

# **Progress Report**

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**Interim progress report: Density Management Study Vegetation Study**

Submitted to:

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## **Project Overview**

We had a two person crew complete installation of vegetation plots for pre-treatment measurements at the new Ward Creek rethinning site. Twenty vegetation plots were installed and all trees were tagged and measured on each plot. These data will be cleaned and added to the DMS vegetation database over the summer. In addition, field verification checks were completed for all DMS sites to address missing or anomalous data values in the database. Follow-up post harvest measurements will be taken at Ward Creek next summer of 2007. The next round of field remeasurements for all thinning and treatment plots will begin the summer of 2008.

All 2005 data from thinning and treatment plots has been cleaned and added to the DMS vegetation database. The DMS vegetation database is currently available online for public query at <http://ocid.nacse.org/nbii/density/>. The DMS vegetation metadata will be published by NBII in the data clearing house.

Most of the data analyses are complete for the vegetation study and we are preparing a manuscript for publication on initial response of vegetation to the initial thinning treatments. Results from this work will not be summarized here, but will be submitted this fall for publication. Results from the analyses of thinning plot data evaluating relationships of overstory and understory vegetation at initial thin and rethin sites are reported here. In addition, we are preparing a manuscript on the rethinning study initial results.

A new post-doc, John McKenna, started on the project August 1, 2006. John will be taking over the position for Shanti Berryman. He will be working on a part-time basis remotely and will join us full time beginning of next year. His initial efforts will be to prepare the findings from the rethinning study for publication.

## **DMS and Vegetation Study Background**

The BLM Density Management Study (DMS) was designed to investigate whether thinning at various densities can accelerate development of late-successional characteristics in managed young forests (40-70 yrs), while permitting timber production at the same time. Such an approach is critical in the PNW where a large portion of federal forest lands are young, even-aged conifer plantations. The DMS consists of two components: initial thinning treatments (7 sites) and re-thinning treatments (5 sites; note that Keel Flats was dropped from the study and Ward Creek was added this year, 2006). These 12 DMS sites are located on four BLM districts in western Oregon: Salem, Eugene, Roseburg, and Coos Bay.

The vegetation study has two main components at this time, both are long-term monitoring studies:

1. Overall treatment effects: OSU installed new vegetation monitoring plots at each of the initial thinning sites to evaluate overall treatment effects (for objectives, see

Vegetation Measurements and Analysis of the Density Management Study Proposal, K. Puettmann 2003). These treatment plots were randomly located within the treatments, including gaps and leave islands.

2. Overstory/understory relationships: Permanent vegetation monitoring plots were initially established by the BLM at each site to monitor the relationships of overstory and understory vegetation to target thinning densities (at rethinning and initial thinning sites). These thinning plots were only established in thinned forests, excluding gaps and leave islands.

## **Project Results**

### **Research**

Summary Results are presented in the Results Appendix, summarizing overstory and understory relationships for the initial thin and rethin sites. These findings are based on analyses of thinning plot data and are therefore limited in inference to areas only where target thinning densities were achieved during harvest. Results of overall treatment effects are being prepared in a manuscript that will be submitted this fall and are not summarized here as part of this report (see summary tables in the Overstory and Regeneration Appendices). Results from the rethinning study are also being prepared for publication this fall/winter.

### **Field Season 2006**

A two person field crew was hired to install new vegetation plots and complete all pre-treatment measurements in May-June at the new Ward Creek rethinning site. This is the first DMS site for which we will have pre-treatment vegetation data. Data were collected following the thinning plot protocol to allow future comparison among all rethinning sites. For added efficiency, the thinning plot protocol was not followed for the characterization of stumps and large coarse woody debris, instead we followed the “treatment plot” protocol. The Ward Creek plots will be revisited post-harvest for vegetation measurements. Data from the Ward Creek plots will be cleaned and updated to the DMS vegetation database this summer.

The crew also performed “field verifications” for data from previous years flagged as anomalous or out-of-range and they will collect missing data (i.e., only for missing data that was not time sensitive). These corrections will be made in the current database.

### **Vegetation Database**

We have finalized the DMS vegetation database and website interface. The data is published on the DMS website for public query and download (<http://ocid.nacse.org/nbii/density/>). Additional updates and fine-tuning will be made to the web interface as necessary. This accomplishment was achieved in collaboration with the Northwest Alliance for Computational Science and Engineering (NACSE), associated with NBII. As new data come in, NACSE will follow a standardized protocol to update

the web database. In addition, a working database will be used by our research team at OSU for future research. This database will be tailored to meet specific research needs and will be updated as new data are collected.

The data management and documentation efforts for the data collected over the past years are complete and the DMS vegetation metadata are complete. Cheryll Solomon, a metadata specialist with USGS National Biological Information Infrastructure (NBII) helped us develop and publish the metadata following a standardized format. The metadata will be updated annually.

## **DMS Vegetation Study Timeline**

### August – December 2006

- Transfer project coordinator position to the new post-doctoral researcher associate, John McKenna, starting August 1, 2006
- Complete and submit manuscript on understory vegetation response to thinning treatments (treatment plot data; Shanti Berryman, Klaus J. Puettmann)
- Complete and submit a manuscript on overstory and understory response to the rethinning treatments (John McKenna, Shanti Berryman, Klaus J. Puettmann)
- Clean 2006 Ward Creek data and integrate into the DMS vegetation database
- Prepare progress report for December 2006

### **Outreach efforts in 2006 (January-June)**

#### **Talks:**

Coates D., **K. Puettmann**, and C. Messier. 2006. Silvicultural Strategies for Managing Complex Structured Forests: Research Approaches, Prediction and Trade-offs. **Invited Keynote..** Natural Disturbance-Based Silviculture: Managing For Complexity. IUFRO 1.14.00 Uneven-aged Silviculture Research Group Conference. Rouyn-Noranda, Quebec, Canada. May 14-23, 2006.

**Puettmann, K. J.** 2006. Silviculture Research to Manage Complexity. CSREES review. April 11, 2006. Department of Forest Science, OSU, Corvallis, OR.

**K. J. Puettmann** and D. Wilson. 2006. What have we learned about young stand management in the last 15 years of studies? BLM Western Oregon RMP Revisions – Science Syntheses Workshop. Corvallis, OR. June 15, 2006.

**K. J. Puettmann**, D. Wilson, and J. Cissel. Managing Young Stands for Biodiversity: What Have We Learned from Young Stand Studies in Western Oregon? USDA Forest Service Biodiversity Initiative: Managing Biodiversity in Pacific Northwest Forests: Strategies and Opportunities. Portland, OR, June 5-7, 2006

**Puettmann, K. J.**, D. Olson, and P. Anderson. 2006. Density Management Study. Large Scale Management Studies Technology Transfer Workshop. April 12-13, 2006, Bonneville, WA.

**Field Trips:**

Green Peak field visit w/ graduate class: FS533 Fundamentals of Silviculture.