

Rationale and Objectives

Studies have shown that non-planted vegetation can be a major competitor for resources in loblolly pine (*Pinus taeda*) plantations. However, studies addressing carbon storage and flux from non-planted species are rare. Information describing carbon cycling in non-target species may be useful in determining ecosystem carbon budgets and its effect on loblolly pine productivity.

The objective of this study is to determine the effects of site, silvicultural treatments, and stand density on non-planted vegetation characteristics in loblolly pine plantations. A description of developmental patterns of non-planted vegetation throughout stand development will be produced. This information will be useful to PINEMAP objectives by incorporating non-planted species biomass estimates into 3-PG and carbon budget models.

Methods

Data used in this project will come from Pinemap Tier II sites and previously collected data from Plantation Management Research Cooperative (PMRC) studies (Figure 1). PINEMAP sampling will provide one-time sample data, while the PMRC data will provide a series of measurements obtained over multiple two-year periods.

The effects of site and stand density on developmental patterns of non-planted vegetation attributes such as size, type, and abundance, will be analyzed from age two through mid-rotation. Competition control, fertilization, and thinning in mid-rotation stands will be analyzed for their effects on non-planted vegetation after treatment. An effort to relate the PMRC sample data to the PINEMAP biomass data will be made through graphical analysis, correlations, and regression techniques. If a relationship exists, estimates of biomass from age two through mid-rotation will be produced.



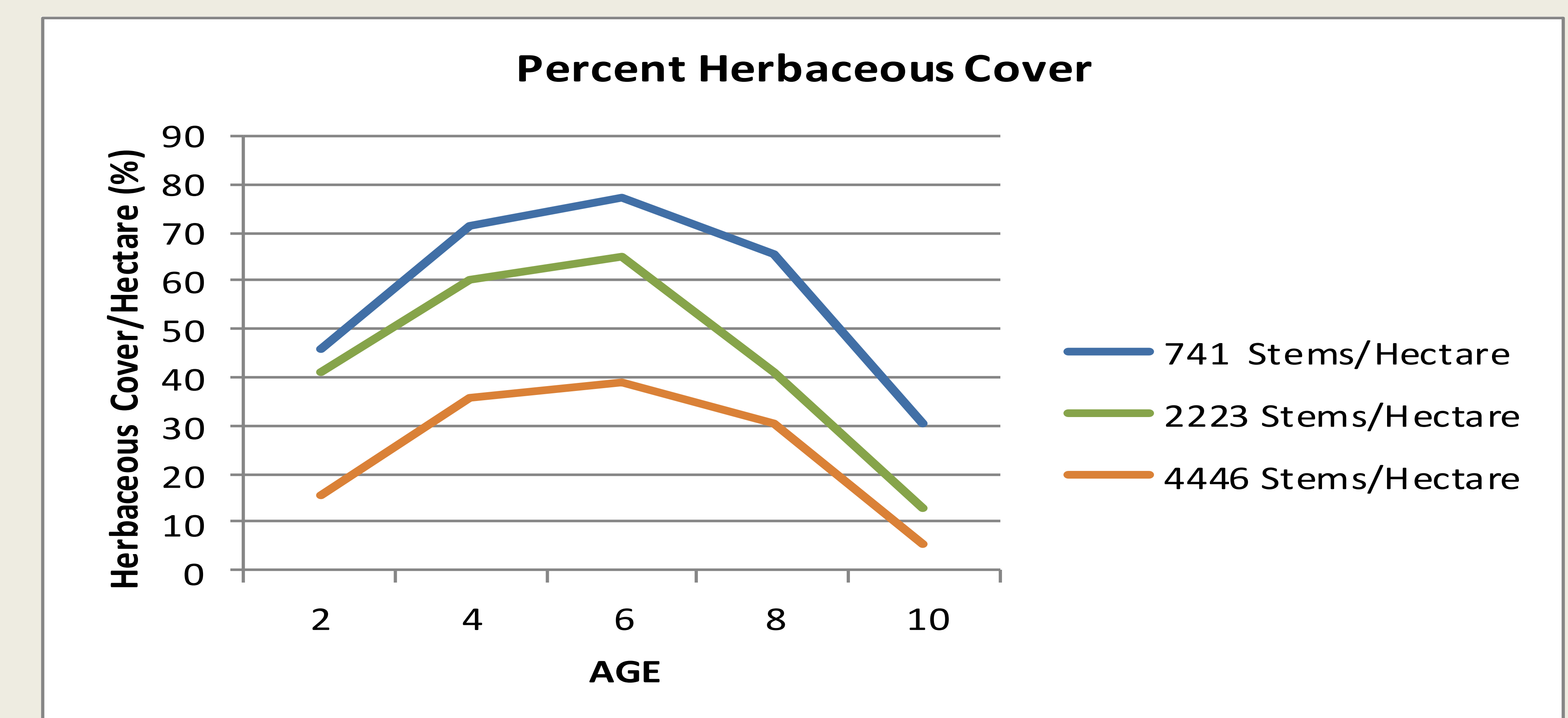
Figure 1. Differences in non-planted vegetation under differing silvicultural regimes (PMRC Site).

Expected Output

Non-planted vegetation patterns from age two through mid-rotation and characteristics after mid-rotation treatments

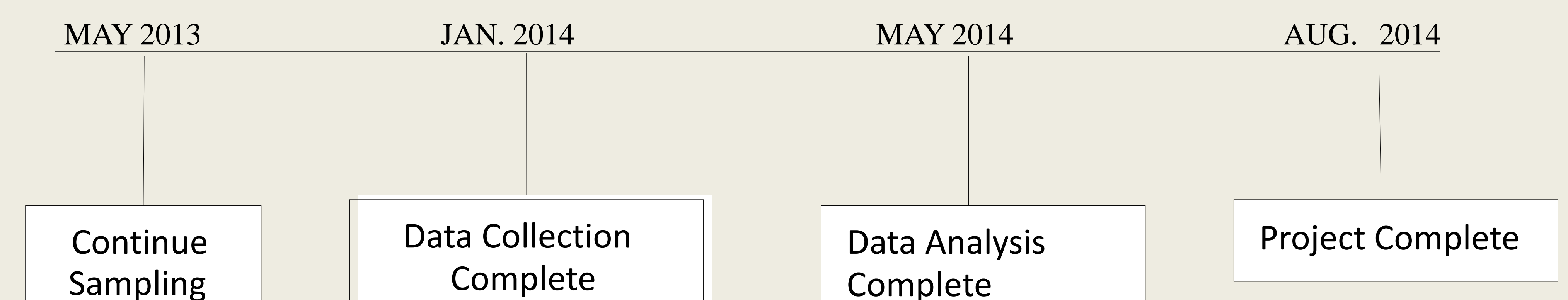
- Biomass per hectare
- Average height and diameter of woody stems (>1.37m height)
- Stems per hectare of woody plants
- Percent groundcover of herbaceous plants (Figure 2)

Figure 2. Example graph of expected output for percent herbaceous cover.



Project Timeline

- Of the 40 PMRC/Pinemap study sites, 14 sites within the UGA/Auburn sub-region will be sampled by January 2014.
- We will be asking the other universities to collect and share data from their sub-regions by January 2014
- Project completion is expected by August 2014.



PINEMAP Linkages

- Aims 1 & 2 (Dr. Stape and Dr. Teskey)- Incorporating non-planted vegetation into 3-PG models
- Aim 2- (Dr. Burkhardt)- Quantifying non-planted vegetation and carbon