

The intent of this brief summary is to highlight prevalent theory and management and to compare it with the Chewaucan Biophysical Monitoring Team findings over the last few years.

The Chewaucan Biophysical Monitoring Team (CBMT) has been monitoring beetle kill in the upper Chewaucan, Sycan and Sprague River watersheds for three years. Eight permanent 1/10 acre plots have been established every two miles along Forest Service road 28 from Currier Springs above Winter Rim to the Campbell Lake area. Ten or more 1/50 acre plots per area were also surveyed to better characterize entire area. Data collected included: tree specie, diameter, height, crown ratio, crown width. Tree moisture and beetle density of approximately 800 trees, predominately lodgepole pine was also collected.

Current Theory & Management:

The prevailing theory is that beetle attacks are cyclical, tend to last about 10 years and kill larger (DBH>10") stressed trees that are slowing in growth. High density stands, due to fire suppression, tend to reduce nutrient and water availability further stressing the larger trees. When beetles find a good food supply, pheromones are released that attract more beetles to the area.

Current management seeks to reduce stand density and focus on thinning from below, leaving the largest trees. This treatment makes limiting resources, water and sunlight, available in greater supply.

Observations:

Beetles tend to attack lodgepole trees with diameters greater than 7.9" (average DBH = 17.3"), and with large tree stand basal area >90ft² /acre (the overall basal area and the number of stems in the stand does not appear to be as important as once thought).

Affected trees have similar average growth rates (11.3 rings/cm) versus the unaffected trees (11.6 rings/cm), however the upper 95% of mean for dead lodgepole is 12.7 rings/cm while it is 13.2 rings/cm for surviving lodgepole pine. This indicates that the surviving lodgepole pine with smaller diameters were growing slower (in diameter) than their beetle infested counterparts.

Another startling discovery was that two areas, Lee Thomas Crossing and Ingram Station, which had been thinned from below to a basal areas of around 120ft²/ac leaving predominately larger diameter trees(DBH>10"), were completely devastated by beetles in spite of their low density and low stand basal area, which is the management method currently being used to treat beetle infestations. Stands were reduced from around 120 ft² basal area per acre to around 10 ft² basal area per acre by beetles.

Conclusions:

1. Trunk surface area may be the major factor in attracting beetles to trees;
2. Large tree density and stand basal area density appear to be the predisposing factors encouraging beetle epidemics;
3. Faster growing trees do not appear to stem beetle infestations, but may in fact, attract them.

Therefore: Management should focus on reducing the density of large lodgepole pine trees within at-risk stands.