

Research/Teaching/Demonstration Project Study Plan – Sorting Fir-Acoustics

7 November 2006

1. Relevance to McDonald-Dunn Forest Plan

Forest Plan Appendix – Silviculture Team (Theme 2)

The McDonald-Dunn Forest Plan established five appendix teams to write appendices and investigate research questions in the forest. The Silvicultural Themes Team developed a Silvicultural Framework attached as Appendix 2 to the Forest Plan. The Silviculture Team is also proposing and leading four RTD Projects beginning in CY2007.

The project proposed in this study plan supports the Forest Plan by testing a novel sensor field method for determining the best markets for Douglas-fir logs harvested from Theme 2 plantations.

2. Title of RTD Project

Theme 2 Sorting Fir-Acoustics Project: in-forest log-segregation by acoustics for high-quality wood in McDonald-Dunn Forest

3. Principal Investigator

Glen Murphy

4. CY2007 Requests from FEC

Funding Request – potential revenue loss of \$4,000 - \$9,000

College Forests staff-time request – 10 days

5. Objectives of RTD Project

The objectives of the Sorting Fir Acoustics Project are to (1) research and demonstrate how to capture additional value from intensively managed forests, (2) measure the wood-stiffness of Douglas-fir logs through acoustic evaluation in the field during a Theme 2 timber harvest in the McDonald-Dunn Forest during CY2007, and (3) evaluate the costs and value gains from fitting acoustic segregation technology to mechanized harvesting equipment. This will be the seventh site included in a larger study supported by industry; Roseburg Forest Products provided six other

sites, equipment and logistical support and tracked logs through to finished product (green veneer) from their six sites during summer 2006.

6. Timeline: 2006-2007

2006: Trees in the harvest unit have been tagged and analyzed; contracts written-up.

2007: During the harvest, acoustic resonances will be measured and evaluated. Students will be invited to observe.

2008: Results will be written up, compared to other studies, and published.

7. Basic overview of approach/methods

Evaluating wood stiffness through acoustics involves:

- (1) Measure 200 standing trees using acoustic tools
- (2) Fell and extract the trees to roadside
- (3) Measure acoustic stiffness of all processed logs on the ground
- (4) Measure a sub-sample of logs in more detail as they are being bucked on a processor
- (5) Predict output of the logs in terms of veneer grade recovery using relationships developed for logs from the six Roseburg Forest Products sites

8. Budget for Project: CY2007

2007: The Sorting Fir-Acoustics Project is requesting up to \$9,000 to reimburse the College Forest for revenue loss due to slowing down the harvest procedure for measurements. The revenue loss is estimated by College Forest staff to be as little as \$4K and as great as \$9K.

9. Teaching components of RTD Project

Students will be invited to observe the process during harvests. Murphy will address classes about the technology on request. One PhD student will focus part of their thesis work on this Project.

10. Outreach components of RTD project

Results of the Sorting Fir-Acoustics Project will be submitted for publication in 2008 and will be presented to 3rd International Forest Engineering Conference.