Sacramento Mountain Wood Industry Summit March 2016

Logging Utilization in New Mexico

Eric Simmons
Steve Hayes
**State Level Logging Utilization Objectives**

The goal is to update logging residue data for New Mexico. The study is designed to provide factors that are scalable to commercial timber harvesting operations at the state level.

- Characterize harvest operations
- Profile harvest by tree dbh
- Develop residue ratios for calculating residue quantities based on harvest volume
**Terminology**

**Growing stock** vs. non-growing stock

**Removals** = volume cut

- **Timber products** = logs to mills
- **Logging residue** = left in woods, component of “slash”
**Site selection**

- Based on recent county level harvest volumes
- Measurable felled trees & stumps
- Commercial products
- Not salvage
- Safe!

Map courtesy of Chelsea McIver, Research Specialist in our program
Logging Utilization Methods

Site information from loggers & foresters

- equipment & methods used
- products & receiving mill(s)
- log lengths & small-end diameters
- cutting card was a utilization guide!
- checked log decks and residue piles for top diameters.
Logging Utilization Methods

Felled-tree measurements:
- Species & cut stump height
- Diameters along bole at key points & sections ≤ 16’ from ground to tip of main stem
- Identify each bole section as used (product) or not (residue)
Preliminary Results

- 55% of sites were mechanically felled and merchandised
- All 20 sites employed ground based skidding
- On 70% of sites trees were skidded tree length & merchandised at landings
Trees by diameter

- 50% of trees were ≤ 12 inches dbh, provided 40% of volume & created 55% of the total logging residue.
- 50% of volume came from trees ≤ 14.5 inches dbh & created 72% of the total logging residue
- Generally speaking, smaller diameter trees produce proportionally more logging residue than larger diameter trees
Proportions of mill delivered volume, harvested trees, and residue per mill delivered volume by tree dbh, New Mexico.
**Trees by species**

- **Percent of sampled tree volume by species**
  - Ponderosa pine: 60%
  - Douglas fir: 21%
  - Spruce: 9%
  - White fir: 7%
  - Southwestern white pine: 3%

- **Percent of harvest volume by species 2012**
  - Ponderosa pine: 54%
  - Douglas-fir: 19%
  - Other species: 15%
  - True firs: 8%
  - Spruce: 4%

**Sample from logging study**
- Ponderosa pine: 60%
- Douglas-fir: 21%

**Harvest based on mill survey**
- Ponderosa pine: 54%
- Douglas-fir: 19%
New Mexico removals factors

For every 1,000 cubic ft. (cf) of volume delivered to the mill:

• 1,053 cf of growing stock (GS) is removed
• 979 cf of GS is delivered to the mill
• 74 cf of GS logging residue is created
• An additional 21 cf of non-GS (stumps and tops) is delivered to the mill
New Mexico harvested tree bole utilization

Harvested tree bole
(portions of main stem from cut stump to tip of tree excluding limbs)

- 1.9% Non-growing stock mill delivered
- 89.6% Growing stock mill delivered
- 6.8% Growing stock logging residue
- 1.7% Non-growing stock bole residue

In New Mexico, 8.5% of the harvested bole volume (plus limbs & tops) remains in the woods as logging residue.
Uses for this information

- Removals factors
- Whole tree volume equations for tops and limbs
- Mill study data
- Scalable to harvest

1.76 green tons of residue per MBF of commercial harvest
Logging residue estimates based on 2012 TPO data.

Total 50,690 green tons

- Area 1 - 38%
- Area 2 - 33%
- Area 3 - 12%
- Area 4 - 11%
- Area 5 - 6%

Residue estimates prepared by Todd Morgan, the Director of our program
Sustainable Stewardship

The resource: Land managers
Northwest Advanced Renewables Alliance (NARA)

Washington State University, Oregon State University, Idaho State University, University of Washington and The University of Montana

• The answers will not be the same for New Mexico
• Methodologies may be useful
• Supply chain
• Logistics
• Life cycle analysis (carbon accounting)
• Socio-economic analysis
• Quantifying residues (already partially done with this study)

http://nararenewables.org/
Thank you and see you in the woods!

Eric Simmons: eric.simmons@business.umt.edu
Steve Hayes: steve.hayes@business.umt.edu
http://www.bber.umt.edu/fir/