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**Subject: FY 2006 Progress Report on HFQLG Pilot Project Monitoring
Effects of the Pilot Project on the Stand Structure Attributes**

To: Kurt Winchester, HFQLG Monitoring Team Leader

The following monitoring questions relate to the stand structure attributes and the effect of the Pilot project on these attributes.

- 1): *Do Silviculture and fuel treatments meet California Spotted Owl Interim Direction, fuels, and other stand objectives?*
- 2): *Are the desired abundance and distribution of snags and logs achieved in DFPZs and Group Selections?*
- 3): *Does the implementation of silvicultural prescriptions produce or retain desired stand elements such as logs, canopy cover, large trees, and early seral stage?*
- 4): *Do silvicultural treatments meet California spotted owl interim direction, and fuel and stand objectives over time?*

Background and Sampling Intensity

Overview of Treated Stand Structure Monitoring to Date.

These questions are being answered using one set of protocols that measures stand structure attributes and their changes as a result of the project. Data is collected regarding the desired attributes of the stand structure, fuels, and understory vegetation for both the pre- and post-treatment monitoring. The methodology to measure the stand attributes was formatted using the monitoring procedures of the Forest Health Pilot except that some modifications were made for the understory vegetation attributes and canopy cover.

DFPZ Sampling Plans

The original plan was to sample a set of 70 treatment units before treatment, and re-sample these same 70 units one year after treatment and five years after treatment. The initial sample pool of 70 units included treatment units without bias toward any specific treatment, forest type, or location. Thirty-five units were randomly selected in 2001 and another 35 in 2002 from the pools of units that were approved for implementation each year. Due to the mitigation measure that prevented treating any stands in suitable California spotted owl habitat, all of the 70 sample plots fell within DFPZ treatments and were heavily weighed to ranger districts on the eastside of the Sierra-Cascades outside of California spotted owl habitat.



In 2005, the HFQLG Steering Committee decided to fund the establishment of 70 additional DFPZ monitoring samples. No new plots were established in 2005 due to a lack of candidate stands in new projects.

In 2006, 21 new monitoring samples were established. Seven additional DFPZ samples were monitored for post treatment stand structure. Black's Ridge Units 26 and 28 on the Hat Creek Ranger District and Bidwell Unit 62 on the Eagle Lake Ranger District were measured one-year after treatment in 2006. In addition, 4 units in the Antelope Border DFPZ were measured after the June 2006 Boulder Wildfire. Two of the Antelope Border units were post-one year and two were post-four year monitoring efforts. The summaries of the pre-treatment and post-treatment monitoring are included for these seven units as Appendix 1.

This brings the total of units that have been received post treatment monitoring to 16 of the initial set of 70 units. Five years after the installation of the first pre-treatment plots, 23 percent have completed the mechanical work and underburning.

Group Selection Sampling Plans

In 2004, after the Sierra Nevada Framework Project Amendment was approved, HFQLG projects started to include Group Selection treatments. In conjunction with this change in project plans, a decision was made to establish a second set of 70 plots specifically focused on group selection. The sampling strategy used for the DFPZ monitoring was repeated to monitor the group selection treatments. Group selection units will be randomly selected at a rate of ten units per ranger district until the desired total is reached. This set of data for group selection treatments will be considered as a discrete sample pool. The results from the group selection monitoring will not be combined with the results of the DFPZ monitoring.

The forest stands being monitored in this sample set are not limited to the actual group selection units since the effects of treatment activities will extend beyond the boundary of each 0.5 to 2.0 acres unit. Potential changes to the stand structure of adjacent areas may result from construction of skid trails and landings to remove harvested trees; damage of adjacent trees from timber falling; and potential wind throw of trees along the edge of group selection units. Therefore, the stands where the plots are installed consist of an entire vegetation polygon containing the selected Group Selection units. In some instances a subdivision of a vegetation polygon may be selected. The criteria for selection of a subdivision of a vegetation polygon is based on other topographic (ridge / drainage) or cultural features (road / trail) that would limit the extent of the treatment activities to only a portion of a vegetation polygon. Plots are randomly located within the vegetation polygon and may or may not actually intersect the group selection unit.

The HFQLG Steering Committee decided in 2005 to double the number of group selection units to be monitored. This will bring the total of group selection monitored units to 140. In 2004, group selection monitoring plots were established in ten units in the Meadow Valley project on Mt Hough R.D. No new units were established in 2005 due to a lack of candidate stands in new projects. Twenty additional stands were randomly selected and monitored in 2006. Units were measured on the Feather River, Mt Hough and Hat Creek Ranger Districts. None of the previously measured group selection units were ready for post-treatment monitoring in 2006.

