



# Forest Health Protection Pacific Southwest Region



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To: Patricia Grantham, Forest Supervisor, Klamath National Forest

Subject: Biological Evaluation of Thinning Projects – Goosenest Ranger District  
(FHP Report No. N09-07)

On May 18-21, 2009, Cynthia Snyder (Entomologist) and Pete Angwin (Plant Pathologist) from Forest Health Protection visited the Klamath National Forest to review past, current and future thinning projects requesting FHP funding with Roger Siemers (Klamath National Forest SO).

On May 21, Cynthia, Pete and Roger were joined by Sam Solano and Mike Reed (Goosenest Ranger District) and to look at the Boxcar WUI Thinning Project planned for FY2012, Round Valley Thinning Project planned for FY2010, Big Pony Thinning Project planned for FY2012, and to review the La Honda Thinning Project (part of the larger Tennant WUI Strategy) completed earlier this year using FHP prevention/suppression funding.

On July 30, Cynthia and Pete returned to the Goosenest Ranger District to look at the other projects within the Round Valley EIS with Sam Solano. These included projects planned for FY2010 and beyond, including Round Sink, Thompson Ranch and Cedar Mountain.

On September 3, Cynthia and Pete returned to the Goosenest Ranger District to look at stands in the Thompson Ranch WUI in light of changes made for FY2010 which involve western juniper removal to release ponderosa pine. They were joined by Mike Reed and Goosenest District Ranger, Laura Allen.

Observations and recommendations for the planned project areas are as follows:

### **Boxcar WUI Plantations**

The Klamath NF wants to accomplish 352 acres of precommercial thinning, piling and burning in ponderosa pine plantations in approximately FY2012. This project area is covered under the Erickson NEPA. We visited the area on May 21, and saw plantation

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Figure 1. Overstocked ponderosa pine plantation at Boxcar project area.



Figure 2. Overstocked ponderosa pine plantation at Boxcar project area.

units 738-4 (N41° 38.926', W123° 05.315') and -10. Located in the Butte Creek drainage, the project area is in the Tennant Wildland Urban Interface (WUI). Ponderosa pine was planted in the late 1960s following a winter wildfire. Trees were originally planted at 6 x 6 foot spacing, about 600 trees per acre (TPA). A precommercial thin was done later to a 12 foot spacing. Spacing is currently about 12-14 foot, approximately 300 TPA, reaching capacity with self-pruning starting to occur. The trees are primarily precommercial-sized ponderosa pine, approximately 40 years old with the majority of the trees occupying the codominant crown class, creating a closed canopy (Figures 1 and 2). The stands are becoming very dense, and the risk to attack by western and mountain pine beetle (*Dendroctonus brevicomis* and *Dendroctonus ponderosae*, respectively) is increasing fast. The risk to crown fire and mortality from drought is likewise increasing. To address this problem, the District plans to precommercially thin the plantations, leaving only the healthiest, most vigorous, defect-free trees, mastication may be used to remove brush and precommercial-sized trees. Stocking levels will be reduced to 76-134 trees per acre (20-40 foot spacing) and fuels will be hand piled and burned. These treatments will be sufficient to reduce bark beetle risk and meet Regional Density Management policy.

### Round Valley Plantations

The Klamath NF wants to accomplish 556 acres of precommercial thinning, piling and burning in ponderosa pine plantations near the community of Round Valley in FY2010. The project area is located in the Tennant WUI and associated fuel treatments will protect the stands and adjacent private property from wildfire. NEPA for the project is complete under the Butte Creek WUI Analysis. More plantations will be proposed under the new Round Valley WUI Strategy, a multi-year proposal starting in FY2011.

