCE, 410 pp
 2. S. L. Stephens et al., 4 OCTOBER 2013 VOL 342 SCIENCE, pp 41-42, www.sciencemag.org



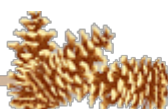
We next heard from Dr. Kyle Rose at New Mexico Highlands University. One of his classes has established monitoring plot points in a stand at Bartley's to evaluate the effectiveness of current treatments on reaching the landowner's goals. It is a mixed species stand that they are managing for ponderosa pine harvest and meanwhile encouraging an understory crop of small white fir and Douglas fir for Christmas trees.



The main goals are to produce merchantable timber while:

1. **Reducing risk of stand replacing fire.** The objective is to create and maintain structure to mitigate risk of both passive and active crown fires. They used two criterion - torching index ≥ 20 mph & crowning index ≥ 20 mph.
2. **Improving wildlife habitat for elk.** The objective is to establish stand structure that will create habitat for elk. The criterion they used was maintain a hiding cover of $\geq 90\%$ of an adult standing animal at 200 ft.
3. **Reducing pest and pathogen presence to promote a healthy forest.** The objective is to remove affected trees while promoting the health of the stand. They used two criterion, although the results were only available for one at this time – reduce the number of mistletoe infected trees $\leq 20\%$ and maintain a pine beetle risk rating under 9.

After a thorough survey of existing stand structure, the class then modeled what would happen to this stand if no forest management was done, if the stand was thinned every 30 years, or if it was thinned and burned. The preliminary results show that the thinning only treatment was equally effective as thinning and burning at keeping the stand above the threshold for both crowning and torching indices. Not surprisingly no forest management actions led the stand into a high likelihood of tree torching in the next 5 years and large crown fires in the next 30. It also showed that regeneration events have a large effect on these criteria. Elk hiding cover reached the desired density with only two alternatives, the thinning and burning and the no action. These alternatives both maintained the stand risk rating for bark beetle below the threshold, although thinning and burning was the most effective. Both the thinning and the thinning and burning management plans maintained a steady amount of



merchantable timber over the next 50 years, while decreasing the stand's likelihood of torching and crown fire

I realize that some of this terminology may be confusing, I highly recommend the website *FireWords* to search for definitions and explanations <<http://www.firewords.net/>>.

1) COMMITTEE MEETING

All Tree Farmers are invited and encouraged to attend our 2nd New Mexico Tree Farm Committee Meeting of the year (three held annually). Please join us at 1:30 pm on Wednesday, August 14th, 2019 at the New Mexico Department of Game and Fish office located at 7816 Alamo Road. NW, Albuquerque, NM 87120. Come out and hear what other tree farmers have been up to and share your tree farm accomplishments with the group. We look forward to visiting with you. If you have any questions, please contact Arnie Friedt at arnie.friedt@state.nm.us

2) BUY, SELL OR TRADE

Are you looking for forestry related equipment to buy (i.e. chipper, splitter, chainsaw, etc.)? Or, do you own forestry related equipment you would like to sell or trade? Forestry related equipment only, please, no homes or land. We would like to help you make the connection with other New Mexico Tree Farmers. Provide us with a description of the equipment, price, photo and contact information and we will post it in the New Mexico Tree Farm Bulletin. If you would like us to help you make the connection, please provide information to Arnie Friedt at arnie.friedt@state.nm.us

FOR SALE: Morbark Model 10, only has 774 hours on it, 56 hp John Deere diesel engine and recently rebuilt twin disc clutch. Good condition, very dependable and easy to maintain machine. \$7,500... reduced from \$8,000. Contact JJ or Kim Duckett, 575-987-2561 or email mountain@dellcity.com --- Located in Timberon, NM.



3) COMMUNITY CORNER

If your community is having a forestry related public event let us know the details and we would be delighted to promote your event in the New Mexico Tree Farm Bulletin. Give us the event details, Who, What, Where and When with contact information and we will include in our monthly bulletin. If you would like us to help you promote your event, please provide information to Arnie Friedt at arnie.friedt@state.nm.us

4) E-MAIL INSTEAD OF SNAIL MAIL

Would you prefer to receive your Tree Farm Bulletin by e-mail instead of snail mail? If so, contact Arnie Friedt at arnie.friedt@state.nm.us and provide him with your contact information. By receiving your Tree Farm Bulletin by e-mail our operating costs are reduced. Thank you for considering this option.

