The impact of wood procurement pressure on sustained yield management on private non-industrial forestland in the Northern Forest

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The use of sustained yield management on family-owned woodlots managed for timber is not tied to wood procurement pressure from sawmills so much as individual landowner characteristics. Political and cultural efforts to promote sustained yield management can be successful and should not fail to target even engaged landowners, who show room for improvement.

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Family forest owners control more than half of all forestland in the Northern Forest states of Maine, New Hampshire, New York, and Vermont. Timber harvesting on these lands has seen a significant increase in recent decades, making the sustainable management of family forests increasingly important for protecting the integrity of forested ecosystems. At the same time, the timber industry is vital to the Northern Forest region and has been identified in policy as a cornerstone for future economic development. Sustainable forest management is therefore important socially as well as environmentally. Understanding those factors that influence management decisions is a first step toward fostering an atmosphere that promotes sustained yield management. For instance, does wood procurement pressure sawmills encourage overharvesting and exploitation, or does it give landowners the financial flexibility to practice sustained yield management? The answer will allow policy makers and managers to predict the effects of changing markets and better plan for them. Past research has examined the level of landowner engagement on their forestland, but few studies have explored how these factors correlate to actual forest management.

In this study we interviewed family forest owners and conducted field surveys on 59 properties of at least 25 acres of timberland, in a four-county region of Vermont, who had harvested timber in the last 5 years. Using recent geospatial wood procurement pressure data, we were able to search for relationships between actual management outcomes and sawtimber procurement pressure, as well as other factors. Sawtimber procurement pressure and competition were not shown to correlate to landowners’ use of sustained yield management (sustaining timber yields and protecting surface water quality), suggesting that this factor will neither help nor hinder sustainable management efforts. Enrollment in Vermont’s Use Value Appraisal tax abatement program, on the other hand, was notably correlated to better forest stocking and practices that protect water quality, demonstrating the success of the program. In addition to examining these factors, we classified landowner engagement in forest management and determined that engaged landowners implement sustained yield forestry during harvest operations. Mediocre management, though, even on engaged landowners’ properties, show that public and cultural programs can still make a difference among these owners and they should not be written off as management successes.
Background & Justification

- Family forests are important to Vermont’s economy and society and are the primary sawtimber source in the state.
  - 67% of forestland in VT is family owned.
  - Forest-based industries add over $1.2 billion to the VT economy and employ almost 10,000 individuals.
  - The average forested acre in VT generates $335/year, in addition to providing ecosystem services.

North East State Foresters Association 2007

- The sustained quality and abundance of the timber resource depends on landowners’ management activities and the factors that influence them.
Many factors are thought to influence family forest owners in their management decisions.

- Sawtimber markets
- Property taxes
- Government subsidy programs
- Educational programs
- Professional management planning

Past research on the effect of these factors has focused on landowners’ intentions and motivations rather than management outcomes directly.
Research questions:

- Does wood procurement pressure from sawmills affect the use of sustained yield management (management that protects a forest’s capacity to grow quality timber into the future while protecting ecological resources)?
- Specifically, is there a relationship between wood procurement pressure and forest stocking, BMP implementation, and landowner characteristics?
- What other factors relate to sustained yield management outcomes?
- Are landowners who intend to use sustained yield management successfully using it?
Methods

- Used Dillman’s Tailored Design Method (2000)
- A sample was created of 2144 private individuals and families from tax parcel data of Chittenden, Washington, Caledonia, and Essex counties in Vermont.
- Family forest owners were selected who:
  - Owned 25 acres or more of timberland
  - Had harvested timber in the last 5 years
- Response
  - 113 qualified respondents replied
  - 59 were sampled due to time constraints
Methods

- **Field Sampling**
  - Systematic sample of 1/10th acre plots were measured across each harvest area.
  - These plots measured forest stocking and species composition.
  - Stumps were also identified and measured.
  - Use of Best Management Practices for protecting water quality (BMP) was evaluated on skid trails, landings, and water diversion devices.

