



# Forest Health Protection Pacific Southwest Region



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To: Area Manager, Bureau of Land Management, Eagle Lake Field Office,  
Susanville, CA

Subject: Evaluation of Forest Health in Hobo Camp  
(FHP Report NE06-08)

At the request of Don Dockery, Forester (Eagle Lake Field Office of BLM), Danny Cluck, Forest Health Protection (FHP) Entomologist, and Bill Woodruff, FHP Plant Pathologist, conducted a field evaluation of Hobo Camp on May 24 and June 1, 2006. The objective was to evaluate the current health of the ponderosa pine in Hobo Camp and to provide management recommendations as appropriate. Don Dockery, Stan Bales (5/24) and Wade Salverson (6/1), BLM, were each present one day. On the June 1<sup>st</sup> visit, Dave Evans, Forest Silviculturist for the Lassen NF participated to provide tree growth expertise.

## **Background**

Hobo Camp (Figures 1 and 2) is a Bureau of Land Management (BLM) day-use recreation site located on a small flat adjacent to the Susan River, less than a mile west of Susanville, CA, at an elevation of 4300 feet. Annual precipitation for the area is 14-16 inches. The forest is a typical eastside pine type consisting mostly of second growth ponderosa pine. The parking and picnic areas in the lower part of the Hobo Camp are forested with large diameter ponderosa pine. The sparse understory consists of grasses, forbs, shrubs and small hardwoods with very little pine regeneration. Management objectives for the site include maintaining the large tree component for shade and aesthetics while minimizing hazard trees and bark beetle caused tree mortality.

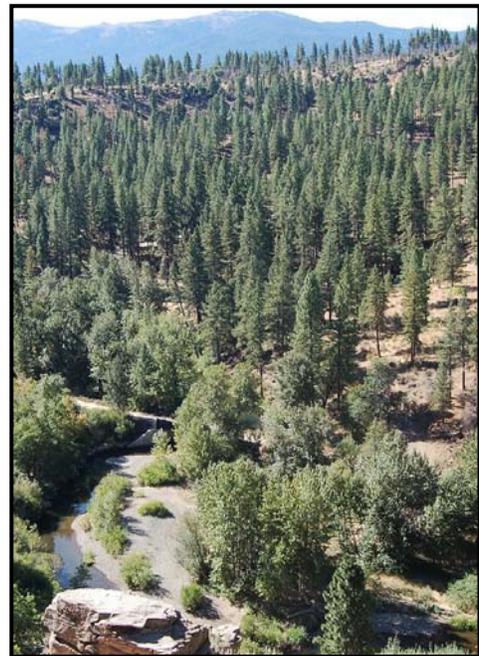


Figure 1. Hobo Camp (Center) from Hwy 36

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Figure 2. Lower Hobo Camp. Hwy 36 is on top of the ridge in the background.

## **Observations**

One overstory pine tree, in upper Hobo Camp adjacent to the parking lot, was recently killed by bark beetles. Several other smaller pines, just outside the camp, have recently died as a result of insect and/or fire damage. All but a few suppressed ponderosa pine trees in lower Hobo Camp are growing at an acceptable rate for the site.

Several ponderosa pine trees in lower Hobo Camp were cored to observe their growth rings. The stand was determined to be two-aged: 160 years and 92 years. The site quality was determined to be a Dunning II which is equivalent to a site index of 90. Basal area was measured to range between 200 ft<sup>2</sup> and 250 ft<sup>2</sup>. The normal basal area guideline (Meyer, 1938) for 160 year old ponderosa pine with a site index of 90 is 213 ft<sup>2</sup>. Current ring growth on the dominant and codominant trees indicates acceptable growth to maintain tree health at this time.

The size, number and health of the pine in Hobo Camp compared with the condition of the pine in the surrounding forest are evidence of the superior growing conditions present in the deeper soils next to the Susan River. An occasional pine tree in the surrounding forest has been killed by bark beetles, but no mortality was observed in the dominant pine in lower Hobo Camp. A few pine stumps of all sizes can be found scattered throughout Hobo Camp, indicating that a low level of pine mortality has been ongoing over recent years.

The crowns of most dominant and codominant ponderosa pine in Hobo Camp are full and appear healthy. Some of the intermediate and overtopped crowns have much less foliage and appear less healthy. One slightly suppressed pine in the lower camp with an intermediate canopy position has a declining crown (Figure 3).

Structurally, the pine trees in lower Hobo Camp appear to be stable. No windthrown trees were observed. Hobo Camp is partially located in a small hollow which is most likely sheltered from the most violent winds. However, many of the large pine in the camp have forked crowns (Figures 4, 5 and 6). One of these has a very large fork (Figure 4) which is leaning towards a large flat area where visitors may congregate. Also, the large tree pictured to the right of the forked tree in Figure 4 is leaning towards the opening.