Unit 742-28 (N41° 35.286', W121° 56.469') was planted to ponderosa pine in 1987. Spacing is currently about 12-14 foot, approximately 300 TPA, reaching capacity with self-pruning starting to occur. The trees are primarily precommercial-sized ponderosa pine (4-6 inch DBH) with the majority of the trees occupying the codominant crown class (Figures 3 and 4). The stands are becoming very dense, and the risk to attack by western and mountain pine beetle (*Dendroctonus brevicomis* and *Dendroctonus ponderosae*, respectively) is increasing. The risk to crown fire and mortality from drought is likewise increasing. Current insect issues include a variety of pine plantation "usual suspects" such as gouty pitch midge (*Cecidomyia piniinopsis*), pine needle sheathminer

(*Zelleria haimbachi*), and western pine shoot borer (*Eucosma sonomana*). The target post-treatment density ranges from 76-134 trees per acre, which will be sufficient to address bark beetle, drought and fire concerns within the parameters of the Region's density management policy and WUI directives.



Figure 3. Overstocked ponderosa pine plantations in the Round Valley project area.



Figure 3. Overstocked ponderosa pine plantations in the Round Valley project area.

### Big Pony Plantation Thin

There are six plantations in the Big Pony project area that are planned for thinning in FY2012. The project area is located in the Tennant WUI and associated fuel treatments will protect the stands and adjacent private property from wildfire. NEPA for the project is complete under the Butte Creek WUI Analysis. These plantations were all planted to ponderosa pine, except 749-41 which was planted to lodgepole pine. White fir has seeded in to some degree in all plantations. We visited stands 749-73 (N41° 33.876', W121° 52.717') and -5 (N41° 32.750', W121° 54.446'), both of which were planted in 1970-71. Both stands have been precommercially thinned in the late 1990s. Spacing is currently about 12-14 foot, approximately 302 TPA, reaching capacity with self-pruning starting to occur. The trees are primarily precommercial-sized ponderosa pine, approximately 40 years old with the majority of the trees occupying the codominant crown class, creating a closed canopy (Figures 5 and 6). The stands are becoming very



Figure 5. Overstocked ponderosa pine plantation (unit 749-5) in Big Pony project area.



Figure 6. Overstocked ponderosa pine plantation (unit 749-73) in Big Pony project area.

dense, and the risk to attack by western and mountain pine beetle (*Dendroctonus brevicomis*), which is present in stand 749-5, is increasing. The risk to crown fire and mortality from drought is likewise increasing. Treatment proposed is thinning to 20-25 foot spacing. The target post-treatment density ranges from 76 -134 trees per acre, which will be sufficient to address bark beetle, drought and fire concerns within the parameters of the Region's density management policy and WUI directives.

### Round Sink

Plantations in the Round Sink project area are part of the larger Round Valley WUI Strategy, which will be proposed as a multi-year proposal starting FY2011. NEPA is completed in the Round Valley EIS. These plantations were planted to ponderosa pine at an 8 foot spacing about 20 years ago. White fir has seeded in to some degree in all plantations. We visited stands 742-27 and -4, and 730-10 and -6. Spacing is currently about 8-12 foot, reaching capacity. The trees are primarily precommercial-sized ponderosa pine (4-6 inch diameter), approximately 20 years old with the majority of the trees occupying the codominant crown class, creating a closed canopy (Figures 7 and



Figure 7. Overstocked ponderosa pine plantation (unit 730-10) in the Round Sink project area.



Figure 8. Overstocked ponderosa pine plantation (unit 730-10) in the Round Sink project area with evidence of western pine beetle.

8). Currently, a suite of plantation pests, including ponderosa pine tip moth (*Rhyacionia zozana*) and western pine shoot borer (*Eucosma sonomana*) are common. Approximately 10 acres of residual ponderosa pines alongside stand 730-10 are experiencing heavy porcupine feeding damage. The stands are becoming very dense, and the risk to attack by western and mountain pine beetle (*Dendroctonus brevicomis* and *Dendroctonus ponderosae*, respectively) is increasing fast. The risk to crown fire and mortality from drought is likewise increasing. The proposed thinning goal is to increase tree spacing to 20-24 feet. The target post-treatment density ranges from 76-134 trees per acre, which will be sufficient to address bark beetle, drought and fire concerns within the parameters of the Region's density management policy and WUI directives.

