



File Code: 3420

Date: August 7, 2001

Route To:

Subject: Evaluation of Gooseneast Plantations (FHP Rept. No. N01-05)

To: Forest Supervisor, Klamath NF

On July 11, 2001, Pete Angwin and Dave Schultz from the Northern California Shared Service Area met with some of the Silviculture staff from the Gooseneast RD to look at pest problems in several plantations.

The War Memorial plantation near the intersection of Highway 97 and the County Road from Grenada has had a number of previous pest problems. During the year 2000, some of the plantation ponderosa pines were defoliated by *Zelleria haimbachi*, the pine needle sheath miner. When we examined the trees this year, there was still a minor amount of feeding from the pine needle sheath miner. There was also considerable defoliation in this plantation from pine sawflies, *Neodiprion fulviceps*. There are at least several hundred acres of pine plantation defoliated by sawflies in the general area of the Military Pass Road on both the Klamath and Shasta-Trinity Forests.

The pine needle sheath miner and pine sawflies are commonly seen in pine plantations. Both of these insects have somewhat cyclic populations and have numerous parasites and predators. High population levels of these insects are generally seen only in fairly dense, contiguous stands of young pines. Although the defoliation can appear rather spectacular, it rarely leads to tree mortality. Both of these defoliators feed fairly early in the season. They generally consume older foliage, and pupate before the new foliage emerges. The trees are rarely bare of foliage for very long.

Several of the plantation trees in the War Memorial plantation had recently died from causes that did not appear to be related to the defoliation. The dead trees were killed by *Dendroctonus valens*, the red turpentine beetle. Most of the attacks were made on the lower boles and roots of trees that had been partially covered with chips from trees that had been thinned. The chips were purposely blown around the base of these trees to avoid placing the chips in sensitive plant habitat. Part of the effect of the chip piles may have been that the highly resinous pile of chips prevented the winter snow and rain from recharging the root zone with moisture. A more likely effect was that the large amount of pine resin released from the chips attracted red turpentine beetles to these trees. The practice of piling fresh chips should be avoided near specific trees that are desirable to keep in the plantation.

We looked at the condition and stocking level of the trees in the War Memorial plantation. Although there have been a number of pest organisms present in the plantation for many years, the greatest hinderance to stand development appears to be the site quality. The plantation is located in an area that has a very sharp moisture gradient. Most of the plantation probably receives an average of around 20 inches of annual precipitation. The soil is excessively well drained in most places. A few locations have lava very near the surface. Western juniper, antelope bitterbrush and mountain mahogany are common in the area. The distribution of older



trees on aerial photographs in the area, as well as the distribution of older stumps in the plantation suggests that a spacing of 40 to 50 feet between mature trees is probably the level that is sustainable. The plantation trees are nearing the size and stocking at which beetles will begin to kill some of the trees. Thinning would prevent some mortality and would assist in maintaining tree cover over most of the plantation. It may be difficult to pick out the trees with the "best" crown until additional foliage develops.

We looked at additional older plantations along Highway 97 near the Cougar Fire Road. This appeared to be a slightly higher site because it is probably in the 25-30 inch annual precipitation band. Several of the plantation trees had been attacked by red turpentine beetle. The only stress factors involved in the mortality appeared to be the stocking level and the current low precipitation. Thinning in these areas is likely to prevent future bark beetle caused mortality. The higher site quality could probably support a spacing of around 25 feet between trees.

We also looked at a ponderosa pine plantation in the area of the First GTR sale. The trees appeared to be very small for their age of 11 years. There were many incidental insect and disease organisms on the trees. A certain amount of the stunting could be explained by having a cattle water trough stationed in the plantation. Heavy browsing had reduced some trees to small balls of foliage. However, some digging in the flat part of the plantation revealed some sort of an impervious layer less than a foot below the ground line. This layer had caused many of the planted trees to be J-rooted. Because there had been a stand of mature timber on the site, we concluded that it must be possible for some trees to get roots through the layer. It would probably be best to consult with the Forest Soil Scientist about the feasibility and economics of deep tilling the site prior to replanting.

Deb Fleming had intended to use part of the First GTR sale as her Silvicultural Prescription recertification stand. The area had already had extensive removals and mortality. Most of the larger, older trees had already been removed, and the understory had been removed. The stand that was left had a lot of smaller diameter white fir infected with white fir dwarf mistletoe. There were a few large white fir trees that had heavy infections of dwarf mistletoe and obvious signs of cull. There were many signs of annosum root rot, *Heterobasidion annosum*, in the stand. There were many signs of windthrow and top breakage in the white fir in the stand. There were some smaller diameter ponderosa pines in the stand. This does not look like a good stand to implement a Green Tree Retention prescription. If forced to implement a GTR prescription in this area, the most viable alternative would seem to be to leave most of the ponderosa pine and as few of the best looking white firs necessary to meet the 15% target. It looks like some of the residual white fir will probably die or be windthrown. The preferred species for planting would be ponderosa pine. The species of dwarf mistletoe and the strain of annosum root disease found in the white fir in this stand will not affect the ponderosa pine.

Let us know if you need more information.

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Entomologist