- **Social Sampling**
  - Interviews were conducted in person or by phone depending on landowner availability.
  - Forest owners were asked to respond to a number of background and land use questions to evaluate the level of landowner engagement.

- Forest stocking management was evaluated using the following four criteria. Scores ranged from 0 (poor implementation) to 1 (sustained yield management).
  - Post-harvest relative density and percentage of relative density removed
  - Change in Quadratic Stand Diameter
  - Percentage of sawtimber removed
  - Percentage of poles removed
Methods

- In order to evaluate if highly engaged landowners practiced better forest management we looked at two factors: 1) landowner engagement, 2) landowner interest

**Landowner Engagement**
- Cost share programs
- Management plans
- Use of a forester in harvests

**Landowner Interest**
- Landowner objectives and values
- Plans for future management
Results/Project Outcomes

- Family forest owners in this study owned a mean of 110 acres of forestland. Our study sample was highly educated, with the majority of landowners being college graduates. Additionally, very few family forest owners valued timber production as a primary reason for owning land and instead valued beauty and scenery, recreation, and protecting nature and biologic diversity.

- **Landowner Characteristics**
  - 32% Absentee owners
  - 81% Participated in a cost share
  - 73% Participated in the UVA program
  - 31% Attended an education event
  - 75% With management plans
  - 59% Forester involved in the harvest
  - 47% Harvest administered by a forester

- **Top Reasons for Owning Property**
  1. To enjoy beauty and scenery
  2. For recreations other than hunting
  3. To protect nature and biologic diversity
  4. To pass on to their heirs
  5. For firewood
  6. For timber production
Results/Project Outcomes

• On average, Best Management Practices were applied with only minor deviations on landings, skid trails, and forest roads; with minor to major deviations on skid trail stream crossings; and with major deviations on water diversion devices.

• Forest stocking management was generally mediocre, but with a core group of properties practicing sustained yield management.
Results/Project Outcomes

- Sawtimber wood procurement pressure was not related to the use of sustainable forest stocking management or Best Management Practices.
  - No relationships were observed between sawtimber procurement pressure or competition and sustained yield management.
  - No relationships were observed between sawtimber procurement pressure and landowner characteristics.

- Vermont’s Use Value Appraisal tax program (UVA) stood out in its relationship to forest stocking and Best Management Practices.
  - UVA enrolled properties scored significantly higher on landing, skid trail, and water diversion device related Best Management Practices.
  - UVA properties scored significantly higher than un-enrolled properties on forest stocking management.
Our classification method identified 30 engaged landowner and 29 non-engaged landowners.

Management practices varied within each group, but overall engaged landowners used sustainable forest management more than non-engaged owners.

Similarly engaged landowners implemented BMP more effectively on skid trails and water diversion devices than non-engaged landowners.
Results/Project Outcomes

Outreach

❖ Completed:
  • 2 oral presentations
  • 6 poster presentations
  • Mailed study results to all participating landowners
  • Mailed individual woodlot reports to all participating landowners

❖ Planned:
  • 3 publications to the Journal of Forestry and the Northern Journal of Applied Forestry.
Implications and Applications

• Family forest management in the Northern Forest is not adequately sustaining environmental and economic goods and services.

• While sawtimber wood procurement pressure does not appear to encourage sustained yield management, it also does not appear to discourage it, suggesting that sawtimber markets can be developed without endangering the long-term viability of the forest.

• Tax abatement programs have a notable potential to encourage good management.
Implications and Applications

- Vermont’s Use Value Appraisal tax program is strong on protecting water quality and sustainable forest management.
- While engaged landowners practice sustained yield management more often than unengaged landowners, there is still room for improvement among them. Outreach efforts should not ignore this group.
- Findings can be used by policy makers and outreach personnel to better target efforts toward sustainable forestry.
Future Directions

• Can landowner modeling be used to predict forest management outcomes?
• How do conservation easements and other specific cultural tools influence management?
• Why are landowners who intend to use sustained yield management not always successful?
Products - Presentations


Products – Manuscripts in Preparation