Results

The California Spotted Owl related stand structure portions of monitoring questions 1 through 4 is not applicable to the Blacks Ridge, Antelope Border or Bidwell projects. These projects are not within suitable habitat for California Spotted Owl and the stand management objectives were focused on silvicultural (stocking control) and fuel reduction objectives.

The treatments are effectively reducing the canopy cover, ladder fuels, and down woody fuels. The treatments have consisted mostly of thinning from below that also results in an immediate increase in the average diameter of the remaining trees. The basal area of large trees remained constant in all units indicating that large trees retention objectives were met. The amount of early seral shrub and herbaceous vegetation has also been observed to increase as the canopy cover is reduced.

The Boulder Fire in June of 2006 tested the effectiveness of the treatments in preserving a desired stand structure. Three of the Antelope Border units were within the fire perimeter and experienced a wide range of fire effects. Unit 15b was adjacent to drainage and suffered the greatest damage to the existing forest structure. This unit had been mechanically treated in 2002, but had not yet been underburned. The unit has very low canopy cover, 11% in trees over six feet tall, and had 22% shrub cover with an average height of three feet. After the fire, the scorch height exceeded 15 feet on many of the trees, the shrubs, and down woody fuels were nearly 100% consumed. Most of the remaining trees survived the fire but should be monitored for long-term effects.

Antelope Border Units 15a and 13b had been underburned three years before the Boulder Fire. The majority of the stand structure in these units remained intact after the fire. Scorch height on most trees was less than four feet with a small percentage of trees being scorched up to 10 feet in height. The most significant changes were the reduction in small woody fuels and snags.

Snag numbers were generally reduced on treated stands and had fewer snags than the prescription recommended. Two of the Antelope Border units and both of the Black's Ridge units had no snags greater than 15 inches before treatment and none were recruited. The Bidwell aspen regeneration unit had 5 snags per acre before treatment and all were lost during the treatment. Antelope Border units 22 and 15b both reduced snags to the objective of 3 snags per acre.

Large wood was generally less abundant than prescribed both pre- and post-treatment. The amount of large logs (greater than 20" diameter) declined in Bidwell unit 62 from 5 to 1 ton per acre and in Black's Ridge unit 26 from 3 to 0 tons per acre. Antelope Border unit 22 increased from 3 to 6 tons per acre. The remaining four units had no large logs prior to treatment and recruited none.

Conclusion

The amount of post treatment data still is sparse with only 23 percent of the monitored DFPZ units being completed and none of the monitored group selection units completed. The results to date show the retention of large trees, significant reduction of ladder fuels, reduction of down woody fuels to below maximum acceptable levels, and reduction of canopy cover to less than 40 percent cover. The ability to answer monitoring questions 1 through 4 remains limited as the vast majority of monitored units are outside of the range of the California Spotted Owl.

Key Findings

The amount of post treatment data still is sparse with only 23 percent of the monitored DFPZ units being completed and none of the monitored group selection units completed. Comprehensive results will not be available until a larger sample size has been monitored.

1 & 4): Do Silviculture and fuel treatments meet California Spotted Owl Interim Direction, fuels, and other stand objectives?

Stand restructuring objectives were met in all stands, whether for fuels and canopy reduction or aspen regeneration. No units were treated in suitable California spotted owl habitat and therefore not available to analyze California Spotted Owl Interim direction.

2): Are the desired abundance and distribution of snags and logs achieved in DFPZs and Group Selections?

Snag numbers were generally reduced on treated stands and had fewer snags than the prescription recommended. Large wood was generally less abundant than prescribed both pre- and post-treatment.

3): Does the implementation of silvicultural prescriptions produce or retain desired stand elements such as logs, canopy cover, large trees, and early seral stage?

The treatments are effectively reducing the canopy cover, ladder fuels, and down woody fuels. The basal area of large trees remained constant in all units indicating that no large trees were lost during treatment.

Appendix A

Data Summary Sheets for FY2006 1-year and 4-year Post monitoring TSSM plots are available for the following units:

Antelope Border 13b 4-years post-treatment
Antelope Border 15a 4-years post-treatment
Antelope Border 15b 1-year post-treatment
Antelope Border 22 1-year post-treatment
Black's Ridge 26 1-year post-treatment
Black's Ridge 28 1-year post-treatment
Bidwell 62 1-year post-treatment

Data sheets are filed at `K:/vms/tssm/NEPA_data/` and then by district and timber sale name.

Photos of plots are available at `K:/vms/tssm/tssm06/report06/tssm06pics.zip`