United States Department of Agriculture

Forest Service

Northern California Shared Service Area

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Route To:

Subject: Evaluation of Thinning Slash at Juanita Lake (FPM Rept. N99-2)

To: Forest Supervisor, Klamath NF

The Goosenest RD has an area adjacent to the Juanita Lake campground under contract to be thinned by a feller-buncher. The area was sheared and bundled during the spring and early summer of 1998. Thousands of bundles of unlimbed plantation trees have laid on the ground for up to a year. The purpose of leaving the bundles in the woods is to allow the trees to dry out prior to being chipped to reduce the haul cost. Thousands of acres have been treated in a similar manner over the past 6 years on the Goosenest RD without any elevated level of mortality noticed in the leave trees.

A number of questions have been raised on the Goosenest RD about the risks associated with the practice of allowing bundles of trees to dry in the woods. The clean chips produced from this material has a relatively low value, and the market is very volatile. In order to attract a bidder to the current Juanita Lake project, it was necessary to offer considerable flexibility in the timing of operation and the length of the contract. Any mitigating measures proposed to reduce the risk of subsequent mortality due to insects breeding in the slash needs to be weighed against the possibility that any increased cost may eliminate this method of thinning plantations.

On May 12, 1999, the slash in the Juanita Lake planation was examined by the following group:
Dave Schultz, Entomologist, Forest Pest Management,
Pete Angwin, Pathologist, Forest Pest Management,
Roger Siemers, District Silviculturist, Goosenest RD,
Deb Fleming, Silviculture, Goosenest RD.

Roger Siemers had some specific questions about the Juanita Lake snip and chip thinning, and some future sales which will be very similar. The following discussion pertains only to the Goosenest RD due to the combination of forest types, climate, and slash-breeding insects found there. Attempting to apply this same information to west-side stands will produce entirely different results.

Question: Is there a current threat posed by the bundles of trees in the Juanita Lake plantation?

Answer: No. Or, at least it is very low. There are only a few species of beetles which have any potential to infest pine slash on the Goosenest RD. None of these are very likely to build up in slash and then emerge and attack standing, healthy pine trees. The larger parts of the boles of the thinned trees in the bundles were infested last year by the California flatheaded borer, *Melanophila californica*, and the pine engraver *Ips pini*. There were probably also a few other miscellaneous insects which infested the material, but the cambium of the larger material was so chewed up that it is difficult to identify other species. Some of the tops of the trees in the bundles are still green enough that they are being infested by *Ips pini*. The California flatheaded borer infests only trees which are in the process of dying, and does not pose a threat to thrifty plantation trees. In northeastern California, the pine engraver is primarily a slash-breeding insect which normally infests only slash, and diseased or damaged pine trees. Since 1924, there have been only 13 documented outbreaks of *Ips pini* in the 1.3 million acres of eastside pine in northeastern California. There are 7 or 8 other species of *Ips* in California, so the risk of pine

leave tree mortality will be different in other areas of California.

Question: Is there anything which could or should be done with the slash on the ground in the Juanita Lake plantation now?

Answer: The simple answer is that there is no action needed. That is fortunate, because it would be almost impossible for the Forest Service to move fast enough to cause the contractor to remove material prior to the current generation of *Ips pini* completing a life cycle and emerging. Even when private industrial timber companies have their own equipment on their own land, it is rare that they can move fast enough to actually remove or destroy infested slash before the brood emerges. The key to managing mortality of leave trees caused by slash-breeding insects in an efficient and economical manner is to understand which insects are likely to be present in a given area and which particular management activities pose a predictable risk to the leave trees.

The greatest risk from the slash at Juanita Lake was during the spring and early summer of 1998. There is currently a very low risk of leave tree mortality. This risk will remain low as long as the existing slash is removed in an orderly manner at a time of year when the soil is dry and the bark on the leave trees is firm.

Question: Which slash-breeding insects are present in the Juanita Lake area, and which management activities pose an increased risk of mortality to the leave trees?

Answer: There are a number of beetles which have the ability to breed in freshly cut or broken pine. Some of these beetles, such as the California flatheaded borer and some weevils are important in the decomposition of wood, but have no potential to kill any of the thrifty leave trees, so they will not be discussed any further.

The traditional cause for worry about slash-breeding insects was the idea that beetles would infest the slash, and the brood which emerged from the slash would attack the surrounding leave trees. On the Goosenest RD, the greatest threat is the beetles going into the fresh pine slash, rather than the beetles emerging from slash. The first beetles to infest the fresh pine slash produce pheromones which attract additional beetles of the same species. If the stems of the pine trees cut during thinning are left within 5 feet of the bole of a pine leave tree, the beetles attracted to the slash under attack may overshoot their target and attack the leave tree. The primary species of slash-infesting beetle capable of causing residual leave tree mortality in this manner on the Goosenest RD would be the pine engraver, *Ips pini*. Other beetle species which are capable of causing pine leave tree mortality around slash bundles or piles during the spring on the Goosenest RD would be the western pine beetle, *Dendroctonus brevicomis,* and the mountain pine beetle, *Dendroctonus ponderosae.* While neither of these *Dendroctonus* beetles are true slash-breeding insects, they will sometimes begin boring in pine slash or snow breakage during the spring, when other suitable host material is scarce. Although the *Dendroctonus* beetles usually emerge from the slash after boring a meandering adult gallery and laying only a few token eggs, they release pheromones while they are boring in the cambium. This can occasionally result in a ring of trees being attacked around a slash pile or bundle.

A worst-case scenario resulting from leaving thousands of bundles of pine stems in close proximity to pine leave trees over several hundred acres on the Goosenest RD would be in the order of about 10 groups of 6 to 10 pine leave trees killed. Mortality of this magnitude would be compatible with management prescriptions for most of the general forest or unregulated areas.

Question: Would it be worthwhile to include a C-clause to require the purchaser to remove

pine slash infested with *Ips*?

Answer: No. On the Goosenest RD, most of the damage to the leave trees would have been done during the process of the slash becoming infested. Requiring the infested slash to be removed on the Goosenest RD would be analogous to locking a barn door after the horse has been stolen. To the extent that the C-clause would reduce the bid price for the trees to be snipped, this would result in increased cost with no benefit.

Question: Are there any slash manipulation measures which would reduce the risk of residual mortality while being cost-effective on the Goosenest RD.

Answer: Yes, in the limited areas where the resource values are high. Examples would be in campgrounds, administrative sites, critical wildlife habitat, and adjacent to property lines of other owners. The maximum effective distance the beetle pheromones are capable of inducing attack on a green tree on the Goosenest RD is approximately 25 feet. A relatively simple way to lower the risk of residual mortality in these limited areas of higher values is to prohibit piling and storing slash or bundles of stems within 25 feet. To the extent that these higher value areas where piling would be prohibited can be identified in advance and included on maps, it may limit the impact this would have on bid prices.

Please contact me if you need more information or want to discuss any ideas.

/s/

Dave Schultz
Entomologist

Cc: Tom Farmer
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