### Cedar Mountain

Plantations in the Cedar Mountain project area are part of the larger Round Valley WUI Strategy, which will be proposed as a multi-year proposal starting FY2011. NEPA is completed in the Round Valley EIS. We visited units 722-12. These plantations were all planted to ponderosa pine in the mid-1980s and are currently a mix of young planted ponderosa pine and residual ponderosa pine. Spacing is currently about 8-12 foot,



**Figure 9.** Overstocked ponderosa pine plantation in the Cedar Mountain project area.



**Figure 10.** Overstocked ponderosa pine plantation in the Cedar Mountain project area.

reaching capacity with self-pruning starting to occur. The trees are primarily precommercial-sized ponderosa pine, approximately 20-25 years old with the majority of the trees occupying the codominant crown class, creating a closed canopy (Figures 9 and 10). The stands are becoming very dense, and the risk to attack by western and mountain pine beetle (*Dendroctonus brevicomis* and *Dendroctonus ponderosae*, respectively) is increasing fast. The risk to crown fire and mortality from drought is likewise increasing. The proposed thinning goal is to increase tree spacing to 20-24 feet. The target post-treatment density ranges from 76-134 trees per acre, which will be sufficient to address bark beetle, drought and fire concerns within the parameters of the Region's density management policy and WUI directives.

Current insect and disease issues include western dwarf mistletoe (*Arceuthobium campylopodum*) coming from infected residual overstory ponderosa pines (Figures 11 and 12). The stands in the project area will be further assessed for dwarf mistletoe



**Figure 11.** Vegetative shoot of western dwarf mistletoe.



**Figure 12.** Female plant of western dwarf mistletoe with ripe fruits.

intensity and distribution and thinning prescriptions will be adjusted accordingly. At the present time, infestation in the stands that were visited appeared to be light enough that sanitation thinning is feasible.

### **Thompson Ranch WUI**

The Klamath NF had originally planned to accomplish 400 acres of precommercial thinning and western juniper removal in ponderosa pine plantations and natural stands in FY2010. The project area is located in the Tennant WUI and associated fuel treatments will protect the stands and adjacent private property from wildfire. NEPA for the project is complete under the Butte Creek WUI Analysis.

In September of 2009, this plan was changed to simply 400 acres of western juniper removal in plantations scheduled for PCT and adjacent natural stands. Western juniper grows much faster than ponderosa pine and uses a large amount of water which represents a potential water loss to the competing pine. Juniper reduction may significantly increase the relative availability of late season soil moisture (Bedell et al. 1993, Deboot et al. 2009, Deboot 2009) thereby releasing and creating better growing conditions for the residual pines.

We looked at stand 729-6 (N41° 40.130', W121° 52.262') and natural stands between PCT units 729-5 and 729-3 (N41° 40.222', W121° 51.917'). Currently the PCT stands are clumpy with a BA of 120 sq.ft./ac. with a desired outcome of 80 sq.ft./ac. using a two step process of thinning ponderosa pine below 10 inch DBH and juniper removal leaving approximately one juniper per acre for wildlife diversity. The natural stands consist of approximately 3 large (20+ inches DBH) ponderosa pines per acre, a 50/50 mix of smaller (~30 year old) ponderosa pine and western juniper (100-150 trees per acre) and a mix of ponderosa pine and western juniper seedlings/saplings coming in underneath (Figures 13 and 14). This area would also be taken down to one western juniper per acre leaving all ponderosa pine. The area is considered prime deer winter range with a mix of cover and bitterbrush. The treatment of removing all but one juniper per acre may be sufficient to address drought and fire concerns which would protect remaining pines from bark beetle attack. They are also within the parameters of the Region's density management policy and WUI directives.



**Figure 13. Ponderosa pine plantation (unit 729-6) slated for 2-step process of commercial timber sale and non-commercial juniper removal to release pine residuals.**



**Figure 14. Natural stand of ponderosa pine and western juniper where juniper removal is needed to release pine.**

## La Honda Review

In spring of 2009, the Goosenest Ranger District completed 600 acres of thinning and mastication on the La Honda portion of the Tennant WUI Strategy. Stands in the La Honda portion were reviewed in 2008 (Figures 15 and 16 from Success Story “Western Bark Beetle Initiative, Region 5, Striving for Healthy Forests: A Partnership Between Forest Health Protection and the Klamath National Forest”). However, the 2009 treatment stands were not thinned as heavily as the previous treated stands (Figures 17 and 18). Stands 743-8 (N41° 37.077', W121° 52.234') and 743-9 (N41° 38.290', W121° 50.190') were thinned to as little as 10-15 foot spacing and we questioned whether the thinning would meet the Regional Forester’s 20-year re-entry guideline.