Figure 3: Declining crown.

Figure 4. Forked and leaning trees.

Figure 5. Forked tree

Fig. 6. Forked tree

## **Discussion and Treatment Alternatives**

**No thinning:** The pine stocking in Hobo Camp is at 100% of normal on average. Doing nothing in Hobo Camp will maintain the stand at a stocking level that is slightly higher than what would be recommended to reduce the risk of bark beetle caused mortality. Some scattered mortality of individual trees can be expected during very dry years and periods of elevated bark beetle activity. During significant periods of below normal precipitation, increased mortality can be expected, especially in the steeper uplands where soils are shallow and have a limited water holding capacity.

**Thin from below:** Inter-tree competition and moisture stress can be reduced in lower Hobo Camp by thinning the pine to basal area  $192 \text{ ft}^2$  (i.e. 90 percent of normal ( $0.9 \times 213 \text{ ft}^2 = 192 \text{ ft}^2$ )). Further, thinning to a level that is at 80% or less of normal will reduce the risk of future bark beetle caused mortality. The BLM is planning to reduce the pine stocking outside of Hobo Camp from approximately  $175 \text{ ft}^2$  to approximately  $80 \text{ ft}^2$ . Something approaching this level of treatment will be necessary to reduce future mortality in the upper extremities of Hobo Camp where soil moisture is most limiting and the site quality is poorer.

Since the intermediate and overtopped trees are the least vigorous and most stressed, it is logical to remove them during any thinning operation. However, removing only these trees will only slightly reduce basal area. The basal area in many places will remain over  $213 \text{ ft}^2$  and the risk of bark beetle attack will remain slightly elevated.

**Aggressively thinning large and small pine:** Thinning the large ponderosa pine to 192 ft<sup>2</sup> basal area (90 percent of normal) in the lower camp could lower the risk of future bark beetle caused mortality. More aggressive thinning will be required for the pine growing on the drier soils in Hobo Camp where the site quality is lower. This alternative will allow for the removal of some of the large forked or leaning pine trees that could become future hazards.

It should be noted that many recreation areas like Hobo Camp have a history of vehicular and foot traffic which compacts soil around tree roots. Soil compaction reduces water holding capacity and may damage roots. Where compaction exists, trees may not respond as expected after thinning treatments.

### **Drought mitigation measures**

Regardless of the treatment implemented at Hobo Camp, during an extended drought period many pine trees could be attacked and killed by bark beetles. Two short-term preventative measures which could reduce pine mortality during such an event are preventative spraying with insecticides and deep watering.

To be effective, preventative spraying should saturate each tree bole (greater than 8" DBH) with a registered insecticide before it becomes infested with beetles. Treatment provides up to two years of protection. Trees must be treated prior to mid-May to be effective (ie. before the first beetle flight of the year). Consideration needs to be given to the choice of insecticide since the campground is in close proximity to the river.

Since Hobo Camp is located on Susan River, deep watering may be the most practical and inexpensive alternative because of water availability and the safety of not using chemicals near the river. To be effective, deep watering needs to provide water to tree roots early in the growing season before the tree becomes stressed. Deep watering, however, will not prevent bark beetle attacks during outbreak or epidemic conditions when bark beetles can attack and kill trees regardless of vigor.

### **Hazard trees**

Forked and leaning trees are often considered to be at higher risk of failure than straight trees with one stem. For this reason it is important to monitor Hobo Camp for tree hazards annually. In addition to the traditional practice of annually identifying and removing dead trees and other hazards (eg. large dead branches or dead tops) in areas where people congregate, Hobo Camp managers need to monitor forked and leaning trees for bole cracks or soil movement near the base which indicate that these trees are becoming hazardous.

### **Conclusion**

Hobo Camp is a unique and beautiful day-use area located a short distance from Susanville. The ponderosa pine trees in the camp have survived 160 years partly because they are growing on a north-facing slope in a protected hollow where the soils are deep. The large

pine trees are now slightly overstocked and some mortality is occurring. The risk of future bark beetle related mortality can generally be reduced by thinning to at least 80% of normal. However, excessive soil compaction may be an issue within Hobo Camp and thinning may not provide a significant growth and vigor response. Since the ponderosa pine in Hobo Camp are considered high value trees for recreation and aesthetics, other management options exist, such as preventative spraying and deep watering, that may allow land managers to maintain higher stand densities without significant bark beetle caused tree mortality.

Forest Health Protection can assist with funding on a competitive basis for thinning the trees in and around Hobo Camp for the purpose of reducing the risk of future bark beetle caused mortality. If future conditions warrant a preventative spray project, Forest Health Protection may also assist with emergency funding for NEPA documentation and spraying high value trees. Funding is granted based on availability and regional priorities.

If you have any questions regarding this report and/or need additional information please contact Danny Cluck at 530-252-6431 or Bill Woodruff at 530-252-6680.

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