Getting involved with managing your woodland for timber products

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Retired © forestry professor
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Overview

Starting timber management
Getting help
How involved?
Forest inventory
Continuing management
Questions
Starting timber management

Management area – compartment or stand

Compartments are areas that are relatively uniform in

* forest type
* age (size)
* density
* history
* topography
Starting timber management (cont)

Forest types:
- Oak-hickory
- Northern hardwoods
- Bottomland hardwoods
- Pine
- Aspen-birch
- Spruce-fir
- Plantations
Starting timber management (cont)

**Age / size** –
- even aged, all aged, multiple aged

**Density** – crowding (open or closed)

**History** – harvesting, fire, grazing

**Topography** – slope and aspect
Starting timber management (cont)

1 - divide the woodland into compartments
2 - determine the condition of the trees in each compartment
3 - identify a timber management goal for each compartment
4 - determine activities needed to reach each compartment’s goal
5 - carry out needed management activities
Divide the woodland into compartments

Use aerial photos and walking through (GPS?) to develop a map

Minimum size – 1 to 2 acres (4)

Maximum size – whole woodland

What if entire woodland is the same or a compartment is very large?
Old field

Brushy Creek

Bottomland hardwoods

Oak hickory

Access to cabin

Pine plantation
Determine condition of the trees by compartment

Forest inventory

Involves statistics – because you usually measure only a portion of the trees in a compartment

Many uses for inventory (planning, sale preparation, land purchase)

Inventory’s use determines how many trees are measured
Determine condition of the trees by compartment (cont)

Estimate some or all
- trees/acre
- basal area/acre
- board feet/acre
- cords/acre
- den trees/acre
- $/acre

For all species combined and by species
Identify a timber management goal for each compartment

Production of veneer, sawtimber, pulp, biomass, firewood or nothing

Modify timber management to achieve a mix of goals
Determine activities currently needed by each compartment

- Planting
- Weed control
- Pruning
- **Thinning**
- Regeneration cut
- Roads, landings, skid trails
Carry out needed management activities

Do yourself or hire out

Depends upon you, your budget and your acreage
Getting help

Lots of internet resources
State agencies and extension
Master Woodland Managers in Iowa

Consultants
You need some training
You need at least some help
Interested in working with owners
How involved?

First, what to get involved in?

- Identify compartments
- Inventory
- Select production goal for compartments
- Decide management activities needed
How involved? (cont)

- Plant seedlings
- Weed control
- Precommercial thin
- Prune
- Commercial thin
- Harvest
How involved? (cont)

Depends upon you, your knowledge about forest management and your woodland

For a plantation (simplest), potentially do it all with help to get started

For northern hardwoods (most complex), less
Forest inventory

Used to estimate characteristics of trees in a compartment

“Estimate” because you take a sample
Forest inventory (cont)

What information is needed?
Depends upon management objective for compartment and age of trees

Young stands

Trees/acre and percent stocking are needed to make management decisions

Estimate by establishing many small plots in the compartment
Establish small (1/1000 Ac) plots

Count the number of seedlings in each plot

Use counts to estimate average number of seedlings per acre and percentage of plots with at least one seedling (stocked)
Forest inventory (cont)

Middle aged and old stands

Trees, basal area and volume/acre are used to make management decisions

Collect information by establishing plots and recording species, DBH and merchantable height of all trees on each plot

Fixed area vs prism plots
Establish 0.1 to 0.25 Ac plots and measure “all trees” in each plot
Forest inventory (cont)

Processing information from large plots:

**For each tree:**

Calculate basal area

\[
\text{Basal area (sq ft)} = 0.00545 \times \text{DBH}^2
\]

Look up board foot and cord volumes in appropriate volume tables
Doyle (Form Class 78) – Mesavage and Girard (1946)

**Number of 16-foot logs**

<table>
<thead>
<tr>
<th>DBH</th>
<th>1/2</th>
<th>1</th>
<th>1-1/2</th>
<th>2</th>
<th>2-1/2</th>
<th>3</th>
<th>3-1/2</th>
<th>4</th>
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<td>9</td>
<td>14</td>
<td>17</td>
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<td>66</td>
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<td>29</td>
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<td>84</td>
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<td>36</td>
<td>60</td>
<td>78</td>
<td>96</td>
<td>108</td>
<td>121</td>
<td>128</td>
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</tr>
</tbody>
</table>
Forest inventory (cont)