Figure 15. Ponderosa pine plantation at La Honda prior to thinning in 2008.



Figure 16. Ponderosa pine plantation at La Honda thinned to 25-30 foot spacing in 2008.



Figure 17. Ponderosa pine plantation at La Honda (unit 743-8) thinned in 2009 to 10-15 foot spacing.



Figure 18. Ponderosa pine plantation at La Honda (unit 743-9) thinned in 2009 to 10-15 foot spacing.

Mike Reed, Silviculturist, Klamath National Forest, ran several FVS simulations to determine the difference in stocking levels and the effect on probability of bark beetle outbreak based on Oliver’s Stand Density Index (SDI) calculations (Oliver 1995) for 20 vs. 30 foot spacing. His simulations showed the optimum spacing for ponderosa pine, based on data collected from the La Honda plantations, was 20 feet. This spacing provided for the greatest increase in tree volume while remaining below the 50% max SDI threshold for imminent bark beetle outbreak determined by Oliver. Some of the

2009 treatments may have to be returned to for more thinning if forest funds are available for the treatment.

Hundreds of bundles of unlimbed plantation trees have laid on the ground for up to a year (Figure 19). 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 several years on the Goosenest RD without any elevated level of mortality noticed in the leave trees. However, pine engraver (*Ips pini*) was found in nearly all of the piles looked at in May (Figure 20). 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



Figure 19. “Doodle” piles of cut ponderosa pine found throughout La Honda plantations thinned in 2008 and 2009.



Figure 20. Boring dust from pine engraver (*Ips pini*) beetles infesting slash left in La Honda plantations.

California (Schultz 1999). It is from the advice of Dave Schultz that 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. 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 (Schultz 1999).

### Summary

The proposed treatments (for portions proposed for FY2010 and the multi-year portions starting FY2011), if fully implemented, will be effective in addressing concerns regarding bark beetles, fire and drought, and will meet the Regional Forester’s density management policy that high risk density levels will not be reached again for at least 20 years. Western juniper removal in the Thompson Ranch area will be effective in addressing concerns regarding future bark beetles and current concerns regarding drought and wildlife diversity. I fully support the treatments as described.

If you have any questions regarding this report and/or need additional information please contact Cynthia Snyder at 530-226-2437 or Pete Angwin at 530-226-2436.

*/s/ Cynthia Snyder*

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**References:**

Bedell, T.E., L.E. Eddleman, T. Deboodt and C. Jacks. 1993. Western Juniper: Its impact and management in Oregon rangelands. Oregon State University Extension Service report EC 1417.

Deboodt, Timothy L., Michael P. Fisher, John C. Buckhouse and John Swanson. 2009. Hydrologic Responses to Western Juniper Removal: The Camp Creek Paired Watershed Study 62nd Society for Range Management Annual Meeting. Paper No. 2050-5.

Deboodt, Tim. Increasing water availability through juniper control. [egov.oregon.gov/.../Juniper/ControllingJuniperandWater\\_deboodtfinal.pdf](http://egov.oregon.gov/.../Juniper/ControllingJuniperandWater_deboodtfinal.pdf). Accessed September 2009.

Oliver, W. W. 1995. Is self-thinning in ponderosa pine ruled by *Dendroctonus* bark beetles? Proceedings of the 1995 National Silviculture Workshop, May 18–21, Mescalero, New Mexico, 21213–18. General Technical Report RM-GTR-267. Fort Collins, CO: U.S. Forest Service.

Schultz, Dave. 1999. Evaluation of Thinning Slash at Juanita Lake. FPM Rept. N99-2, Redding, CA: US Forest Service.