For each plot:
Add basal area and volumes to calculate totals for each plot

For each compartment:
Add plot basal areas and volumes to calculate averages for plots and adjust to per acre values
Forest inventory (cont)

Calculations are repetitious, a bit complicated and error prone
Excel can do some of the analysis easily
Various programs can do some aspects
TIGER for Woodlands and Compartments can do all that and more
You only need to enter the data and indicate what you want done
Forest inventory (cont)

TIGER for Woodlands and Compartments

Started 30 years ago at Iowa State U.
Dick Hall asked about a WI version

Now for seven states
   (IA, IL, MI, MN, MO, WI)

Fixed area or prism plots

Illinois and Iowa DNR use it
SIU and ISU forestry faculty use it
Forest inventory (cont)

TIGER for Woodlands and Compartments
Estimates current and future conditions
Simulates many types of thins
Displays stocking guide and tracks woodland over 20 years
The red circles are the expected tract of the stand over 20 years on Gingrich's upland oak stocking guide.
Type of inventory

- Traditional (plot based)
- 100% inventory

Basic stand information

- Woodland name
- Compartment name
- Crew names
- Year of inventory
- Size of sampled area (acres)
- Average tree age

Enter GPS coordinates for each plot?  
- No
- Yes
Which tree characteristics were measured?

- Pulpwood Height (bolts)
- Pulpwood Height (total height)
- Sawlog Height
- Veneer Height
- Tree Class

Or

- Trees Indicated for Thinning
- Future Sawlog Height
- Future Veneer Height
- Crown Ratio
- Percent Cull
- Total Height

Names for 'Other species'

<table>
<thead>
<tr>
<th>Name for &quot;Other 1&quot;</th>
<th>Other 1</th>
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</thead>
<tbody>
<tr>
<td>Name for &quot;Other 2&quot;</td>
<td>Other 2</td>
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<td>Name for &quot;Other 3&quot;</td>
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<tr>
<td>Name for &quot;Other 5&quot;</td>
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</tbody>
</table>
Site index

If you do not know the site index for any species, select any species and enter a site index of 0.

Site index species

Site index

Sampling method

Number of plots (99 maximum)

- Variable radius (prism) plots
- Fixed area plots (one size)
- Fixed area plots (two sizes, nested)

Plot size (acres)
### This is plot 1 of 4

To move to a specific plot, select the plot # in the box below and then click the Go to plot button.

<table>
<thead>
<tr>
<th>Tree #</th>
<th>Species Name</th>
<th>DBH</th>
<th>Sawlog Ht.</th>
<th>Tree Class</th>
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<td>Bur Oak</td>
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<td>0</td>
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<td>2</td>
<td>Shagbark Hickory</td>
<td>21</td>
<td>1</td>
<td>Good</td>
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<tr>
<td>3</td>
<td>Shagbark Hickory</td>
<td>19</td>
<td>1</td>
<td>HARV</td>
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<tr>
<td>4</td>
<td>Shagbark Hickory</td>
<td>16</td>
<td>0.5</td>
<td>HARV</td>
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<tr>
<td>5</td>
<td>Black Cherry</td>
<td>4</td>
<td>0</td>
<td>CULL</td>
</tr>
<tr>
<td>6</td>
<td>17-Birch spp.</td>
<td>5</td>
<td>0</td>
<td>CULL</td>
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<tr>
<td>7</td>
<td>Shagbark Hickory</td>
<td>16</td>
<td>1.5</td>
<td>Good</td>
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<tr>
<td>8</td>
<td>Shagbark Hickory</td>
<td>20</td>
<td>1</td>
<td>RES</td>
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<table>
<thead>
<tr>
<th>Start Up</th>
<th>Inventory prep</th>
<th>Inventory data</th>
<th>Stumpage rates</th>
<th>Analysis prep</th>
</tr>
</thead>
</table>
Forest inventory (cont)

Information about TIGER for Woodlands and Compartments at

www.CWMSoftware.com
Continuing management

Monitor the condition of the trees in each compartment

An annual walk through

Reinventory a few years before next planned activity

Determine activities currently needed to reach each compartment’s goal

Carry out management activities based on management plan
Questions???